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Editorial

Journal of Economics and Behavioral Studies (JEBS) provides distinct avenue for quality research in the ever-changing fields of economics & behavioral studies and related disciplines. Research work submitted for publication consideration should not merely limited to conceptualization of economics and behavioral developments but comprise interdisciplinary and multi-facet approaches to economics and behavioral theories and practices as well as general transformations in the fields. Scope of the JEBS includes: subjects of managerial economics, financial economics, development economics, finance, economics, financial psychology, strategic management, organizational behavior, human behavior, marketing, human resource management and behavioral finance. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal, and that all listed authors approve its submission to JEBS. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. Journal received research submission related to all aspects of major themes and tracks. All submitted papers were first assessed by the editorial team for relevance and originality of the work and blindly peer-reviewed by the external reviewers depending on the subject matter of the paper. After the rigorous peer-review process, the submitted papers were selected based on originality, significance, and clarity of the purpose. The current issue of JEBS comprises of papers of scholars from South Africa, Zimbabwe, Nigeria, Tanzania, Uganda and Indonesia. Socio-economic challenges faced by SMMEs, influence of experience & owner-managers education on sme performance, determinants of eastern cape gross fixed capital formation, women purchasing behavior & the zero moment of truth, factors affecting the business performance of small businesses, farmers' preference for soil & water conservation practices, the rise of Chinese investments in Africa, inflation targeting monetary policy & unemployment, relationship between social media collaboration & ecosystem management, migrant remittance patterns in South Africa, integration of information & communication technology into women entrepreneurship, efficiency estimates of public health center, impact of FDI inflows, exports and domestic investment on economic growth, econometric analysis of the relationship between changes in government bonds, exchange rate & inflation, work-life conflict of native & immigrant entrepreneurs, investor-state dispute settlement, trade openness, FDI & exchange rate effects on job creation, integrated supply chain management in the fast-moving consumer goods manufacturing industry, technology, financial innovations & bank behavior, multi-skilled workforce & the flexibility of project resource scheduling & costs, inter-generational effect of socio-economic status on education attainment, labour dynamics in climate & techno reliant small scale production, owners' characteristics & the financial bootstrapping strategies, importance of entrepreneurship as a contributing factor to economic growth & development and conflicts intervention & peace-building mechanisms were some of the major practices and concepts examined in these studies. Current issue will therefore be a unique offer where scholars will be able to appreciate the latest results in their field of expertise, and to acquire additional knowledge in other relevant fields.

Prof. Sisira R N Colombage, Ph. D.
Editor In Chief

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PAPERS

A Comparative Analysis of the Socio-Economic Challenges Faced by SMMEs: The Case of the Emfuleni and Midvaal Local Municipal Areas

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Abstract: Flourishing and thriving small, medium and micro enterprise (SMME) sectors have become one of the leading recognised cornerstones of economic development. The ability of these businesses to act as key drivers of economic growth, innovation and job creation make them valuable assets towards any nation's strive for a more inclusive economic and social outlook. For South Africa in particular, burdened by an epidemic of unemployment, poverty and income inequality, SMMEs role in improving the socio-economic environment proves pivotal. Yet, despite their potential, these businesses face a myriad of challenges, emanating from both internal and external environments, that restricts their growth and development. The primary aim of this study is to identify and compare the main socio-economic challenges faced by SMMEs in two local areas within the Vaal Triangle region. The study made use of a quantitative research approach and a cross-sectional research design through means of the survey method. The sample consisted of a total of 198 SMME owners that resided in both the Emfuleni (ELM) (n = 100) and Midvaal (MLM) (n = 98) local municipal areas. Data analysis involved the use of descriptive statistics, cross tabulations and chi-square tests. Overall the results of the study revealed that amongst the biggest challenges faced by SMMEs included managerial as well as economic aspects such as a lack of skilled labour, insufficient business training and lacklustre local economic conditions. The comparative analysis further revealed more significant infrastructural challenges in the Emfuleni local municipal area while market challenges such as a lack of demand as well as higher transportation costs were experienced by SMMEs located in the Midvaal area. The findings of the study provide valuable insight towards fostering an enabling environment for SMME development, specifically on local levels. In this regard policy stakeholders should adopt a multi-sectoral SMME focus. Possible recommendations include enhanced macroeconomic stability, strong public-private partnership formation and the provision of strong business support structures that facilitate management skills development together with the provision of strategic finance facilities.

Keywords: *SMMEs, socio-economic challenges, enabling environment, Emfuleni, Midvaal, South Africa.*

1. Introduction

South African residents are faced with several socio-economic challenges almost on a daily basis. In addition, small, micro and medium enterprises (SMMEs) are also confronted with similar challenges and ultimately, this affects their day-to-day activities. Wickert, (2016) for example, lists various financial, managerial, economic and market challenges. This, in turn, can negatively affect SMMEs performance and decrease the potential contribution they can make towards economic growth and local economic development (LED) (Kongolo, 2010). South Africa is faced with a myriad of challenges such as high unemployment, inequality, corruption and high poverty rates resulting in many socio-economic challenges in the economy (Aliber, 2003). The increase in the unemployment rate has placed a huge responsibility on SMMEs and their sustained growth in the country (Thurik et al., 2008). As such, the government has placed much emphasis on SMMEs to help alleviate this issue and in turn contribute to the reduction of challenges such as poverty and inequality, in order to achieve a higher standard of basic living (The Presidency, 2011).

The emphasis on SMMEs to help improve the overall socio-economic challenges are two-fold. First, hope is placed on SMMEs to employ more people and secondly, due to limited employment opportunities there is a need for more unemployed people to start new businesses (Feindt et al., 2002). There are different motives for starting a business that include, but are not limited to, labour market flexibility, the existence of profitable opportunities, and for survival purposes, as there may not be any alternative employment opportunities available (Pena, 2002). A considerable amount of research has been conducted on socio-economic challenges and how it affects the development of a country (Christina et al., 2014; Chimuchek & Mandipaka, 2015). However, little is known about the effect these socio-economic challenges have on SMMEs within the South African context and even less information is available on a local level (Abor & Quartey, 2010; Meyer & Meyer,

2016a). SMMEs are often referred to as the drivers of economic growth and development especially in low-income parts of a country (Acs, 2006).

As more people earn a sustainable income, general economic development conditions should improve (Lall, 2001). However, as each area is faced with different socio-economic challenges further investigation into specific challenges on a local level as well as how these challenges affect economic development is needed (Simmie & Martin, 2010). Through the better understanding of the effects socio-economic challenges faced by SMMEs have on economic development on a local level, improved policies and regulations could be formulated and implemented to target and improve the level of these socio-economic challenges (Okpara, 2011). Based on the aforementioned, the primary aim of this study is to identify and compare the main socio-economic challenges faced by SMMEs in two local areas within the Vaal Triangle region.

2. Literature Review

South Africa is faced with many daunting socio-economic challenges such as poverty, unemployment and inequality. As a result of these challenges, the government has realised the importance that SMMEs play in potentially alleviating some of these challenges. Most developed economies such as the United States (US), have SMMEs playing a central role towards development and growth in their economies (Kongolo, 2010). SMMEs have the ability to create jobs and are therefore a possible solution to unemployment, jobless growth and other challenges emanating from this phenomenon (Meyer, 2014). Developing countries such as South Africa are starting to adopt a culture of establishing more SMMEs in order to reduce the growing unemployment rate in the country (Kingdon & Knight, 2007). SMMEs have an important role to play in transitioning and developing countries such as South Africa (Sriram & Mersha, 2010) and its development and promotion have been one of the key policy focus areas in South Africa since 1995 (Rogerson, 2011). The SMME sector has the potential to reduce poverty and help to create jobs (Amra et al., 2013). A number of policies have been developed in this regard, accompanied by different policy programmes and initiatives that have been introduced to develop SMMEs in the country (Lewis, 2001; World Bank, 2015). SMMEs are defined as small businesses or firms that are non-subsidiary, independent, and normally employ a few employees compared to large firms with more employees (Kesper, 2001). Globally, SMMEs are seen as important contributors towards the development and increasing productivity and efficiency in an economy and help to boost economic development (Abor & Quartey, 2010). Most developed economies have already implemented SMME policies in order to boost job creation (Rogerson, 2006). In addition, developing economies, especially in Africa, also started following this practice in an attempt to increase SMME development, growth and sustainability (Tambunan, 2008; Kurnia et al., 2015). Table 1 depicts the general definitions of SMMEs based on the National Small Business Act of South Africa.

Table 1: Broad Definitions of SMMEs in the National Small Business Act

Type of firm	Definition
Medium enterprise	Medium enterprises mainly operate in the mining, electricity, construction and manufacturing industry. They have between 100 and 200 employees.
Small enterprises	These have a limit of 50 employees. Small enterprises are more established than very small enterprises.
Very small enterprises	There are less than 10 to 20 employees depending on the industry.
Microenterprise	Usually operates in the informal sector and includes enterprises such as spaza shops (small general dealers) and minibus taxis.
Survivalist enterprise	Also characterised as the microenterprise sector. The income generated is at times beneath the poverty line.

Source: Mahembe, (2011)

As observed from Table 1, the grouping referred to as SMMEs includes several sub-categories and most of the South African, and other developing countries, businesses fall within one of these sub-categories. The importance of SMMEs in current economic conditions can be ascribed to the new and fresh ideas that small businesses bring about through new innovation (Trimi & Berbegal-Mirabent, 2012). Innovation allows SMMEs to take over evolving technologies, making them forerunners of economic development. In addition to

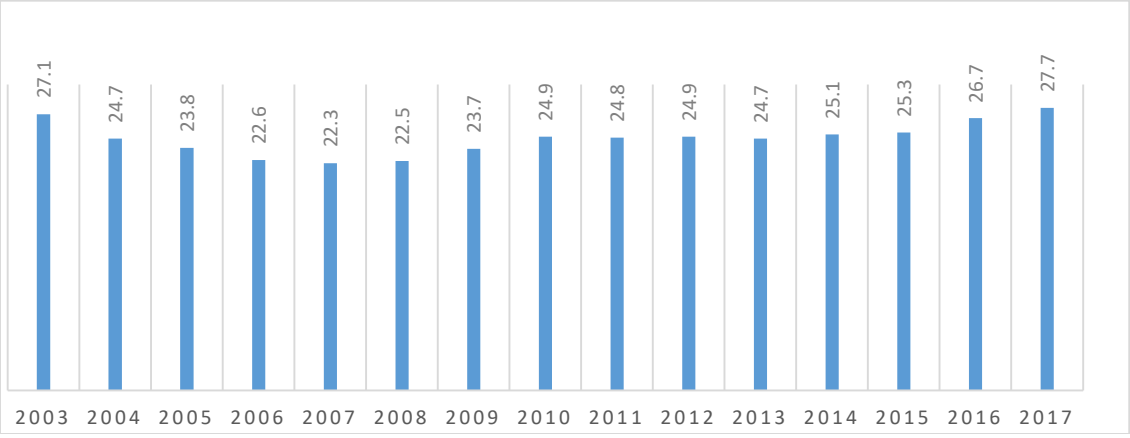
this many established SMMEs adapt to change much easier compared to large firms due to their robust and lean nature (Koudelková & Svobodová, 2014). SMMEs are seen as a key to economic development and play an important role in a country's economy.

Therefore, governments of developing economies should aim their focus on uplifting the development of SMMEs and creating an enabling environment for them to grow in (Aremu & Adeyemi, 2011; Meyer & Meyer, 2016b). As previously mentioned, South Africa is a country that suffers from a high unemployment rate and the government has focused much attention on SMMEs as a potential solution to alleviate this problem (Herrington et al., 2010). Since SMMEs are seen as vital to the economy's prosperity, without the development of these institutions the economy can risk being stagnant and even show no economic growth (Snyman et al., 2014). SMMEs have an important role to play in transitioning and developing countries such as South Africa (Sriram & Mersha, 2010). SMME development and promotion has been one of the key policy focus areas in South Africa since 1995 (Rogerson, 2011). The SMME sector has the potential to reduce poverty and help create new jobs (Amra et al., 2013).

Linking to these statements, a number of policies have been developed, and supported by different policy programmes and initiatives, aimed at assisting in the development of SMMEs in the country (Lewis, 2001; World Bank, 2015). One of the first South African economic post-Apartheid policies was the Reconstruction Development Plan (RDP), which was initiated in 1994. It highlighted that SMMEs are important to develop an economy and create employment (Kongolo, 2010). However, the policy did not receive enough support at that time and struggled to effectively achieve its predetermined objectives. Due to high levels of poverty and unemployment during that time, the purpose of the RDP was to initiate employment creation, increase income distribution and spur economic growth (Ardington & Lund, 1995). The RDP was developed as a socio-economic policy that was aimed to unify the citizens of South Africa and its resources towards the final process of abolishing the inequalities created through Apartheid with the goal to build a democratic, non-racial, non-sexist nation (Rogerson, 2004).

Since the National Small Business Act (Act 102 of 1996) was established, a number of policies and programs have been developed in support of SMMEs. Nevertheless, the motivation behind SMME development in South Africa is complex and many of these policies and initiative seemed lacklustre. Improving the implementation and subsequent impact of these policies and initiatives can greatly aid in the development and growth of SMMEs. The results could be significant and include increased economic growth and help reduce the growing epidemic of unemployment in the country, resulting in an improvement in the populations' quality of life (Kongolo, 2010). This could increase the distribution of income in the country with an opportunity to reduce the inequality gap amongst the South African population (Zulu, 2014). South Africa is faced with several socio-economic challenges that not only affect the local population, economy and general living conditions but also have a major impact on business activities and success rates. The South African unemployment rate reached its ultimate high in 14 years at 27, 7 percent in 2017 as indicated in Figure 1 (Stats SA, 2017).

Figure 1: Unemployment Rate (2003-2017)



Source: Stats SA (2017)

Figure 1 graphically illustrates the unemployment rate from 2003 to 2017. It shows that the unemployment rate has hit its ultimate high since 2003. This could be partly due to several large parastatals and industries (for example, Telkom, Lon min, South African Post Office, Absa, Harmony Gold and Samancor) implementing mayor retrenchments and staff reduction policies resulting in the layoff of thousands of workers (Writer, 2016). There is an urgent need to find ways to combat this growing epidemic (Chibba & Luiz, 2011). In an attempt to find a solution to this problem much emphasis has been placed on education and entrepreneurial development. The lack of an entrepreneurial culture and the present state of education in the country is alarming. Realistic policies and initiatives need to be implemented in order to enhance education and entrepreneurial development in the country. The South African education system is facing many different challenges and compared to other developing countries, the standard of education in South Africa is generally very poor. This has resulted in challenges such as a lack in basic skills and knowledge, which could also a potential contributor to the high unemployment rate. As the population continues to grow and the number of citizens who attend tertiary institutions increase, the reality of rising unemployment due to limited formal employment opportunities become more prevalent. In light of this, the need for entrepreneurs and small business development should be emphasised in order to create more sustainable jobs. Many developed economies have used entrepreneurship as a tool to alleviate the unemployment and growing population challenges (Nkechi et al., 2012). Identifying the challenges faced by SMMEs in realising their development potential could be key to finding sustainable long-term solutions to overcome these. The South African business environment has been struggling with several economic and socio-economic issues deteriorating the much needed enabling environment needed for them to reach their full potential.

3. Research Methodology

This section of the study has the purpose to elucidate on the methodology that was used in successfully completing the inquiry. Henceforth, sections that are discussed include the research purpose, geographical area of the study as well as the procedure method for data collection. Additionally, aspects such as the sampling strategies as well as analysis techniques that were used are likewise elaborated on.

Research Purpose and Design: The primary objective of this study was to identify and compare the main socio-economic challenges faced by SMMEs in two local areas within the Vaal Triangle region. Towards achieving this aim, the study made use of a quantitative research approach and a cross-sectional research design through means of the survey method. Kelley et al. (2003) assert that these methods ascribe various advantageous in the research process including the provision of information on a wide range of variables, freedom and anonymity to participants that facilitates better responses and additionally permits coverage of sample sizes that are too some extent generalize-able to the population. Finally, based on the statistical nature of the study and the belief that understanding social occurrences is best done through observation (Clarke, 2009) a positivist paradigm was chosen to serve the philosophical base for the inquiry.

Geographical Area of the Study: The study was undertaken in the Southern parts of the Gauteng province within two local municipal areas of Emfuleni and Midvaal. The areas are located within the Vaal Triangle functional economic region situated 50 km South of Johannesburg. The region is well known for its industrial nature with predominant economic sectors comprising manufacturing, trade, government and business services, all which attribute various linkages with surrounding areas such as Bloemfontein, Sasolburg and Rand burg (Vyas-Doorgapersad, 2014). These areas were specifically chosen given the fact that many local municipal areas face a range of issues that include but are not limited to the lack of service delivery, lack of sanitation, the lack of access to resources and the inability of providing an enabling environment for their citizens and small businesses for growing in. Emfuleni in this regard faces many socio-economic challenges (as shown in Table 2) such as high unemployment rates and a high number of the population living below the poverty line.

In comparison, the Midvaal Local Municipality is the fastest growing and developing municipality within the Sedibeng district. Upon viewing the socio-economic data presented in Table 2, the municipality attributes a higher human development index (HDI) scores, GDP per capita levels and comprises more diversified economic structures (higher tress index scores). Nevertheless, as depicted in Table 2, challenges in the area do exist, particularly concerning property and violent crimes, lower levels of urbanisation and severely high

levels of income inequality. The sample was selected by using a non-probability snowball sampling technique. Through the use of a historical referencing approach (Stander, 2011; sample size = 87; Rasego, 2011; sample size = 138), a final sample size of 200 was deemed adequate. After data collection was concluded and the preliminary data analysis was finalised, a total of 198 completed questionnaires were deemed useable with no discrepancies shown in the responses.

Table 2: Socio-Economic Background of the Emfuleni and Midvaal Local Municipal Areas (2017)

Indicator	Emfuleni LM	Midvaal LM
GDP per capita	R45 137	R51 358
Trade balance	R-4 729 738	R-64 474
Average income per household	R180 075	R306 042
Human Development Index	0.68	0.74
Gini coefficient	0.63	0.63
Crime index	92.33	120.11
People below the lower poverty line	264 391	25 991
Unemployment rate	56.3%	34.3%
Economic active population	50.1%	51.5%
Level of urbanisation	99.3%	87.2%
Infrastructure index	0.83	0.89
Tress index	51.93	42.12

Source: IHS Global Insight (2017)

Survey Design, Procedure Method and Sampling: For the purpose of collecting the required primary data, a self-administered questionnaire was used. The questionnaire was constructed based on extensive literature and empirical reviews regarding the various challenges faced by SMMEs in the Southern African context. The questionnaire included three sections. The first of these had the aim of gathering information on the participants' demographic background. Included questions comprised aspects pertaining to the age, race and level of education. The second section was directed towards capturing business specific information such as the sector of operation, legal form and the size of the business based on employee numbers. Finally, the last section, section C, was aimed at gathering information on the main socio-economic challenges faced by the SMMEs specifically regarding economic and business related aspects which are hindering development. In doing so, Olawale and Garwe's, (2010) tested and validated scale was used. The scale comprises a total of 30 items that are evenly divided between challenges relating to the internal and external aspects of the business.

After the construction of the questionnaire was completed and prior to its actual distribution, the measuring instrument was subject to a pre-test and peer review. This was done with the objective of assessing the design and structure of the measuring instrument (Burns & Bush, 2010). This entailed distributing the questionnaire among various experienced researchers in the field of economic development and entrepreneurship with the purpose of enhancing face validity. Thereafter, the questionnaire was piloted on a group of 48 local business owners in the study area which did not form part of the final sample. After ascertaining its applicability, the questionnaire was finally distributed through four experienced fieldworkers within the Emfuleni and Midvaal local municipal regions where the density of business owners (small, large and medium enterprises) was relatively high. This included central business districts (CBDs) as well as industrial areas. In order to ensure clarity, the fieldworkers made sure that the participating business owners understood the questions and explained any uncertainties when deemed necessary.

Ethical Considerations: In order to ensure the integrity and objectiveness of the study, all ethical standards of academic research were strictly followed. This included subjecting the measuring instrument to a review by a university's ethics committee, providing assurance of voluntary participation during the data collection process and strictly confirming anonymity in reporting the findings of the study. Moreover, with the purpose of achieving high standards of a technicality in research, the study involved rigorous principles of referencing in order to reject any form of plagiarism.

Data Analysis: The statistical package for social sciences (SPSS 25.0) software was used for the purpose of the data analysis. The first step included an analysis of the demographics of the respondents and the composition of their businesses by making use of descriptive techniques and frequency distributions. Thereafter, both the internal and external socio-economic challenges of respondents in the respective local municipal areas were identified and compared. These included various financial and management aspects of the SMMEs together with various economic, market and infrastructural related hindrances these businesses face on a daily basis. In conducting the comparative analysis, the study made use of cross-tabulations, chi-square statistics and a one-way ANOVA analysis in order to ascertain if the various challenges were experienced similarly by SMMEs in the two study areas. More specifically, these techniques were applied to test the following hypotheses:

$\mathbf{H_0}$**:** Internal and external challenges faced by SMMEs in both municipalities are the same.

$\mathbf{H_1}$: Internal and external challenges faced by SMMEs in both municipalities are different.

4. Findings of the Study

This section showcases the findings of the study and comprises two sections. The first of these report on the demographic background of the participants together with the composition of their businesses. This is followed by the results pertaining to the comparative analysis in respect of the various socio-economic challenges faced by SMMEs in the study areas. Here, results directed towards the internal challenges are discussed first. Thereafter, results pertaining to the external challenges are elaborated on.

Demographic Background and Business Composition: As the first part of the analysis, Table 3 and 4 report on the composition of the sample. Results show that participants consisted of approximately 41.4 percent of White business owners, 33.3 percent Black business owners while 18.6 percent were Indian or Asian. Considering age, Table 1 indicates that a large majority of the sample were between the ages of 31 to 60 years. More specifically, those between the ages of 41 and 50 years comprised almost a third (28.8%) of the sample which was followed by the 51 to 60-year age group (26.3%) and those between the ages of 31 and 40 years (23.7%). Relatively a small percentage of the business owners indicated that they were younger than 30 years (17.1%). Likewise, Tyrell (2015) reported that business owners who are younger than 35 years of age has dropped from 13,3 percent in 1989 to 11,7 percent in 2013. The study suggests that lower representation from younger age cohorts are structured primarily around the lack of funding and collateral for younger applicants. The distribution pertaining to the participants based on their gender indicates that almost three-quarters of the sample consisted of male business owners (f=145; 73.3%) compared to the 26.7 percent who were female. Whilst this is comparatively high, business ownership in South Africa continues to illicit large-scale inequality regarding gender. In fact, female entrepreneurs in the country are more likely to encounter challenges compared to their male counterparts solely based on gender stereotyping (Mordi et al., 2010).

Whilst these aforementioned characteristics showed somewhat noticeable differences, the distribution of the business owners according to the level of education illustrates a more representative composition. Results from Table 3 indicate that approximately 28.8 percent of the participants were in possession of a secondary qualification, followed by those that obtained a tertiary certificate (23.7%) and those who had a diploma (19.3%). Only a small fraction indicated that they had obtained a degree (10.2%) and even more so for those who had a post-graduate degree (5.4%). Worryingly though, is that eight percent reported that they did not complete any form of secondary schooling. Finally, as part of the measuring instrument, participants were asked on their duration of self-employment. As shown in Table 3, the majority (76.2%) reported that they were in the position for more than 3 years while only 18.2 and 5.6 percent were operating their businesses for 1 to 3 years and less than a year respectively.

Table 3: Demographic Composition of the Sample

Aspect	Sub-category	Frequency (*f*)	Percent (%)
Race	Black / African	66	33.3
	Coloured	13	6.6
	White	82	41.5
	Indian / Asian	37	18.6
Gender	Female	53	26.7
	Male	145	73.3
Age	Younger than 21 years	5	2.5
	21 – 30 years	29	14.6
	31 – 40 years	47	23.7
	41 – 50 years	57	28.8
	51 – 60 years	52	26.3
	Older than 60 years	8	4.04
Level of education	Not completed matric	25	12.6
	Secondary school	57	28.8
	Certificate	47	23.7
	Diploma	38	19.3
	Degree	20	10.2
	Postgrad. Degree	11	5.4
Duration self-employed	Less than 1 year	11	5.6
	1 – 3 years	36	18.2
	More than 3 years	151	76.2

Source: Authors own compilation from collected survey data

In conjunction with the demographic analysis, it was necessary to obtain the business specific information, which included the type of sector the sampled businesses were operating in, their legal forms as well as the size of the business to better comprehend the nature of the challenges faced. Results showcasing these statistics are reported in Table 4. Based on the sectoral representation, results indicate that approximately a third of the sample (31.8%) operated within the Trade sector and was closely followed by those in Services (26.3%). Representation from other sectors was somewhat lower where among other 8.1 percent of the businesses were situated in Transport, 6.1 percent in Manufacturing and only 4.0 percent in Education. Whilst the most dominant sector in the Vaal Triangle and in the Sedibeng district is the manufacturing sector (30,8%), this particular study focused on SMMEs in the Emfuleni and Midvaal areas which might suggest the lower representation in these specific sectors. Regarding the participants' business' legal form, results shown in Table 4 point out that the majority of small businesses in the area are partnerships (29.8%), sole proprietors (21.7%) as well as those that were not formally registered (20.7%) Conversely, larger legal forms such as public companies (6.6%) and closed corporations (9.6%) served as minority within the sample. Finally, regarding the size of the business, as one would come to expect given the nature of SMMEs, the distribution of the sample favoured smaller entities. Almost half of the sample (48.9%) comprised businesses with one to five employees this was followed by those with six to 10 employees and those with 11 to 49 employed individuals.

Table 4: Distribution of the Sample According to Business Characteristics

Aspect	Sub-category	Freq. (*f*)	Percent (%)
Sector of business	Agriculture	9	4.5
	Manufacturing	12	6.1
	Construction	13	6.6
	Trade	63	31.8
	Education	8	4.0
	Transport/Distribution	16	8.1
	Health and safety	12	6.1
	Financial services	3	1.5
	Production	4	2.0
	Services	52	26.3

	Other	6	3.0
	Sole proprietor	43	21.7
	Partnership	59	29.8
Legal form	Closed corporation	19	9.6
	Private company	23	11.6
	Public company	13	6.6
	Not registered	41	20.7
	Only myself	29	14.6
	1–5 employees	97	48.9
Business size	6–10 employees	33	16.7
	11–49 employees	29	14.6
	50–200 employees	10	5.2

Source: Authors own compilation from collected survey data

Descriptive Analysis on the Socio-Economic Challenges Faced by SMMEs: After reporting on the composition of the sample, the next step in the analysis pertained to the descriptive analysis of the various challenges faced by the SMMEs. However, prior to this exploration it was first necessary to determine the reliability and validity of the constructs that were used within the scale. This was done by using the Cronbach's alpha as well as average inter-item correlations as measures of internal consistency for which results are reported in Table 5. Results from the tests show that all computed Cronbach's alpha coefficients were estimated above the prescribed 0.7 level (Malhotra, 2010) and all average inter-items correlations between the accepted 0.15 and 0.5 thresholds (Clark & Watson, 1995) indicating that the used constructs in the measurement process were all deemed reliable. This includes the provision of sound and stable macro and microeconomic environments, transparent and effective regulations and prioritising responsive SMME support. Secondly, whilst SMMEs are seen as pivotal drivers towards reducing large-scale structural unemployment, their ability to do so largely hinges on the employment of skilled labour. Therefore, in order to take advantage of these enterprises' potential for poverty alleviation and the improvement in general economic conditions necessitates the creation and supply of innovative training initiatives and entrepreneurship promotion, especially among young unemployed individuals.

Table 5: Results of the Internal Consistency Tests for All Used Constructs

Construct Name	Number of items	Cronbach alpha	Average inter-item correlation
Financial challenges	9	0.809	0.180
Managerial challenges	6	0.730	0.311
Economic challenges	6	0.798	0.278
Market challenges	4	0.735	0.223
Infrastructural challenges	5	0.710	0.329

Source: Authors own compilation from collected survey data

Internal challenges faced by the businesses: Internal factors in the business environment relate to the factors that are largely controllable by the firm. These factors include among other, finance (such as owners' equity and collateral) and managerial competency (Fatoki & Asah, 2011) all which have a substantial influence in the success or failure of running a business. Towards analysing the specific internal challenges these participants faced, the study made use of cross-tabulations and chi-square statistics with the purpose of elucidating if these challenges were experienced differently in the selected study areas. Table 6 indicates results pertaining specifically to the various financial challenges that the participants encountered. Results from the table show that business owners from both areas agreed that a number of these challenges were a concern. For instance, 91.8 percent (11.2 + 80.6) of the participants in the Midvaal area agreed that the lack of collateral is a core aspect relating to the financial challenges as did 73.4 percent (21.4 + 52) of the participants in Emfuleni. Furthermore, 92.7 percent (41.1 + 51.6) of the Midvaal participants and 90.8 percent (43.9 + 46.9) of the participants in the Emfuleni concur that production costs is a huge financial restraint towards the prosperity of the business. The OECD (2017) in this regard reiterates that SMMEs,

especially those in developing countries, struggle to acquire the needed finance which prohibits possible dynamism and the ability to be financially viable.

Table 6: Participants Perceptions Regarding the Financial Challenges Faced in the Study Areas

Aspect	Midvaal LM				Emfuleni LM				χ^2
	SD	D	A	SA	SD	D	A	SA	p-value
Access to finance	4.1	29.6	35.7	30.6	9.0	27.0	42.0	22.0	0.158
Collateral	2.0	6.1	11.2	80.6	4.1	22.4	21.4	52.0	0.000*
Crime	1.0	6.1	21.4	71.4	0.0	14.0	36.0	50.0	0.009*
Lack of equity	2.0	48.0	29.6	20.4	6.1	29.6	40.8	23.5	0.042**
Credit record	1.0	6.2	52.6	40.2	0.0	18.0	46.0	36.0	0.062***
Government support	1.0	11.2	53.1	34.7	1.0	17.0	36.0	46.0	0.113
Production costs	0.0	7.4	41.1	51.6	0.0	9.2	43.9	46.9	0.781
Information technology	1.1	63.2	28.4	7.4	1.1	34.4	37.6	26.9	0.000*
Corruption	4.9	62.2	22.0	11.0	1.1	36.6	33.3	29.0	0.001*

Note: * significant at 0.01 sig. level ** significant at 0.05 sig. level *** significant at 0.10 sig. level
SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree
Source: Authors own compilation from collected survey data

Relating to aspects pertaining to insufficient access to information technology and high corruption in their local environment, responses (as shown in Table 6) indicate high percentages of disagreement in the Midvaal area signalling that business owners did not believe these aspects affected their business operations. Conversely though, participants from the Emfuleni area showed strong agreement. The high chi-square statistics of 19.660 and low p-values (0.000) for information technology and chi-square statistics of 17.025 and p-value (0.001) for corruption, indicate that these dissimilarities were in fact significant at a 1 percent significance level. Madumo, (2015) opinions that there exists widespread acknowledgement regarding inexplicably high levels of corruption at a local municipal level in South Africa. Whilst these actions affect various processes, their impact on SMME development is detrimental. Leboea, (2017) indicates that the underlining presence of corruption increases longevity in compliance processes as well as induces additional monetary expenses used to bypass these practices. Moreover, these actions deter resource distribution initially intended towards improving the operational environment and as a result attributes significantly lower support for these enterprises.

In addition to these internal aspects, the lack of management skills has shown to have a significant impact on the chances of SMME success (Chimucheka & Mandipaka, 2015). Without adequate operational knowledge and sufficient training, efficiency regarding management of the enterprise can pose a significant hurdle towards the longevity of SMMEs. Table 7 shows results pertaining to the various managerial challenges that the participants experienced in the selected study areas. Amongst the six included items, participants from both areas illustrated a strong acknowledgement that the lack of sufficient business straining as well as a shortage of skilled labour posed significant managerial challenges for their businesses. High levels of unemployment in the country have continuously been attributed to a lack of needed tertiary skills. As a result, various individuals attempt to obtain a means of financial independence seek self-employment however, without the needed skill set to effectively operate the business. This furthermore poses a challenge when trying to fill vital employment positions requiring specific skill sets (Mxunyelwa & Vallabh, 2017). Whilst these challenges were experienced relatively similar amongst the groups, perceptions surrounding the lack of business skills showed statistically significant differences (p-value < 0.01). From this perspective, business owners in the Midvaal area seemed to perceive the challenge as less important when considering the responses from those in the Emfuleni municipal area.

Table 7: Perceptions Regarding the Managerial Challenges Faced in the Study Areas

Aspect	Midvaal LM				Emfuleni LM				χ^2
	SD	D	A	SA	SD	D	A	SA	p-value
Lack of experience relevant to the venture	1.0	29.6	37.8	31.6	0.0	20.0	30.0	50.0	0.050**
Founder not familiar with the industry	2.0	37.8	36.7	23.5	3.0	16.0	44.0	37.0	0.006*
Lack of networking	1.0	9.3	39.2	50.5	1.0	15.2	47.5	36.4	0.219
Lack of business skills	1.0	43.9	20.4	34.7	3.0	16.0	36.0	45.0	0.000**
Shortage of skilled labour	1.0	10.2	13.3	75.5	2.0	10.1	29.3	58.6	0.139
Lack of training	0.0	6.0	23.5	70.4	0.0	12.0	35.0	53.0	0.138

Note: * significant at 0.01 sig. level ** significant at 0.05 sig. level *** significant at 0.10 sig. level
SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree
Source: Authors own compilation from collected survey data

External challenges: External challenges are classified as challenges that SMMEs have no control over but have an influence on the establishment and prosperity of a business. Furthermore, the changes that take place in the external environment can either have a negative or positive influence on business. These external issues include; economic, market and infrastructural challenges. Table 8 shows the participants' perceptions regarding the various economic challenges faced. Considering all items included within the construct, participants agreed that most of the underlining economic conditions faced had a serious impact on their business operations. For both areas, more than 90 percent of the participants agreed that presuming tax rates, interest rates and recessionary pressures all posed significant challenges in their daily operations. For the last decade the South African economy has experienced significantly low economic growth rates contributing to low consumer confidence which has significantly reduced sales (Leboea, 2017). Moreover, many small businesses are predisposed to exchange rate risks and at times some business owners do not realise it (Mahapa, 2017).

Table 8: Perceptions Regarding the Economic Challenges Faced in the Study Areas

Aspect	Midvaal LM				Emfuleni LM				χ^2
	SD	D	A	SA	SD	D	A	SA	p-value
High interest rates	0.0	4.1	38.8	57.1	0.0	7.0	36.0	57.0	0.650
High taxes and tariffs	0.0	2.0	34.7	63.3	3.1	11.5	38.5	46.9	0.007*
Recession in the economy	0.0	2.0	24.5	73.5	0.0	5.0	34.0	61.0	0.142
High inflation rates	0.0	4.1	13.3	82.7	0.0	8.0	31.0	61.0	0.003*
High exchange rates	0.0	1.0	24.7	74.2	0.0	6.1	36.4	57.6	0.021**
Location of the business	8.4	32.6	46.3	12.6	7.1	26.5	43.9	22.4	0.332

Note: * significant at 0.01 sig. level ** significant at 0.05 sig. level *** significant at 0.10 sig. level
SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree
Source: Authors own compilation from collected survey data

SMMEs in this sense are often hit the hardest during an economic recession with noticeable impacts on the cash flow of the business and ultimately job losses. Businesses often find it difficult to establish the right market and at times they cannot control certain context-specific factors. In measuring the extent of such challenges for SMMEs, participants were asked to what extent they believed competition levels, transportation costs and inadequate market research affected their likelihood of success. From the responses shown in Table 9, a total of 92.9 percent (33.7 + 59.2) of the participants in the MLM area and 84 percent (44 + 40) in ELM agreed that high transportation costs are one of the core market challenges. Ndiang'ui (2012) suggests that most small businesses are highly dependent on hired transportation to transport goods from manufacturers and wholesalers and can have a substantial impact on the final profit margins of these businesses. The high chi-square value = 8.380 and low p-value = 0.015 suggest that, although both groups agreed, their indifferences are significant at a 1 percent significance level. Relating to the lack of demand for

their products, 56.1 percent (6.1 + 50.0) of the participants in the MLM area disagreed while 55.2 percent (36.6 + 18.6) in the ELM area agreed that this is in fact a challenge affecting their business operations. These differences are shown to be significantly different across the groups (*p-value < 0*) suggesting that lower demand levels might be more prevalent in the Emfuleni area.

Table 9: Perceptions Regarding the Market Challenges Faced in the Two Study Areas

Aspect	Midvaal LM				Emfuleni LM				χ^2
	SD	D	A	SA	SD	D	A	SA	p-value
Inadequate demand	6.1	50.0	33.7	10.2	6.2	39.2	36.1	18.6	0.000*
High competition	0.0	11.2	27.6	61.2	4.0	15.0	26.0	55.0	0.185
High transport costs	0.0	7.1	33.7	59.2	0.0	16.0	44.0	40.0	0.015**
Inadequate market research	3.1	38.1	42.3	16.5	8.0	31.0	36.0	25.0	0.168

Note: * significant at 0.01 sig. level ** significant at 0.05 sig. level *** significant at 0.10 sig. level
SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree
Source: Authors own compilation from collected survey data

Finally, Table 10 showcases participants' perceptions regarding the infrastructural capacities relevant to their area of operation. Results from the table show that a total of 88.8 percent (37.8 +51.0) of the participants in the Midvaal a read is agreed towards aspects such as poor infrastructure capacity and maintenance while 87.8 percent (43.9 + 43.9) similarly did not acknowledge that poor service delivery was present. Additionally, 83.7 percent (18.4 + 65.3) of the participants illicita high degree (83.7%) of disagreement regarding poor telecommunications. On the other hand, participants in ELM area responded otherwise. High chi-square values and low p-values relating to these specific aspects (poor infrastructure capacity;χ^2 = 34.96; p = 0.000; poor service delivery; χ^2= 34.124, p = 0.000; poor telecommunications;χ^2= 32.141, p = 0.000), all suggest that participants in the two study areas significantly differed in their perceptions. Therefore, the null hypothesis that these challenges were experienced similarly can be rejected at a 1 percent significance level. These results tend to suggest that businesses in the Midvaal area were more positive regarding the prevailing infrastructural environment as well as the delivery of services they experienced. Similar results were reported by Meyer et al. (2016) which found business owners' perceptions to be above average regarding service delivery in the Midvaal area. Despite these differences, participants in both areas did agree that the lack of available business premises and red tape regulations are key infrastructural challenges. The latter has extensively been recognised as deterring factor for SMME operations in South Africa.

Table 10: Perceptions Regarding the Infrastructural Challenges Faced in the Two Study Areas

Aspect	Midvaal LM				Emfuleni LM				χ^2
	SD	D	A	SA	SD	D	A	SA	p-value
Poor infrastructure capacity and maintenance	37.8	51.0	5.1	6.1	22.0	28.0	21.0	29.0	0.000*
Poor service delivery	43.9	43.9	5.1	7.1	26.0	18.0	29.0	27.0	0.000*
Poor telecommunications	18.4	65.3	10.2	6.1	10.4	34.4	31.3	24.0	0.000*
Lack of available business premises	4.1	19.4	33.7	42.9	3.0	15.2	38.4	43.4	0.808
Red tape and regulations	1.0	22.9	31.3	44.8	4.1	22.4	31.6	41.8	0.605

Note: * significant at 0.01 sig. level. SD: Strongly Disagree, D: Disagree, A: Agree, SA: Strongly Agree
Source: Authors own compilation from collected survey data

One-Way a nova Analysis: After concluding the analysis on specific individual aspects that affected SMME success within the study area, it was likewise important to ascertain whether as a whole, the various internal and external challenges were perceived similarly. In doing so, the study made use of a one-way between groups ANOVA analysis for which results are reported in Table 11. From the illustrated results, it can be deduced that challenges relating to these businesses' internal environment were perceived alike. Here, both F-statistics relating to financial (F = 0.010) and managerial aspects (F = 0.547) together with the

corresponding p-values suggest that the null hypothesis could not be rejected even at 0.10 significance level. SBP (2013) reiterates that these concerns revolve mainly around three factors including mandatory business regulations, restrictive labour market laws and municipal discrepancies which disrupts and deters effective business operations.

However, regarding the external environment, significant differences were noted specifically considering economic (at 0.05 significance level) and infrastructural aspects (at 0.01 significance level). For economic challenges specifically, mean scores for the Emfuleni group were somewhat lower compared to those of the Midvaal group. This suggests that more economic challenges are prevalent in the area. The Partial Eta Squared coefficient (η^2) of 0.003 however suggests the effect size be small ($0.01 < \eta^2 < 0.09$). Contrastingly, businesses in the Emfuleni area seem to experience greater infrastructural constraints in comparison to the Midvaal area with a η^2coefficient of 0.119 (> 0.130) portraying a medium effect size.

Table 11: One-Way Between Groups a Nova Results

Socio-economic challenges	Midvaal LM ($\bar{x}$)	Emfuleni LM ($\bar{x}$)	F-statistic	p-value	η^2
Financial	3.067	3.072	0.010	0.922	0.000
Managerial	3.234	3.287	0.547	0.460	0.003
Economic	3.500	3.368	6.356	0.013*	0.033
Market	3.059	3.003	0.595	0.442	0.003
Infrastructural	2.400	2.855	25.156	0.000*	0.119

Note: Mean ($\bar{x}$) scores ranged from 1 to 4

5. Conclusion and Recommendations

The primary objective of this study was to identify and compare the main socio-economic challenges faced by SMMEs in two local areas within the Vaal Triangle region. Based on the literature review as well as the findings of the study, SMMEs in the South African context seem to face a myriad of external and internal challenges that are severely restricting their potential as crucial growth drivers. Within the context of the study area there seems to be various overarching factors that similarly affect these entities particularly pertaining financial, managerial and market-related aspects. These included factors such as a lack of access to finance, insufficient government support, significantly high levels of competition and the lack of needed skills and expertise to be successful. Significant differences were however noted in the manner in which businesses experienced challenges regarding their economic environment and infrastructural capacities. For businesses in the Emfuleni area the latter specifically came to the fore with participants recognising the need for improved infrastructural capacities and effective and efficient service delivery. On the other hand, participants located in the Midvaal area attributed greater economic related hindrances such as higher taxes as well as inflation rates.

Additionally, these aspects together with managerial related factors were considered the most deterring challenges in both areas. The findings of the study therefore disclose various implications. First, among these, the study revealed that SMME success crucially depends on the creation of an enabling environment from local stakeholders. Further recommendations include the provision of incentives to spur on new business development, facilitating enhanced public-private partnership formation and ensuing with an invigorated focus towards identifying areas for export competitiveness. Whilst the study significantly contributes to the body of knowledge surrounding SMME development within developing regions its limitations surrounding non-probability sampling and cross-sectional design provide the potential for future inquiries. Forthcoming studies should seek to analyse these stumbling blocks using longitudinal designs in order to provide varying insights. Moreover, these endeavours can possibly further include comparisons with more developed local regions.

References

Abor, J. & Quartey, P. (2010). Issues in SME development in Ghana and South Africa. *International Research Journal of Finance and Economics*, 39(6), 215-228.

Acs, Z. (2006). How is entrepreneurship good for economic growth? *Innovations*, 1(1), 97-107.

Aliber, M. (2003). Chronic poverty in South Africa: incidence, causes and policies. *World Development*, 31(3), 473-490.

Amra, R., Hlatshwayo, A. & McMillan, L. (2013). SMME employment in South Africa. Paper presented at the biennial conference of the Economic Society of South Africa.

Ardington, E. & Lund, F. (1995). Pensions and development: social security as complementary to programmes of reconstruction and development. *Development Southern Africa*, 12(4), 557-577.

Aremu, M. A. & Adeyemi, S. L. (2011). Small and medium scale enterprises as a survival strategy for employment generation in Nigeria. *Journal of Sustainable Development*, 4(1), 200-215.

Burns, A. C. & Bush, R. F. (2010). Study Guide and Technology Manual for SPSS: Marketing Research (6th ed), Boston: Prentice Hall.

Chibba, M. & Luiz, J. M. (2011). Poverty, inequality and unemployment in South Africa: context, issues and the way forward. Economic Papers: *A Journal of Applied Economics and Policy*, 30(3), 307-315.

Chimucheka, T. & Mandipaka, F. (2015). Challenges faced by small, medium and micro enterprises in the Nkonkobe Municipality. *The International Business & Economics Research Journal*, 14(2), 309-316.

Christina, B., Neelufer, A. & Al Amri, S. (2014). Challenges and barriers encountered by the SMEs owners in Muscat. *International Journal of Small Business and Entrepreneurship Research*, 2(3), 1-13.

Clark, L. A. & Watson, D. (1995). Construct validity: Basic issues in objective scale development. *Psychological Assessment*, 7(3), 309-319.

Clarke, C. (2009). Paths between positivism and interpretivism: An appraisal of Hay's via media. *Politics*, 29(1), 28-36.

Fatoki, O. O. & Asah, F. (2011). The impact of firm and entrepreneurial characteristics on access to debt finance by SMEs in King Williams' Town, South Africa. *International Journal of Business and Management,* 6(8), 170-179.

Feindt, S., Jeffcoate, J. & Chappell, C. (2002). Identifying success factors for rapid growth in SME e-commerce. *Small Business Economics*, 19(1), 51-62.

Herrington, M., Kew, J. & Kew, P. (2010). Global Entrepreneurship Monitor: 2010. Graduate School of Business, Centre for Innovation and Entrepreneurship, University of Cape Town.

IHS Global Insight. (2017). Regional explorer. http://www.ihsmarkit.co.za/products/pdf/IHSGISA%20Regional%20eXplorer.pdf Date of access: 13 May 2018.

Kelley, K., Clark, B., Brown, V. & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in health care*, 15(3), 261-266.

Kesper, A. (2001). Failing or not aiming to grow? Manufacturing SMMEs and their contribution to employment growth in South Africa. *In Urban Forum*, 12(2), 171-203.

Kingdon, G. & Knight, J. (2007). Unemployment in South Africa, 1995–2003: causes, problems and policies. *Journal of African Economies*, 16(5), 813-848.

Kongolo, M. (2010). Job creation versus job shedding and the role of SMEs in economic development. *African Journal of Business Management,* 4(11), 2288-2306.

Koudelková, P. & Svobodová, A. (2014). Knowledge creation and sharing as essential determinants of SMEs innovation. *International Economics Letters,* 3(1), 12-20.

Kurnia, S., Choudrie, J., Mahbubur, R. M. & Alzougool, B. (2015). E-commerce technology adoption: A Malaysian grocery SME retail sector study. *Journal of Business Research*, 68(9), 1906-1918.

Lall, S. (2001). Competitiveness indices and developing countries: an economic evaluation of the global competitiveness report. *World development*, 29(9), 1501-1525.

Leboea, S. T. (2017). The factors influencing SME failure in South Africa. Masters dissertation. Cape Town: University of Cape Town.

Lewis, J. D. (2001). Policies to promote growth and employment in South Africa. Informal discussion papers on aspects of the economy of South Africa. Washington, D.C.: World Bank.

Madumo, O. S. (2015). Developmental local government challenges and progress in South Africa. *Administration Publica*, 23(2), 153-166.

Mahapa, R. R. (2017). Management of foreign exchange risks exposure by SMEs in South Africa. Mini-dissertation. Pretoria: University of Pretoria.

Mahembe, E. (2011). Literature review on small and medium enterprises' access to credit and support in South Africa. Pretoria: National Credit Regulator.

Malhotra, N. K. (2010). Marketing Research: An Applied Orientation (6th Ed), Upper Saddle River: Pearson.

Meyer, D. F. (2014). Job creation, a mission impossible? The South African case. *Mediterranean Journal of Social Sciences*, 5(16), 65-77.

Meyer, D. F. & Meyer, N. (2016a). Management of small and medium enterprise (SME) development: An analysis of stumbling blocks in a developing region. *Polish Journal of Management Studies*, 16(1), 127-141.

Meyer, D. F., Meyer, N. & Neethling, J. R. (2016). Perceptions of business owners on service delivery and the creation of an enabling environment by local government. *Administration Public*, 24(3), 52-73.

Meyer, N. & Meyer D. F. (2016b). The relationship between the creation of an enabling environment and economic development: A comparative analysis of management at local government sphere. *Polish Journal of Management Studies*, 14(2), 150-160.

Mordi, C., Simpson, R., Singh, S. & Okafor, C. (2010). The role of cultural values in understanding the challenges faced by female entrepreneurs in Nigeria. *Gender in Management: An International Journal*, 25(1), 5-21.

Mxunyelwa, S. & Vallabh, D. (2017). Skills as impediment to small and medium tourism enterprises (SMTEs), Eastern Cape, South Africa. *African Journal of Hospitality, Tourism and Leisure,* 6(4), 1-8

Ndiang'ui, J. M. (2012). Transportation as a determinant of small and medium enterprises performance: Case of Kibera Division of Nairobi, Kenya. Masters dissertation. Nairobi: University of Nairobi.

Nkechi, A., Emeh Ikechukwu, E. J. & Okechukwu, U. F. (2012). Entrepreneurship development and employment generation in Nigeria: problems and prospects. *Universal Journal of Education and General Studies*, 1(4), 88-102.

OECD (Organisation for Economic Co-operation and Development). (2017). Enhancing the contributions of SMEs in a global and digitalised economy. OECD Publishing, Paris.

Okpara, J. O. (2011). Factors constraining the growth and survival of SMEs in Nigeria: Implications for poverty alleviation. *Management Research Review*, 34(2), 156-171.

Olawale, F. & Garwe, D. (2010). Obstacle to the growth of new SMEs in South Africa: A principle component analysis approach. *African Journal of Business Management*, 4(5), 729-738.

Pena, I. (2002). Intellectual capital and business start-up success. *Journal of Intellectual Capital*, 3(2), 180-198.

Rasego, C. M. (2011). A comparative study between white and black women entrepreneurs in selected areas in South Africa. Mini-dissertation. Potchefstroom: North-West University.

Rogerson, C. M. (2004). The impact of the South African government's SMME programmes: a ten-year review (1994–2003). *Development Southern Africa,* 21(5), 765-784.

Rogerson, C. M. (2006). Developing SMMEs in peripheral spaces: the experience of Free State province, South Africa. *South African Geographical Journal*, 88(1), 66-78.

Rogerson, C. M. (2011). Local economic development in South Africa: strategic challenges. *Development Southern Africa*, 27(4), 481-495.

SBP (Business Environment Specialists). (2013). Effect of red tape on small firms in South Africa: SME Growth Index. SBP, Johannesburg.

Simmie, J. & Martin, R. (2010). The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3(1), 27-43.

Snyman, H. A., Kennon, D., Schutte, C. S. & Von Leipzig, K. (2014). A strategic framework to utilise venture capital funding to develop manufacturing SMEs in South Africa. *South African Journal of Industrial Engineering*, 25(2), 161-181.

Sriram, V. & Mersha, T. (2010). Stimulating entrepreneurship in Africa. *World Journal of Entrepreneurship, Management and Sustainable Development,* 6(4), 257-272.

Stander, C. J. (2011). Exploring women entrepreneurship in selected areas in South Africa. Mini-dissertation. Potchefstroom: North-West University.

Stats SA (Statistics South Africa). (2017). Quarterly employment statistics. http://www.statssa.gov.za/?p=10530. Date of access: 18 Sept. 2017.

Tambunan, T. (2008). SME development, economic growth, and government intervention in a developing country: The Indonesian story. *Journal of International Entrepreneurship,* 6(4), 147-167.

The Presidency, (2011). National Development Plan 2030. http://www.gov.za/issues/national-development-plan-2030. Date of access: 12 June 2017.

Thurik, A. R., Carree, M. A., Van Stel, A. & Audretsch, D. B. (2008). Does self-employment reduce unemployment? *Journal of Business Venturing*, 23(6), 673-686.

Trimi, S. & Berbegal-Mirabent, J. (2012). Business model innovation in entrepreneurship. *International Entrepreneurship and Management Journal*, 8(4), 449-465.

Vyas-Doorgapersad, S. (2014). Gender equality, pro-poor growth and MDG Goal 1 in South Africa municipal governance: the case of Sedibeng District Municipality. *Mediterranean Journal of Social Sciences*, 5(21), 327-334.

Wickert, C. (2016). Political corporate social responsibility in small and medium-sized enterprises: a conceptual framework. *Business & Society*, 55(6), 792-824.

World Bank. (2015). Small and medium enterprises (SMEs) finance. http://www.worldbank.org/en/topic/financial sector/brief/smes-finance. Date of access: 7 Oct. 2017.

Writer, S. (2016). Massive job cuts at South Africa's largest clothing retailer: report. https://businesstech.co.za/news/business/111765/massive-job-cuts-at-south-africas-largest-clothing-retailer-report/. Date of access. 8 Jun. 2017.

Zulu, L. (2014). Importance of SMMEs is big business for country. http://www.iol.co.za / business-report /opinion/importance-of-smmes-is-big-business-for-country-1768670. Date of access: 12 June 2017.

The Influence of Experience and Owner-Managers Education on SME Performance: Case of Motor Spares Enterprises at Kelvin Light Industries in Bulawayo

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Abstract: The continued failure of small to medium enterprises and lack of growth of those that survive, continue to pose some challenges to the Zimbabwean economy. Lack of experience and education by owner-managers of SMEs, is one of the major challenges impeding their survival and growth. The study sought to establish the influence of experience and owner-managers education on SME performance specifically focusing on motor spares SMEs at Kelvin Light Industries in Bulawayo. The objective of this study, therefore, was to analyse the relationship between experience and owner-managers education and the performance of SMEs. The descriptive research design was employed in this study. The researcher adopted stratified sampling technique supported by simple random technique to select participants from the population. Closed-ended questionnaires were used to collect data from owner-managers operating at Kelvin Light Industries. SPSS version 20 was used to analyse and present the data. The results of the study showed that there was a strong relationship between both education and experience of owner-managers on SME performance. The researcher recommends that owner-managers should continuously receive training on how to run and manage their SMEs. Owner-managers should employ human capital on merit which would give them a competitive advantage in business.

Keywords: *SME performance, experience, education, owner-managers*

1. Introduction

Small to Medium Enterprises (SMEs) are regarded as a veritable instrument of economic growth and poverty alleviation (Dumbu, 2014). They are being hailed as the seed-bed for the development of big entities and are the lifeblood of economic sustainability especially in this turbulent environment (Chivasa, 2014). SMEs have been expressed differently across the globe (Robu, 2013). Generally, SMEs are defined according to the number of employees, annual turnover and sales (Mudavanhu, Bindu, Chiguuswa and Muchabaiwa, 2011). However, in Zimbabwe, Small Enterprise Development Cooperation (SEDCO) refers to an SME as a firm that has the capacity to accommodate not more than 100 employees, with maximum annual sales of up to $830 000 (Majoni, Matunhu and Chaderopa, 2016). SMEs are playing a significant role in economic development in both developed and developing countries in the world (Sarpong, 2012). The extant literature has touted SMEs as the engine to economic recovery, contributing extremely in reducing poverty and playing a pivotal role in creating employment if well nurtured and supported (Hamad and Karoui, 2011; Sarpong, 2012). They cover 99% of European organisations; moreover, they provide 67% of the private sector jobs (Nguyen, Beeton and Halog, 2014). SMEs also contribute more than 50% of the total value-added created by entities in the European Union (Nguyen et al, 2014). In Zimbabwe's business circles, SMEs are appreciated remarkably as contributing more than 60% on employment (Majoni et al., 2016).

Ndlovu, (2015) a reporter of Chronicle noted that SMEs are contributing 50% on Gross Domestic Product (GDP) and he also reported that Minister of Finance, Mr Chinamasa acknowledged the fact that SMEs are increasingly playing a key role in the economy thereby making a notable contribution to the Zimbabwean economy. However, despite their positive contribution to the economy, these emerging entities are failing to survive and those who survive are lagging behind in terms of growth and this has posed some challenges to the Zimbabwean economy (Dumbu, 2014). The situation is still prevailing as Motor Spares entities at Kelvin light industries in Bulawayo are finding it difficult to grow and survive. Furthermore, the dynamic and capricious changes in the economy have also affected the operations of SME's, compelling some to close shops and downsize (Chivasa, 2014). The failure of this sector has been exacerbated by a myriad of challenges such as owner-manager experience and level of education (Isaga, 2015). In the extant literature, it has been vindicated that human capital is the most influential factor that necessitates the prosperity of entrepreneurs (Mmari, 2014). Education and experience are major components of human capital which are critical to the

owner-managers for their SME's to survive, especially in Zimbabwe were the business environment is turbulent.

Statement of the Problem: SMEs play an important role in ensuring economic growth, employment creation, income stability and poverty reduction in the whole world. However, despite the above importance, the continued failure of small to medium enterprises and lack of growth of those that survive continue to pose some challenges to the Zimbabwean economy. Performance of SMEs is deteriorating due to lack of various factors. The failure of these emerging enterprises subsequently results in employees being laid off contrary to the government's main objective of poverty reduction. However, despite the fact that the contribution of human capital is not new in business but in the Zimbabwean context it is yet to be fully realised, and that has motivated the researchers to carry out a research on the influence of experience, owner-manager' education on SME performance. However, education and experience have been touted as the panacea and this has resulted in it becoming ubiquitous. Colleges, training institutions and workshops are run almost every day with their objective being to educate people to enhance their potential in running SMEs. The question that remains is whether experience and owner-managers' education has an influence on SME performance?

Research Objectives:

- To analyse the relationship between experience and owner-managers' education and the performance of SMEs
- To determine the value that SMEs stand to gain if their owner-managers' have both experience and education
- To examine challenges that impede SMEs with owner-managers' without experience and higher educational level

Research Questions:

- Is there any relationship between experience and owner-managers' education and performance of SMEs?
- What are the values that SMEs stand to gain if owner-managers' have both experience and education?
- What are the challenges that impede SMEs with owner-managers' without experience and education?

Statement of hypothesis:

Hypothesis 1;

H_0 : There is no relationship between experience and owner-managers' education on SMEs performance.

H_1 : There is a relationship between experience and owner-managers' education on SMEs performance.

Hypothesis 2

H_0: Registration of SMEs is not influenced by experience and education of owner-managers

H_1: Registration of SMEs is influenced by experience and education of owner-managers

2. Literature Review

SMEs envelop a wide range of definitions and measures varying from country to country and between the sources reporting SME statistics (Amwele, 2013). Some of the commonly used criteria are the number of employees, total net assets, sales, and skill of labour and investment level (Abor and Adjasi, 2016). In nations like the USA, Britain and Canada, SMEs are viewed in terms of annual turnover and number of employees the organisation is able to employ formally. Britain defines small-scale entities with an annual turnover of 2 million pounds or less, with not more than 200 employees who are on a pay role (Afande, 2013). In Egypt, SMEs are viewed as organisations which employ more than 5 employees and fewer than 50 employees (Bouri, Breij, Diop, Kempner, Klinger and Stevenson, 2011).

In Zimbabwe, Ministry of SMEs separated small and medium enterprises, small entities are those who are not able to hire more than 50 employees while operating as a legally registered firm and medium entities are those who employ 75 to 100 human capitals (Majoni, et al, 2016). Zimbabwe Association of SMEs described

an SME as a small entity which has a turnover of less than $240 000 and the asset value of less than $100 000. Medium enterprise has a turnover of more than $ 240 000 but less than $ 1000 000 in asset base (Chivasa, 2014). The above figures are presented in table 2.1 below.

Table 1: Synopsis of SME Definitions in Zimbabwe

Enterprise	Employees	Annual Turnover	Asset Base
Small	5 to 50	< $240 000	< $100 000
Medium	75 to 100	>$240 000	< $ 1000 000

Importance of SMEs: SMEs are the backbone of many countries and the engine of economic growth in both developed and developing nations. They are being echoed worldwide as the real drive force which alleviates poverty because of their capabilities of employing a number of intellectual assets. They also contribute effectively to the GDP in different nations on the globe (Afande, 2013). The Organisation for Economic Co-operation and Development (OECD) states that more than 95% SMEs employ more than 60 % (Bouri et al, 2011). The Global Entrepreneurship Monitor (GEM) in 2010 articulated that countries like Angola, Ghana, South Africa Uganda and Zambia, their SMEs are improving (Yeboah, 2015). Maranga, (2014) expressed that, SMEs in Kenya are playing a prolific role in alleviating poverty, they created about 89, 9% of employment and they contribute about 59% to the GDP. In South Africa, SMEs are also instrumental because they are said to contribute 50 to 57% to the GDP and they also play a superb role in employment creation, it was estimated that they provide 61% of the labour force (Mahembe, 2011). In addition, the sector is also doing justice to the Zimbabwean milieu. Zimbabwe's Ministry of Finance propounded that, SME sector employs more than 60% of the country's labour force and contributes around 50% of the country's GDP (Ruzivo Trust, 2013). The information above shows that SMEs play an important role in Zimbabwe's economy, with the ability to bring a fundamental solution in reducing the number of unemployed citizens. However, SMEs are failing because some of the owner-managers lack experience and education to run and manage these entities.

Theoretical Framework

Human Capital Theory: Human capital theory suggests that education and training is the best ingredient that makes organisations unique and different (Mmari, 2014). Ogubazghi and Muturi (2014) posit that human capital theory can be articulated as the resource that envelops experience, skills and knowledge which influence the success of an entity. There are several studies which postulate that the quality of human capital increase due to the time spent by owner-managers in training (Ogubazghi and Muturi, 2014). Sarwoko and Frisdiantara (2016) propounded that experience is the key factor that is used by owner-managers to out-compete their rivals. In business, there is bound to be competition, therefore owner-managers should be well equipped intellectually so that they can stand competition. Furthermore, Ng'ang'a, Ngugi, and Odhiambo (2014) concurred that education of owner-manager has a positive influence on the decision process of an entity. They also agree that the level of education of owner-manager influence organisational performance. The tacit knowledge of owner-manager is essential in both decision making and quality of products the organisation will produce at the end of the process (Ng'ang'a et al., 2014). The human capital theory emphasizes the importance of education to employees of any organisation. It conceptualises workers as embodying a set of skills which can be hired by owners of production to enhance performance. In addition, an organisation needs skills which cannot be imitated by competitors, hence these unique skills can act as the sustainable competitive advantage.

Empirical literature Review on experience and owner-manager education: There is a plethora of research conducted by different scholars in different continents throughout the world; their main objective was to establish the effects of experience and owner-manager education on SME performance. The following discussion will include some of the findings realised by other researchers.

Relationship between experience and owner-manager education on SME performance: Education has been always perceived as the important factor that influences the performance of any organisation (Mmari, 2014). Blackburn, Hart and WainWright (2013) carried out research in the United Kingdom about Small business performance: business strategy and owner-manager characteristics and it was concluded that high

level of education by owner-manager increases their capabilities and survival chances of an enterprise. On the same vein, Brijlal, Naicker and Peters, (2013) carried out their research in South Africa about education and SMME business growth, and it was discovered that 73% of respondents acknowledged the fact that expansion of most businesses was influenced by the high level of education. Furthermore, Mmari, (2014) carried out research in Tanzania about the relationship between experience and owner-manager education on the performance of SMEs, a case study of garages in Arusha City and Moshi Municipality, and it was found that education of owner-manager influences the performance of an enterprise. To support the aforementioned statement, Isaga, (2015) also carried out research in Tanzania about owner-managers demographic characteristics and the growth of SMEs and it was disclosed that workshops attended by the owner-managers have a significant influence on the growth and sustainability of SMEs. It was also revealed that, for the business to be successful, owner-managers should improve their level of education (Mmari, 2014).

Woldie, Leighton and Adesua (2008) carried a study in Nigeria about the factors that influence the performance of SMEs and reported that performance differs with the level of education. An owner-manager who holds a degree performs better than owner-manager with a low level of education (Mmari, 2014; Yeboah, 2015). However, training is a continuous process; and it is necessary for owner-managers to upsurge their knowledge by attending different workshops and enrolling with different educational institutions to further their educational levels. Level of education plays a prolific part in the performance of different entities. However, some researchers have argued that education is insignificant on the performance of SMEs.

Amarteifio and Mensah, (2013) carried out research in Accra, Ghana about the level of education, experience and performance of SMEs and it was concluded that education is not that important on the performance of SMEs. They noted that, an entrepreneur only needs basic education for his or her entity to positively perform. Kamunge, Njeri and Tirimba (2014) also argued that the lack of managerial skills affect the performance of an entity but on a moderate scale. Experience is defined as knowledge and skills attained by observing and physically dealing with a number of tasks encountered during the organisation's work processes (Soriano and Castrogiovanni, 2012). Some researchers have reported different perceptions about the relationship between experience and performance of enterprises. Some academies have revealed that experience enhances the positive performance of an entity, while others argued that experience is ineffective when it comes to a company's performance (Woldie et al., 2008).

Soriano and Castrogiovanni, (2012) carried out a research on the impact of education, experience and inner circle advisors on SME performance, and it was discovered that experience gained from previous work which is different from your own business has a negative bearing on profitability, however, it was further revealed that experience from previous work on the same industry correlate to productivity (Soriano and Castrogiovanni, 2012). The notion above was also supported by Chachar, (2013) who carried out research in Pakistan about the impact of owner-managers education and work experience on the growth of handicraft SMEs. He established that the higher the number of years of work experience the higher the growth of enterprises with respect to profits, sales, number of employees and customer base. Amarteifio and Mensah (2013) also established that work experience is not the only important instrument which enables improvement of SME performance. They articulated that age can also play an important role in SME performance.

Value that SMEs stand to gain if their owner-manager has both experience and education: Brijlal et al. (2013) in their research revealed that, there is a higher chance of increasing labour force if the owner-manager is highly educated. Soriano and Castrogiovanni, (2012) reported that owner-managers experience is critical because the organisation will be able to attract more customers and suppliers; thereby increasing their market share. In addition, experience helps the owner-manager to exploit relevant material which is valued by the customers (Soriano and Castrogiovanni, 2012). Smit and Watkins, (2012) posit that education and experience of entrepreneurs assist them to apply relevant strategies especially in the turbulent business environment. Some empirical studies have also suggested that managerial experience in emerging economies pave a way on how to embrace relevant policies which can glue in positive results for an entity (Shava and Rungani, 2016). However, the value that can be gained by enterprises with owner-manager holding high educational qualifications is that, the risk is managed amicably, therefore this enforce the growth of an

organisation. Sarwoko et al. (2013) cement that, education and experience are critical to the survival and growth of an enterprise. They further relay that experience and education enhance owner-manager to recognise the opportunity and utilise it.

Challenges that impede SMEs with owner-managers without experience and high level of education: It has been established by previous literature that experienced and highly educated owner-managers are influential on the performance of any organisation. However, some previous studies have also highlighted that, there are several challenges that are faced by inexperienced owner-managers. Chachar, (2013) opine that education and experience have positively influenced the growth of any organisation. Education is influential on the sales, profit and number of human capital employed by the enterprise (Chachar, 2013). If the owner-manager is lagging behind in terms of education and experience, the organisation will employ a limited number of employees and furthermore, their sales and profits would be very low. If the owner-manager is inexperienced and uneducated, the organisation will not survive, hence, it will close shop within a short period of time in business (Hove and Chikungwa, 2012). It is essential for the researchers to test if registration of entities is influenced by owner-managers education and experience.

Registered SME's are owned by educated and experienced owner-managers: There are a number of SMEs which are mushrooming in the business circles. However, a number of these SMEs are not being registered. It was noted that informal entities do not register because regulations of different nations are too complex (Bruhn and Loeprick, 2016). However, some of the reasons which necessitate failure of registration of SMEs by owner-managers are that, they lack the knowledge and experience on how to go about it. It is also important to note that; some of the requirements which are required by policymakers are too many and sometimes complex, thereby making it difficult for owner-managers to register their enterprises.

3. Research Methodology

The descriptive research design was employed by the researchers to describe characteristics of a population being studied. It is a research method that uses various forms of data as well as incorporating human experience. Descriptive research provides answers as to who, what, where and how questions on the influence of experience and owner-manager education on SME performance (Creswell, 2011). However, the researchers applied this research design to get an insight of the impact of experience and education of owner-manager on SMEs. Philosophical approach of interpretivism was employed moving towards positivism to guide the whole research. Furthermore, this study adopted a mixed method approach, which represents the collection, analysis and interpretation of quantitative and qualitative data in a single study (Creswell and Plano, 2011). Mixed method approach is aimed at increasing the validity of evaluation and the research findings, which essentially combines both the qualitative and quantitative approaches (Mertens, 2009).

A deductive research approach was used to get answers in response to research questions which were crafted in chapter one of the study. Deductive research approach involves testing of the theory which underpins the study, for example in this research, the human capital theory was applied in literature review which was discussed in chapter two (Mmari, 2014). The data was quantified and examined to provide insights which were used to form the conclusion. Kelvin Light industry was randomly used in this study. The information obtained from Bulawayo City Council, unfolded that there are 53 motor spares which are registered and 56 were operating while they were not registered, therefore total population was 109. Researchers calculated one-third of the total population and the targeted population was 16 participants from registered entities and 17 participants from unregistered SMEs. The table below present the total and targeted population of the sample.

Table 2: Total and targeted population of sample

Respondents	Total population	Target population
Owner-Managers (Registered)	53	16
Owner-Manager (Not Registered)	56	17
Total	109	33

However, for the purpose of yielding valid results, the researchers increased the number of targeted population from 33 to 40 owner-managers' participants. The targeted population was so because the researchers saw it worthy to deal with only owners of SMEs. On that same vein, Roscoe (1975) alluded that the sampling size should be more than 30, but less than 530. The proposed sampling size is regarded as enough to produce effective results. Due to the above two distinct subpopulations, stratification sampling technique was employed. Stratification sampling technique is the process of dividing members of the population into homogeneous subgroups before sampling (Frerichs, 2008). For instance, this research includes two subpopulations which are registered and unregistered motor spares shops, therefore stratification sampling technique was the best technique to employ because it is less prone to bias. Random sampling was employed to randomly select representatives from both registered and unregistered SMEs (Cooper and Schindler, 2011). The researcher employed closed-ended questions because of its inclusiveness in nature since they were premeditated to produce easily quantifiable data.

Reliability of the Study: The researchers formulated 28 questionnaires to assess the influence of experience and owner-managers' education on SME performance. 22 of the questions were in a five point Likert scale ranging from "strongly disagree" to "strongly agree". Before the questionnaire was finally adopted the validity of the instrument were measured with the aid of the Statistical Package for Social Sciences (SPSS) software package version 20. Cronbach's alpha was run on all of the questions in order to ascertain the reliability of the questionnaire.

Data Analysis and Presentation: To conduct quantitative research it is necessary to code the data from the questionnaire. This process was done to refine data into simple analysable components. Coded data from questionnaires were loaded into the SPSS an electronic tool used for data analysis, descriptive statistics, graphical presentations as well as data documentation (Cooper and Schindler, 2011). Data were analysed and presented in a clear, readable manner allowing the construction of clear relationships in the data.

4. Findings

Relationship between experience and owner-manager education on SME performance

Table 3: Regression Analysis results on sales

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.887[a]	.786	.769	.613

Predictors: (Constant), Years of work experience, Professional Qualification: The research showed that there is a positive relationship between experience and owner-manager education on SME performance. The results which were obtained from regression analysis between work experience and professional qualification on sales of SMEs operating at Kelvin Motor Spares Light Industry revealed that R^2 is at 78.6% which show that both experience and education has a positive impact on the performance of SMEs. The results are consistent with results of Blackburn, et al. (2013) and Mmari, (2014) who were discussed in chapter two of the research who concluded that both education and experience of owner-managers' have significant effects on SME performance. Therefore, hypothesis number $1H_1$ which states that, there is a relationship between experience and owner-managers' education on SMEs performance is accepted.

Value that SMEs stand to gain if their owner-manager have both experience and education

Table 4: Regression Analysis of customer base

Model Summary				
Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	.855[a]	.731	.714	.613

Predictor: (Constant), Years of work experience, Professional Qualification: It was established that, owner-managers with both experience and better level of education enhances the enterprise to increase their customer base, increased number of intellectual assets and growth. The regression analysis was employed to test if experience and education significantly impact customer base of SMEs. The results indicated that R^2 is 73.1% which implies that education and experience are critical in up surging number of customers. To support the above results, the chi-square test was also engaged.

Table 5: Chi-Square Tests between headcount and professional qualification

Chi-Square Tests			
	Value	Df	Asymp. Sig (2-sided)
Pearson Chi-Square	33.955[a]	12	.001
Likelihood Ratio	30.970	12	.002
Linear-by-Linear Association	19.740	1	.000
N of Valid Cases	35		

19 cells (95.0%) have expected count less than 5. The minimum expected count is .23

Chi-square was employed to assess the relationship between both experience and education of owner-managers on headcount and it was indicated that p-value was less than our chosen significant level of 0.05 and therefore, it was concluded that both independent variables and headcount are related. Hence, there was a significant association between the independent variables and headcount. The results were constant with the results of Brijlal et al. (2013) which were discussed in chapter two, who concluded that business expansion was being influenced by the high level of education.

Challenges that impede SMEs with owner-managers without experience and high level of education

Table 6: Cross tabulation between professional qualification and owner-managers' ability to apply for a loan

The owner-manager is able to apply for a loan to any financial institution *Professional Qualification: Crosstabulation							
			Professional Qualification				Total
			None	Certificate	Diploma	Degree	
The owner-manager is able to apply to any financial institution	Strongly Disagree	Count	2	0	0	0	2
		%within the owner-manager is able to apply for a loan to any financial institution	100%	0.0%	0.0%	0.0%	100%
	Disagree	Count	0	3	0	0	3
		%within the owner-manager is able to apply for a loan to any financial institution	0.0%	100%	0.0%	0.0%	100%
	Neither disagree nor agree	Count	2	2	1	0	5
		%within the owner-manager is able to apply for a loan to any financial institution	40%	40%	20%	0	100%
	Agree	Count	0	3	10	1	14
		%within the owner-manager is able to apply for a loan to any financial institution	0.0%	21.4%	71.4%	7.1%	100%
	Strongly Agree	Count	0	0	6	5	11
		%within the owner-	0.0%	0.0%	54.5%	45.5%	100%

	manager is able to apply for a loan to any financial institution					
Total	Count	4	8	17	6	35
	%within the owner-manager is able to apply for a loan to any financial institution	11.4%	22.9%	48.6%	17.1%	100%

The results obtained from the cross tabulation above indicated that those owner-managers without any professional qualification, 100% strongly disagreed that they are able to apply for a loan, 100% of holders of certificates disagreed that they are able to apply for a loan. On the other hand, 71.4% of diploma holders agreed that they are able to apply for a loan, 54.5% of them strongly agreed that they are capable. Furthermore, from the degree holders, 45.5% strongly agreed and 7.1% also agreed that they are able to apply for a loan to any financial institution. Therefore, the results show that education plays a big role in accessing financial help. It can be concluded that failure to apply for a loan is another bottleneck which holds back SME owner-managers to perform as expected. These results are also consistent with findings of who carried out their research in the United Kingdom about barriers faced by SMEs in raising bank finance and they concluded that graduates had the least difficulties raising finance. The regression analysis below also revealed the same results. Therefore, hypothesis number $2H_1$ which states that, registration of SMEs is influenced by experience and education of owner-managers is accepted.

Registered SME's are owned by educated and experienced owner-managers

Table 7: Regression analyses between professional qualification and tax returns

Model Summary				
Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	.831[a]	.691	.682	.734

Predictors: (Constant, Professional Qualification

The frequency analysis results had indicated that 13(37.1%) of respondents agreed that their tax returns are in place, 10(28.6%) strongly agreed that they have tax returns in place. On the other hand, 10(28.6) of participants disagreed that their tax returns are in place and 2(5.7%) strongly disagreed. However, this shows that there are some owner-managers who are operating whilst they are not legally registered by authorities. The researcher seeks to explore if professional qualification influences SMEs to have tax returns in place. Regression analysis was also employed. From the results obtained on the regression analysis table above, R^2 is 69.1% which demonstrate that professional qualification influences SMEs to have tax returns in place. However, researchers have concluded that level of education positively influences registration of SMEs.

5. Conclusion

The results show that experience and owner-managers' education is significant on SME performance. It was revealed that owner-managers with a high level of education and relevant experience are able to increase the number of their intellectual assets, customers and their sales. Furthermore, the research demonstrated that owner-managers without education and experience are facing some challenges in accessing financial support from financial institutions as compared to owner-managers with experience and better level of education. It was also unfolded that education and experience of owner-managers' influences registration of SMEs.

Recommendations: Recommendations to follow were gathered after a thorough understanding of the problem and assessing the data obtained from the owner-managers' of SMEs operating at Kelvin Light Industry. The recommendations proposed are critical and of versatile to all SMEs in Zimbabwe and abroad. On the same vein, recommendations cannot be fruitful on their own but they need a commitment from both the owner-managers and the government.

Policy Implications

Government Should Provide Training Programmes Specifically for SME Owner-Managers: Education and experience of owner-managers was found to be influential on the performance of Motor Spares SMEs. Owner-managers should continuously further their studies to remain relevant and competitive. The government should support SME owners by increasing the number of workshops which offer training on how to effectively manage emerging entities. It is also recommended that the training they receive should help them to run their businesses ethically and professionally. There is also a need for SMEs to embrace corporate governance principles in their operations. Furthermore, the government should support SMEs financially so that they may augment their capital base.

Areas for further research: The research has given an insight into the area of education and experience of owner-managers and how these two variables impact performance of SMEs who are into buying and selling vehicle spare parts at Kelvin Light Industries in Bulawayo. The following aspects should be considered for future research: Research related to SMEs covering the whole of Zimbabwe. If possible the research should cover SMEs who are into manufacturing and service delivery to make an informed judgment with a larger sample. There is need also to do a similar study on different economic conditions. Future studies might consider using different research paradigm. Triangulation on the basis of more qualitative data and other different variables in addition to education and experience, for example age and gender. In addition, an extension of this work can be comparisons between Zimbabwe and other countries like South Africa, Botswana and Zambia because entrepreneurs who are buying and selling vehicle spare parts are mushrooming even across borders.

References

Abor, J. & Adjasi, C. K. D. (2016). Corporate Governance and the Small and Medium Enterprise Sector: Theory and Implications, *Corporate Governance Journal of Business Society*, 7(2), 111-122.

Afande, F. O. (2013). Adoption of Corporate Governance Practices and FinancialPerformance of Small and Medium Enterprises in Kenya, *Research Journal of Finance and Accounting*, 6(5), 36-74.

Amarteifio, E. N. A. & Mensah, J. V. (2013). Level of Education, Experience and Performance of Small and Medium Enterprise in the Accra Metropolis', Ghana, University of Cape Coast.

Amwele, H. N. (2013). An Empirical Investigation into the Factors Affecting the Performance of SMEs in the Retail Sector in Windhoek, Namibia, Polytechnic of Namibia.

Blackburn, R. A., Hart, M. & Wainwright, T. (2013). Small Business Performance: Business Strategy and Owner-Manager Characteristics, *Journal of Small Business and Enterprises Development*, 20(1), 8-27.

Bouri, A., Breij, M., Diop, M., Kempener, R., Klinger, B. & Stevenson, K. (2011). Report on Support to SMEs in Developing Countries Through Financial Intermediaries, Dalberg, Geneva.

Brijlal, P. & Naicker, V. (2013). Education and SMME Business Growth: A. Gender Perspective from South Africa, *International Business and Economics Research Journal*, 12(8), 855-867.

Bruhn, M. & Loeprick, J. (2016). Small business Tax Policy and Informality: Evidence from Georgia, *International Tax and Public Finance,* 23(5), 834-53.

Chachar, A. A. (2013). The Impact of Owners' Education and Work Experience on the Growth of Handicraft SMEs in Hyderabad Region Pakistan, University of Bedfordshire, Luton.

Chivasa, S. (2014). Entrepreneurship Culture Among SMEs in Zimbabwe. A Case of Bulawayo SME's, *International Journal of Economics, Commerce and Management*, 2(9), 1-13.

Cooper, D. R. & Schindler, P. S. (2011). Business Research Methods, (11th Ed), McGraw-Hill-Irwin, New York.

Creswell, J. W. & Plano, C. V. L. (2011). Designing and Conducting Mixed Methods Research, (2nd Edition), CA: Sage, Thousand Oaks.

Dumbu, E. (2014). An Evaluation of the Management of Micro and Small Enterprises (Mses) In Zimbabwe: A Case Study of the Manufacturing Mses in Masvingo Urban', Zimbabwe, Zimbabwe Open University.

Frerichs, R. R. (2008). Simple Random Sampling, Accessed at www.randomsampling.com on 24/02/17 at 22:57 hours.

Hamad, S. B. & Karoui, A. (2011). The SMEs Governance Mechanisms Practices and Financial Performance: Case of Tunisian Industrial SMEs, *International Journal of Business and Management,* 6(7), 216-226.

Hove, P. & Chikungwa, T. (2012). Internal Factors Affecting the Successful Growth and Survival of Small and Micro Agri-business Firms in Alice Communal Area', *Journal of Economics*, 4(1), 57-67.

Isaga, N. (2015). Owner-Managers Demographic Characteristics and the Growth of Tanzanian Small and Medium Enterprises, *International Journal of Business and Management*, 10(5), 1-14.

Kamunge, M. S., Njeru, A. & Tirimba, O. I. (2014). Factors Affecting the Performance of Small and Micro Enterprises in Limuru Town Market of Kiambu County, Kenya, *International Journal of Scientific and Research Publications*, 4(1)2, 1-20.

Mahembe, E. (2011). Literature Review on Small and Medium Enterprises' Access to Credit and Support in South Africa National Credit Regulator (NCR)', Underhill Solutions (UCS) Publications, Pretoria.

Majoni, T. Matunhu, J. & Chaderopa, B. (2016). SMEs Policies and Challenges: A Comparative Analysis of Zimbabwe and South Korea', *International Journal of Science and Research Publications*, 6(6), 377-385.

Maranga, G. M. (2014). The Effects of Corporate Governance on Financial Performance of Small and Medium Enterprises in Nairobi County, Kenya, Business Administration School of Business, University of Nairobi.

Mertens D. M. (2009). Transformative Research and Evaluation, New York, Guilford.

Mmari, G. A. (2014). Influence of Education on Performance of SMEs: Experience from Vehicle Garages in Arusha City and Moshi Municipality, Tanzania, *International Journal of Research Reports Series*, 2(2), 1-28.

Mudavanhu, V., Bindu, S., Chiguuswa, L. & Muchabaiwa, L. (2011). Determinants of Small and Medium Enterprises Failure in Zimbabwe: A Case Study of Bindura, *International Journal of Economics Research*, 2(5), 82-89.

Ndlovu, P. (2015). 2016 Budget: Divergent Optimism for SMEs, the Chronicle, Bulawayo, 03 December, p. 05.

Nganga, P. K., Ngugi, P. K. & Odhiambo, R. (2014). Influence of Owner/Manager Personal Characteristics on the Demand for Business Development Service by Micro and Small Enterprises from the Upper Echelons Theory, *International Journal of Business and Social Science,* 5(6), 1-7.

Ogubazghi, S. K. & Muturi, W. (2014). The Effect of Age and Educational level of Owner/Managers on SMMEs' Access to Bank in Eritrea: Evidence from Asmara City, *American Journal of Industrial and Business Management*, 4, 632-643.

Robu, M. (2013). The Dynamic and Importance of SMEs in Economy, *The USV ANNALS of Economics and Public Administration*, 13(1), 84-89.

Ruzivo Trust. (2013). Micro, Small and Medium Enterprise (MSME) Sector, Available at www.ruzivo.co.zw accessed on 20/02/2017 at 13:04 hours.

Sarpong, D. (2012). Micro, Small and Medium Scale Enterprises in Ghana: Challenges and Prospects: A Case Study of Sekondi-Takoradi Metropolis, Accessed at www.ccsenet.org/journal/index on 27/02/2017 at 11:37 hours.

Sarwoko, E. & Frisdiantara, C. (2016). Growth Determinants of Small Medium Enterprises (SMEs), *Universal Journal of Management*, 4(1), 36-41.

Shava, H. & Rungani, E. C. (2016). Influence of Gender on SME Performance in Emerging Economies, *Acta Commercii - Independent Research Journal in the Management Sciences*, 1-9.

Shumba, V., Manzini, S. & Ndlovu, N. (2015). The Effects of Separating Ownership and Control on The Performance of Retail Stores in Southern Zimbabwe, *International Journal of Economics, Commerce and Management***,** 2 (6), 1-17.

Smit, Y. & Watkinds, J. A. (2012). A Literature Review of Small and Medium Enterprises (SME) Risk Management Practices in South Africa, *African Journal of Business Management: Victoria Island*, 6(21), 324-330.

Soriano, D. R. & Castrogiovanni, G. J. (2012). The Impact of Education, Experience and Inner Circle Advisors on SME Performance: Insights from a Study of Public Development Centers, *Journal of Small Business Economics*, 38, 333-349.

Yeboah, M. A. (2015). Determinants of SME Growth: An Empirical Perspective of SMEs in the Cape Coast Metropolis, Ghana, *The Journal of Business in Developing Nations*, 14, 1-31.

Woldie, A., Leighton, P. & Adesua, A. (2008). Factors Influencing Small and Medium Enterprises (SMEs): An Exploratory Study of Owner/Manager and Firm Characteristics, *Journal of Banks and Bank Systems*, 3(3), 5-9.

Determinants of Eastern Cape Gross Fixed Capital Formation and Its Impact on the South African Economic Performance

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Abstracts: This study aimed at investigating the factors that determine gross fixed capital formation in the Eastern Cape province of South Africa using time series autoregressive distributive lags (ARDL) on a data covering 1996-2015. We are constraint with the time length of the data because the range of time falls within the period when South Africa got her independence and actually the reliability of most data for most economic activities began after independence. The analyses carried out in this study are basically from two study dimensions. Firstly, we investigated which factors determine the growth of Eastern Cape Gross fixed capital formation and the classification of all economic activity into primary, secondary and tertiary sectors enabled us to identify the significant role of tertiary sector among others in analyzing which factors determine Easter Cape gross fixed capital formation. Again, growth is enhanced through the following determinants: Catering and Accommodation (TF17) and not necessarily when Wholesale and retail trade is inclusive; Again, there is a better performance of the GFCF in the tertiary sector with Communication (TG19) than when Transport and storage are merged together, and finally, Business services (TH21) behaves better with tertiary sector than when it combines with Finance, Insurance and real estate. Hence, for policy implication, the growth of primary and secondary should be considered urgent and should be given ultimate policy consideration as it appears that these sections contribute very negligibly to the growth of Eastern Cape gross fixed capital formation.

Keywords: *Gross fixed capital formation, Eastern Cape, ARDL, Economic Growth*

1. Introduction

Economic theory has established that economic activity resulting in high saving rates, together with high levels of capital formation are preconditions for sustained economic growth in any given economy. This is because to finance high levels of capital formation, the high level of savings are required for an increased high level of productivity and consequently long-term growth in the economy. To finance capital formation, nations can hardly totally be dependent on foreign investment (Akinola, and Omolade, 2013). Capital formation is an integral aspect of the gross domestic product and this concept emphasized that society does not concentrate the whole part of her current production output to the immediate consumption needs but rather keeps a proportional part of it for the creation of capital goods. Capital formation enhances production, hence it determines the speed of economic growth in any country (Jhingan, 2005). In the recent time, South Africa chose privatization policies as an alternative option, with the aims to stimulate, to enhance and to foster faster improvement in the propensity to invest in the form of capital formation among the various levels of citizens, real sectors and the government of the country.

The result of this Privatization policies lead to efficiency in the allocation of economic resources, expectations of efficiency, reduce unemployment, maintain a low inflation rate and increase in aggregate supply (Karim et al., 2010). The process of development that could be traced in other to achieve the expected capital formation are these interrelated conditions: availability of financial institution to manage the channelled of funds, availability of investible fund for savings while investing the return of savings into capital goods (Jhinghan, 2003). Hence, capital formation is a concept that identified investment as the part of current income that is not consumed but rather invested in returns for future real incomes (Bakare, 2011). Capital formation could impact on the country's economy as it helps the citizens to improve and maintain general standards of living. Adopting Mathematical approach, it attempts to weigh the value of currently purchased or existing assets (fixed) by the government, businesses, and households and this process involves the acquisition of productive capital goods. The need for this study came from the concern to determine the possible contribution of Eastern Cape to the Investment target policy of the current government.

The study is interested in viewing the various sectors of GFCF in Eastern Cape from the perspective of their overall impact on South African Economic growth, and if South Africa as a nation would need to meet her economic development objectives, of great importance is the need for capital formation or capital accumulation otherwise known as physical capital stock. This is because South African economic development could only be measured effectively through the building of capital equipment on a sufficient scale to increase productivity in mining, agriculture, plantations and industry in a large quantity sufficient enough to move the economies to the targeted level. Of course, capital accumulation is required to construct hospitals, schools, railways, roads, standards of living, hence the study's hypothesis is that there is no significant sectorial impact of Eastern Cape economic activity on the Eastern Cape Gross Fixed Capital Formation. The objectives of the paper are: To examine the Eastern Cape sectorial activity and their impacts on the overall Eastern Cape gross fixed capital formation. To analyze which of the sectors contribute to Eastern Cape gross fixed capital formation.

2. Literature Review

The following theories are applied for this study to showcase the behavioural investment features among government, firms and organisations in the Eastern Cape Province of South Africa. According to the Harrod-Domar model, when investment is stimulated, it would lead to more economic growth in the economy. Therefore, for a nation to invest more in capital formation, it would be expected that the economies save sizeable part of its resources from the current consumption, since savings simply means diverting a certain proportion of its current consumption. Bakare (2011) argued that a given economy should save a reasonable proportion of her national income in other to replace a worn out capital good, However, Pettinger (2014) opined that improving saving ratio would not be appropriate in an era where getting food for the people places a big concern to the government, therefore improving the ratios of saving in developing economies is most difficult to achieve. Certain factors such as levels of corruption, labour productivity and technological innovation were ignored in the Harrod-Domar model.

Investment in the Neo-Classical approach takes another dimension as it addresses the objective to remove the Harrod-Domar model shortcomings. According to the neoclassical approach, the rental cost of capital and the level of output are the important factors that determine capital stock (Uremadu, 2012). In 1968, Tobin Q investment theory allowed the cost of capital to determine the growth of the economy and therefore argued that investments could still be achieved provided the market value and the book value remain unequal (Kanu, and Ozurumba, 2014). Again, from the Marginal efficiency of capital hypothesis, the value of capital compared to the interest rate determines the level of investment in a given economy (Kanu, and Ozurumba, 2014) and therefore, investment should be discouraged provided the marginal rate of capital is lesser than interest rate, otherwise, investments should be increased. The rate of interest and rate of return over cost in any direction, determine the level of investment (Fisher, 1930).

Empirical Literature: In this paper, various aspects of the relationship connecting economic growth and capital formation have been reviewed. Under Some reviewed studies, ordinary least squares (OLS) were employed together with Vector Error Correction Model (VECM) to show the significant contribution of capital formation on economic growth as conducted by Bakare (2011) who examined the relationship between capital formation and growth in Nigeria. Rajni (2013) studied the causal effects among imports, exports, and Indian capital formation, the study was conducted by adopting a test on Granger causality. The collected data was from the economic survey and handbook of India. He discovered from his findings that there is a bidirectional causal relationship between export growth and gross domestic capital formation whereas there was an existence of unidirectional causal effects among import, capital formation and export emanating from the test on Granger causality. Malawi (2005) investigated the gross fixed capital formation trends and its impacts on money supply and economic performance in Algeria during the time period of 1971 and 2003. Granger- causality test was the adopted method to decompose the variance, and consequently the impulse response functions. The result indicates that all the variables, namely money supply and fixed capital formation can boost economic growth according to the Granger test. Ugochukwu and Chinyere (2013) for instance, analyzed the effects of capital formation on economic growth in Nigeria. Their findings indicated that capital formation is significantly and positively contributes to economic growth in Nigeria.

According to Ncanywa and Makhenyane (2016), some studies have shown in the recent years that the role of capital formation economy among the developing countries is of great importance to economic growth (Ghura, and Hadji, 1996; Ghura, 1997; Beddies, 1999; Kumo, 2012; Ugochukwu, and Chinyere, 2013). It has been verified, that the increase in the economic growth, is associated to flow with an increase in capital formation in Nigeria (Ugochukwu, and Chinyere, 2013; Adegboyega, and Odusanya, 2014; Muneer et al., 2016). Pathunia (2013) argued that there is a connection between exports growth and capital formation in a given economy. Hence, through the activities inherent in capital formation, a nation could improve its tangible capital stock as it injects more fund in the economic infrastructure and social and consequently impact on economic growth. Karim (2010) however, noted that there is no significant long-run relationship between economic growth and net investments in Malaysia. There is a gradual improvement in the gross fixed capital formation moving from 73 065 ZAR Million in 1962 to 624 408 ZAR Million in last quarter of 2014 according to South Africa experienced (Stats SA, 2015).

This could be the result of South African adherence to the movement towards privatization policies' adoption, as the country tries to stimulate the growth in the capital formation (Perkins et al., 2005). The original aim is to increase aggregate supply, allocate economic resources efficiently, maintain a low inflation rate and reduce unemployment. From the contradicting results indicated by scholars so far, together with the trends exhibited by the South Africa gross fixed capital formation (GFCF) over the years, it is interesting to investigate which factors determine the increase in the Eastern Cape GFCF. In addition, capital formation exhibited positive effects on the stock market, whereas it negatively contributes to inflation and rates interest (Ugochukwu, and Chinyere, 2013; Khan et al., 2013). The most remarkable conclusion was that Nigeria's capital formation accumulation could boost the economy in the long run and develop the real state of the economy. Shuaib and Dania (2015) also argued that there is a significant relationship between growth and gross domestic capital formation in Nigeria. Adegboyga and Odusanga (2014) examined the relationship among trade openness, Foreign Direct Interest, gross fixed capital formation and growth in the Nigerian economy, they also found a positive association-ship when time series data were adopted.

Based on the result of Adegboyga & Odusanga (2014) the findings showed that capital formation could positively impact on the growth of the economy. They further suggested that Nigeria needs to increase the quality of its monetary and fiscal policies to promote her exports which would finally impact on her economic growth. They further recommended that the government of Nigeria must consider the framework within the institutional setting since there is a positive but insignificance volume of Foreign Direct Investment on economic growth. Kanu and Ozurumba (2014) also examined the contributing effects of capital formation on the Nigerian economic growth through the adoption of techniques in the multiple regression. The study adopted economic growth, gross fixed capital formation, total imports, total exports, inflation and total savings as her main variables. Findings revealed that gross fixed capital formation does not significantly contribute on economic growth in the short run, however VAR model in the long run showed that lagged values of GDP, total exports, gross fixed capital formation and had a positive long-run relationship with Nigerian economic growth.

3. Methodology

To further establish which factors determine the GFCF for Eastern Cape, the study builds on the model developed by (Langat, 2007; Ugochukwu, and Chinyere, 2013)

$$GFCFEC_t = \int\left(\Pr y\sec_t + Sec\sec_t + Ter\sec_t\right) \qquad (1)$$

$$GFCFEC_t = \alpha_0 + \alpha_1\sum_{1}^{2}\Pr y\sec_t + \alpha_2\sum_{1}^{15}Sec\sec_t + \alpha_3\sum_{t}^{11}Ter\sec_t + \varphi_t \qquad (2)$$

Dynamic transformation of the model is given as:

$$GFCFEC_t = \alpha_0 + \alpha_1 GFCFEC_{t-1} + \alpha_2\sum_{1}^{2}\Pr y\sec_t + \alpha_3\sum_{1}^{15}Sec\sec_t + \alpha_4\sum_{t}^{11}Ter\sec_t + \varphi_t \qquad (3)$$

Where:

Primary sector includes: (1) Agriculture, forestry and fishing, (2) Mining and quarrying.

Secondary sector includes: (1) Manufacturing, (2) Food, beverages and tobacco (3) Textiles, clothing and leather goods (4) Wood, paper, publishing and printing (5) Petroleum products, chemicals, rubber and plastic (6) Other non-metal mineral products (7) Metals, metal products, machinery and equipment (8) Electrical machinery and apparatus (9) Radio, TV, instruments, watches and clocks (10) Transport equipment (11) Furniture and other manufacturing (12) Electricity, gas and water (13) Electricity (14) Water (15) Construction.

Tertiary sector includes: (1) Wholesale and retail trade, catering and accommodation (2) Wholesale and retail trade (3) Catering and accommodation services (4) Transport, storage and communication (5) Transport and storage (6) Communication (7) Finance, insurance, real estate and business services (8) Finance and insurance (9) Business services (10) Community, social and personal services (11) General government.

Estimating Technique: The study followed Pesaran, Shin and Smith in 2001 on time series Auto Regressive Distributed Lag (ARDL) or Bound Testing. In other for the objective of this paper to be achieved, this paper has engaged this estimating technique method to investigate the co-integrating relationship among the independent variables of our study. Due to the good benefits and peculiarities inherent in time series ARDL, time series ARDL would be employed in this study. These features include: It is flexible as there are no restrictions on the possibility of variables to be integrated of the same order. This technique is applicable to variables integrated at both orders I (1) I and (0). Pesaran, Shin and Smith (2001) argue that, ARDL offers dependable and consistent estimates of long-run coefficients provided they are normally distributed asymptotically irrespective of their integration order of either I (1) or I (0). ARDL model despite its endogeneity possibility offers reliable coefficients since it adopts the lags of outcome and independent variables (Pesaran et al., 2001) and again the problem of pre-testing which is a common issue in the conventional cointegration analysis are controlled through the adoption of ARDL.

The Model when transformed to ARDL format gives;

$$\Delta GFEC_t = c_0 + \sum_{j=1}^{n} \beta_{1j} \Delta GFEC_{t-j} + \sum_{j=1}^{n} \beta_{2j} \Delta \Pr y \sec_{t-j} + \sum_{j=1}^{n} \beta_{3j} \Delta Sec \sec_{t-j} + \sum_{j=1}^{n} \beta_{4j} \Delta Ter \sec_{t-j}$$

$$+ \sigma_1 GFEC_{t-1} + \sigma_2 \Pr y \sec_{t-1} + \sigma_3 Sec \sec_{t-1} + \sigma_4 Ter \sec_{t-1} + U_t \ldots\ldots\ldots(4)$$

In this modelΔ is the first difference operator; j = the number of lags, c_0 is the model constant, whereas n is the optimal or maximum lag length., $\beta_{1j-}\beta_{4j}$ represents the short run coefficients of the respective independent variables and U_t is the stochastic / composite error term. $\sigma_1 - \sigma 4$ denotes the long run coefficients. There are three stages involved to carry out the study regression analysis: (i) we attempt to engage ARDL model in our regression equation model (4) from ARDL environment, we analyze the ordinary least square. (ii) we also analyze long-run relationship in the adoption of bound testing and the null hypothesis, such that; $H_0 : \sigma_1 = \sigma_2 = \sigma_3 = \sigma_4 = 0$ and the alternative hypothesis; $H_1 : \sigma_1 \neq \sigma_2 \neq \sigma_3 \neq \sigma_4 \neq 0.$

Data Source: All the adopted data for primary, and secondary and tertiary section in this study are sourced from Quantec Database 2016. In this section, the factors that determine Eastern Cape GFCF are classified into three categories. These factors are primary, secondary and the tertiary sectors.

4. Results

The long and short run results have indicated that the various sectors are strongly significant. And each sector positive impacts on the Eastern Cape GFCF except the lag of tertiary. A 1% increase in the primary sector for instance would cause Eastern Cape GFCF to increase by 3.2% and similar % change in the secondary sector would cause Eastern Cape GFCF to increase by 16.2%. However, there is a significant impact in the tertiary sector as a 1% increase in the tertiary sector would cause Eastern Cape GFCF to grow by 81.24%. The rate of the sectors' contribution in the long and short run appears to be similar as the primary, secondary and tertiary sectors impact on the Eastern Cape GFCF by 3.9%, 17.8% and 78.9% respectively. The result has indicated that the tertiary sector in Eastern Cape contributes significantly to the Eastern Cape GFCF than the other sectors.

Table 1: Showing the series of the dependent variables GFCFEC and the explanatory variables of the primary, secondary and tertiary sector.

ARDL Cointegrating and Long Run Form
Dependent Variable: LOGGFCF
Selected Model: ARDL(1, 1, 1, 2)
Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGPRIMARY)	0.032563	0.000837	38.896703	0.0000
D(LOGSECONDARY)	0.162253	0.001180	137.453163	0.0000
D(LOGTERTIARY)	0.812440	0.001969	412.531294	0.0000
D(LOGTERTIARY(-1))	-0.003849	0.000802	-4.796738	0.0010
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGPRIMARY	0.038973	0.001337	29.156355	0.0000
LOGSECONDARY	0.178037	0.008710	20.441120	0.0000
LOGTERTIARY	0.789570	0.009492	83.179385	0.0000
C	0.547478	0.025756	21.256078	0.0000

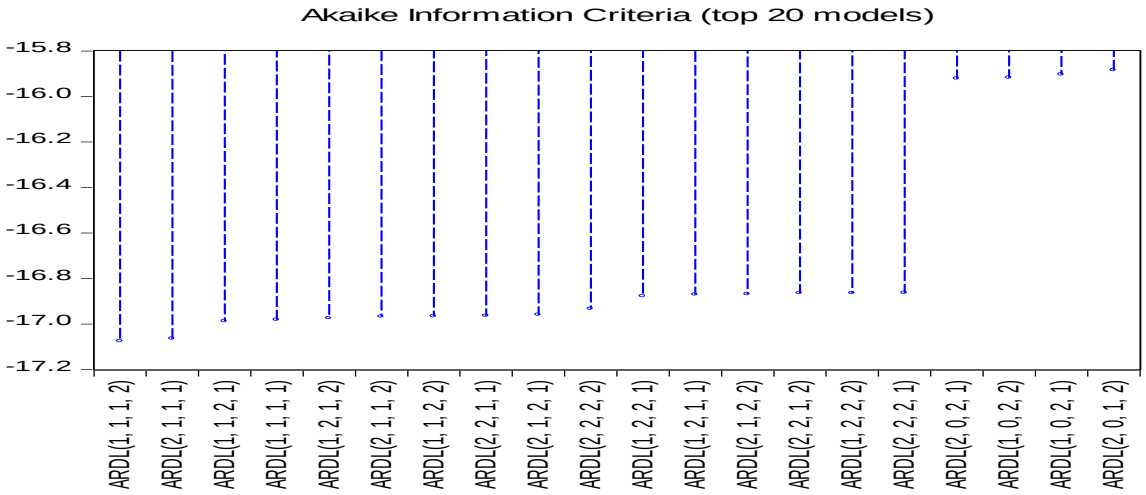
Source Authors' Computation, 2017

Table 2: Error Correction Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ECT(-1)	-0.313845	0.028540	-10.996823	0.0000

Source Authors' Computation, 2017

The short and long-run dynamic results in this study's model are examine through the adoption of Error Correction term (ECT). The coefficient of ECT indicates the degree of how slowly or quickly the variables under examination tend to revert to the equilibrium state (i.e., their speed of adjustment). As seen in the table 2, the sign of the negative coefficient in the ECT shows that there was an earlier existence of disequilibrium in the system, however, the process of adjustment is in the right direction. The value -0.313845 (31.38%) of ECT depicts the system speed of adjustment moving from the short run deviation to the long run equilibrium and the possibility of improvement in South Africa GFCF. In addition, the ECT which is significant statistically at 1 %, clearly shows that equilibrium in the long run is obtainable. The result supports the finding of Rabbi (2011), which concurred that when Error correction model is strongly significant, it is an indication that there is an existence of a stable long-run relationship, and the steady-state or speed of convergence in the system is predictable.



Measuring the Strength of the P-ARDL Regression Model: To establish the strength of the Akaike Information Criterion (AIC) model selection summary over other models (the Schwarz criterion and Hannan-Quinn criterion) as engaged in our time series ARDL regression model, and to further establish the long and short run relationships in the study model, we have employed criteria graph to examine the top sixteen (16) different time series ARDL models. The common rule of the tomb in the literature on model benchmark analysis indicates that, a lesser value of AIC performs better and is mostly preferred in any given model. It is evidenced from the figure above that the first time series ARDL (1, 0, 1, 1, 1) with the value of -14.8 in the model exhibit to be the most expected model above others as it offers the lowest value of the AIC.

Table 3: The Result of ARDL Bound Resting

ARDL Bounds Test
Null Hypothesis: No long-run relationships exist

Test Statistic	**Value**	**K**
F-statistic	7.901343	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source Authors' Computation, 2017

We again run the bound test to further establish the long relationship between these variables. It is traditional that the value of F- statistics must be higher than both the lower and higher value of the upper bound. As indicated in the table, we can see that the value of 7.9 is higher than 3.65 and 4.66. This further establishes that there exists a long run relationship among the variables in question.

Table 4: Result of Serial and Heteroskedastic

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.463685	Prob. F(2,7)	0.1549
Obs*R-squared	7.436062	Prob. Chi-Square(2)	0.0243
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.209945	Prob. F(7,10)	0.3789
Obs*R-squared	8.254264	Prob. Chi-Square(7)	0.3107
Scaled explained SS	0.801949	Prob. Chi-Square(7)	0.9974

Source Authors' Computation, 2017

Test for heteroskedasticity and serial correlation ware carried out on the regression analysis where it is expected that the variance of the error term is constant for all levels of observation. If this assumption is violated, then heteroskedasticity problem sets in. We use the Breusch- Pagan- Godfrey test to confirm the existence of heteroskedasticity. The rule of thumb here is that three probability values must not be significant. As indicated in our table, this condition was met in our result, meaning that there exists no heteroskedasticity and serial correlation in the model.

Tertiary determinants: The section addresses the tertiary sector of the Eastern Cape gross fixed capital formation made up Wholesale and retail trade, catering and accommodation (TF), (2) Wholesale and retail trade (TF16), (3) Catering and accommodation services (TF17), (4) Transport, storage and communication (TG), (5) Transport and storage (TG18), (6) Communication (TG19), (7) Finance, insurance, real estate and business services (TH), (8) Finance and insurance (TH20), (9) Business services (TH21), (10) Community, social and personal services (TI), (11) General government (TJ). However, determination of lag length is required before going into the regression analysis as this selection would guide in the number of lags appropriate for our model. Based on the result of the on the order selection criteria, lag one most appropriate, hence the adoption of lag one in this estimation and analysis. Endogenous variables: LOGTERT LOGTF, LOGTG, LOGTH, LOGTJ,

Table 5: VAR Lag Order Selection

Lag	Log L	LR	FPE	AIC	SC	HQ
0	240.4683	NA	1.18e-17	-24.78614	-24.53760	-24.74408
1	361.4154	165.5065*	5.44e-22*	-34.88583*	-33.39461*	-34.63346*

* indicates lag order selected by the criterion

Table 6: Ordinary Least Square Regression

Dependent Variable: LOGTERT			**Prob (F-statistic)**	**0.000000**
Durbin-Watson stat		2.308473	R-squared	0.999915
Selected Model: ARDL(1, 0, 0, 0, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGTERT(-1)	0.260655	0.055173	4.724362	0.0005
LOGTF	-0.080793	0.018549	-4.355703	0.0009
LOGTG19	-0.015985	0.017325	-0.922671	0.3744
LOGTH21	0.464497	0.056932	8.158855	0.0000
LOGTJ	0.601723	0.036720	16.38660	0.0000
LOGTJ(-1)	-0.192804	0.047380	-4.069348	0.0016
C	0.225912	0.315703	0.715586	0.4879

SourceAuthors'Computation,2017

Table 7: ARDL Cointegrating and Long Run Result

ARDL Cointegrating and Long Run Form
Dependent Variable: LOGTERT
Selected Model: ARDL(1, 0, 0, 0, 1)
Cointegrating Form

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LOGTF17)	-0.085696	0.016859	-5.083144	0.0003
D(LOGTG19)	-0.016363	0.017021	-0.961331	0.3554
D(LOGTH21)	0.486092	0.043123	11.272240	0.0000
D(LOGTJ)	0.592014	0.026886	22.019777	0.0000
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGTF17	-0.109276	0.019102	-5.720545	0.0001
LOGTG19	-0.021620	0.022987	-0.940571	0.3655

LOGTH21	0.628255	0.057384	10.948277	0.0000
LOGTJ	0.553083	0.033334	16.591970	0.0000
C	0.305558	0.417916	0.731146	0.4787

Cointeq = LOGTERT - (-0.1093*LOGTF17_ -0.0216*LOGTG19 + 0.6283 *LOGTH21 + 0.5531*LOGTJ + 0.3056)

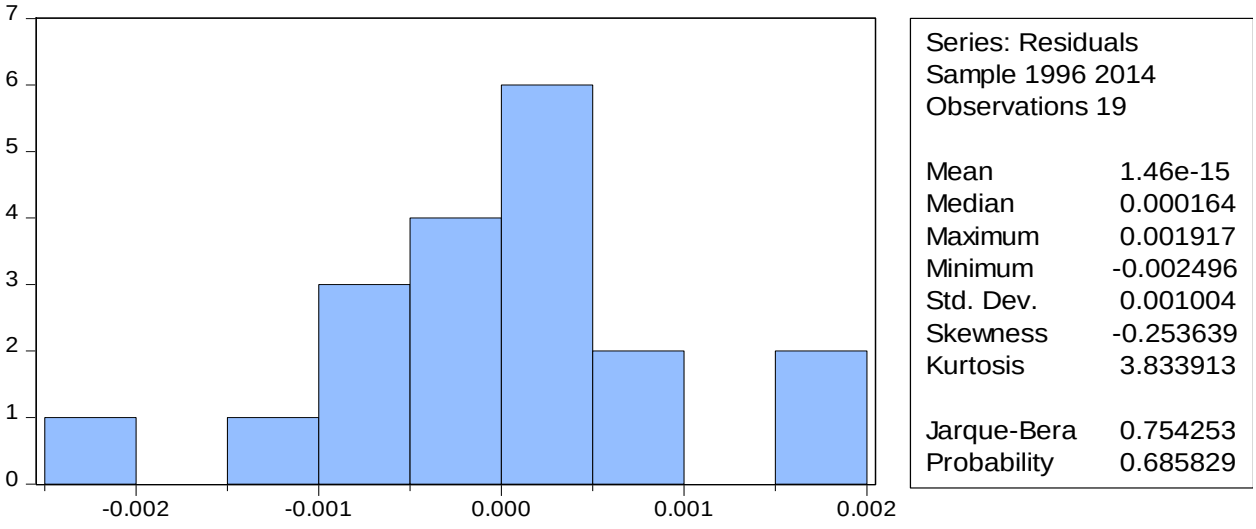
This section showcase the result of the time series ARDL analysis. The variables regressed are Catering and Accommodation (TF17), Communication (TG19), Business services (TH21) and General government (TJ). The selection is appropriate as other variables are submerged into these variables, therefore, to avoid the problem of multicollinearity, the represented variables are selected. Here the long and short run results are submitted and from our estimation, our short and long-run result indicates that Communication (TG19) does not significantly impact on the Eastern Cape tertiary sector. Whereas Catering and Accommodation (TF17), has an inverse relationship both for a long and short-run relationship. However, Business services (TH21) and General government (TJ) positively impact on the Eastern Cape tertiary sector. Meaning that increasing this sector would increase the tertiary sector. It is interesting to note that the combination of some sectors do not necessarily imply compatibility as some cases are in the study.

Table 8: Error Correction Coefficient

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
ECT(-1)	-0.683068	0.090149	-7.577129	0.0000

Source Authors' Computation, 2017

The short and long-run dynamic results in this study's model are examined through the adoption of Error Correction term (ECT). The coefficient of ECT indicates the degree of how slowly or quickly the variables under examination tend to revert to the equilibrium state (i.e., their speed of adjustment). As seen in table 8, the sign of the negative coefficient in the ECT shows that there was an earlier existence of disequilibrium in the system, however, the process of adjustment is in the right direction. The value -0.6830 (68.30%) of ECT depicts the system speed of adjustment moving from the short run deviation to the long run equilibrium and the possibility of improvement in South Africa GFCF. In addition, the ECT which is significant statistically at 1 %, clearly shows that equilibrium in the long run is obtainable. The result supports the finding of Rabbi (2011), which concurred that when Error correction model is strongly significant, it is an indication that there is an existence of a stable long-run relationship, and the steady-state or speed of convergence in the system is predictable. The model experiences excess height, if K> 3. Indicating above average height. The Kurtosis value of 3.8 fits in as it slightly goes above 3by implication our model is normally distributed. In addition, in this study normality test on the regression analysis further conducted. This is done to control for normal distribution, our expectation based on the existing rule of thumb is that the value for kurtosis should cluster around the Kurtosis of 3.0



Jarque-Bera: A further test of normality is from the value of J-Bera which combines both Skewness and Kurtosis. The normal standard or Decision Rule:If *J-B < 5.99* → We do not reject the H_o (it shows there is normality). If *J-B > 5.99* → We reject the H_o (i.e. there is no normality). Again, with Jarque Bera Value of 0.68529 ,we do not reject $H_{o,}$ meaning there is normality.

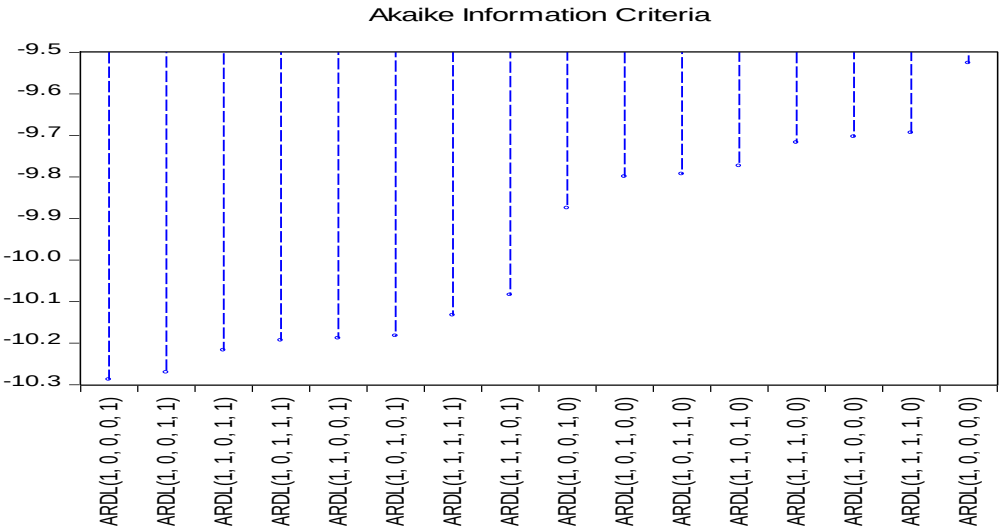


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Table 9: ARDL Bound Testing

ARDL Bounds Test		
Null Hypothesis: No long-run relationships exist		
Test Statistic	**Value**	**K**
F-statistic	11.54376	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source Authors' Computation, 2017

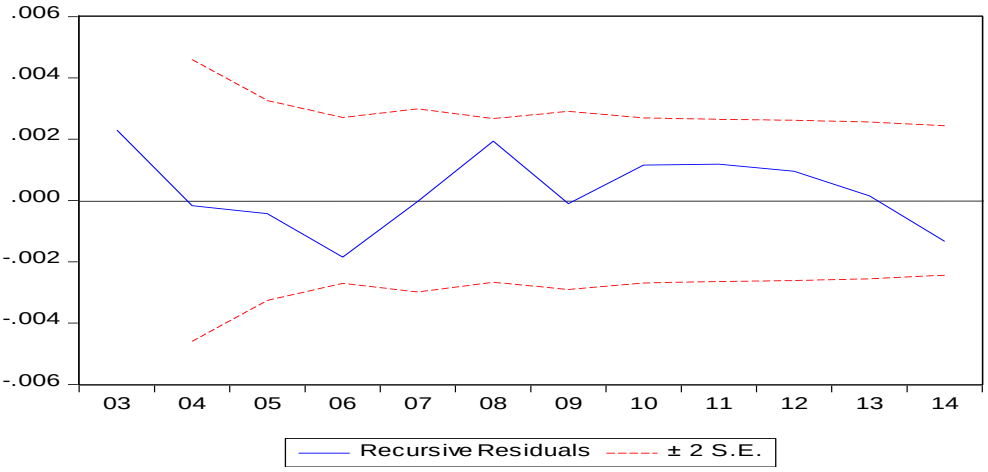
This section records the result of serial correlation. The traditional rule guiding the result on serial correlation is that to show that our model is free from serial correlation problem, the F-Statistic and the value of the observed R squared must not be significant. Hence our result adequately passed this test as shown in the table. This section records the result of serial correlation. The traditional rule guiding the result on serial correlation is that to show that our model is free from serial correlation problem, the F-Statistic and the value of the observed R squared must not be significant.

Table 10: Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.556527	Prob. F(2,10)	0.2579
Obs*R-squared	4.510622	Prob. Chi-Square(2)	0.1048

Source Authors' Computation, 2017

Stability Test



Again, the study conduct stability test on recursive residual using Cusum procedure at 5% level of significance. The normal tradition of stability of variables in the model entails that the blue line falls within the two red lines, and clearly shown from the regression result, it shows that our result is stable and it further affirms the claim that there is a long run relationship as shown in the figure above. Again, the study further checks the possibility of having short run relationship flowing from the set of the provincial determinants of GFCF in Eastern Cape and Eastern Cape GFCF by adopting the Wald test with a null hypothesis of no short-run co-integration in the model.

Table 11: Wald Test

Wald Test:			
Equation: Untitled			
Test Statistic	**Value**	**Df**	**Probability**
F-statistic	23582.85	(6, 12)	0.0000
Chi-square	141497.1	6	0.0000
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
Catering & Accommodation		0.260655	0.055173
Communication		-0.080793	0.018549
Business Services		-0.015985	0.017325
General Government		0.464497	0.056932

Null Hypothesis: Catering & Accommodation= Communication=Business Services= General Government. H_0 : There exists no short-run co-integration for the set of the determinants of GFCF in Eastern Cape and Eastern Cape GFCF. H_1 : There exists a short run co-integration among the selected set of the provincial GFCF variables and South Africa GFCF determinants of GFCF in Eastern Cape and Eastern Cape GFCF. The Decision rule: Accept null hypothesis (H_0) when the P-Value is greater than 5%. Reject null hypothesis (H_0) when the P-Value is less than 5%. The result indicates that there is an existence of short-run relationship moving from the set of the determinants of GFCF in Eastern Cape and Eastern Cape GFCF at the 1%P- value. It shows that the study cannot accept the null hypothesis, we therefore reject the null hypothesis and accept the alternative

hypothesis. Since statistic argues that Eastern Cape contributes 7.5% of GFCF to South African Economic growth, our result has been able to establish that this contribution is positive and hence the need to increase it in other to improve the growth rate of South African Economic. Time series ARDL is adopted in our estimating technique using augmented Cobb Douglas as our model equation. The study discovers the mixed relationship among the variables under investigation. For policy implication, rather than government activity prevalent in Eastern Cape in the area of grants and financial aids.

Table 12: Short-Run Causality Tests on the series Log of SA GFCF on the Log of MPU, EC, NW and NE

	EQUATION: P-ARDL, H0=TF17=TG19=0		
Statistics	**VALUE**	**DF**	**PROBABILITY**
F –statistics	107.9229	(2, 12)	0.0000
	EQUATION: P-ARDL, H0=TG19=TJ=0		
Statistics	VALUE	DF	PROBABILITY
F –statistics	46.26115	(2, 12)	0.0000
	EQUATION: P-ARDL, H0=TG19=TJ=0		
Statistics	**VALUE**	**DF**	**PROBABILITY**
F –statistics	44.31432	(2, 12)	0.0000

Source Authors' Computation, 2017

Inferences, Comparison with Other Studies: This study carried out an extensive analysis on the effects of various sectors of primary, secondary and tertiary activities on the overall Eastern Cape Province GFCF of South African. Our result clearly shows that all the three sectors of the economy, namely: primary, secondary and tertiary sector have a significant impact on Eastern Cape GFCF. However, the tertiary sector has more impact than other sectors. More particularly, steps have been taken to consider factors that determine the growth of Easter Cape GFCF, and from the result, tertiary sector has the tendency of improving the Eastern Cape GFCF since of all the three sectors, tertiary sector contributes greatly to the tune of 81.24%. This result is supported by the study conducted by Torbira and Ogbulu (2014); Karim, Karim and Ahmad (2010), who found a positive relationship with the tertiary sector of the economy and growth. The positive significant relationship result conforms with the outcome result of Fedderke (2005); Kumo (2012); Nowbutsing (2012) and Bakare (2011). However, our result negates the claim of Kanu and Ozurumba 2014; Torbira and Ogbulu 2014 who found a negative relationship between factors that determine GFCF and GFCF among countries of interest.

5. Discussion and Conclusion

This study investigates the nexus among the GFCF of South African Provinces and particularly that of the Eastern Cape and its overall impacts. Data adopted cover a period between 1996 and 2015. The null hypothesis for this study is that there is no significant statistical contribution between Eastern Cape GFCF and the factors that determine it on South African Economic growth. Some of the contributions to the knowledge of the study to the growing literature are that: (1) the study has been able to provide evidence beyond mere statistical evaluation that Eastern Cape contributes significantly to South African Economic growth, however, the extent of its contribution is a function of the factors that determine it. (2) Again, we provide evidence to establish that tertiary sector of the Eastern Cape GFCF contribute more than the addition of both primary and secondary sector put together in the province (3) We also provide evidence to establish that government activity contributes more among the factors that determine the Easter Cape GFCF, there must be a redirection of fund for the development of Primary sectors such as agriculture and mining since this sector contributes only 3.3% to the overall Easter Cape GFCF. It is interesting to note that the combination of some sectors do not necessarily implies compatibility to enhance the growth of the tertiary sector as some case are in the study.

For instance, Growth is enhanced through the following determinants: Catering and Accommodation (TF17) and not necessarily when Wholesale and retail trade is inclusive; Again, there is a better performance of the GFCF in the tertiary sector with Communication (TG19) than when Transport and storage, are merged together, and finally, Business services (TH21) behaves better with tertiary sector than when it combines with Finance, Insurance and real estate. In the light of the above findings, both sectors that stimulate capital

formation and those that performed otherwise need policy restructuring to enhance economic growth. Hence, South Africa policymakers must look inward to the splitting of sectors such as Transport and storage to be managed individually rather than being merged together as this would lead to an improvement in productivity. The study is interested in viewing the various sectors of GFCF in Eastern Cape from the perspective of their overall impact on South African Economic growth, and if South Africa as a nation would need to meet her economic development objectives, of great importance is the need for capital formation or capital accumulation otherwise known as physical capital stock.

References

Adegboyega, B. & Odusanya, I. (2014). Empirical analysis of trade openness, capital formation, FDI and economic growth: Nigeria experience. *The international journal of social science and humanities*, 1, 36-50.

Akinola, G. W. & Omolade, A. (2013). Savings, Gross Capital Formation and Economic Growth Nexus in Nigeria, *IOSR Journal of Economics and Finance (IOSR-JEF),* 1(2), 19-25.

Bader, M. & Malawi, A. I. (2010). The impact of interest rate on investment in Jordan: a cointegration analysis. *Journal of King Abdulaziz University: Economics and Administration,* 24(1), 199-209.

Bakare, A. S. (2011). A theoretical analysis of capital formation and growth in Nigeria. *Far East Journal of Psychology and Business,* 3(2), 11-24.

Beddies, C. (1999). Monetary policy and public finances: Inflation targets in a new perspective. *International monetary fund (IMF)*, 46(3).

Fisher, R. (1930). The genetic theory of natural selection. Oxford University Press. Oxford.

Ghura, D. & Hadji, M. (1996). Growth in Sub-Sahara Africa. Staff paper, the International monetary fund (IMF), 43.

Ghura D. (1997). Private investment and endogenous growth: Evidence from Cameroon. International monetary fund (IMF), Working Paper 97/165.

Jhingan, M. (2003). Macroeconomic theory. New Delhi: Vrinda publications limited.

Jhingan, M. L. (2005). The Economics of Development and Planning, 38th Ed. New Delhi: Virade Publications (P) Ltd, India.

Langat, P. K. (2007). The determinants of fixed capital formation in Kenya. A research paper submitted to the School of Economics, the University of Nairobi in partial fulfilment of the requirements for the degree of Master of Arts in Economics.

Kanu, I. & Ozurumba, A. (2014). Capital Formation and Economic Growth in Nigeria. *Journal of human-social sciences: Economic,* 4(4).

Karim, Z. (2010). Monetary policy and firm's investment in Malaysia: A panel evidence. *Journal of economics and management,* 18(2), 221-253.

Khan, F., Muneer, S. & Anuar, M. A. (2013). Relationship between Stock Prices and Economic Variables: Sectoral Analysis. *Actual Problems of Economics*, 5(143), 544-553

Kumo, W. L. (2012). Infrastructure investment and economic growth in South Africa: A Granger causality analysis. African Development Bank Group Working Paper Series, (160).

Malawi, A. (2005). The impact of gross fixed capital formation and money supply on economic activity in Algeria. Mu'tah University. Jordan.

Ncanywa, T. & Makhenyane, L. (2016). Can investment activities in the form of capital formation influence economic growth in South Africa?

Nowbutsing, B. (2012). Capital formation and economic growth in Mauritius: Does FDI matter? University of Technology. Mauritius.

Muneer, S., Jahanzeb, A. & Suwandi. (2016). Income diversification and performance: a comparison of commercial and Islamic banks of Pakistan. *Abasyn Journal of Social Sciences*, Special Issue, 471-485

Pathunia, R. (2013). Linkages between exports, import and capital formation in India. Journal of social sciences, 2.

Perkins, P., Fedderke, J. & Luiz, M. (2005). An analysis of economic infrastructure investment in South Africa. *South African Journal of Economics*. 72(2), 211-228.

Pesaran, M. H., Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.

Pettinger, T. (2014). Savings ratio in the UK. [Online] www.economicshelp.org [accessed on 28/10/2017].

Quantec. (2016). Quantec databases for South Africa. Pretoria, South Africa.

Rabbi, F. (2011). Effectiveness of Monetary Policy in Pakistan: Empirical Evidences based on Bound Test Approach.

Rajni, P. (2013). Linkages between export, import and capital formation in India. *International Research Journal of Social Sciences*, 2(3), 16-19.

Stats, S. A. (2015). www.statssa.gov.za. [Accessed 25/05/2017].

Shuaib, M. & Dania, E. (2015). Capital formation: Impact on the economic development of Nigeria 1960-2013. *European journal of business economics and accountancy*, 3(3).

Torbira, L. L. & Ogbulu, O. M. (2014). Fund Mobilization by Insurance Companies and Fixed Capital Formation: Evidence from the Nigerian Economy. *International Journal of Financial Research,* 5(2), 69-81.

Ugochukwu, S. & Chinyere, U. (2013). The impact of capital formation on the growth of the Nigerian economy. *Research Journal of finance and accounting*, 4(9).

Uremadu, S. (2012). The impact of capital structure and liquidity on corporate returns in Nigeria. *International Journal of Academic Research in Accounting*, 2(3).

The South African Women Purchasing Behavior and the Zero Moment of Truth

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Abstract: The decision-making process after online consumers have been stimulated through traditional advertising is a new and crucial part of the traditional three-phase marketing model. This paper was undertaken to understand the relevance of the Zero Moment of Truth (ZMOT) to women in Living Standard Measure (LSM) B in Durban, South Africa. The three questions that were the main focal point of this study aimed to assess the relevance of the ZMOT theory to women in Durban, South Africa within LSM B, the most frequented product categories as well as the platforms that were accessed to gain brand-related information in order to make the purchase decision. Data for this study was collected through mixed methods with a sample group of 100 women. The findings from the research suggest that there is a link between the relevance of core products like groceries and basic household items and the need to make smart purchases, as money needs to be spent wisely. The most frequently accessed category amongst women in LSM B was basic household items and groceries, this category was closely followed by skin care and cosmetics. The most widely accessed platform to search for brand information was the Google search engine.

Keywords: *ZMOT, LSM B, South African Women, Products.*

1. Introduction

In 2005 Proctor & Gamble (P & G) stated that shoppers make up their mind about whether to purchase a product in the first seven seconds after walking into the store and noticing the product or brand on the shelf, P & G called this the "First Moment of Truth. The second moment of truth then refers to the consumers having used and experienced the product themselves (Lecinski, 2011:10). The first moment of truth was labelled as the most important element to consider when marketing to consumers. This theory was challenged in 2011 by Google who said marketers needed to consider, what they referred to as, the "Zero Moment of Truth", which refers to the point at which consumers go online and make use of the internet and numerous sources of brand information to help them better understand the product or service they are researching and then to say yes I will buy the brand or no I will not. (Lecinski, 2011:10). In order to segment the South African market, South Africans make use of what is called Living Standard Measure or LSM groups (SAARF LSM, 2012). SAARF LSM is a unique way of segmenting the South African market. The market is segmented according to household income (McEvan, Hughes, Bek 2015). The population has been divided into 10 groups, 10 being the highest (households with the highest monthly income) and 1 being the lowest (households with the lowest monthly income). A household in LSM 1 would be earning roughly R1 363 a month, compared to a family in LSM 10 whose household income is roughly R29 512 a month (SAARF AMPS, 2012). Corporates usually make use of LSM supergroups, this is easier as you very rarely choose one LSM to focus your marketing efforts on. Grouping them up into two or three is a better way to go about defining your target market, LSM B refers to LSM 6 and 7 (McEvan, Hughes, Bek 2015).

The ZMOT theory was introduced in 2011 and is a relatively new theory to marketers worldwide (Lecinski, 2011:10). There are only two studies that have been done, assessing the relevance of ZMOT in two continents, these being the USA and Asia. This is problematic, as the ZMOT theory suggests a new way for all business to target consumers, assuming all consumers are making use of the ZMOT. Few people in South Africa are aware of ZMOT as a theory, (Lyu and Lim, 2017) and many people are not aware of the possibility that women within LSM B could be making use of ZMOT to influence their purchase decision (Hussain, Ghufran, Chaubey, 2016). No information can be found surrounding the categories of products these women may be searching for online, nor can the platforms they use to search for these products be identified. Little information about the purchase behavior of women in South Africa within LSM B is available. This necessitates a rigorous investigation into establishing how the Zero Moment of Truth is being used in South Africa, more importantly to women in LSM B (or LSM 6 & 7). The categories of products they are accessing most frequently and the platforms they are using in which to search for information. This study is important is understanding the

marketability of products in certain target audiences that can be a benefit to the business sector as such. This may lead to particular strategy development with attendant benefits to concerned organizations.

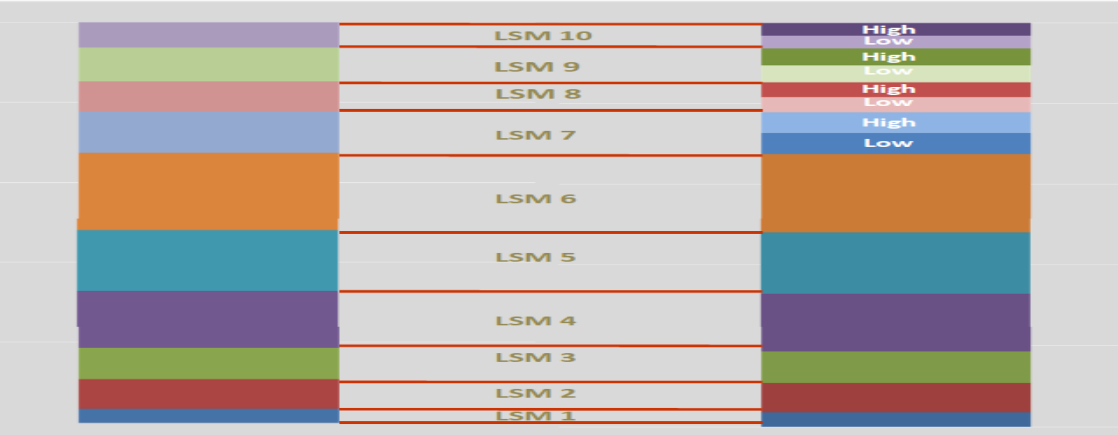
2. Literature Review

In 2005 the Wall street journal posted an article that in some opinions changed the way in which marketers consider marketing products today. The morning after the article was published blogs and websites all over the world were filled with comments about this 'new' type of marketing that was based purely on the strength of in-store executions. The article entitled "In a Shift, Marketers Beef Up Ad Spending Inside Stores" (Nelson, & Ellison, 2005) got people in the corporate world talking, as they considered this approach for their own businesses. The article stated that Proctor & Gamble (P & G) believed, that shoppers make up their mind about whether to purchase a product in the first seven seconds after walking into the store and noticing the product on the shelf, P & G called this the "First Moment of Truth". The "Second Moment of Truth" is harder to measure as this is when the consumer has purchased the product and begins using it. In view of the understanding of the role of importance of this moment, Prana (2016) contends that this is an especially important moment in turning the shopper into a buyer. In 2011 Jim Lecinski, the Managing Director of US sales for Google, wrote a book entitled Winning the Zero Moment of Truth (Le Beau, 2012). In order to turn Google's thoughts into quantitative data that they could then feedback to the rest of the world Google commissioned an independent research firm called US Shopper Sciences (USSC) to quantify the results (thinkwithgoogle, 2011:4). USSC surveyed 5,000 shoppers in the United States across 12 different sub-categories with the aim of finding out which sources influenced shopper buying decisions. Lecinski, 2011:12 suggests that the research produced results that led to the development of the ZMOT theory. The ZMOT came about by Jim focusing on three critical moments in both a consumer and a marketer's path to purchase (Wharton, 2011). These being:

Stimulus: This refers to any traditional media or advertising presented to consumers (Tabita, 2011:6), for example, mom is watching the 8 O' Clock news and sees an advertisement for the new GHD Titanium hair straighter and she thinks to herself "I need something like that to straighten my thick hair, in the convenience of my own home, no more trips to the hairdresser."

Shelf: This refers to the action of a consumer walking into the store, finding the product on shelf and proceeding to purchase it (Tabita, 2011:7), for example, mom walks into the nearest Hair on Edge salon and finds the new GHD Titanium on the shelf with a beautiful display, one of the hairdressers tells her how well the product works and how she uses it on all of her clients and she proceeds to purchase it.

Figure 1: Living Standard Measure chart



Living Standard Measure chart (SAARF AMPS, 2012:5)

Experience: This refers to the stage after purchase when the product is used by the consumer, for example, mom takes her GHD home, uses it to straighten her hair and finds that it works as well as the saleswoman said it would. And it was pointed out that the new critical moment for marketers is realizing that between

mom watching the television advert and proceeding to the salon to purchase she takes out her cell phone, tablet or computer, goes online and starts researching whether the new GHD Titanium really is the best straightener on the market (Cummings, 2013). She reads product reviews on Beauty insider as well as posting a status on Facebook asking if any of her friends have tried this product out for themselves. The South African Audience Research Foundation or SAARF, produces and directs information on media audience and product brand research, for the benefit of its stakeholders. SAARF looked for variables already measured in the SAARF AMPS survey that would be strong discriminators which one could use to segment (place into groups) the population. Once SAARF had chosen a set of indicators they labelled the scale Living Standard Measure or LSM (SAARF, 2012). LSM breaks the population up into groups under the assumption that people behaves similarly to one another (SAARF AMPS, 2012). The image below illustrates how the South African population has been broken up into 10 groups and shows what percentage of people live within each LSM segment.

Within LSM 7-10 divided into two groups. A number of requests were made to provide greater differentiation of the target markets at the top end of the scale. SAARF commissioned exploratory work to identify how these subgroups behave differently and the results were encouraging (SAARF AMPS, 2012:31). One of the variables that divide LSM 1-10 is household income. Below is a chart put together by SAARF that illustrates what the average monthly income is for each household?

Table 1: LSM Groups Monthly Income (SAARF AMPS, 2012:41)

	Average Household Income	
	Jun10	**Jun11**
LSM 1	R1,496	R 1 363
LSM 2	R1,732	R 1 929
LSM 3	R2,052	R 2 258
LSM 4	R2,829	R 3 138
LSM 5	R3,832	R 4 165
LSM 6	R6,398	R 6 322
LSM 7	R10,066	R10 255
LSM 8	R13,698	R 14 014
LSM 9	R18,414	R 19 654
LSM 10	R27,143	R 29 512

The introduction of the Zero Moment of Truth adds an important element to the traditional three-step marketing model and is being largely and positively received by marketers all over the world. Over 200,000 marketers have read the book 'winning the zero moments of truth' and have embraced this new customer journey. The importance of Zero moments of truth is well captured by Hyken (2016) who states that however remote the area of business is, consumers have often an opportunity to make an impression of a business.

3. Methodology

Mixed method research and comparative study with the aim to explore the relevance of the Zero Moment of Truth and the most frequented categories for Durban women in LSM B was employed in this study. Three semi-structured interviews with authority figures in the advertising and retail world and then a comparative assessment was done assessing similarities in results from this study with the study done in Asia. A mixed method approach was best suited to this study as the results from one method could inform or help the other method (Cresswell, 2003:16). The sampling method best suited to this study was probability sampling and in particular simple random sampling. Simple random sampling looks at all elements of the population as having an equal chance of being selected to partake in the study. This allows for the least bias and is the most generalizable sampling technique (Ruggunan, 2010:72). The sample group consisted of 100 women. Three interviews with authority figures in the advertising and retail world were conducted with Richard Barrow, Dale Tomlinson and Melanie Collins. All three figures provided useful insight into the purchase behavior of

women in South Africa that could not be found through secondary sources as well as helping to understand how this research could be beneficial to marketing and advertising departments in the country.

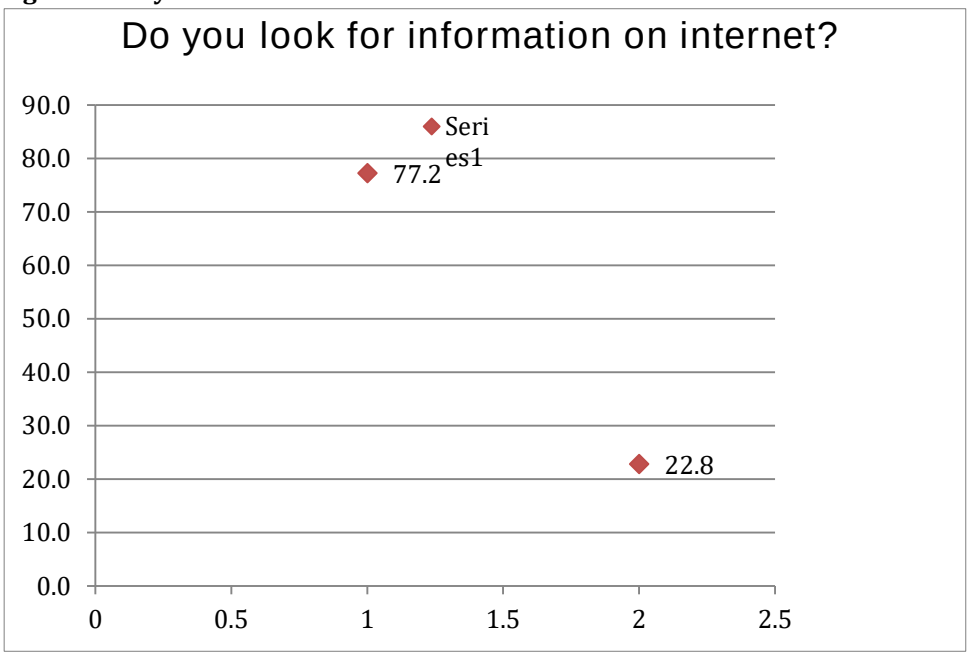
In order to make this research relevant to the marketers of products within South Africa quantitative research was employed as well. Quantitative percentages have been able to give the marketers an accurate number of consumers within their target market, in the Durban area making use of online platforms to inform their purchase decision, this information can then be used to determine whether utilizing ZMOT will be beneficial for their business. The final part of this action process was conducting a comparative assessment using the Zero Moment of Truth in Asia as well as the results collected in Durban, South Africa. Both Asia and Africa are emerging markets and possible similarities in results was expected. The sample chosen for this study was found appropriate due to the marketing styles noted as they were found to be connected to the internet in terms of their shopping habits. Those who were chosen for interviews were leaders in the field and had several years of experience.

4. Findings

The interviews were designed to gain qualitative knowledge that aimed to assist the development of the research instrument. Along with that, these questions assessed what authority figures in the advertising and retail world, currently familiar with the idea of ZMOT and consumer behavior, thought the outcomes to the study would be. The following questions are the opinion of the authority figures in terms of the ZMOT theory. How often would you suspect consumers would be accessing the Internet? The assumptions of all three respondents were that these women would be accessing the Internet weekly. None knew for definite how often they were accessing the Internet, yet all assumed it would be weekly. What proportion of women in South Africa within LSM 6 and 7 do you suspect are making use of ZMOT? Respondents felt that between 20-50% of women within LSM 6 and 7 would be making use of ZMOT in Durban, South Africa. What are the categories of products you think women in South Africa, within LSM 6 and 7, will be looking for online? Food preparation, health care as well as big-ticket items are what was suspected, women within this LSM would be searching for online.

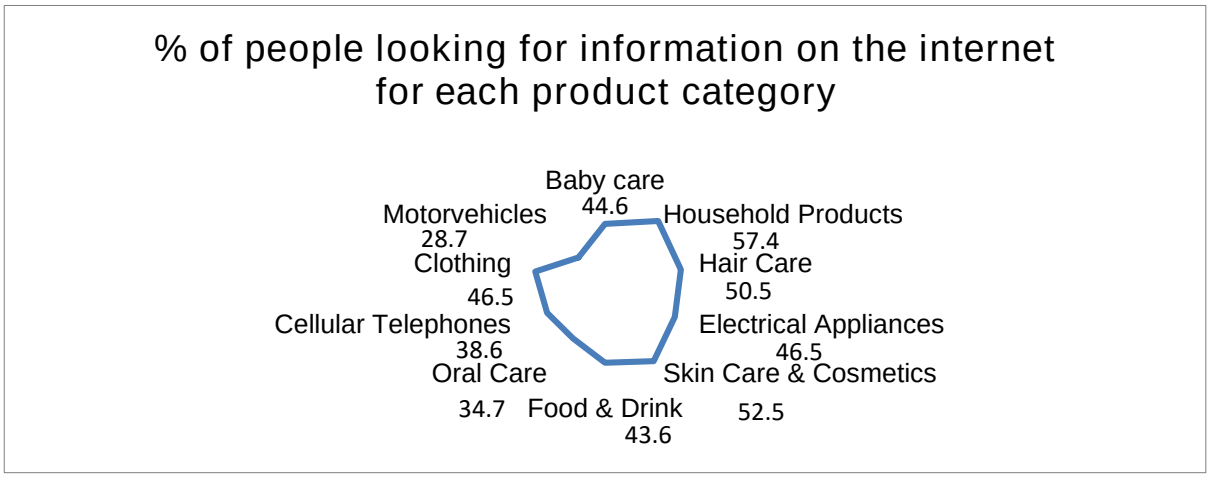
What platforms of information do you think women in South Africa in LSM 6 and 7 will be making use of to find information online? Both Melanie and Dale suspected Mxit as well as Google search would be the largest platforms made use of to search for brand information. The results of questions from the questionnaire are analyzed and discussed below. The responses to every closed-ended question was analyzed using IBM SPSS, a statistical analysis and data management based software. Respondents were allowed to choose more than one answer. To what extent is the purchase behavior of Durban women in LSM B influenced by the ZMOT? The image below represents the percentage of the sample that stated they do and do not make use of the Internet.

Figure 2: Do you look for information on the Internet?



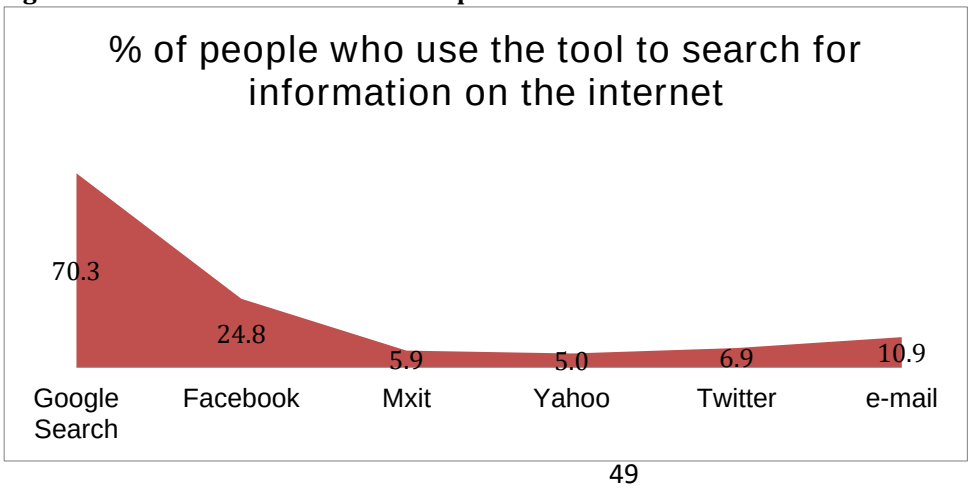
This image shows that, 77% of the sample accessed brand information on the internet with 23% not making use of the internet. This was expected as all of the respondents were employed and earning an income which suggests that they are more likely to own technology and access the internet. The data suggests that ZMOT is relevant to 77% of the sample's lives. This is a large percentage of the sample. It was expected that ZMOT would not be relevant to the entire sample and this data proves that 23% of the sample did not make use of ZMOT at all. Which categories of consumer products are most popular for Durban women in LSM B, when looking for information online? The following Babycare, Household Products, Hair Care, Electrical Appliances, Skincare & Cosmetics, Food & Drink, Oral Care, Cellular Telephones, Clothing, Motor vehicles were chosen. These categories were chosen according to the ZMOT study done in Asia, also a developing market, in order to be able to compare the results at a later stage. Dallas (2017) records how up to 80% of the customers look into the internet for products. This therefore supports the nature of the business that is apparent.

Figure 3: % of people looking for information on the Internet for each product category



As shown in figure 3, the largest percentage of participants with 57,4% are accessing household products, secondly with 52,5% skincare and cosmetics, 50,5% accessing hair care information, electrical appliances and clothing both at 46,5%, baby care 22,6%, food and drink 43,6%, 38,6% cellular telephones, 34,7% oral care and motor vehicles with the smallest percentage at 27,7%. The results suggest that basic household items are the most researched items on the Internet. This may seem strange because it is a low involvement category but it shows the relative importance of core product purchases like household detergents and groceries versus more personal items like skin care and cosmetics and hair care products. Maslow's Hierarchy of needs suggests that basic needs like food and shelter come first, then lastly things that help us achieve our personal goals, items like hair care, makeup and skin care (Campbell and Bickle, 2017). Which online platforms are utilized for seeking information on these popular categories? The responses were Google search, Facebook, Mxit, Yahoo, Twitter and e-mail.

Figure 4: What are the most common platforms in which information is accessed?



The findings of this study support the findings that state that 8 out of 10 Americans do shopping over the internet (Perez, 2016). This then shows that the amount of that shopping using the internet is astronomical. It is recommended that the ZMOT theory is more widely understood amongst the advertising and retail world, and special attention paid to pain and pleasure points found along the consumer journey by brand managers and marketing departments. There is a need for further research into the number of sources being used per shopper to inform their purchase decision as this will determine their confidence in specific sources. It is further recommended that further surveys be carried out in understanding the age and information sharing that customers have on the internet. Since the findings of this study have noted that the greater the age lesser the information sharing regarding the products gotten online, it is recommended that organizations concentrate on lower age groups in advertising their products. In addition to the above recommendation, it is also suggested that organizations, focus more on Google advertisements than facebook, given that 70% of the customers tend to use google. Figure 4 above depicts that 70,3% of respondents are using Google search to access brand information, 24,8% Facebook, 10,9% e-mail, 6,9% Twitter, 5,9% Mxit and 5,0% Yahoo. This suggests that Google search is the most commonly used platform to search for product/ service information, followed by Facebook and e-mail. Google is the largest search engine in the world and is set as a default option on all android Internet browsers on cell phones. Facebook at 24,8% suggests that accessing brand pages as well as conversation surrounding brand information on social networks is increasingly more common. The least used platforms were Mxit and Yahoo. Age * Do you look for information on the Internet on your cell phone, laptop, computer or tablet about different products or services?

Table 2: Crosstabulation

			Do you look for information on the Internet on your cell phone, laptop, computer or tablet about different products or services?		
			Yes	**No**	**Total**
Age	20-35	Count	27	4	31
		% of Total	27.0%	4.0%	31.0%
	35-50	Count	36	6	42
		% of Total	36.0%	6.0%	42.0%
	50-65	Count	12	8	20
		% of Total	12.0%	8.0%	20.0%
	+65	Count	2	5	7
		% of Total	2.0%	5.0%	7.0%
Total		Count	77	23	100
		% of Total	77.0%	23.0%	100.0%

Table 3: Chi-Square Tests

	Value	**Df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	16.119[a]	3	.001
Likelihood Ratio	14.268	3	.003
Linear-by-Linear Association	12.550	1	.000
N of Valid Cases	100		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.61.

A Chi-square test for independence indicates a significant association between age group and the search of information on the internet because of Chi-square (3, n=100) = 16.119, p =.001. This means that people from 20 to 50 years old are more likely to search for information about products on the internet than people older than 50. Age * Do you share what you have learned online about the product or service with your friends or family members?

Table 4: Crosstabulation

			Do you share what you have learned online about the product or service with your friends or family members?		
			Yes	No	Total
Age	20-35	Count	25	6	31
		% of Total	25.0%	6.0%	31.0%
	35-50	Count	31	11	42
		% of Total	31.0%	11.0%	42.0%
	50-65	Count	10	10	20
		% of Total	10.0%	10.0%	20.0%
	+65	Count	1	6	7
		% of Total	1.0%	6.0%	7.0%
Total		Count	67	33	100
		% of Total	67.0%	33.0%	100.0%

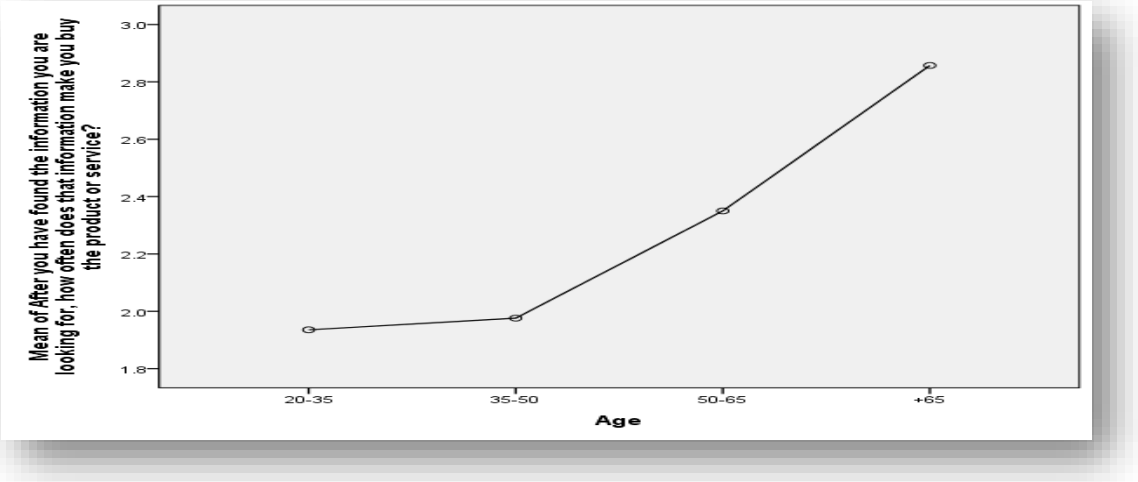
Table 5: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.903[a]	3	.002
Likelihood Ratio	14.603	3	.002
Linear-by-Linear Association	12.784	1	.000
N of Valid Cases	100		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 2.31.

A Chi-square test for independence indicates a significant association between age group and the sharing of information learned online because Chi-square (3, n=100) = 14.903, p =.002. This means that people from 20 to 50 years old are more likely to share information learned online than people older than 50. The figure above indicates that the more the age increase the less the frequency of buying is. And lastly the comparative study regarding ZMOT in Asia versus ZMOT in South Africa. The study conducted in Asia looked at female shoppers across 8 different market categories within consumer-packaged goods or CPG.

Figure 5: Mean of Information



Both Asia and Africa are emerging markets, thus expecting similarities in data from both ZMOT studies. The top reasons for consulting the internet in Korea and Thailand is for Baby care products followed by skin care and cosmetics and then basic household groceries, (Lecinski, 2013:28) compared to this the results of this study show that basic household goods are the most searched for items on the internet, however followed closely by skin care and cosmetics and hair care. The top reason for looking up skincare and cosmetics information online in Asia is for special deals, coupons and rewards programmes (Lecinski, 2013:28).

Compared to this, in Durban South Africa the top reason for consulting the internet across all market categories is to compare price. Here we can see there is a link between basic grocery items and skincare and cosmetics being searched for online. Both product categories fall into the top two most searched for categories online in Both Durban South Africa and Korea and Thailand, Asia. According to Lecinski, ZMOT becomes even more important when money is tight.

He stated that many families in Asia cannot afford to waste money when buying everyday items like groceries because they need that money to get to work, pay bills, feed their families and send their children to school. This is even more apparent in developing economies (Lecinski, 2013:31). The same can be said for this study. It is apparent in the results that basic necessities like groceries are the most commonly searched for items online, this means that core products like these are hugely important to these women and that making the right product purchase decisions is a necessity for them as they cannot afford to waste money. It seems strange that core items like groceries are largely searched for online as well as more 'personal' or 'luxury' items like skin care and cosmetics. A reason for this may be that if these women do choose to spend money on themselves they need to make sure they choose the right product that is likely going to work for them as the likelihood them being able to repurchase if the item doesn't work is low as they cannot afford it. In Asia, search engines are ranked as the most used digital source in nearly 1 out of 3 shoppers. 70% of this study also made use of search engines to find product information online. Here we can see that search engines in both studies are the most commonly used platform to search for brand information. The link between core product purchases and accessing information online in emerging markets is apparent. Both the ZMOT study done in Asia as well as South Africa has evidently experienced similarities in results and this was expected.

5. Conclusion

This study is one of the first studies of its kind in South Africa and no studies regarding ZMOT in South Africa could be identified prior to this. The ZMOT study in Asia proved to have similarities in results. The data collected from this study will prove useful for marketers and advertisers involved in the marketing of CPG (Consumer Packaged Foods) and FMCG (Fast Moving Consumer Goods), Skin Care and Cosmetics, Hair Care, clothing, electrical and baby care products as they will be able to see that consumers within the areas of Umlazi and Kwa-Mashu in Durban are making use of the internet to research brand information in those product categories. A large majority of this study's respondents were not the first language, English speaking citizens and language did prove to be a limitation in this study as some respondents did not fully understand the questions asked and needed assistance. The areas of Kwa-Mashu and Umlazi were the two areas visited in Durban and geographic location was limited as the researcher was not able to visit more areas within Durban. The study's primary focus was to understand the relevance that ZMOT played in the lives of these women.

It also aimed to investigate which product categories were the most commonly accessed categories of brand information on the Internet as well as the most frequented online platforms in which brand information was searched for. This information is relevant to the marketing and advertising world in South Africa as understanding what when and how consumers are accessing the internet for brand information will help brands know how they should talk to their consumers and what information they need to provide consumers with at the ZMOT, in order for consumers to be more likely to purchase their brand over a competitor. Due to the fact that the ZMOT theory is a new theory and not widely recognised amongst South Africans, there is limited secondary knowledge of ZMOT theory. There have been no studies done in South Africa, available online, on the use of ZMOT and little to no opposing theories or arguments.

References

Campbell, J. M. & Bickle, M. C. (2017). Bridging the Gap between Millennial Consumers, Social Media, and Agricultural Branding Programs: A Qualitative Assessment. *Journal of International Food & Agribusiness Marketing*, 29(4), 346-365.

Creswell, J. W. (2003). Research Design Qualitative Quantitative and Mixed Methods Approaches. 2nd ed. London: SAGE Publications.

Cummings, R. (2013). ZMOT- How Can You Use This in Your Business. [ONLINE]. Accessed at www.horticulture-nextgeneration.com.au/zmot[Accessed 15 April 2014]

Dallas, M. (2017). 5 Steps to Winning the Zero Moment of Truth. [ONLINE]. https://www.inc.com/entrepreneurs-organization/5-steps-to-winning-zero-moment-of-truth.html. [Accessed on 25th April 2018]

Hyken, S. (2016). The moment of truth in Business. [ONLINE].https://www.forbes.com/sites/shephyken/2016/04/09/new-moment-of-truth-in-business/#2ee6f10a38d9. [Accessed on 25th April 2018]

Hussain, S., Ghufran, A. & Chaubey, D. S. (2016). Relevance of Social Media in Marketing and Advertising. *Splint International Journal*, 3(7), 1-15.

Le Beau, C. (2012). Info Junkie: Jim Lecinski. Chicagobusiness.com. [ONLINE]http://www.chicagobusiness.com/article/20120616/ISSUE03/306169986/info-junkie-jim-lecinski[Accessed 13 March 2014]

Lecinski, L. (2011). Winning the Zero Moment of Truth. [ONLINE]. Google Inc. Accessed at: http://www.thinkwithgoogle.com/collections/zero-moment-truth.html[Accessed 1 April 2014]

Lecinski, L. (2013). Winning the Zero Moment of Truth in Asia. [ONLINE]. Google Inc. Accessed at:http://www.thinkwithgoogle.com/collections/zero-moment-truth.html[Accessed 1 April 2014]

Lyu, J. & Lim, H. (2017). The role of sense of community in brand online social networking. *International Journal of Web-based Communities*, 14(2), 149-171.

McEvan, C., Hughes, A. & Bek, D. (2015). Theorising middle-class consumption from the global South: A study of everyday ethics in South Africa's Western Cape. *Geoforum*, 67, 233-243.

Nelson, E. & Ellison, S. (2005). Reports at the WSJ: In a Shift, Marketers Beef Up Ad Spending Inside Stores. [ONLINE]. Accessed at:www.wsj.com/news/articles[Accessed 15 April 2014].

Perez, S. (2016). 79 per cent of Americans do shopping online but its cost than convenience that sways them. [ONLINE]. https://techcrunch.com/2016/12/19/79-percent-of-americans-now-shop-online-but-its-cost-more-than-convenience-that-sways-them/. [Accessed on 25th April 2018]

Prana. (2016). The relevance in African markets [ONLINE]. http://pranabusinessconsulting.com/winning-at-the-first-moment-of-truth/[Accessed on 25th April 2018]

Ruggunan, S. & Cassim, N. (2010). University of Kwa-Zulu Natal Westville Campus: Honors Research Methodology. Course Handbook.

SAARF, AMPS. (2012). South African Research Foundation: Living Standard Measure[ONLINE]. www.saarf.co.za/LSM/LSMS.asp [[Accessed 16 April 2014]

Tabita. (2011). Book Review: Winning The Zero Moment of Truth. [ONLINE]. www.webgnomes.org/book-review[Accessed 22 April 2014]

Thinkwithgoogle. (2011). The ZMOT Macro Study.US Shopper Sciences. [ONLINE] www.gstatic.com/ads/research2011[Accessed 21 April 2014]

Wharton, M. (2011). ZMOT [ONLINE]. www.knowledge.wharton.upen.edu/article/googles-jim-lecinski[Accessed 17 April 2014]

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Factors Affecting the Business Performance of Small Businesses in Sekhukhune

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Abstract: This study identifies the factors that affect the business performance of Small, Micro and Medium Enterprises (SMMEs) in the Sekhukhune District of the Limpopo Province in South Africa. The study collected data from a randomly selected sample of 200 SMMEs and used WARP PLS software to analyse data. The results indicated that five factors, namely "finance", "characteristics of entrepreneurs", "location of business", "government support", as well as "products and services" were positively related to business performance. In contrast to other studies, this study found that owners' personal funds and their proper management played a key role in the performance of businesses. This has a major implication for government support agencies that provide funding opportunities.

Keywords: *SMMEs, Owner's Funds, Location of Business, Finance, Business Performance*

1. Introduction

Small and Medium Enterprise (SME) employment is attributable to about 35% of the total employment generated by SMEs globally, while this number is 52% for developing economies compared to 34% for emerging and 41% in developed economies. However, in recent years (2015-2016), this contribution remained stagnant with a marginal increase of 34.6 % to 34.8%, (International Labour Organisation News, 2017). In China, SMEs contribute60% to the country's Gross Domestic Product (GDP) 50% to tax revenue; 70% to import and export trade; and 80% of employment in urban areas (Zhu, Wittman and Peng, 2012). In the United States (US), SMEs represent 99.7% of firms and contribute more than 50% to the non-farm GDP and are responsible for 60% to 80% of new jobs in the economy (Longley, 2006). In Pakistan, SMEs represent about 90% of all enterprises; 80% of the non-agricultural labour force; and 40% to its GDP (Harvie and Lee, 2002; Neumark, Wall and Zhang, 2008). In South Africa, SMEs account for around 40% of the GDP and SMEs are expected to provide 90% of the new jobs created by 2030 (Jones, 2016). Notably, it is important to implement the right policies to create a conducive environment for SMEs in South Africa. It is therefore imperative to study the current challenges that these SMEs face. Although several studies have touched on the topic, this study attempts to explore these factors in the Sekhukhune District of the Limpopo Province, which is not as developed as the Gauteng or North West Provinces of South Africa. The study identifies factors that affect the success of small businesses and to assess the relationship between these factors and business performance.

2. Literature Review

SMEs and SMMEs are used interchangeably worldwide due to the absence of a universally accepted definition. The geographic location and legislation influence the various definitions of these types of enterprises. As such, definitions differ across countries and industries (Orobia and Byabashaija, 2013; Islam, Keawchana and Yusuf, 2011; Leopoulos, Kirytopoulos, and Malandrakis, 2006). The European, Indian and US definitions of SME includes both qualitative and quantitative characteristics as criteria for defining small businesses. However, the most common measures used to define small businesses include the number of employees, annual turnover, ownership, value of fixed assets, production methods and legal status (Agyei-Mensah, 2011; Abor and Quartey, 2006). The South African definition, as per the National Small Businesses Act, 1996 (Act No 102 of 1996), considers the number of employees plus the annual turnover. With the above definitions as a reference point, the next section details the factors that affect the success of small businesses.

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The contribution between the first author and second author in this paper is 60:40.

Factors Affecting the Success of Small Businesses: Numerous studies have identified the factors that affect business success, such as finance; characteristics of an entrepreneur; location of business; government support; and product and services (Daskalakis, Jarvis and Schizas, 2013; Fatoki and Asah, 2011; Fatoki and Garwe, 2010; Chittithaworn, Islam, Keawchana & Yusuf, 2011; Garg and Makukule, 2015). Each factor will be discussed in detail in the following section.

Financial Resources: Access to finance plays an essential role in the success of small businesses. Without sufficient capital, small businesses are unable to grow and introduce new products and services. Numerous studies have highlighted finance as the major reason why small businesses fail, especially during the start-up phase (Coleman, 2000; Islam, Khan, Obaidullah and Alam, 2011; Rogerson, 2008; Okpara and Wynn, 2007). Furthermore, research has revealed that small businesses rely heavily on their own funds and prefer not to raise capital from sources outside the family. Simultaneously, many small business owners are unaware of existing funding agencies, while others consider applying for grants to be a waste of time. It was found that small businesses who obtain outside financial assistance experience a smooth transition from a start-up to a well-established business (Daskalakis, Jarvis and Schisas, 2013; Yusuf, 2014). Researchers have highlighted that external credit is not readily available to small businesses. This is attributed to the fact that commercial banks are reluctant to provide credit facilities to small businesses. One of the reasons for this is that commercial banks believe that lending to SMEs is less profitable than lending to large businesses. Notably, lending to small businesses involves high credit administration costs and high risks (Okpara and Wynn, 2007; Van Scheers, 2010; Abor and Biekpe, 2006; Pansiri and Temtime, 2010; Ladzani 2010; Mambula, 2002; Gill and Biger, 2012). Collateral was found to be an essential determinant for accessing finance.

Small business owners struggle to obtain loans; as financial institutions do not deem them trustworthy. In addition, small business owners do not have a reliable track record and often fail to understand the importance of proper budgeting (Mbonyane and Ladzani, 2011; Bosma and Levie, 2009; Ahmad and Seet, 2009). Numerous studies have found that small businesses should prioritise financial management training to overcome growth barriers. Furthermore, research has revealed that small business owners spend their capital on items that are unrelated to the business, as they are unable to distinguish between capital and profit. This has resulted in cash-flow problems, as too much of the business' cash is used for personal expenses (Neneh and Van Zyl, 2012; Bezuidenhout and Nenugwi, 2012; Rogerson, 2000; Acts, Arendius, Hay and Minniti, 2004; Okpara and Wynn, 2007). The above literature suggests that financial resources like owners' funds and borrowing from external sources play a key role in business success. External credit is not readily available to small businesses due to their inability to provide collateral. Furthermore, financial institutions do not find small businesses trustworthy and prefer to lend money to large businesses with higher profitability.

Characteristics of an Entrepreneur: Entrepreneurship involves a special type of decision-making process. Therefore, an entrepreneur's characteristics are the key determinants of business success. Research has proven that the success of a business depends on the entrepreneur's personality structure, which includes experience and expertise. A business owner's entrepreneurial spirit and motivation largely determine the growth and survival potential of his/her business (Islam et al., 2011; Ligthelm, 2010; Kritikos, 2007). Numerous studies have highlighted a positive relationship between business management, entrepreneurial conduct and business success. Therefore, an entrepreneur's competence, characteristics, attitudes, motives and risk-taking capabilities have a significant impact on the success of the business. Entrepreneurs with human, social and financial knowledge were found to be in a better position to identify potential opportunities accurately (Hill, 2001; McCartan-Quinn and Carson, 2003; Dockel and Ligthelm, 2005; Omri, Frikha and Bouraoui, 2015).

In addition to the above, various studies have found that small businesses fail due to a lack of the required competencies on the part of business owners. This is evidenced by entrepreneurs' irrational behaviour in managing their businesses, as well as their inability to conduct thorough research on market demand before investing in a business venture (Stokes and Blackburn, 2002; Kiggundu, 2002; Beaver and Jennings, 2005). Various studies have revealed that entrepreneurs who successfully start and grow their business ventures possess the required skills. This not only involves identifying, launching and selecting the right business opportunity, but also having the required knowledge on how to manage the businesses effectively.

Therefore, it is essential that entrepreneurs acquire basic business managerial skills to manage their business ventures successfully (Baughnand Neupert, 2003; Sriramand Mersha, 2010). Research has highlighted a lack of both technical and managerial skills as constraints to business development. Furthermore, 90% of entrepreneurs believe that one of the reasons for high business failure is inadequate managerial skills in the business sector (Perks and Austin, 2013; Brink, Cant and Ligthelm, 2003; Rogerson, 2008; Young, Schaffers and Bruwer, 2012). The above literature concludes that entrepreneurial, technical and managerial skills and the ability to conduct thorough market research are essential skills for small businesses to succeed and grow.

Location of Business: Studies by Eckert and West (2008), Fatoki and Garwe (2010), Fatima and Muneer (2016) and Rantso, (2016) established that the survival and growth of a firm are associated with the geographic location. Notably, location was found to influence the performance of rural businesses, as it is related to the availability of markets and access to infrastructure. As a result, the choice of a business location should be considered carefully to minimise distribution costs, meet demand and beat competition. Therefore, potential business owners should check the suitability of their target location prior to making any decision pertaining to where to embark on their business.

Government Support: Lack of government support is cited as a major barrier to the growth of small businesses. This is associated with inadequate, inefficient support systems regarding the availability of public services. Furthermore, it can be attributed to the fact that institutions and associations that provide business support to SMEs are fragmented and uncoordinated. This is partly due to a lack of clear guidance and policy pertaining to the sector's development (Bilal and Mqbali, 2015; Peng and Luo, 2000; Ladzani and Netswera, 2009). Literature also reveals that most SMEs believe that they do not receive adequate support from the government. This is despite government initiatives that are in place. Furthermore, business owners found it challenging and discouraging to obtain government support, as it is perceived to be based on bribery and business connections. To this end, a study conducted in China indicated that the country's government has rolled out several business support systems for SMEs based on research and development (R&D). However, most small business owners in the country admitted that they find it difficult to access and benefit from these support services (Okpara, 2011; Zhu, Wittman and Peng, 2012; Fatoki and Garwe, 2010).

Products and Services: Innovative products, as well as quality, affordability and reliability of services are key strategic determinants of business success (Chittithaworn et al., 2011). SMEs that focus on introducing new products have a higher growth rate than SMEs that fail to introduce new products. To achieve growth, small business owners should find new products, markets and exploit new business opportunities (Tuan and Yoshi, 2009; Unger, Keith, Hilling, Geilnik and Frese, 2009; Coyne and Leeyson, 2004). Access to markets was revealed as one of the barriers to small business growth. This challenge is brought about by the fact that established firms are associated with advanced production processes, know trade secrets and have superior technology. Other advantages of large businesses include customer loyalty, extensive product advertising and marketing, as well as access to distribution channels (Moy and Luk, 2003; Briggs, 2009; Karakaya, 2002; Krasniqi, 2007; Ladzani and Van Vuuren, 2002). It was revealed that small businesses' outdated technology is a hindrance to SME-based development. Subsequently, SMEs require assistance with capacity building and access to technology.

Business owners and managers need to be trained on information technology (IT) to improve business performance, managerial competence, as well as increased responsiveness and flexibility to the external environment (Chittithaworn et al., 2011; Swierczek & Ha, 2003; Fielden, Davidson and Makin, 2000). Businesses can improve their efficiency by implementing the latest technology. It was further revealed that social media has a substantial impact on SMEs' performance. The internet and social media represent a potential vehicle to help small businesses create better brand awareness, customer relationships and sales. On the other hand, social ties provide a platform for investors to obtain business information and allow entrepreneurs to access resources to pursue business opportunities. (Shane and Cable, 2002; Jones, Borgman and Ulusoy, 2015; Kadam and Ayarekar, 2014; Ghouri, Khan, Malikand Raza, 2011). In conclusion, above literature highlights various aspects of finance, such as the availability of capital and credit, difficulty in taking out loans due to collateral requirements, poor financial management skills, as reasons for business discontinuation. Further characteristics of entrepreneurs, such as the capacity to identify and exploit opportunities, risk-taking capabilities, attitudes, motives etc.

3. Objectives of the Study and Research Methodology

Limpopo Province is the most rural province in South Africa. Sekhukhune is one of five districts in Limpopo Province. Unlike other district municipalities in Limpopo, it is situated some distance from major towns. The level of skills in Sekhukhune is the lowest of any district in Limpopo. This severely hampers the district's ability to be innovative in implementing economically productive ventures. Consequently, there is an increased reliance on Government for trade purposes. Furthermore, this district is classified as the poorest of the poor districts in the country. Currently, 35% of the economically active population is employed within the district. On the other hand, 60% of workers are employed outside the district. This is attributable to the low level of job opportunities. For this reason, Sekhukhune in Limpopo Province was selected for this study. While other factors like the location of business and Government support plays a critical role in SMEs success. Lastly product and services, technology, efficiency etc. can be supportive to the success of small businesses.

Studies conducted by various researchers (Fatoki and Garwe, 2010; Van Scheers, 2010; Thornhill and Amit, 2003) confirm that 75% of the small businesses in South Africa remain unsustainable until they graduate into established firms. The estimated failure rate of SMMEs in South Africa is between 70% and 80%, while less than half of newly established businesses survive beyond five years, resulting in millions of rand being lost on business ventures. This is a common phenomenon throughout the world. To reduce the risk of failure and increase the chances of success, it is essential to understand the factors that affect business performance. As such, this study addresses the question: What are the factors that contribute to the business performance in SMEs operating in Sekhukhune? Accordingly, the two objectives are: to identify factors that affect the success of small businesses in Sekhukhune; and to assess the relationship between these success factors and business performance.

Population and Sample Size: The population consisted of small businesses in Sekhukhune that have been operating for more than three years. The size of the small businesses, number of years in business and the number of employees were used to identify businesses that fall within the parameters of the definition of a "small business". Included were retail shops, general dealers, building material hardware shops, restaurants, greengrocers, brick makers, public phone operators, welders, motor mechanics, car washes, as well as panel beaters and spray painters. Liquor shops and restaurants were excluded from the study. Out of the population of 549 registered small businesses in Sekhukhune (Limpopo Business Support Agency, 2011), a structured questionnaire was distributed to a randomly selected sample of 200 businesses. The sample calculator formula for a population of 549, with a 95% confidence level and a 5% margin, yields a sample size of 220. A sample size of 200 (37% of the population) was found suitable to obtain a final response of at least 100, which provides stable statistical results.

The respondents included small business owners or managers operating in the said district municipality. The data collection process took approximately three weeks. To obtain a high response rate, the respondents were requested to complete the questionnaires on the spot. The returned questionnaires were checked for completeness. Questionnaires with more than two missing responses were rejected. A total of 160 responses were returned of which 124 were fully completed. Some of the reasons for non-response included the fact that there was no financial benefit or respondents did not have time. The participants were fully informed of the purpose and objectives of the study before they participated in the study. Furthermore, participants were guaranteed privacy, confidentiality and anonymity with regard to the information provided. In cases where both the owner and the manager were actively involved in the day-to-day running of the business, the person who oversaw the overall management was requested to complete the questionnaire.

Questionnaire Design: The questionnaire utilised in the study was aligned with the above-mentioned research objectives. The literature on small businesses was used as a point of reference to formulate the questionnaire. Accordingly, the question naira utilised in this study was adapted from various studies on factors that affect the viability of small businesses. This included studies by Chittithawornet al. (2011), Ladzani and Netswera, (2009), Garg and Makukule, (2015), Fatima and Muneer (2016) and Fatoki, (2011). Questionnaires from these studies were modified to suit the South African setting. The questionnaire for this study comprised of three sections, namely A, B and C. Section A related to respondents' demographic profiles. Respondents were requested to provide information on nature of their businesses, staff numbers educational qualifications, number of years in business, age, marital status and gender. Section B covered factors that

affect business success. It comprised of 25 questions. The variables (dependant)included "finance", "characteristics of an entrepreneur", "location of business", "government support", as well as product and services". Section C was used to measure the perceived business performance (dependent variable). Table 1 below shows the development of sections B and C of the questionnaire. The questions shown in italics (FIN3, FIN 4, etc.) could not be validated for this study.

Table 1: Section B and C of Survey questionnaire and associated variables

VARIABLE	CODE	QUESTIONNAIRE	REFERENCES
Section B of the questionnaire			
Finance	FIN1	I had enough money to start my business.	Chittithaworn et al. (2011), Ladzani and Netswera (2009), Garg and Makukule (2015), Fatima and Muneer (2016), Fatoki (2011).
	FIN2	My business has adequate cash resources.	
	FIN3	*Existing capital is insufficient to maintain and take advantage of business opportunities.*	
	FIN4	*The banking sector is willing to give loans to small businesses.*	
	FIN5	*I am satisfied with the financial facilities provided by banks and other lending institutions.*	
Characteristic of an entrepreneur	COE1	I have plans to expand my business.	Chittithaworn et al. (2011), Fatima and Muneer (2016), Garg and Makukule (2015), Fatoki, 2011.
	COE2	I take risks in order to expand my business.	
	COE3	*I keep a full record of my business transactions (sales, expenses, separate bank accounts etc.).*	
	COE4	*I have identified a set of performance measurements to use in assessing business performance.*	
Location of business	LOC1	Choosing a suitable location is essential for business success.	Ladzani and Netswera (2009), Garg and Makukule (2015).
	LOC2	The location has an impact on the cost of doing business.	
Government support	GOS1	Government policies are favourable to small business development.	Chittithawornet al. (2011), Fatima and Muneer (2016), Ladzani and Netswera, (2009), Fatoki (2011).
	GOS2	Government agencies are prepared to assist small businesses.	
	GOS3	*I am aware of the small business support services offered by the government.*	
	GOS4	*I am one of the beneficiaries of government incentives.*	
Products and services	PAS1	My business uses e-commerce for business purposes.	Chittithawornet al. (2011), Fatoki (2011).
	PAS2	*Changes in products and services have not been quite as significant in the preceding three years.*	
	PAS3	*My products are reliable and received good customer feedback.*	
Section C of the questionnaire			
Business Performance	BUP1	My business asset base has increased in the preceding three years.	Chittithaworn et al. (2011), Fatima and Muneer (2016), Garg and Makukule (2015).
	BUP2	My customers are increasing year by year.	
	BUP3	I am satisfied with the growth in sales and profitability of the business.	
	BUP4	A portion of the profit generated is reinvested in the business.	
	BUP5	The market share of my business has increased over the previous three years.	
	BUP6	The number of staff members has increased in the past three years.	
	BUP7	I consider my business to be successful.	

The questionnaire was pre-tested before starting the data collection process. The purpose of pre-testing was to assess whether the questions were clear and whether respondents were given enough time to complete the questionnaire. Furthermore, the pre-testing phase helped refine the questionnaire, so that respondents could answer the questions easily and eliminate problems relating to data recording. The pre-test took place through prearranged sessions with 10 business owners and managers residing in the survey area that have the knowledge and experience of running a small business. Subsequently, minor adjustments were made to the questionnaire, which related to sentence construction or phrasing and language used. Three types of analysis were conducted. Descriptive statistics were applied to the demographic profile. A chi-square test was applied to find the relationship between the demographic profile and the study's variables.

4. Data Analysis

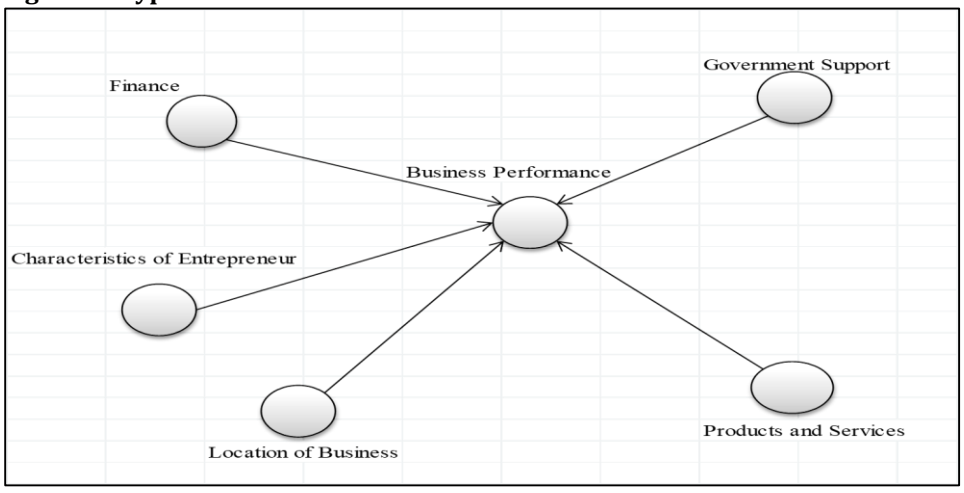
The demographic results reflected that small businesses that were operating in Sekhukhune, Limpopo, were sole traders that were owned or run by males (71%). Small business owners with more than 20 years' business experience represented 43% of the respondents. A total of 62% of respondent had a high school qualification. The majority (57%) of the respondents were married. A total of 43% of respondents were over 50 years of age. Most small business owners who participated in this study indicated that their business establishments (72%) employed between one and five people. Table 2 below shows the average, standard deviation, Skegness and kurtosis scores, as well as Cronbach's alpha for all the variables used in this study. The Cronbach's alpha scores for all variables were in the range of 0.7 or above, while other parameters were in the expected limits. The average values above 2 on a scale of 4 suggest that all the factors had a positive correlation.

Table 2: Average Values, Standard Deviation, Cronbach's Alpha, Skewness and Kurtosis of the Final Distribution of the Indicators (N=124)

Construct	Mean	Std. Dev	Kurtosis	Skewness	Cronbach's alpha	Composite reliability coefficient
Finance	2.03	0.71	-0.33	0.42	0.696	0.866
Characteristics of the enterprise	3.12	0.51	1.48	-0.69	0.759	0.891
Location of business	3.32	0.43	-1.15	0.59	0.696	0.866
Government support	2.34	0.64	-0.08	0.33	0.782	0.901
Products and services	3.21	0.67	1.93	-0.92	1.00	1.00
Business performance	2.89	0.45	0.85	-0.40	0.739	0.819

Figure 1 below depicts the model that was hypothesised to test the relationship between dependent and independent variables. "Business performance" was the dependent variable, while "finance", "characteristics of an entrepreneur", "location of business" and "government support" were the independent variables. It was hypothesised that all independent variables had a positive relationship with dependent variables.

Figure 1: Hypothesised Model



A three months' trial version of Warp Partial Least Square (5.0) statistical software was utilised for data analysis. The elements of the model, decision criteria, factor-loading, cross-loading, internal consistency and construct validity are depicted in Annexure 1. All model characteristics were within decision criteria (seeTablesA1 and A2 in Annexure 1). The factor loadings suggest that there was no major multicollinearity between the indicators, given the fact that the indicator loadings in relation to its constructs are greater than the other constructs (see Table A3 in Annexure). To determine internal consistency and discriminates validity, the constructs were merged in the form of a model. The results suggest good internal consistency, as well as convergent and discriminates validity for all constructs. Furthermore, all constructs had an AVE greater than 0.5, or 50%. The decision rule is that AVE should be greater than 0.5. This implies that at least 50% or more of the variance of indicators should be accounted for (see Table A4 in Annexure 1). Bootstrap re-sampling was performed to examine the statistical significance of path loading, weights and T-values. Table 3 below shows the results of the analysis.

Table 3: The Path Loading and T-Values

Path	Loading	T-Values
Finance → business performance	0.140	1.397*
Characteristics of an entrepreneur → business performance	0.100	1.598*
Location of business → business performance	0.140	1.398*
Government support → business performance	0.080	1.172*
Products and services → business performance	0.310	1.978*

*statistically significant at 95% confidence level

Figure 2: Model Showing the Paths and Loadings

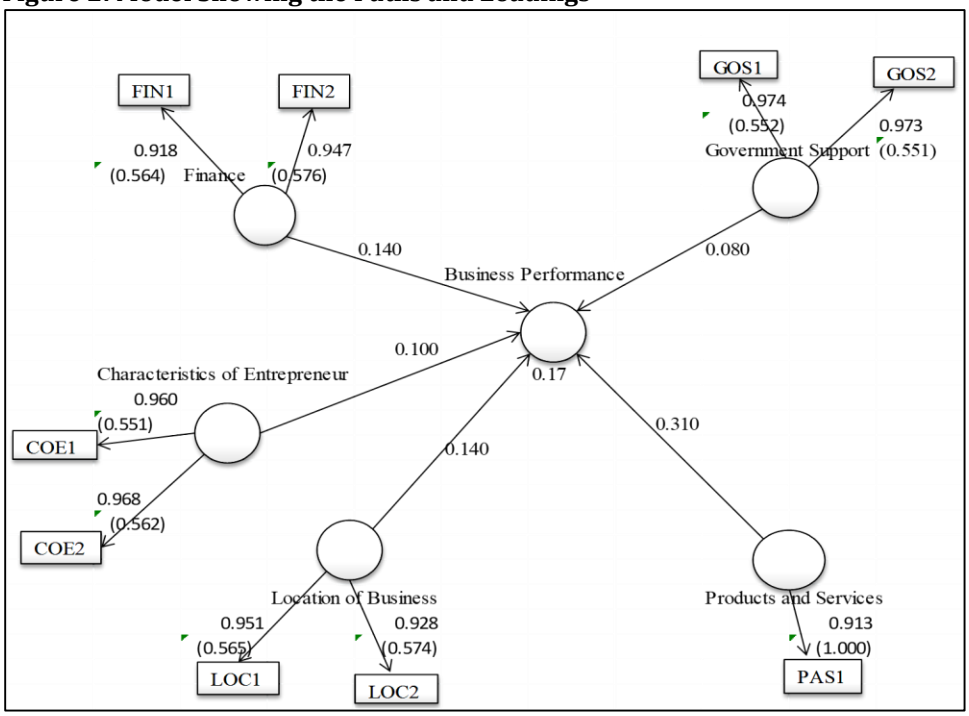


Table 4: Chi-Square and Crosstabs between Demographic Data and Variables

Variable	Age	Gender	Marital status	Educational qualifications	Business type	Number of staff members	Years in business
Finance	0.524	0.069	0.001*	0.008*	0.013*	0.000*	0.076
Characteristics of an entrepreneur	0.010*	0.027*	0.699	0.016*	0.347	0.001*	0.000*
Location of business	0.550	0.291	0.069	0.004*	0.000*	0.961	0.032*
Government support	0.494	0.565	0.000*	0.005*	0.001*	0.015*	0.000*
Product and services	0.601	0.227	0.040*	0.381	0.354	0.181	0.002*
Business performance	0.352	0.007	0.004*	0.003*	0.014*	0.002*	0.053

*p-value of less than 0.05 shows the association between the demographic information and the variables.

Table 4 shows various statistically valid relationships between variables. However, there was no specific trend or specific conclusions that could be drawn. In general, it can be said that that there was an association between "business performance" and the demographic variables, marital status, business type and educational qualifications, number of staff members or staff complement.

Analysis of the Model Path Coefficients Per Factor: The path coefficient values suggest that all factors, namely "finance", "characteristics of an entrepreneur", "business location", "government support", as well as "products and services" had a weak positive relationship with" business performance". The chi-square test was performed to determine whether there was an association between the variables and the demographic data (age, gender, marital status, educational qualifications, business type and years in business). The decision rule is that the p-value must be less than 5% or 0.05 for an association to exist between demographic information and variables.

Discussion: The objective of this study was to identify factors that affect the success of small businesses and to assess the relationship between these factors and business performance. This section discusses the factors that were validated in this study.

Finance: Literature suggests that finance plays a significant role in the success of SMMEs. Accordingly, this study considered five indicators under the variable "finance". These factors are indicated in Table 1 as FIN 1 to FIN 5. The factor analysis showed that the indicators FIN3, 4 and 5 were not valid indicators while, FIN 1 and 2 were validated. These validated factors indicate that business owners had enough money to start businesses and adequate cash resources to perform business. There was a weak but positive relationship between the indicators representing "finance" and "business performance. This finding suggests that "finance" is a factor that impacts "business performance". However, the key factors in finance are the owners' financial resources and the adequacy of SMME operations. The factors did not validate indicate that external finance is not a key factor in business performance. This explains the fact that small businesses fail despite external finance. Owner's financial resources and the proper management thereof plays a key role in the performance of small businesses. These findings are contrary to previous research findings on external financial support for SMMEs, which argued that external finance was the key to business success (Okpara and Wynn, 2007; Gill and Biger, 2012; Fatoki and Garwe, 2010). Rather, the current research findings are in line with that of Daskalakis et al. (2013) and Yusuf (2014). Notably, these authors found that small business owners rely heavily on their own funds, were unaware of existing funding agencies and some considered applying for grants as a waste of time.

Characteristics of entrepreneur: The "characteristics of the entrepreneur" is another determining factor in the success of SMMEs. This study used four indicators (COE1 to COE 4 in Table 1). Factor analysis did not validate record keeping and an identified set of performance measures. In turn, plans to expand business and

risk-taking to expand business showed a positive but weak relationship with "business performance". These findings suggest that small businesses did not practice record keeping and did not have any performance measures. However, it was revealed that risk-taking and plans to expand business enterprises were inherent characteristics of SMMEs studied. This is in line with the findings of authors like Hill (2001), McCartan-Quinn (2003), Dockel and Lighthelm (2005), Omri et al. (2015), Garg and Makukule, (2015) and Garg and Letsolo, (2016).

Location of Business: Choosing a suitable location and impact of location on cost were the two indicators that were tested and validated in this study. It was established that "location of business" had a positive but weak positive relationship with "business performance". These findings are consistent with the studies conducted by Eckert and West (2008), Fatoki and Garwe, (2010), Fatima and Muneer (2016) and Rantso, (2016).

Government Support: Government policies and other types of support are considered a key aspect in the success of SMMEs and were positively related to "business performance". The factor analysis showed that government policies were favourable, and agencies were prepared to assist small businesses. However, other factors such as awareness of government support to SMMEs and beneficiary of government support were not validated in this study. These findings suggest that government agencies should do more to render support to SMMEs. Notably, the aforementioned findings are in line with that of Okpara, (2011), Zhu et al. (2012), Fatoki and Garwe, (2010), Bongomin, Munene, Ntayi and Malinga, (2018) and Gupta and Mirchandani, (2018).

Products and Services: The right product mix and knowledge of customers are necessary for businesses to succeed. The study found a positive relationship between "products and services" and "business performance". Factor analysis results found that changes in SMMEs' products and services and customer feedback on their products were not valid indicators, suggesting that SMMEs did not focus on product and service mix. However, they were using e-commerce for business purposes. Researchers such as Garg and Choeu, (2015) and Chittitwhaworn et al. (2011) support this finding.

5. Conclusion and Recommendations

This study confirms that finance, characteristics of entrepreneurs, the location of the business, government support etc. played a role in the business performance of SMMEs in the selected sample. The study concluded that small businesses rely heavily on their own funds. Furthermore, results revealed that some businesses were unaware of funding opportunities and considered applying for government funding a waste of time. As such, it is recommended that government funding should be marketed more broadly to reach target markets. They should also make funding procedures hassle free. Risk-taking remains one of the key determining factors in small businesses. To this end, training programmes to identify and quantify risks can help small businesses safeguarding against business risks. Training in record keeping is also recommended. The study also found that the location of a business, as well as products and services were important determinants of business success. Hence, local agencies should provide advisory services to help small businesses succeed. The authors propose to revert these recommendations to the Sekhukhune Local Municipality for implementation. However, the findings in the study cannot be generalised, especially the findings on financial aspects which are contrary to other studies. Furthermore, findings from this study can provide feedback to Government with regard to various schemes they have launched to support SMMEs in South Africa.

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References

Abor, J. & Biekpe, N. (2006). Small business financing initiatives in Ghana. *Problems and Perspectives in Management*, 4(3), 69-77.

Acts, Z. J., Arenius, P., Hay, M. & Minniti. (2004). Global Entrepreneurship Monitor. Babson College and London.

Ageyei-Mensah, B. K. (2011). Financial management practices of small firms in Ghana: An empirical study. *African Journal of Business Management*, 5(10), 3781-3793.

Ahmad, N. H. & Seet, P. (2009). Dissecting behaviours associated with business failure: A qualitative study of SME owners in Malaysia and Australia. *Asian Social Science,* 5(9), 98-104.

Baughn, C. C. & Neupert, K. E. (2003). Culture and national conditions facilitating entrepreneurial start-ups. *Journal of International Entrepreneurship*, 1(3), 313-324.

Bezuidenhout, A. & Nenugwi, A. L. (2012). A competency framework for the small business sector in Johannes burg South Africa. *African Journal of Business Management*, 6(47), 11658-11669.

Beaver, G. & Jennings, P. (2005). Competitive advantage and entrepreneurial power: The dark side of entrepreneurship. *Journal of Small Business and Enterprise Development*, 12(1), 9-23.

Bilal, Z. O. & Mqbali, N. S. (2015). Challenges and constraints faced by small and medium enterprises (SMEs) in Al Batinah governorate of Oman. *World Journal of Entrepreneurship, Management and Sustainable Development*, 11(2), 120-130.

Bongomin, G., Munene, J. C., Ntayi, J. M. & Malinga, C. A. (2018). Determinants of SMMEs' growth in post-war communities in developing countries: Testing the interaction effect of government support. *World Journal of Entrepreneurship, Management and Sustainable Development*, 14(1), 50-73.

Bosma, N. & Levie, J. (2009). Global Entrepreneurship Monitor. Babson College, Universidad del Desarrollo and Reykjavik University; available from http://www.gemconsortium.org/.

Brink, A., Cant, M. & Ligthelm, A. (2003). Problems experienced by Small Businesses in South Africa: 16th Annual Conference of Small Enterprise Association of Australia and New Zealand, held in Australia on 28 September-1 October, 2003. Ballarat.

Briggs, B. R. (2009). Issues affecting Ugandan indigenous entrepreneurship in trade. *African Journal of Business Management,* 12(3), 786-797.

Chittithaworn, C., Islam, M. D. A., Keawchana, T. & Yusuf, H. M. (2011). Factors affecting the business success of small and medium enterprises in Thailand. *Asian Social Science*, 7(5), 180-190.

Coleman, S. (2000). Access to capital and terms of credit: A comparison of men-and women-owned small businesses. *Journal of Small Business Management*, 38(3), 25-37.

Coyne, C. J. & Leeyson, P. T. (2004). The Plight of underdeveloped countries. *Cato Journal*, 24(3), 235-249.

Daskalakis, N., Jarvis, R. & Schizas, E. (2013). Financing practices and preferences for micro and small firms. *Journal of Small Business and Enterprise Development*, 20(1), 80-101.

Dockel, J. A. & Lighthelm, A. A. (2005). Factors responsible for the growth of small business. *Bureau of Market Research, University of South Africa*, 8(1), 54-62.

Eckert, A. & West, D. S. (2008). Firm survival and chain growth in a privatised retail liquor store industry. *Review of Industrial Organisation*, 32(1), 1-18.

Fatima, S. M. A. & Muneer, M. S. A. (2016). Factors influencing women entrepreneur's performance in SMEs. *World Journal of Entrepreneurship, Management and Sustainable Development*, 12(2), 82-101.

Fatoki, O. & Asah, F. (2011). The impact of firm and entrepreneurial characteristics on access to debt finance by SMEs in King Williams Town, South Africa. *International Journal of Business Management*, 6(8), 170-179.

Fatoki, O. & Garwe, D. (2010). Obstacles to the growth of new SMEs in South Africa: A principal component analysis approach. *African Journal of Business Management*, 4(5), 729-738.

Fatoki, O. O. 2011. The impact of human, social and financial capital on the performance of small and medium-sized enterprises (SMEs) in South Africa. *Journal of Business Management*, 29(3), 193-204.

Fielden, S. L., Davidson, M. J. & Makin, P. J. (2000). Barriers encountered during micro and small business start-up in North-West England. *Journal of Small Business and Enterprise Development*, *7*(4), 295-304.

Garg, A. K. & Makakule, P. (2015). Business risk management–the key success factor: evidence from shebeens and taverns in Soshanguve Township. *Problems and Perspectives in Management,* 13(2), 71-81.

Garg, A. K. & Letsolo, P. (2016). Gender, Risk-Taking Propensity and Culture of Entrepreneurs at Small and Medium Enterprises in Gauteng. *Journal of Economics and Behavioral Studies,* 8(3), 41-47.

Garg, A. K. & Thobeng, C. (2015). The Adoption of Electronic Commerce by Small and Medium Enterprises in Pretoria East. *The Electronic Journal of Information Systems in Developing Countries*, 68(7), 1-23.

Ghouri, A. M., Khan, N. V. R., Malik, M. A. & Razza, Q. A. (2011). Marketing practices and their effects on a firm's performance: Findings from small and medium-sized catering and restaurants in Karachi. *International Journal of Business and Management*, 6(5), 251-259.

Gupta, N. & Mirchandani, A. (2018). Investigating entrepreneurial success factors of women-owned SMEs in UAE. *Management Decision*, 56(1), 219-232.

Gill, A. & Biger, N. (2012). Barriers to small business growth in Canada. *Journal of Small Business and Enterprise Development*, 19(4), 656-668.

Harvie, C. & Lee, B. (2002). The Role of SMEs in National Economies in East Asia. Edward Elgar Publishing. USA.

Hill, J. (2001). A multidimensional study of the key determinants of effective SME marketing activity. *International Journal of Entrepreneurial Behaviour and Research*, 7(5), 171-204.

Islam, M. A., Keawchana, T. & Yusuf, D. H. M. (2011). Factors affecting business success of Small & Medium Enterprises (SMEs) in Thailand. *Asian Social Science*, 7(5), 180-190.

Islam, M. D. A, Khan, M. A, Obaidullah, A. B. Z. & Alam, M. S. (2011). Effects of entrepreneur and firm characteristics on the business success of Small and Medium Enterprises (SMEs) in Bangladesh. *International Journal of Business and Management,* 6(3), 289-299.

Jones, E. (2016). SMEs struggle for survival in South Africa CNBS AFRICA (ONLINE). Jones, N., Borgman, R. & Ulusoy, E. (2015). Impact of social media on small businesses. *Journal of Small Businesses and Enterprise Development*, 22(4), 611-622.

Kadam, A. & Ayarekar, S. (2014). Impact of social media on entrepreneurship and entrepreneurial performance: Special reference to Small and Medium-scale enterprises. *Journal of Management,* 10(1), 1-11.

Karakaya, F. (2002). Barriers to entry in industrial markets. *Journal of Business and Marketing,* 17(5), 379-388.

Kritikos, A. S. (2007). Is Entrepreneurship Success Predictable? An Ex-Ante Analysis of the Character-Based Approach. [Discussion Paper: 2687]; available from kritikos@gfa-kritikos.de.

Kiggundu, M. N. (2002). Entrepreneurs and entrepreneurship in Africa: what is known and what needs to be done. *Journal of Development Entrepreneurship*, 7(3), 239-258.

International Labour Organisation (ILO) News. (2017). Sluggish SME development hurts jobs and the economy; available from http://www.ilo.org/global/about-the-ilo/newsroom/ news/WCMS_579872/lang--en/index.htm.

Ladzani, L. & Netswera, G. (2009). Support for rural small businesses in Limpopo Province, South Africa. *Development Southern Africa,* 26(2), 225-239.

Ladzani, W. (2010). Historical perspective of small business development initiatives in South Africa with special reference to Limpopo Province. *Problems and Perspective in Management*, 8(3), 68-79.

Ladzani, M. W. & Van Vuuren, J. J. (2002). Entrepreneurship training for emerging SMEs in South Africa. *Journal of Small Business Management*, 40(2), 153-160.

Leopoulos, V. N., Kirytopoulos, K. A. & Malandrakis, C. (2006). Risk Management for SMEs: Tools to use and how. *Journal of Production Planning and Control*, 17(3), 322-332.

Ligthelm, A. A. (2010). Entrepreneurship and Small Business Sustainability. *Southern African Business Review*, 14(3), 131-153.

Limpopo Business Support Agency (LIBSA). (2011). Annual Report. Polokwane: LIBSA.

Longley, R. (2006). Small business drives US economy, provide jobs for over half of nation's private workforce; available fromhttp://usgovinfo.about.com/od/smallbusiness/a/ sbadrives.htm. [Accessed on 25th April 2018].

Mambula, C. (2002). Perceptions of SMEs growth constraints in Nigeria. *Journal of Small Business Management*, 40(1), 58-65.

Mbonyane, B. & Ladzani, W. (2011). Factors that hinder the growth of small businesses in South African townships. *European Business Review*, 23(6), 550-560.

McCartan-Quinn, D. & Carson, D. (2003). Issues which impact upon marketing in the small firm. *Small Business Economics*, 21(2), 201-213.

Moy, J., & Luk, V. W. M. (2003). The life cycle model as a framework for understanding barriers to SME growth in Hong Kong. *Asia Pacific Review*, 10(2), 199-220.

Neneh, N. B. & Van Zyl, J. (2012). Towards establishing long-term surviving Small and Medium Enterprises (SMEs) in South Africa: *An Entrepreneurial Approach. African Journal of Business Management*, 6(28), 8327-8343.

Neumark, D. Wall, B. & Zhang, J. (2008). Just the fact. Small business and job creation: Do Small businesses create jobs? Public Policy Institute of California; available fromhttp://www.ppic.org.

Omri, A., Frikha, M. A. & Bouraoui, M. A. (2015). An empirical investigation of factors affecting small business success. *Journal of Management Development*, 34(9), 1073-1093.

Okpara, J. O. (2011). Factors constraining the growth and survival of SMEs in Nigeria. *Management Research Review*, 34(2), 156-171.

Okpara, J. O. & Wynn, P. (2007). Determinants of small business growth constraints in a sub-Saharan African economy. *SAM Advanced Management Journal*, 72(2), 24.

Orobia, L. A. & Byabasha, W. (2013). How do small business owners manage working capital in an emerging economy? *Qualitative Research in Accounting and Management*, 10(2), 127-143.

Pansiri, J. & Temtime, Z. T. (2010). Linking firm and manager's characteristics to perceived critical success factors for innovative entrepreneurial support. *Journal of Small Business and Enterprise Development*, 17(1), 45-59.

Peng, M. W. & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link. *Journal of Academy of Management*, 43(3), 486-501.

Perks, S. & Austin, G. D. (2013). Exploring business growth aspirations and strategic planning of hairdressing salons in South Africa. *Integrative Business & Economics,* 2(1), 319-332.

Rantso, T. A. (2016). Factors affecting performance/success of small scale-rural non-farm enterprises in Lesotho: *Journal of Enterprising Communities: People and Places in the Global Economy,* 10(3), 226-248.

Rogerson, C. M. (2000). Successful SMEs in South Africa: the case of clothing producers in the Witwatersrand. *Development Southern Africa*, 17(5), 687-716.

Rogerson, C. M. (2008). Tracking SMME development in South Africa: Issues of finance, training and the regulatory environment. *Urban Forum*, 19, 61-81.

Shane, S. & Cable, D. (2002). Network ties, reputation, and the financing of new ventures: *Journal of Management Science*, 48(3), 364-381.

South Africa. (1996). National small business Act, 102.Sriram, V. & Mersha, T. (2010). Stimulating entrepreneurship in Africa. *World Journal of Entrepreneurship*, *Management and Sustainable Development*, 6(4), 257-272.

Stokes, D. & Blackburn, R. (2002). Learning the hard way: the lessons of owner-manager who have closed their businesses. *Journal of Small Business and Enterprise Development*, 9(1), 17-27.

Swierczek, F. W. & HA, T. T. (2003). Entrepreneurial orientation, uncertainty avoidance and firm performance: An analysis of Thai and Vietnamese SMEs. *Entrepreneurship and Innovation*, 4(1), 46-58.

Thornhill, S. & Amit, R. (2003). Learning About Failure: Bankruptcy, Firm Age, and the Resource-Based View. *Organisation Science*, 14(5), 497-509.

Tuan, N. P. & Yoshi, T. (2009). Factors contributing to the growth of Small and Medium Enterprises: An empirical analysis of Vietnam's manufacturing firms. *Management Review*, 31(2), 35-51.

Unger, J. M., Keith, N., Hilling, C., Gielnik, M. M. & Frese, M. (2009). Deliberate practice among South African small business owners: Relationships with education, cognitive ability, knowledge, and success. *Journal of Occupational and Organisational Psychology*, 82, 21-44.

Van Scheers, L. (2010). Challenges of small groceries shops in South Africa. *World Journal of Entrepreneurship*, *Management and Sustainable Development*, 6(3), 221-231.

Young, L., Schaffers, L. & Bruwer, J. P. (2012). South African informal businesses sustainability in the Cape Town Central Business District: The power of internal financial controls. *African Journal of Business Management*, 6(45), 11321-11326.

Yusuf, J. E. (2014). Impact of start-up support through guided preparation. *Journal of Entrepreneurship and Public Policy*, 3(1), 72-95.

Zhu, Y., Wittman, X. & Peng, M. W. (2012). Institution-based barriers to innovation in SMEs in China. *Asia Pacific Journal of Management*, 29, 1131-1142.

ANNEXURE 1

Table A1: Elements of the Model

Number of latent variables	Latent variables	Number of indicators	Number of paths	
6	Finance	2		1
	Characteristics of an entrepreneur	2		1
	Location of business	2		1
	Government support	2		1
	Product and services	1		1
	Business performance	7		1
Total number of indicators		16	**Total number of paths**	5
Sample size		124	**Measurement (Outer) Model Analysis**	Factor-Based PLS Type PTH1
Re-sampling method used		Bootstrapping	**Structural (Inner) model analysis**	Warp3 Basic
Number of resample used		100	**Number of iterations**	8

Table A2: Model Characteristics and Decision Criteria

Model fit and quality indices	Baseline model	Acceptable statistics
Average path coefficient (APC)	0.155 P<0.001	APC<2 P<=0.05
Average R-squared (ARS)	0.165 P=0.442	ARC<2; Highest R-squared should be selected; Lowest p-values.
Average adjusted R-squared (AARS)	0.130 P=0.769	P<=0.05
Average block variance inflation factor (AVIF)	1.213	<=5 ideally <=3.3
Average full collinearity (AFVIF)	1.176	<=5 ideally <=3.3
AVIF + AFVIF	2.389	For more than 2 indicators; both AVIF plus AFVIF<5
Tenenhaus GoF (GoF)	0.354	Small >=0.1, medium >=0.25, large >=0.36
Simpson's paradox ration (SPR)	0.800	>=0.7, ideally = 1
R-squared contribution ratio (RSCR)	0.955	>= 0.9, ideally = 1
Statistical suppression ratio (SSR)	1.000	>=0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	0.400	>=0.7

Table A3: Factor Loading and Cross Loading for the Constructs

Code	Fin	COE	LOB	GOS	PAS	BUP
FIN1	**0.918**	-0.017	-0.369	0.141	0.020	0.005
FIN2	**0.947**	-0.130	-0.210	-0.079	0.017	0.191
COE1	-0.066	**0.960**	0.102	0.179	0.174	-0.026
COE2	-0.083	**0.928**	0.070	0.186	0.294	0.082
LOC1	-0.262	0.047	**0.951**	0.040	0.056	0.142
LOC2	-0.324	0.118	**0.928**	-0.078	0.087	0.080
GOS1	0.044	0.207	0.058	**0.973**	0.054	0.052
GOS2	0.026	0.172	-0.101	**0.974**	0.016	0.107
PAS1	0.022	0.256	0.084	0.039	**0.913**	0.302
BUP1	0.302	-0.128	-0.100	-0.168	0.195	**0.903**
BUP2	0.082	0.067	0.079	0.033	0.226	**0.964**
BUP3	-0.046	0.128	-0.028	0.264	0.225	**0.928**
BUP4	-0.031	0.066	0.360	0.452	-0.011	**0.813**
BUP5	0.134	0.010	0.079	-0.074	0.218	**0.961**
BUP6	0.064	0.084	0.284	0.062	0.535	**0.786**
BUP7	0.147	-0.053	0.155	0.017	0.410	**0.885**

Table A4: Internal Consistency and Discriminant Validity Constructs

Code	FIN	COE	LOC	GOS	PAS	BUP	AVE	SAVE
FIN	**0.874**						0.763	0.873
COE	-0.090	**0.897**					0.804	0.897
LOC	-0.366	0.104	**0.874**				0.763	0.873
GOS	0.041	0.219	-0.025	**0.906**			0.820	0.906
PAS	0.024	0.280	0.092	0.043	**1.000**		1.000	1.000
BUP	0.121	0.036	0.137	0.092	0.330	**1.000**	0.633	0.796

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Farmers' Preference for Soil and Water Conservation Practices in Nigeria: Analytic Hierarchic Process Approach

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Abstract: Enhancing agricultural production through sustainable soil/land and water conservation practices are vital to the sustenance of the human race as entrenched in the United Nation's Sustainable Development Goals 2, 12 and 15 respectively. Smallholder farmers are faced with myriads of soil and water-related issues in production which make them vulnerable to land degradation and low productivity. This calls for policies to enhance sustainable food production; hence, the need for this study which highlighted the influencing dynamics governing the preference and use of SWC practices alternatives in Nigeria with particular reference to Osun State. Multi-stage sampling technique was adopted in this study to select the representative sample of 240 respondents. Data collected through primary source include information on selected farmers' socio-economic attributes, institutional and farm level characteristics as well as the SWC practices prevalent in the study area. The SWC practices highlighted in this study include: Soil Management/Amendment Practices (SAP), Agronomic Practices (AP) and Cultivation Practices (CP). The data collected were analyzed with cross-tabulation analysis, AHP technique and the logit regression model. The results from AHP revealed that Agronomic Practices (AP) is the most preferred and used SWC practice option in the study area while marginal effects of the logit regression revealed that age, gender, years of formal education, membership of local level institutions, access to extension services and frequency of extension visit as well as farmers' perception on the impact of extension visit are significant influencing dynamics governing the rural farmers' preference and use of SWC practices alternatives in the study area. Hence, concerted efforts should be geared towards developing pro-farmers policies in line with these influencing dynamics.

Keywords: *Soil and water conservation, Preference, MCDM-AHP, Logit, Nigeria*

1. Introduction

Land degradation according to James and Ngala, (2015a) is a critical problem mostly caused by human activities. It is a major consequence of soil and water-related issue in agricultural production and partly that of climate change problem because there is groundwater loss due to increased temperature which often results in soil productivity decline. It usually occurs as a result of the interactions of various factors such as population pressure, obsolete, inefficient and traditional farming practices by humans. The traditional farming systems employed by most smallholder farmers who are also resourced poor have led to dwindling and reduced production output which in turn manifests in low revenue accrue and by extension vicious cycle of poverty. This ugly scenario has a negative effect on the availability and distribution of food crops especially the arable crops across the nation and especially the study area. However, past studies (for instance; Ezeaku, 2012; Dimelu, Ogboona and Enwelu, 2013; Babalola and Olayemi, 2013) have stressed on the significance of modern agricultural practices and the need for a transition from farmers' obsolete farming techniques to improved modern practices such as SWC practices.

It was further noted by these studies that improved farming practices can significantly have multiplier effects on the production output; which implies that, its capacity to improve the welfare of the populace cannot be underestimated. Therefore, against this background, this study examined the influencing dynamics driving the use of modern SWC practices by reflecting on the smallholder farmers' preference and use of SWC practices alternatives. It is important to note that, efficient use of these modern farming practices is vital to the sustenance of the human race as entrenched in the United Nation's Sustainable Development Goals 2, 12 and 15 respectively. And, nothing is more basic to the long-term survival of the human race than the availability of fertile soils to maintain plant and animal population. Yet, soils have been mined by erosion, constant cultivation and extraction of available nutrients (James and Ngala, 2015a). Therefore, because of this development, the policy calls for a sustainable agricultural development and production system such as Soil and Water Conservation (SWC) Practices came to the forefront. Soil and water conservation practices are practices or multi-practices that aim at achieving the following set of objectives.

Covering of soil surface with crop residues to enhance water percolation and/or infiltration rate, reduces topsoil runoff and achieving enhanced soil fertility for improved agricultural production output. And, such practices according to Adimassu et al. (2013) include but not limited to: terracing, tree planting, agroforestry, cover cropping, sole cropping, mixed cropping, contour vegetation strip and zero or minimum tillage. These sets of practices could either be used singly or in combination; in fact, most farmers use a combination of these practices to achieve an optimum productivity output. In the same vein, Ezeaku, (2012) strongly emphasized the need for sustainable soil and water management strategies in farming activities. The author also stressed on the necessity to guard against the washing away (being eroded) of the topsoil from the earth's surface or becoming altered chemically as a result of several factors associated with overutilization of soil, salinization and/or acidification, or chemical contamination of soil. All these are in line with the earlier school of thoughts discussed. Ezeaku, (2012) further noted that, good and efficient combination soil and water management techniques or practices will guard against soil degradation and depletion as a result of the natural occurrence, human activities and other human-induced factors. In the opinion of Dumaski et al. (2006) as well as Smith and Smithers, (2006), the soil and groundwater management practices efforts "offer and promote minimum disturbance of the soil by tillage (minimum tillage) as well as balance application of chemical inputs which are required to improve soil quality for healthy crop production. In essence, effective soil and groundwater conservation practices can potentially boost soil productivity and groundwater loss, reduce long-term dependency on external inputs which often times led to increased cost of production and enhance environmental management as well as reduce the emission of greenhouse gases borne out of human activities such as burning". All these can ultimately improve agricultural productivity and food security with minimum costs given considerations to the available cultivable land resources in Africa and sub-Saharan Africa in particular.

According to James and Ngala, (2015a), of the total landed area of approximately 2,976 million ha in Africa, two-third of this quoted figure is associated with various production limitations such as low fertility, saline and poorly drained soils and soil acidity. This situation has earlier been emphasized and affirmed by Mbagwu, (2003) who stated that poor and inappropriate soil and water management practices are the main cause of physical, chemical and biological degradation of most cultivated land in Africa which is manifested through an obvious yields decline, decreased vegetation covers, soil salinity, low soil fertility, loss of groundwater as well as increasing rate of soil erosion. These are clear indications of soil degradation and desertification with attendant negative consequences on food security and zero hunger. Therefore, soil depletion and erosion pose a serious threat to the agricultural development of nations which is a call to action point for local, state, national and regional economic development; most especially in an agrarian-based economy such as Nigeria where the majority are smallholder rural farmers. In response to this issue, mitigation pathways are the major talking points among agricultural policymakers and experts in sub-Saharan Africa (SSA) and Nigeria in particular (Iheke and Onyenorah, 2012). In Nigeria, over 80% of the farmland areas are being ravaged by erosion. This situation exposes farmland to degradation because of the run-off.

An estimated mean annual loss of about 25 million tons of crop productive capacity according to Olatunji, (2003) as cited in James and Ngala, (2015b) has been attributed to land degradation with attendant consequences of low yield, famine, low standard of living, reduction in availability of fuelwood, food insecurity, poverty and ultimately rural-urban migration. On the other hand, Salako and Tian, (2003) as cited in James and Ngala, (2015b) noted that farms which adopt soil and water conservation practices did have increased yields compared to the farms which did not, even as they operate in the same agro-ecological zone or region. Therefore, soil productivity maintenance in the short and long run is an important crux of conservation of both soil and groundwater to boost food crop production. Recently, Dimelu et al. (2013) stressed that, land degradation issue is a significant threat to the achievement of a sustainable food production system. This is also threatening the realization of United Nations' Sustainable Development Goal2as well as the welfare of the smallholder farmers considering their traditional methods of farming. This issue as emphasized by Dimelu et al. (2013) is a major impediment to: the sustained agricultural development of nations-especially agriculture-dependent ones, achievement of zero hunger, better rural farming households' welfare and poverty reduction in the world, SSA and Nigeria in particular. Apparently, rural farmers are known to use several traditional practices such as simple agronomic practices, age-long soil amendments management practices as well as the obsolete mechanical methods of soil management. Nonetheless, the application of these techniques has just been useful in keeping the pace of production, at

least on a considerable subsistence level, but not without its attendant consequences such as land degradation and productivity decline after a certain limit.

However, several efforts have been put forward and implemented to reverse this ugly situation and trend of land degradation, but available documented evidence of public interventions on soil and groundwater conservation in Nigeria and other developing countries revealed a poor performance (for instance, Babalola and Olayemi, 2013; Dimelu et al. 2013; James and Ngala, 2015a). The reasons adjudged for this poor impacts could be attributed to the nature of conservation practices involved (Babalola and Olayemi, 2013; Anande-Kur, 1986), socio-economic and demographics of the farmers who are the users of these practices, among other explainable and unexplainable factors (Jansen et al. 2006; Bravo-Ureta, et al. 2006). It thus becomes imperative to pay proper attention to this topical issue bothering on food and nutrition security as well as the welfare condition of the populace. In addition, based on the submission of Babalola and Olayemi, (2013), concerns on the need to meet the food demand with attendant myriads of socio-cultural problems and political instability as well as unstable economic situation are other serious challenges facing Nigerian rural farmers. Thus, appropriate and genuine interventions devoid of political interference can certainly affect food and nutrition security positively among nations. Similarly, combating land degradation through appropriate choice and preference of soil and water management practices by farmers has become an urgent priority in the global efforts to ensure zero hunger and food security for the ever-bourgeoning population in Nigeria.

Most importantly, the appropriate measure and evaluation tool on choice and preference for SWC practices by farmers need serious attention. Recently, multi-criteria analysis (MCA) technique otherwise known as Multi-Criteria Decision Making (MCDM) technique has been identified and emerged as an alternative and relatively comprehensive evaluation tool for choice and preference based survey; this was followed and extended to this study focusing on SWC practices preferences among smallholder farmers which of course include non-economic criteria. From the reviewed literature so far, there is no known study which have been conducted on the preference and choice of SWC practices and which clearly and explicitly considers and integrates farmers' economic needs and environmental objectives at a local level in Nigeria using Multi-Criteria Decision Making (MCDM) approach. Based on the aforementioned, this study investigated the influencing dynamics on farmers' preference for soil and water conservation practices in Nigeria with particular reference to Osun State, South-Western Nigeria; the choice of the study area is governed by the prevalent farming activities in this region especially among rural smallholder farmers.

2. Materials and Methods

The Study Area: The study was conducted in Osun State, Nigeria; located in the South-western part of Nigeria. The area is agrarian in nature, which is responsible for the prevalent farming and farming related activities; though mostly dominated by smallholder farmers. More so, other livelihood activities available in this area include but not limited to food processing, marketing, civil service and trading. There also abounds moderate level of social capital among the inhabitants of this area under study which informs the observed interactions and homogeneity in culture, values and norms among the residents.

Sampling Units and Procedure: The Agricultural Development Program (ADP) of Osun state is structured into 3 strata; these are: Osogbo, Iwo and Ife-Ijesha zones. Multistage sampling technique was used to select the240 respondents used for this study. A purposive selection of Iwo and Ife-Ijesha ADP zones was carried out in the first stage because of the prevalent agricultural activities in these zones. Thereafter, random and proportionate to size sampling techniques were simultaneous used to select the representative sample used for this study. The reason for this approach is to give individual farmers equal opportunity of being selected and to account for the variation in the respective population across the villages selected and used for this study.

The Proportionality Factor is given as:

$$S = \frac{n}{N} \times 240 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$ where:

S = sampled respondents from each of the selected villages,

n = population of registered farming households in each of the selected villages,
N = total population of registered farming households in all the 8 villages chosen,
240 = total number of respondents sampled in the study area.

Data Collection and Analytical Techniques: The study made use of cross-sectional data sourced primarily by administering study objectives-based questionnaires to the farmers in a scheduled interview process due to the perceived low literacy level of the respondents in the study area. Cross-tabulation analysis and mean values were used to describe the farmers and farm-based characteristics in relation to preference for soil and water conservation practices. Also, using Focus Group Discussion (FGD) with the farmers, Multi-Criteria Decision Making (MCDM) (using Analytic Hierarchic Process (AHP) technique as earlier applied by Saaty, (1987) and Adimassu et al. (2013) was employed to determine the optimal farmers' choice/preference for soil and water management practices among several other alternatives. The choice of this technique becomes useful to find out which of the exploratory scenarios with respect to choice and preference for soil and groundwater conservation practices best matches the farmers' (who are decision makers) expectations and sets of options/alternatives; the caveats needed to satisfy with respect to this methodology suggest that decision makers (farmers) need to agree or reach a consensus on a weighted set of criteria with which to judge the performance of the soil and water conservation practices chosen. Thereafter, the logit regression model was used to isolate the influencing dynamics governing the rural farmers' preference for each of the dominant soil and water conservation practices alternatives. Results obtained were further subjected to diagnostic test and post-estimation analysis to ascertain the goodness of fit and reliability of the model with the use of STATA 13 software.

Approach to Multi-Criteria Decision Making Analysis (Analytic Hierarchic Process Technique): This study benefited immensely from the guidelines provided in the works of Toda et al. (1981); Saaty, (1987); Mendoza and Martins, (2006); Adimassu et al. (2013); Babalola and Olayemi, (2013) and Chaudhuri, (2014). In line with the caveats governing the use of MCDM approach (AHP technique) and following the stepwise procedure as explained and highlighted in the reviewed literature, MCA on decision making among several alternatives using Analytic Hierarchic Process was adopted and used to carefully mirror farmers' preference and choice use decision of soil and water conservation practices. Multi-Criteria Decision Making (MCDM) or MCA technique employed to assess the preferences of soil and water management practices is a "pragmatic evaluation framework that ranks the performances of decision options against multiple objectives/criteria (Hajkowicz and Collins, 2007; Hajkowicz, 2008). Typically, the criteria were weighted using pair-wise ranking by decision makers (farmers) to reflect their relative importance. Criteria are attributes or indicators used to measure performance against decision makers' objectives. MCDM or MCA is a systematic way of making choices according to criteria and available options (Hajkowicz, 2008; Herva and Roca, 2013)".

This approach does not rely on monetary values and it offers a great potential to address the shortcomings of other evaluation methods (for instance, cost-benefit analysis). This method has been widely applied by several authors to evaluate natural resource management technologies and events that have to do with choice and preference (see Ananda and Herath, 2009; Chaudhuri, 2014). According to Adimassu et al. (2013), the following are the major AHP techniques and stepwise procedures involved:

- Establishing the decision context/determination of objectives
- Identifying options/alternatives
- Identifying criteria
- Determining the effects of alternatives
- Standardizing the effects of alternatives
- Ranking the criteria
- Aggregating results and ranking

Following the above stepwise procedures, this study evaluated the preference and choice of SWC practices by the farmers using the AHP approach. And, from a large set of probable choices and based on the overall joint preferences of the farmers with respect to the choice and use of SWC practices, a small set of suitable choices were agreed on. Hence, from the FGD session, the followings represent the agreed short-listed choices: soil management/amendment practices, agronomic practices as well as cultivation practices. The reason for this is that, it is important to quickly form the first set of preferences and make a short-list on the basis of

evaluation of these short-listed choices informally. This thus helps to focus on detailed analysis and evaluation based on preferences covering a small number of choices. Also, using inventive principle rushing through technique, a criteria analysis was done and the following three short-listed criteria were agreed on: maintenance criteria (soil fertility), technical criteria (reduction in soil loss and soil moisture improvement), and economic criteria (crop yield increase and low labor requirements).

Apparently, the choice and use of SWC practices are reliant on the objectives set to achieve as highlighted in the shortlisting criteria. According to Chaudhuri, (2014), the caveats needed to fulfil with respect to AHP technique stipulate the use of a limited number of criteria and that the short-listed criteria are fairly mutually exclusive of each other and also be comprehensively exhaustive. It is worthy of note that this second requirement is of paramount importance in any kind of multi-criteria decision making analysis to avoid creating an entangled situation. Then, the inter-criteria judgment matrix was constructed by doing a detailed analysis of evaluation criteria exhaustively together with short-listing of favorable choices. And, between the three criteria, the farmers were asked to make a judgment on which is more important and how much more important is the criteria one by one; and this was recorded by putting judgmental values (1, 2 and 3 corresponding to "equally important", "somewhat more important" and "extremely more important" in that order) to the judgment matrix (3 by 3 matrix) as shown in Table 3a. This is where the mathematics of assigning numerical values to the agreed judgment on the relative importance of the three criteria comes in. Therefore, the farmers' judgment on: maintenance criteria, technical criteria and economic criteria were scored and ranked based on the order of importance. It is pertinent to note that there exists a high level of social-cohesion viz-a-viz social capital among the sampled smallholder farmers owing to their involvements in local level institutions in the study area.

This also informs the similarities observed in their decision with respect to the choice and use of SWC practices as well as the criteria agreed on during the FGD exercise. The evaluation of the judgment matrix finally produced the inter-criteria importance in the form of a decimal number for each criterion; the total of which must be equal to unity (1). And, the more the value share of a criterion is, the more is its importance while evaluating the choices against all the criteria. This decimal share is thus referred to as the 'inter-criteria weight' (Chaudhuri, 2014). Thereafter, the evaluation of the relative importance of the choices against the criteria was done as shown in the choice versus criteria table (that is, Table 3b) where the farmers were asked to assign judgmental utility values (un-weighted) to each choice against each criterion with a caution that the allotted decimal number values to each 'choice-criterion cell' for the three choices against a criterion must also sum up to unity (1) as specified by (Chaudhuri, 2014). And, the final step involved multiplying the un-weighted utility values by the corresponding criteria weights and total up to arrive at the final weighted utility values for the choices. Hence, the choice with the highest weighted total utility value is the most preferred and used choice of SWC practices by the farmers in the study area.

Logit Regression Model: The choice of the logit model is guided by the fact that the response variable(s) are discrete and/or dummy. Hence, where the response variable is dichotomous, the two commonly used models are logit and probit regression models. In line with the submission of Amemiya, (1981), the use choice between these two models is at times confusing as a result of the statistical similarity between them. However, the logit model is computationally easier and adopted for this study.
Following Gujarati (1988), the model is specified as follows:
$L_n (P_i / (1-P_i) = ß_0 + ß_1X_1 + ß_2X_2 \ldots\ldots\ldots\ldots\ldots + ß_6X_6 + \varepsilon_i$ where:
L_n = natural logarithm
P_i = probability of farmer's preference or choice for different SWC practices
$1-P_i$ = probability of not using SWC; $ß_0$ = intercept; ßi (1, 2, 3.....n) = regression explanatory variables, and ε_i = random error term.
The dependent variable is the natural logarithm of the probability of a farmer using particular SWC practices divided by the probability of not using it.
The followings are various SWC practices examined in this study:

- Soil Management/Amendment Practices (SAP) which involves the use of any: compost and farm/green manure – organic and inorganic manure.
- Agronomic Practices (AP) which involves the use of any: mixed cropping, mulching, planting of the cover crop, crop rotation and agroforestry.

- Cultivation Practices (CP) which involves the use of any: minimum/zero tillage and land fallow.

According to Babalola and Olayemi, (2013) as well as Olawuyi and Balogun, (2017), the following variables have been hypothesized to influence adoption – preference, choice and use of SWC practices either positively or negatively based on a-priori expectations:

X_1 = age of farmers (years)
X_2 = gender of farmers (male = 1, 0, *Otherwise*)
X_3 = years of formal education (years)
X_4 = household size (actual number)
X_5 = farm size under cultivation (ha/number of plots)
X_6 = membership of local level institutions, for instance, farmers' cooperative (yes = 1, 0, *Otherwise*)
X_7 = access to extension services/education by the farmers, (yes =1, 0, *Otherwise*)
X_8 = frequency of extension visit (actual number of visit)
X_9 = perceived impact of extension visit (good = 1, poor = 0).
X_{10} = mode of land acquisition (inheritance = 1, 0, *Otherwise*)

3. Results and Discussion

This section presents the summary statistics of the respondents' socioeconomic characteristics. The cross-tabulation analysis of the selected respondents' socio-economic characteristics and the preference for SWC practices alternatives and the results of MCDM analysis as well as the dynamics governing farmers' preferences for SWC practices were also highlighted. Also, post-hoc and reliability tests were carried out to ascertain the goodness of fit as well as the reliability of the fitted model. Table 1 revealed the summary statistics of selected socio-economic attributes of the respondents. The findings revealed that the mean age of respondents in the study area is about 52.06 years while the minimum and maximum ages of the enumerated respondents are 24 and 76 years respectively. The maximum years spent in school was estimated at 18 years with a mean value of approximately 7 years corresponding to primary (elementary) school level of education in Nigeria. Also, the maximum household size is 9 persons with an estimated mean of 62 persons in every 10 households. Then, the findings revealed an average farm size under cultivation of approximately 2ha, which suggests that the respondents are smallholder farmers. Additionally, the estimated frequency of extension visits and years of farmers' farming experience are approximately once in every month and 21.28 years respectively. This suggests that the number of extension contact is very low; this can potentially affect the uptake of modern farming techniques such as SWC practices. Similarly, the findings revealed that the respondents have ample years of experience in farming which is also an added advantage for easy uptake and choice of SWC practices.

Table 1: Summary Statistics of Selected Respondents' Socio-Economic Variables

Socio-economic variables	Mean	Standard Dev.	Min	Max
Age	52.06	11.42	24	76
Years spent in School	6.73	3.78	0	18
Household size	6.22	1.86	2	9
Farm size under cultivation	1.91	1.07	1	6
Frequency of extension visit	1.39	0.87	0	3
Years of experience in farming	21.28	11.34	1	50

Source: Data Analysis, 2017

Cross-Tabulation of Socio-Economic Characteristics & Preferences for SWC Practices: The results as shown in Table 2 at a glance revealed that fairly aged people ranging between 41-50 and 51-60 years of age are involved in farming activities with the identified three preferred SWC practices alternatives in the study area. More so, the majority of the respondents fall within the educational class of having between 1-6 years and 7-12 years of formal education. In the same vein, many of these farmers involved in the identified SWC practices in the study area have their respective household size ranging from 5-8 persons. And, of these three preferred SWC practices identified, Agronomic Practices (AP) is the most preferred and used SWC practices option. This finding is consistent with Babalola and Olayemi, (2013); James and Ngala, (2015a).

Table 2: Cross-Tab Analysis of SWC Preferences and Socio-Economic Variables of the Respondents

	SAP		AP		CP	
	0	**1**	**0**	**1**	**0**	**1**
Age group						
20-30	10	3	0	13	0	13
31-40	19	4	7	16	9	14
41-50	42	15	30	27	37	20
51-60	46	22	25	43	49	19
61-70	39	9	25	23	36	12
Above 70	8	4	6	6	11	1
Total	**164**	**57**	**93**	**128**	**142**	**79**
Educational group						
0	17	11	20	8	28	0
1-6	75	22	30	67	51	46
7-12	63	22	35	50	53	32
13-18	7	2	6	3	8	1
Above 18	2	0	2	0	2	0
Total	**164**	**57**	**93**	**128**	**142**	**79**
Household size group						
1-4	37	22	23	27	37	13
5-8	117	38	63	92	94	61
9-12	10	6	7	9	11	5
Total	**164**	**57**	**93**	**128**	**142**	**79**

Source: Data Analysis, 2017

Multi-Criteria Decision Making (MCDM) - Analytic Hierarchic Process (AHP) Technique: The results as shown in Tables 3a and 3b revealed the farmers' preference and used a choice of the identified SWC practices alternatives in the study area. And, judging from the results of the MCDM (AHP technique) final step as described earlier, that is, the final weighted utility values for the choices made, it can therefore be logically inferred that the choice with the highest weighted total utility value (Agronomic Practices (AP)) is the most preferred and used SWC practices by the farmers in the study area. This thus corroborates the earlier submission made in Table 2.

Table 3a: Inter-criteria Weights

Criteria	**Soil Maintenance / Amendment Criteria (2)**	**Technical Criteria (3)**	**Economic Criteria (1)**	**Row Totals**	**Inter-criteria Weights / Relative utility**
Soil Maintenance / Amendment Criteria (2)	2/2 = 1	2/3 = 0.67	2/1 = 2	3.67	0.33
Technical Criteria (3)	3/2 = 1.5	3/3 = 1	3/1 = 3	5.5	0.5
Economic Criteria (1)	1/2 = 0.5	1/3 = 0.33	1/1 = 1	1.83	0.17
Grand Total				**11**	**1**

Source: Author's computation, 2017

Table 3b: Choice versus Criteria

Criteria Weights	**Criteria**	**Un-weighted Utility Values**			**Weighted Utility Values**		
		SAP	AP	CP	SAP	AP	CP
0.33	Soil Maintenance / Amendments Criteria	0.4	0.5	0.1	0.132	0.165	0.033
0.5	Technical Criteria	0.1	0.6	0.3	0.05	0.3	0.15
0.17	Economic Criteria	0.4	0.2	0.4	0.068	0.034	0.068
	Final Values				0.25	**0.499**	0.251

Source: Author's computation, 2017

Factors Influencing the Preference for SWC Practices Alternatives: According to Adimassu et al. (2013), the processes through which farmers develop an attitude, make decisions and order their preferences for SWC practices are sequential, which guide the use or non-usage of particular sets of alternatives. And, based on literature review and a-priori expectations, a number of explanatory variables based on farmers' socio-economic, institutional, and farm level factors were hypothesized to influence farmers' choice/preference and decision to use a particular set of SWC practices. Therefore, the logit regression model was estimated to isolate these influencing dynamics governing the rural farmers' preference for each of the identified and dominant SWC practices alternatives in the study area. In lieu of this, Table 4 presented the post-hoc/post-estimation marginal effects result of the fitted logit regression model for each of the three dominant and preferred SWC practices alternatives so as to ascertain the goodness of fit of the model and to clearly mirror the dynamics governing farmers' preferences for SWC practices alternatives. The results revealed a good fit for the SWC practices model as evident by the significance of the diagnostic statistics; that is, chi-squared and log likelihood values for each of these practices.

The findings further show that gender has an inverse and significant (p<0.01) relationship with the preference/choice and use of SAP among the smallholder farmers in the study area; this suggests that male-headed households are less likely to prefer and use SAP. In the same vein, years of formal education and access to extension services negatively and significantly (p<0.1 and p<0.01 respectively) influenced the preference and use of SAP; this implies that the more educated a farmer is, the less likely will be the decision to prefer and use SAP as a measure against land degradation and soil water issue. This is in contrast with a-priori expectations and findings of Babalola and Olayemi, (2013), because higher educational attainment is associated with a higher understanding of the importance and use of SWC practices towards achieving sustainable land management and by extension, increased crop productivity output. Also, it is less likely for farmers to prefer and use of SAP with an increase in institutional support such as access to extension services. This is because there is an observed low contact with extension agents in the study area as reported earlier. Conversely, the frequency of extension visit has a direct and significant (p<0.01) influence on the preference and use of SAP in the study area.

This is expected because there is a high likelihood of using one or more of the SWC practices especially the SAP, with an increase in farmers' contact with government institutional framework (in this case, extension system). Likewise, by extension, the farmers' perception on the impact of government institutional support is significantly positive (p<0.05), which suggests that the farmers perceive government continued support as an important entity to achieving sustainable agricultural production through appropriate SWC practices. Also, the use of CP in the study area according to the findings was influenced by the age of the respondent, gender of the respondents and access to government institutional support (for instance, extension visit). These variables are significant (p<0.05; p<0.01; p<0.05 respectively) and inversely influence the use of CP in the area under study. This suggests that there is less likelihood with respect to preference and use of CP as an SWC practice with an increase in age of the respondent; though, the result is viewed with mixed feelings. First, the aged farmer is expected to prefer and use CP (especially, minimum tillage) because minimum tillage is less laborious and less time consuming but the findings revealed otherwise.

Second, the observed less preference and use of CP (in this case, land fallow technique) could be because aged people find it difficult to move from one fallow land to another and as such opt for another SWC practices. The inverse and significant relationship of the gender of farmer and government institutional support with CP could be said to have the same explanation as in the case of SAP. In the same vein, the findings also revealed that the preference and use of AP in the study area is significantly determined by age (p<0.01), gender (p<0.05), membership of local level institutions (p<0.01) and farmers' perception on the impact of extension visit (p<0.1). Age and gender of the farmers negatively influence the preference and use of AP in the study area; as such, the same explanation could be attributed as in the case of CP. Also, membership of local level institutions and farmers' perception of the impact of extension visit do have an inverse influence on the preference and use of AP. This suggests that being a member of any social organization does not have any positive influence on the preference and use of SWC practices especially AP.

Furthermore, it means that farmers in these local level institutions mostly focus on credit facilities and social activities instead of sharing useful information also that can be beneficial and assist members in mitigating

the prevalent land/soil and water challenges in agricultural production. In the case of farmers' perception of the impact of extension visit, the same explanation could be given for this also as in the case of SAP. These findings are consistent with Miller, Chin and Zook, (2012) who submitted that education is required to answer why questions, given that, farmers who are knowledgeable about the environmental, agronomic, and economic benefits of SWC practices are more likely to adopt them. Also, in line with Druschke and Secchi, (2014), gender exercises a nuanced, critical, and understudied influence on farmers' choice and use of SWC practices; a plausible explanation for this is that, female farmers usually have significantly more positive attitudes toward conservation practices and collaboration than the male counterparts.

Meanwhile, younger farmers according to Gabrielyan, Chintawar and Westra, (2010) are also likely to adopt alternative tillage and SWC practices at higher rates than the older ones. Perhaps because they have longer farming horizons and can benefit more from long-term conservation benefits, or because they are more environmentally oriented, and maybe because older farmers are more set in their obsolete ways and embedded in old and longstanding community traditions of the right way to farm. All in all, it could be inferred from the results of the fitted logit regression models that age, gender, years of formal education, membership of local level institutions (that is, social organizations and community based organizations), access to extension services and frequency of extension visit as well as farmers' perception on the impact of extension visit are significant influencing dynamics governing the rural farmers' preference and use of SWC practices alternatives in the study area.

Table 4: Factors influencing the preference for SWC practices alternatives

CA adoption decision	SAP	CP	AP
Age	-0.0005 (-0.19)	-0.0069 (-2.16)**	-0.0139 (-4.17)*
Gender	-0.2350 (-2.88)*	-0.2794 (-3.96)*	-0.2122 (-2.39)**
Years of formal education	-0.0146(-1.82)***	-0.0047 (-0.51)	0.0006 (0.06)
Household size	-0.0014(-0.08)	-0.0013 (-0.07)	0.0213 (1.10)
Farm size under cultivation	-0.0016(-0.05)	-0.0039 (-0.12)	0.0439 (1.33)
Membership of local level institutions	0.0613(0.81)	-0.0577 (-0.61)	-0.2787 (-2.66)*
Access to extension services	-0.5116(-3.75)*	-0.7891 (-2.11)**	0.0014 (0.01)
Frequency of extension visit	0.1279(2.60)*	0.0492 (0.84)	-0.0276 (-0.46)
Perceived impact of extension visit	0.1826(2.22)**	0.1012 (1.24)	-0.1404 (-1.84) ***
Mode of land acquisition	0.0199(0.31)	-0.0034 (-0.04)	0.0203 (0.27)

Figures in parenthesis are z-values of the coefficients; Number of observation = 221
*, ** and *** - represent p<*0.01*, p<*0.05* and p<*0.1* probability levels respectively.
Source: Data Analysis, 2017

Estimating Differences of Proportions: To further ascertain the appropriateness and reliability of the fitted model, McNemar's diagnostic test was applied to estimate differences of proportions with respect to the binary response variable(s). McNemar's test is analogous to the paired t-test, except that it is applied only to dichotomous data especially when it has to do with binary response variable(s). In comparing the means in two or more groups of paired observations, the standard t-tests are not always appropriate because the variance of the difference in means is derived under the assumptions that the two groups are independent and so it does not take into account the covariance-correlation term which can either increase or decrease that term. However, the resultant effect in this scenario is that both the hypothesis tests and confidence intervals that are based on this assumption will not provide the accurate inference. To correct these anomalies, McNemar's diagnostic test for paired binomial data is applied. The benefit of conducting the diagnostic tests is that, it is always necessary to separate the true positive cases and the true negative cases as determined by reference standard information and analyze them separately. Therefore, McNemar's test is an approximate test to provide an accurate and valid picture of the fitted logit regression model.

McNemar's Diagnostic Tests: The findings from the tests conducted were shown in Tables 5a, 5b and 5c respectively. The findings from Table 5a (SAP and CP) revealed a relative difference of 0.5546875 which suggests that for every 100 controls (i.e. those not using any SWC practices), 55.4% might be expected to use any of these SWC practices if they chose to be exposed to and easily access modern SWC training. Also, it appears the sensitivity of the tests results is different by about 32% as observed from the result. The same

explanation holds for the relative differences of 0.278481 in Table 5b (SAP and AP) while its sensitivity of the tests result is different by approximately 10%. On the other hand, as in the case of Table 5c (CP and AP), the findings revealed a relative difference of -0.6202532and it appears that the tests differ slightly with respect to specificity, although the difference is inverse and likely uninteresting. The idea of the odds ratio for matched pairs is the odds of using any SWC practices given that the farmer is exposed to modern SWC training relative to the odds of using SWC practices when not exposed to modern SWC training. The odds ratio of 6.07 as shown in Table 5a suggests that a farmer is nearly 6 times more likely to use any SWC practices if such is exposed to modern SWC training than if otherwise. The same explanations hold for Tables 5b and 5c with an odds ratio of 1.55 and 0.19 respectively. In other words, the odds ratio tells us the strength of the relationship or association. The odds ratio in Table 5c is not unexpected because of the inverse nature of its relative difference value earlier reported. In the same vein, the Exact McNemar significance probability values (p-values) as in the case of Tables 5a, 5b and 5c were estimated at *p<0.01*, *p<0.05* and *p<0.1* respectively. Suffix to say that, the size of p-values tells us how certain we are that the proportion of cases using SWC practices are different from the proportion of controls.

Table 5a: **Testing for SAP and CP**

	Controls		
Cases	**Exposed**	**Unexposed**	**Total**
Exposed	79	85	164
Unexposed	14	43	57
Total	93	128	221

McNemar's chi^2 (1) = 50.92 Prob > chi^2 = 0.0000
Exact McNemar significance probability = 0.0000
Proportion with factor

Cases	0.7420814		
Controls	0.4208145	[95% Conf. Interval]	
difference	0.321267	0.2393307	0.4032033
ratio	1.763441	1.505853	2.065091
rel. diff.	0.5546875	0.4530186	0.6563564
odds ratio	6.071429	3.427256	11.57484 (exact)

Table 5b: Testing for SAP and AP

	Controls		
Cases	**Exposed**	**Unexposed**	**Total**
Exposed	102	62	164
Unexposed	40	17	57
Total	142	79	221

McNemar's chi^2(1) = 4.75 Prob > chi^2 = 0.0294
Exact McNemar significance probability = 0.0371
Proportion with factor

Cases	0.7420814		
Controls	0.6425339	[95% Conf. Interval]	
difference	0.0995475	0.0064208	0.1926742
ratio	1.15493	1.01443	1.314889
rel. diff.	0.278481	0.0656451	0.491317
odds ratio	1.55	1.025109	2.367606 (exact)

Table 5c: Testing for CP and AP

Cases	Controls Exposed	Unexposed		Total
Exposed	81	12		93
Unexposed	61	67		128
Total		142	79	221

McNemar's chi^2 (1) = 32.89 Prob > chi^2 = 0.0000
Exact McNemar significance probability = 0.0000
Proportion with factor

Cases	0.4208145		
Controls	0.6425339	[95% Conf. Interval]	
difference	-0.2217195	-0.2961523	-0.1472866
ratio	0.6549296	0.56612	0.757671
rel. diff.	-0.6202532	-0.890073	-0.3504333
odds ratio	0.1967213	0.096407	0.3690071 (exact)

4. Conclusion and Recommendations

The study concludes that Agronomic Practices (AP) is the most preferred and used SWC practice options in the study area as evident from the cross-tabulation and MCDM results. Also, the findings revealed that age, gender, years of formal education, membership of local level institutions (that is, social organizations and community based organizations), access to government support (extension delivery services) and number of contact with extension agents as well as farmers' perception on the impact of extension visit are significant influencing dynamics governing the smallholder farmers' preference and use of SWC practices alternatives in the study area. Consequent on the findings of this study, the following recommendations are of importance: There is a need for active participation in farming operation within the ambient of production capacity of individuals as ageing sets in; this is evident from the findings of this study. Similarly, adult education should be promoted with the existing Universal Basic Education (UBE) system to ensure a quality education that can aid uptake of modern farming techniques among aged people since it was evident that the use of SWC declines with age increase. More so, active sensitization is necessary on the need for people to embrace farming regardless of individual's educational attainment; this is paramount because human capital (proxied by years of formal education) inversely and significantly affects the preference and use of SWC practices.
In fact, active farming participation especially speaks directly to youths (female gender inclusive) who migrate to look for white collar jobs in the cities after a certain level of educational attainment. Thus, the need for their active involvement in farming activities as well as the readiness to use new innovations that can boost food production cannot be underestimated. Hence, agricultural policy should not be gender bias and as such, female gender roles should go beyond being relegated to households' chores. Additionally, extension service delivery is an important gateway to disseminate agricultural innovations to farmers especially when it has to do with pathways addressing the effects of soil/land degradation and water conservation; therefore, efforts need to be geared up on the frequency of visits by extension agents, services rendered, farmers' training as well and capacity building programme for smallholder farmers on the need for modern soil/land and water conservation practices in a bid to ensure food and nutrition security in line with the sustainable development goals. Also, there is a need to encourage investment in local level institutions among smallholder farmers because membership of local level institution was found to have inverse effects on the preference and likelihood use of SWC practices by farmers. The local level institution is regarded as a strong tie which facilitates mutual interactions among heterogeneous network members; this could further be achieved through effective intra and interlocal institutional framework where relevant and useful information can be acquired as well as diffusion of beneficial ideas could be ensured especially in the aspects of improved farming techniques.

References

Adimassu, Z., Gorfu, B., Nigussie, D., Mowo, J. & Hilemichael, K. (2013). Farmers' Preference for Soil and Water Conservation Practices in Central Highlands of Ethiopia. *African Crop Science Journal*, 21(3), 781-790.

Amemiya, A. (1981). Qualitative response models: A survey. *Journal of Economic Literature*, 19, 1483-1533.

Ananda, J. & Herath, G. (2009). A critical review of multi-criteria decision-making methods with special reference to forest management and planning, *Ecological Economics*, 68, 2535-2548.

Anande-Kur, S. (1986). Control and management of erosion. The Agulu-Nanka gully erosion scheme (case study). Paper presented at the National Workshop on soil erosion held at the Federal University of Technology, Owerri Imo State, Nigeria.

Babalola, D. A. & Olayemi, J. K. (2013). Determinants of Farmers' Preference for Sustainable Land Management Practices for Maize and Cassava Production in Ogun State, Nigeria. Being an invited paper presented at the 4th International Conference of the African Association of Agricultural Economists (AAAE), 22-25.

Bravo-Ureta, B., Solis, D., Cockhi, H. & Omroga, R. (2006). The impact of soil conservation and output diversification on farm income in Central American hillsides farming. *Agricultural Economics*, 35, 267-276.

Chaudhuri, A. (2014). Solving Real Life Multi-Criteria Decision Making Problems using Criteria Analysis Technique.

Dimelu, M. U., Ogbonna, S. E. & Enwelu, I. A. (2013). Soil conservation practices among Arable Crop Farmers in Enugu-North Agricultural Zone, Nigeria: Implications for Climate Change. *Journal of Agricultural Extension*, 17(1), 1-13.

Druschke, C. G. & Secchi, S. (2014). The Impact of Gender on Agricultural Conservation Knowledge and Attitudes in an Iowa Watershed. *Journal of Soil and Water Conservation*, 69(2), 95–106.

Dumanski, J., Peiretti, J., Benitis, R., McGary, D. & Pieri, C. (2006). The Paradigm of Conservation Tillage. Proceedings of World Association of Soil and Water Conservation, 58-64.

Ezeaku, P. I. (2012). Soil conservation and management options for adaptation to climate change in the 21st century in: Enete, A.I. and Uguru, M.I. (eds) Critical Issues in Agricultural Adaptation to Climate Change in Nigeria, Enugu, Chengo Limited, 84-113.

Gabrielyan, G., Chintawar, S. & Westra, J. (2010). Adoption of cover crops and its effect on nitrogen use by farmers. Paper presented at the annual meeting for the Southern Agricultural Economics Association, Orlando, FL, 6-9.

Gujarati, D. N. (1988). *Basic Econometrics*. 2nd edition. New York: McGraw-Hill, 98-102.

Hajkowicz, S. (2008). Rethinking the Economists evaluation toolkit in light of sustainability policy. *Sustainability: Science, practice and policy*, 4(1), 17-24.

Hajkowicz, S. & Collins, K. (2007). A Review of Multiple Criteria Analysis for Water Resource Planning and Management, 21, 1553-1566.

Herva, M. & Roca, E. (2013). Review of combined approaches and multi-criteria analysis for corporate environmental evaluation. *Journal of Cleaner Production*, 39, 355-371.

Howard, A. (1991). A critical look at multiple criteria decision-making techniques with reference to forestry applications. *Canadian Journal of Forest Research*, 21(4), 1649-1659.

Iheke, O. R. & Onyenorah, C. O. (2012). Awareness, preferences and adoption of soil conservation practices among farmers in Ohafia Agricultural Zone of Abia State, Nigeria. *Journal of Sustainable Agriculture and the Environment*, 13(1), 1-8.

James, P. H. & Ngala, A. L. (2015a). Farmers' Awareness, Preference and Adoption of Soil Conservation Practices in Zing Local Government Area of Taraba State, Nigeria. *Journal of Biology, Agriculture and Healthcare*, 5(11), 1-5.

James, P. H. & Ngala, A. L. (2015b). Survey on Soil Conservation Practices among Food Crop Farmers in Zing Local Government Area of Taraba State, Nigeria. *International Journal of Plant & Soil Science* (SCIENCEDOMAIN International), 8(3), 1-7.

Jansen, H. G. P., Damon, A., Rodriguez, A., Pender, J. & Schipper, R. (2006). Determinants of income-earning strategies and sustainable land use practices in hillside communities in Honduras. *Agricultural system,* 88(1), 92-110.

Mbagwu, J. S. C. (2003). Aggregate stability and soil degradation in the tropics. Lecture delivered at the College of Soil Physics, Trieste, Italy. 2003.

Mendoza, G. A. & Martins, H. (2006). Multi-criteria decision analysis in natural resource management: A critical review of methods and new modelling paradigms. *Forest Ecology and Management*, 230, 1–22.

Miller, L., Chin, J. & Zook, K. (2012). Policy opportunities to increase cover crop adoption on North Carolina farms. Masters project, Duke University.

Olatunji, O. J. (2003). The effect of socio-characteristic of farmers on land degradation in the derived Guinea-Savannah Ecological Zone of Nigeria. *International Journal of Environmental Issues*, 1(1), 237-241.

Olawuyi, S. O. & Balogun, T. A. (2017). The Endogeneity Effects of Conservation Agriculture Adoption on Smallholder Farmers' Food Security Status in Osun State, Nigeria. *Journal of Economics and Behavioral Studies*, 9(5), 144-156.

Saaty, T. (1987). The Analytic Hierarchy Process: What it is and how it is used. *Mathematical Modelling*, 9(3-5), 161-176.

Salako, F. K. & Tian, G. (2003). Soil water depletion under various leguminous cover crops in the derived savannah of West Africa. *Agriculture, Ecosystems and Environment*, 100(2&3), 173–180.

Smith, B. & Smithers, J. (2006). Adoption of Soil Conservation Practices: An empirical analysis in Ontario, *Canada. Land Degradation and Rehabilitation,* 3, 1-14.

Toda, T., Amano, K., Abe, H. & Nakagawa, D. (1981). Stepwise Evaluation Method Based on Multi-Criteria Analysis. IFAC Control Science and Technology, (8th Triennial World Congress) Tokyo, Japan, 1507-1512.

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The Rise of Chinese Investments in Africa: For Whose Benefit?

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Abstract: Ever since China's rise as a global superpower, there have been numerous debates about its role in Africa both from an Afrocentric and Eurocentric perspective. This is while some view its presence in Africa as that of a donor because of its growing investments, others are not entirely convinced and see China's rising footprints in Africa as another colonialist state in need of looting Africa its resources. By utilizing a qualitative methodology, this paper ponders Chinese investments in Africa with the view of assessing the drivers underpinning China-Africa relations and how this has been beneficial to both parties concerned. In this vein, the study shows that China-Africa engagements are not something new, their relations dates back for decades though became more prominent from the 1950s after the Bandung Conference. Since then, China has risen to be a prominent player with regards to investments in Africa. It has further established various institutes aimed at strengthening its grip as a noticeable state in Africa's development and political landscapes. The paper concludes by outlining that China has in some way benefited Africa through its investments over the past few decades and these relations have been beneficial to both parties. However, it argues that for more prosperous relations moving forward, African leaders should utilize institutes such as the Forum on China-Africa Cooperation (FOCAC) to articulate clear policies for their engagement(s) with China and to protect their small and fragile economies from cheap Chinese imports.

Keywords: *China, Africa, Investment, FDI, Infrastructure*

1. Introduction

China's rapid rise as an Asian and Global superpower over the last few decades has attracted much attention from both scholars and policy analysts alike. It has gained so much prominence as a new global investor that is seen as a new challenger to the United States of America (USA), particularly as a result of its rapid investments (trade, aid, infrastructural development and information and communication technology) drive in Africa (Stahl, 2016). According to Large (2008) over the years and particularly from the 1950s, China has gained noticeable footsteps in Africa through its foreign policy, such that it has dramatically reduced the monopolistic of Western countries that have enjoyed massive footprints in Africa since the era of colonialism. However, he further contends that much of the attention paid to the nexus between China and Africa took place in a period where most African states were or about to gain their independence from their respective European colonial masters. Nevertheless, as often documented about the interests of European countries (pre and post-colonialism) in Africa in terms of them looting the continent of its resources, questions have emerged concerning the motive behind Beijing's investments in Africa. As Campbell (2008) asserts, this is because ever since the African continent arose from its colonial doldrums, it is no hidden fact that it has attracted both friends and looters. So what are the historical ties between China and Africa relations? While this will be unpacked in the subsequent chapter, the realignment of the Organization of African Unity (now African Union) also gave impetus to China making significant inroads within the continent. As the Organization of Africa Unity sort to develop the continent through economic and political integration, China took this opportunity to re-align its foreign policy and establish various agreements with the African community starting with re-enhancing infrastructural development in various African countries (Campbell, 2008).

Nevertheless, Schoeman (2008); Carrillo, Hood & Kadetz (2017) contend that China's relations with Africa have over the years come with much scrutiny in the sense that like European countries, it is also after African resources as to meet the demands of its ever-increasing industrial and manufacturing sector(s). It is in this vein that there has been much scholarly debate about its true African intentions. So is China the new African colonizer? It is in this regard that the aim of this paper is to unearth the link between China and Africa since the inception of their relations, moreover, to delve on Beijing's push factor(s) for its relations with Africa and to further demonstrate who has been the beneficiary of this partnership China, Africa or both parties. Probing

this ever-increasing Chinese investment in Africa is acute in drawing a nuanced, valid and vigorous standpoint on Beijing's role within Africa.

China-Africa Relations: From a Historical Perspective: According to Alden and Wu (2017) China's engagement with Africa is not a new phenomenon as their relations dates back to centuries ago to as far as (1368-1644) often known as the Ming Dynasty. During this time, Chinese explorers toured Eastern Africa with the command of Admiral Zheng He who was an explorer, mariner and diplomat. However, the founding of the People's Republic of China in 1949 propelled for more robust and progressive engagements between China and Africa. From the second quarter of the 1950s, China's relations with Africa started to take shape and was further spearheaded by the fact that some African states were gaining or about to gain their freedom from their respective European colonizers (Alden & Alves, 2008). As Plummer (2003) affirms, these events presented Beijing with the platform to fully engage with African countries with regards to diverse investment opportunities. While progress was being attained here, a crucial moment in building these relations was accomplished during the Bandung Conference in 1955. This conference hosted Asian, African and Middle East countries and was viewed as a perfect platform to further enhance Asian-African cooperation (Stahl, 2016).

Here, former Chinese foreign minister Zhou Enlai[2] had the privilege to fully engage with African heads of states and stressed that Africa and Asia had to work as a collective through economic, cultural and mutual benefits in order for them to improve their level of development. In this regard, post the Bandung conference, relations and diplomatic visits became more robust and numerous visits were taken by Chinese delegates to various African countries. For instance, Minister Enlai spent almost two months (seven weeks) in ten African countries[3] to intensify Africa-China relations through diplomatic driven missions from December 1963 to February 1964 (Shengnan, 2014). As a result of these diplomatic visits, in the same year (1964) China had already secured bilateral agreements with six African states. From 20 December 1982 to 17 January 1983, eleven African countries were also paid a visit by former Chinese premier Zhao Ziyang[4]to further strengthen South-South cooperation (Alden & Alves, 2008).Basically, the Bandung conference presented China the prospect to make substantial inroads to African territories (Alden & Alves, 2008).Over the years institutes such as the China–Africa joint research exchange plan, China – Africa people to people friendship action and China-Africa youth festival have jointly been established by Beijing and African countries as a tool of further stimulating their relations(Eisenman & Heginbotham, 2018; Shinn & Eisenman, 2012). According to Taylor (2011) in 2000, the Chinese government established the Forum on China-Africa Cooperation(FOCAC)as a mechanism to further stimulate and strengthen China-Africa partnerships (economically, politically and infrastructural). FOCAC aims to forge cooperation between African and China through South-South cooperation and to further promote China's long-term plans for African development. This forum usually takes place every three years with the first being held in Beijing in 2000, the last African country to host the FOCAC was South Africa in 2015 and Beijing will once again be the host for the forthcoming FOCAC in 2018 (Alden & Wu, 2017).

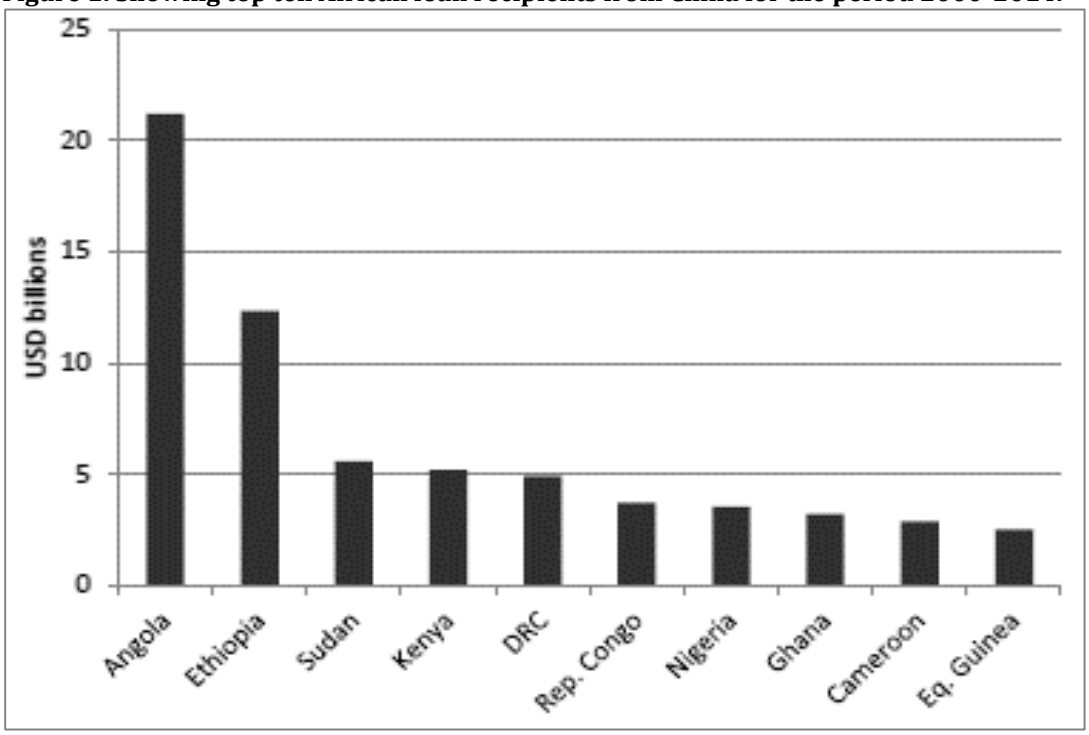
2. Chinese Investments in Africa: Who is the Beneficiary?

According to Hogwe & Banda (2017) China is currently viewed as one of the fastest emerging global power in the world and has often been compared to South Africa, India, Russia and Brazil. However, unlike these countries it is compared with, China has undertaken immense investments in Africa over the past three decades (Song & Golley, 2011). These have been spearheaded by China's Official Development Assistance (ODA)[5] and its foreign policy to be a new donor to Africa's development as the continent is in dire need of Foreign Direct Investments (FDI) for its economic growth frameworks. Beijing has thus regarded Africa as a continent where it can extract its resources and the platform for Chinese firms to build their plant(s) and create employment opportunities (Thrall, 2015). However, China has often downplayed itself as a state in need of African resources for its economy rather portraying itself as another developing country intending to

[2]Was the first Premier of the People's Republic of China who served from 1949 to 1976.
[3] These included the United Arab Republic (currently known as Egypt), Algeria, Morocco, Tunisia, Ghana, Mali, Guinea, Sudan, Ethiopia and Somalia.
[4] Served as the third Premier of the People's Republic of China from 1980 to 1987.
[5] Pertains to the transfer of finance and resources, these are made up of grants, technical assistance and loans. However, these exclude assistance pertaining to military loans or grants (Lola et al., 2017).

be a recognizable driver to Africa's[6] economic growth prospects. As often discussed in academic literature pertaining to China-Africa cooperation, a question that predominantly pops up has always been who benefits from these relations? As Besada (2013) points out, what is been done by Beijing in terms of African investments is what any global player would do as the case with various European countries and the USA. In this sense, Chinese investments in Africa include but not limited to the financing of large infrastructural projects, ever-increasing loans[7] (see figure 1 and 2) debt cancellation, assist in nurturing human resources and granting African states the chance to access Chinese markets and as a result often filling the void in substantial components such as infrastructure and trade (Mlambo, Kushamba & Simawu, 2016).

Figure 1: Showing top ten African loan recipients from China for the period 2000-2014.

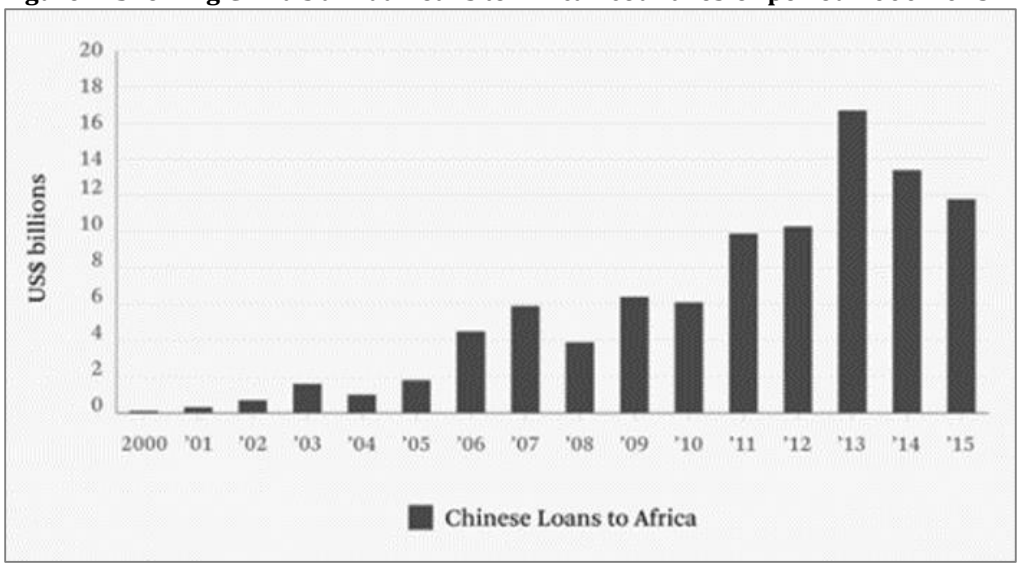


Source: Brautigam & Hwang (2016).

[6] While Beijing's trade in witnessed throughout the African continent, it is more significant in the Least Developed Countries (LDC's). From an African perspective, LDC's include Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, the Democratic Republic of Congo (DRC), Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Tanzania, Togo, Uganda and Zambia (Nowak, 2016).

[7] These loans are often in sectors that include transportation (rail, road and air), communication, dams, mining and energy (Brautigam & Hwang, 2016).

Figure 2: Showing China's annual loans to African countriesfor period 2000-2015.



Source: China Africa Research Initiative (2017)

These infrastructural components include but not limited to the Addis Ababa-Djibouti railway, Kenya's Mombasa-Nairobi railway, the Kaleta Hydroelectric in Guinea and the Abuja-Kaduna rail line in Nigeria which have all been financed through Chinese aid. Hence, China was in 2015 (see table 1) the largest foreign donor in Africa with respect to trade.

Table 1: Showing top five foreign donors (trade) to Africa in 2015

Country	Amount(s) in US$ (billion)
China	188
India	59
France	57
USA	53
Germany	46

Source: Yuan Sun, Jayaram & Kassiri (2017).

As a result of these investments from Beijing, scholars such as Tull (2006) contend that unlike western funding mechanisms which are more focused on reducing poverty levels in the continent, China is heavily focused on infrastructural and trade, a move that is often warmly received by African leaders. Apart from these investments, Beijing does not impose any political obligations in its dealing with African states and regularly invest in sectors where western donors are reluctant to (Ayodele & Sotola, 2014).Over a decade ago in May 2005, former Zimbabwean president Robert Mugabe articulated that "We have turned east where the sun rises and given our backs to the west, where the sun sets" these words were as a result of the renowned appreciation of the FDI from China not only to Zimbabwe but African in general (Mugabe, 2005). So has the increased presence of China been a threat to Africa? For China and Africa, they see their relations being that of dual benefits where both are winners. By observing current China- Africa relations, it seems both parties are benefiting from their collaboration. China is able to attract needed resources while Africa is able to attract much needed FDI from Beijing. As a result of this, Africa seems to be gaining a lot from China and vice-versa coupled with the fact that Africa has openly continued to accept Chinese investments for its economic growth endeavours post the Bandung conference. This has gradually assisted Africa in critical infrastructural components.

Challenges Facing China's Engagement with Africa: As mentioned elsewhere in this paper, Beijing's dramatic rise in the global arena has been well documented, nevertheless, this dramatic rise has over the years come with its own challenges. As a result, things have not been as smooth as they seem as Beijing's

investments in Africa have often come with severe criticism from the West and also in Africa. Drawing from the above, over the years China has failed to win over the trust of African civil society, labour unions and in some instances some African political parties. Therefore, it has vastly struggled to conduct itself in a manner to please these critical societal components. According to Zeleza (2014) Beijing's investments in Africa have often been challenged as a result of biased competitive and investments procedures, safety concerns for African workers, low wages, unable to duly comply with local labour laws and practices, incapable to attract and nature African workers and at times employing dictatorship rule in management positions[8].Furthermore, small African businesses are severely affected by Chinese imports as a result of them being cheap and easily available. It has also been said that China does not adhere to enhance good governance in Africa due to the fact that it does not release accurate data on investments and aid undertaken in the continent (Jahanzeb & Muneer, 2012; Sauls & Heaton, 2016). This often leads to China being labelled an exploit nation with the objective of contributing to the continents de-industrialization (Brazinsky, 2017).

To some extent, this may seem relevant as Africa is a diverse continent comprising of Middle-Income Countries (MDCs) like South Africa, Nigeria, Ghana, Namibia and Botswana and LDC's. The latter countries may be the most affected by cheap Chinese imports as a result of their level of development and not possessing sufficient resources and in this regard may view China as a competition for their development and economic growth initiatives. According to Mlambo, Kushamba & Simawu (2016) while facing criticism from Africa, the west has also been critical of Beijing's investments in Africa. To Western nations, Beijing is predominantly after Africa resources. China has often responded to this criticism by outlining that its development assistance to Africa aims to enhance the transfer of technology, create employment, enhance bilateral agreements and create robust multilateral relationships (Lola et al., 2017). Nevertheless, from a western viewpoint, China is a threat to Africa's development frameworks. These sentiments seem to be true as just recently (March 2018), the USA secretary of state Rex Tillerson toured five Africa countries. In Addis Ababa (Ethiopia) at the African Union (AU) headquarters (built by Chinese investments in 2011) Tillerson said "Chinese investments in Africa do not bring significant job creation locally "and further criticised how China structures its loans to African countries, this further shows what other nations think of Beijing's presence in Africa (Huanxin, 2018).As a result, these challenges may bring with it severe complications to current and future China-Africa relations and undoubtedly need to be addressed as so not to deter the present and future role of China's investments in Africa and its overall relations with the African continent.

3. Methodology

This paper embraced a mainly qualitative research approach by scrutinizing secondary sources to retrieve the required information on China-Africa relations. Researchers undertaking qualitative studies intend to gather a robust viewpoint pertaining to human behaviour and the rationale behind it (Creswell: 2003). As a result, the data drawn was exploited from books, chapters in books, journals, transcripts, news reports, newspaper articles together with reliable online sources. The dependency on secondary sources allowed for a robust and broader explanation of the topic under investigation. All retrieved data was subjected to the essential and extensive use of content analysis. Cole (1988) opines that content analysis is a technique used to analyse written text ranging from books, book chapters, newspaper articles, discussion notes, speeches, interviews, essays and documents. Basically, this analysis grants the researcher to validate theoretic text to better enrich the understanding of the gathered data. It pertains to focusing on every element of written text often supporting in shedding light on the topic under study.

China-Africa Relations: The Way Forward: According to Zhao (2015) China is currently regarded as one of Africa's largest partner in terms of trade and investments. However, while both seem to be reaping the rewards as a result of these relations, what does the future hold in terms of this ever blooming partnership. While China and Africa should continue with their relations as it has been prosperous particularly for Africa as it is in need of development and economic growth investments. Nevertheless, this foreign aid from China must intend on promoting African economic growth and be further aligned to the AU's agenda for African development. African leaders should also implement monitoring mechanisms in their engagement with China in the sense that Beijing must not loot Africa of resources critical for the continents own growth prospects

[8] These management positions are normally held by Chinese nationals.

both in the short and long term. China-Africa engagements should in future prioritize the protection of local businesses from cheap Chinese imports that have severe effects on the growth of small and emerging businesses in specific African states. Therefore, African leaders should utilize their standpoint with China to further articulate clear mandates for their relations with Beijing notably their gains, challenges and what they hope to further achieve from their engagements with Beijing moving forward. Apart from this, there is a pivotal need for regional organizations such as the AU to play a crucial role as the middleman and watchdog in China-Africa cooperation presently and in future. With that said, these relations have seemed to be a good blessing in disguise for Africa thus far. However, this will solely depend on further mutual benefits for both parties moving forward.

4. Conclusion and Recommendations

China's rise as a global power has been well documented and has over the last few decades seem to be a blessing in disguise for most African nations, a move warmly welcomed by a continent that is the least developed from a global perspective. This paper has argued that China-Africa relations are not something new. However, it took further shape post the Bandung conference and further grew when most African countries gained or were about to gain their freedom from respective European colonizers. Since then, China has continued to make substantial inroads in Africa through its investments. This paper shows that both parties (China and Africa) are benefiting from this engagement, Africa through investments and China through gaining much-needed resources. Nevertheless, Beijing's African investments have also faced harsh criticism, especially from the West, often as a result of the manner in which it undertakes its business dealings in Africa. While Chinese's investments are greatly needed in Africa, the paper recommends that this should also promote African development in the short and long term. In essence, African heads of states and continental bodies should monitor their engagements with Beijing. This will also lead to the protection of minor African businesses from cheap Chinese imports that severely have a huge impact on their businesses. Hence, the FOCAC forum gatherings are good avenues to further articulate clear policies and objectives for China-Africa relations for both the present and future.

References

Alden, C. & Alves, A. C. (2008). History and Identity in the Construction of China's Africa Policy. *Review of African Political Economy*, 35(115), 45-58.

Alden, C. & Wu, Y. S. (2017). China Africa–Fact Sheet. http://www.saiia.org.za/special-publications-series/694-2015-china-africa-factsheet/file Accessed 1 March 2018.

Ayodele, T. & Sotola, O. (2014). China in Africa: An Evaluation of Chinese Investments. http://www.ippanigeria.org/articles/China%20-Africa%20relation_Workingpaper_final.pdfAccessed 10 March 2018.

Besada, H. (2013). Assessing China's Relations with Africa. *Africa Development,* 38(1-2), 81-105.

Brautigam, D. & Hwang, J. (2016). Eastern Promises: New Data on Chinese Loans in Africa, 2000 to 2014. https://static1.squarespace.com/static/5652847de4b033f56d2bdc29/t/58ac91ede6f2e1f64a20d11a/1487704559189/eastern+promises+v4.pdfAccessed 26 April 2018.

Brazinsky, G. A. (2017). *Winning the Third World: Sino-American Rivalry during the Cold War*. Chapel Hill. The University of North Carolina Press.

Campbell, H. (2008). China in Africa: Challenging US Global Hegemony. *Third World Quarterly*, 29(1), 89-108.

Carrillo, B., Hood, J. & Kadetz, P. (2017). *Handbook of China Welfare*. Cheltenham, Edwards Elgar Publishing.

China Africa Research Initiative. (2017). Data: Chinese loans to Africa. http://www.sais-cari.org/data-chinese-loans-and-aid-to-africa Accessed 25 April 2018.

Cole, F. L. (1988). Content Analysis Process and Application. *Clinical Nurse Specialist*, 2(1), 53-57.

Creswell, W. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approach*. California, Sage Publications.

Eisenman, J. & Heginbotham, E. (2018). *China Steps Out: Beijing's Major Power Engagement with the Developing World*. New York, Routledge.

Hogwe, F.& Banda, H. (2017). The nature of China's role in development of Africa: The case of Zimbabwe. *Problems and Perspectives in Management*, 15(1-1), 237-247.

Huanxin, Z. (2018). Tillerson talk on China role in Africa criticized.http://www.chinadaily.com.cn/a/201803/09/WS5aa2aa6ea3106e7dcc140bd1.html Accessed 13 March 2018.

Jahanzeb, A. & Muneer, S. (2012). Implication of behavioral finance in investment decision-making process. *Information Management and Business Review*, 4(10), 532

Large, D. (2008). Beyond 'Dragon in the Bush': The Study of China – Africa Relations. *Africa Affairs*, 107(426), 45-61.

Lola, G. K., Rasiah, R., Teng, K. K., Muhammad, M. & Agboola, Y. H. (2017). China's Aid and Oil for Infrastructure in Nigeria: Resource Driven or Development Motive? *Contemporary Chinese Political Economy and Strategic Relations: An International Journal*, 3(3), 1197-1235.

Mlambo, C. T., Kushamba, A. & Simawu, M. B. (2016). China-Africa Relations: What Lies Beneath? *The Chinese Economy*, 49(2), 257-276.

Mugabe, R. G. (2005) in Bauer, J. (2013). The Flight of the Phoenix: Investing in Zimbabwe's Rise from the Ashes during the Global Debt Crisis. Berlin, Epuli GmbH.

Nowak, W. (2016). China-Africa and India-Africa Trade in the Years 2000-2014. *Procedia Economics and Finance*, 39, 140-146.

Plummer, B. G. (2003). Window on Freedom: Race, Civil Right and Foreign Affairs, 1945 – 1988. Chapel Hill, The University of North Carolina Press.

Sauls, P. R. & Heaton, N. D. (2016). Consequences of Chinese Aid in Sub-Saharan Africa. Master's Thesis. Naval Postgraduate School, The United States of America.

Schoeman, M. (2008). China in Africa: Whose Challenge and Whose Opportunity. *Africa Spectrum*, 43(3), 403-413.

Shengnan, Z. (2014). Zhou's visit to Africa had a lasting effect. http://www.chinadaily.com.cn/world/2014livisitafrica/2014-05/05/content_17483420.htm Accessed 29 May 2018.

Shinn, D. H. & Eisenman, J. (2012). China and Africa: A Century of Engagement. Pennsylvania, University of Pennsylvania Press.

Song, L. & Golley, J. (2011). Rising China: Global Challenges and Opportunities. Canberra, The Australian National University Press.

Stahl, A. K. (2016). China's Relations with Sub-Saharan Africa. http://www.iai.it/sites/default/files/iaiwp1622.pdf Accessed 27 February 2018.

Taylor, I. (2011). *The Forum on China-Africa Cooperation*. Abington, Routledge.

Thrall, L. (2015). *China's Expanding Africa Relations: Implications for US National Security*. Santa Monica, Rand Corporation.

Tull, D. M. (2006). China's Engagement in Africa: Scope, Significance and Consequences. *The Journal of Modern African Studies*, 44(3), 459-479.

Yuan Sun, I., Jayaram, K. & Kassiri, O. (2017). Dance of the lions and dragons" How are Africa and China engaging, and how will the partnership evolve? https://www.mckinsey.com/global-themes/middle-east-and-africa/the-closest-look-yet-at-chinese-economic-engagement-in-africaAccessed 27 April 2018.

Zeleza, T. P. (2014). The Africa-China Relationship: Challenges and Opportunities. *Canadian Journal of African Studies*, 48(1), 145-169.

Zhao, S. (2015). *China in Africa: Strategic Motives and Economic Interests*. Routledge, Abington.

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Inflation Targeting Monetary Policy and Unemployment in South Africa

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Abstract: We analyze the impact of inflation, growth and exchange rate on unemployment in South Africa using annual data spanning 1980- 2017. Using the ARDL methodology we find that there is a negative long-run relationship between inflation and unemployment in South Africa and inflation is significant in explaining unemployment. Other variables of interest, economic growth and exchange rate are also significant in explaining unemployment. We use the findings of our study to propose that the South African Reserve Bank(SARB) should consider revising its objectives so that they can consider getting involved in targeting unemployment so that they help nurse the economy from the wounds of high inequality and poverty.

Keywords: *Monetary policy, Inflation targeting, unemployment,*

1. Introduction

South Africa has been characterized by high levels of unemployment, poverty and inequality 23 years into its democracy. A lot of policies have been put in place by the government but these indicators have not responded as expected. Economic policies that are put in place by the government impact on unemployment and other mentioned indicators mainly through fiscal and monetary policy. This paper shall explicitly look at the impact of South Africa's monetary policy stance on unemployment. South Africa adopted a new monetary policy in 2000 which has only one objective, to target inflation so as to make sure that there is price stability in the country. This happens after the Reserve Bank of South Africa has been unofficially targeting inflation for 2 years before its official inception in 2000 (Mboweni, (2003); SARB, 2004). The disciples of inflation targeting (IT) monetary policy lean on the justification that ensuring price stability through targeting inflation will help to anchor inflation expectations. When economic agents are not expecting inflation to increase, that might facilitate saving and investment in the economy. Still on the idea of inflation expectations, the monetary policy trusts that lower inflation boosts investment in the economy hence create jobs and average incomes of citizens (Kabundi and Schaling, 2013). Also the supporters of IT justify themselves by arguing that targeting inflation and achieving a low inflation environment requires central bank independence and therefore improve policy credibility in the country. Basically assumptions behind inflation targeting monetary policy are meant to create a financially stable, investor and business-friendly environment (SARB, 2004). The central bank in order to achieve its main objective of stabilizing prices in the country is basically controlled by one main instrument which is the interest rate (SARB, 2004).

The interest rate will be used by the central bank to achieve both contractionary and expansionary monetary policy. The Bank will decrease the interest rate if they intend to expand the economy (making credit cheaper for consumption and investment) and this will grow the economy through boosting demand which will later lead to the growth of investments in the country and as a result help to reduce unemployment and poverty. The opposite will happen when the interest rate is increased by the Bank. However, given the situation in South Africa a lower interest rate will always be favorable to deal with low domestic investment and unemployment which is standing at 27,6% (Stats SA, 2017). Although the Reserve Bank of South Africa has adopted inflation targeting monetary policy and made price stability its sole objective, statistics of a wide range of indicators in the country communicate that IT is not an appropriate policy for the country. The country is ranked as one of the most unequal countries in the world with a GINI coefficient of 66% as of 2016 (World Bank, WDI, 2017). Unemployment has continuously been increasing from 24.7 in 2012, 25.2 in 2015 and 26.7 in 2016.Poverty rates are estimated to be more than 50% as per recent statistics released by Statistics South Africa in 2017. The hardest hit by this kind of a policy is the youth who are the future of the country and the youth unemployment is standing at shocking statistics of 51.91%. Economic growth grew by unpleasant figures however, failing to deal with problems of poverty and unemployment in the country. Real GDP grew by 2.489% in 2013, by 1,298% in 2015 and by a paltry of 0.279% in 2016 (SARB, 2016). These are indications that there are problems with policies in the country specifically the monetary policy. However, those who believe in targeting inflation and achieve price stability as a priority argue that monetary policy

influences inflation and the economy for example, the demand of goods and services and this leads to affecting the demand for labor who produce these goods and services. This relationship is actually assumed to occur through the influence of the financial conditions of households and firms (Ngalawa, 2009). This then means that monetary policy will be operating through various channels that include the exchange rate, interest rate channel and credit channel. Another assumption of inflation targeting (IT) rests on the argument that, since the interest rate is the main instrument, increasing it will help to tame monetary and credit expansion. The capital inflows that a high-interest rate attracts are then expected to offset all the economic consequences attached to a high-interest rate. This again exposes the fact that IT monetary policy relies much on external factors to solve domestic problems (Epstein, 2007). It explicitly favors low inflation to create a conducive environment for foreign direct investment (FDI) although there is weak empirical evidence that link low inflation and foreign direct investment (see Epstein, 2007).

The available Interesting empirical evidence is that FDI does not cause economic growth but economic growth causes FDI and this justifies why South Africa is supposed to be inward-looking in its policies of trying to achieve low inequality, low poverty rates and low unemployment. Epstein (2007) also had interesting findings of countries that adopted inflation targeting monetary policy as he argued that inflation is not one of the main determinants of foreign direct investment but low-interest rates play a critical role as well as less unequal economies. On the issue of interest rates, comparing South Africa with other emerging economy countries that it is usually compared with (Brazil, Russian, India and China), it has the highest unemployment figures and one of the highest interest rates. The table below shows the statistics:

Table 1: Comparison of Interest, Inflation and Unemployment Rate

	Interest rate	Inflation	Unemployment
South Africa	6.5%	6.32%	26.7%
China	4.35%	2.9%	3.9%
India	6%	4.4%	3.5%
Russia	7.25	2.2%	5%
Brazil	6.5	2.9%	12.5%

Source: World Bank (2017)

The statistics shown on the table above is explicitly evidenced enough to argue that the IT policy recommended to countries by the Washington consensus is not working well for South Africa. This kind of monetary policy has succeeded in most cases where it was implemented as far as anchoring inflation expectations and lowering inflation but it has not succeeded in creating an environment that creates jobs, reduces poverty and inequality. The IT policy has worked in South Africa but the Reserve Bank has struggled with hitting the target since inflation is always on the top band of the target and sometimes it goes outside the band. The most contributing factor to this difficultness is the exchange rate channel which affects inflation directly since South Africa is a small open economy involved in the importation of huge volumes of intermediate goods (Epstein, 2006). Imports are contributing much to headline inflation because the rand has been depreciating its value making the imports to be much expensive and with businesses passing on these exchange rate changes to prices, these are inflationary pressures that are giving the Bank serious problems.

2. Literature Review

This section will focus on a number of researches that were done in other countries where the same monetary policy was adopted. Only researches that are related to inflation and unemployment will be analyzed so that the relationship that exists between monetary policy and unemployment can be unveiled. We start by looking at the research on South Africa by Epstein (2002). Although this study was done in the early years of the monetary policy inception, its findings have come to be true. This study used literature to analyze if inflation targeting was the best monetary policy South Africa could adopt. In conclusion, the paper dismissed the benefits inflation targeting could bring to the South African economy since it argued that South Africa is a small economy hence opening it and allowing the value of the rand to be controlled by the market

forces is going to make it vulnerable. Epstein (2002) recommended that South Africa should tighten its exchange rate rather than leaving it loose. Also he recommended that South African policymakers should insulate the country's financial market from the international capital markets through implementing policies like lending windows, underwriting facilities, asset-based reserve requirements and subsidized credit. This in short meant that the authorities should think of a policy shift that would move away from just focusing on price stability and opening the economy.

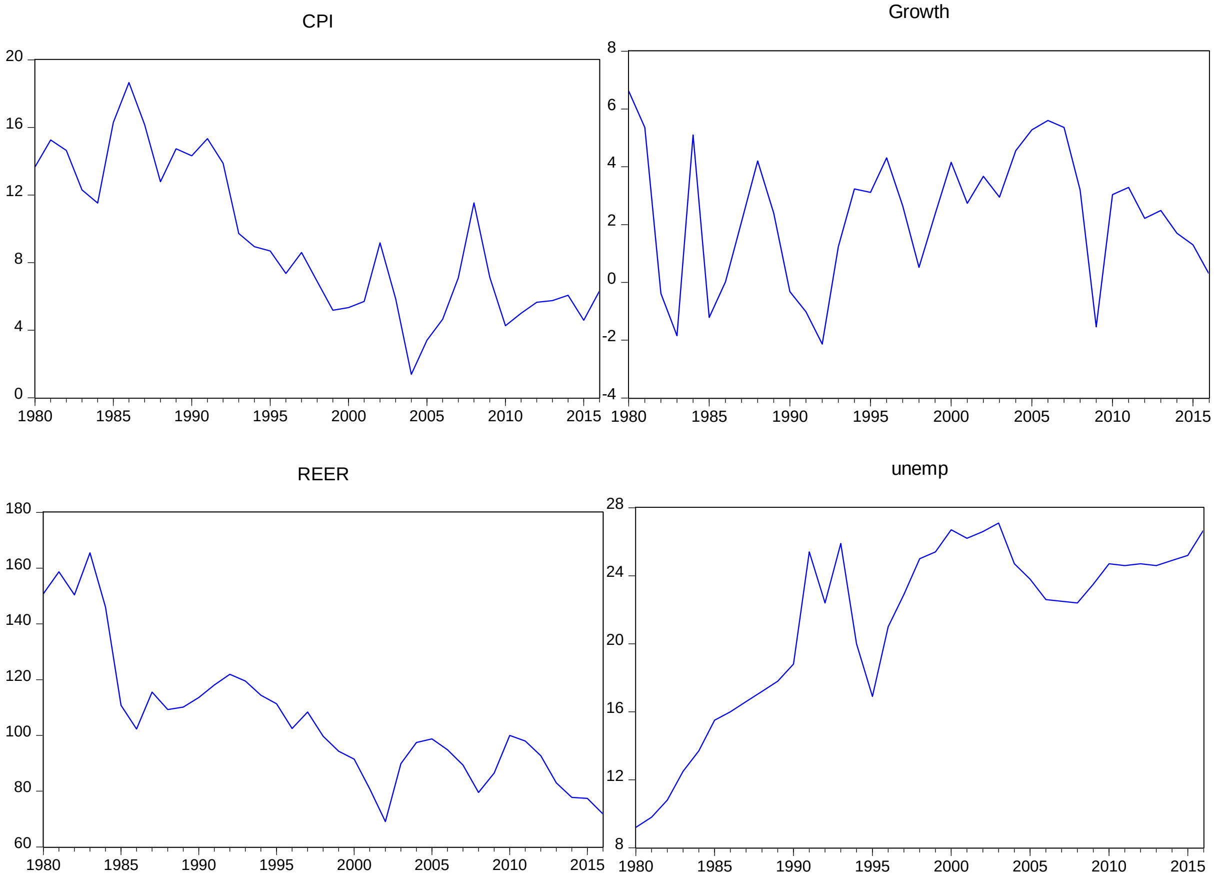
Blinder (2000) and Parsley (2012) concur with the findings and recommendations by Epstein (2002) and they argue that there are better approaches that countries with high unemployment and poverty should adopt when the inflation targeting monetary policy has failed to achieve what the advocates thought it would. Recommendations that come from this work point to the fact those countries that have adopted inflation targeting (IT) but it has failed to deal with poverty and unemployment should quickly abolish it and start reducing the interest rate to promote growth and later on achieve reduced unemployment and poverty. One of the early studies to investigate the role of monetary policy on unemployment was Leeper, Sims and Zha (1996). The study uses a VAR model with monthly data spanning 1960 to 1996 and the findings suggest that a monetary policy that is contractionary in nature does negatively affect employment. The study recommends that if an economy is troubled with high levels of unemployment and poverty, should look at benefits that can be achieved from adopting an expansionary monetary policy with instruments like the interest rate playing a kingship role in stimulating employment. In line with the findings of Leeper, Sims and Zha, an American study by Christiano, Eichenbaum and Evans (1999) also uses a VAR approach and find that contractionary monetary policy shocks cause a fall in employment.

Analyzing the relationship between monetary policy and unemployment in Sweden, Alexius and Holmlund used a structural vector autoregressive (SVAR) methodology. Alexius and Holmlund (2007) use quarterly data spanning 1980 to 2005 on the output gap, unemployment, monetary conditions index, foreign output gap, technology and government deficit. The study finds out and concludes that expansionary monetary policy increases the output gap and as a result reduce the level of unemployment in a country. Walsh (2009) in an effort to find the relationship between inflation targeting and economic growth used a propensity score matching estimation technique and examined seven inflation targeting and other fifteen that were not targeting inflation but they are all industrialized economies. The study finds that IT has no significant impact of output growth. On a similar note, a study by Daboussi (2014) employed a panel data analysis of inflation targeting and non-targeting countries using an extended form of difference-in-difference estimation methodology. The findings of the study indicate that inflation targeting significantly lowers inflation volatility and enhances economic performance. The argument to this rest on the fact that IT reforms the behavior of monetary authorities in a way and manner they operate their instruments. To the interest of this study, the work of Daboussi (2014) failed to account for the effects of the economic development of economic performance and also the issue of financial development and this makes the benefits a country can realize from adopting IT in this case very inconclusive.

3. Methodology

This section will focus on the tools and methods used to gather and analyze data for this research. The main goal of this research is to investigate the impact of the South African monetary policy on unemployment. To determine the impact of monetary policy on unemployment, most studies opted for the Vector Autoregressive method but the current study employed the bounds testing AutoRegressive Distributed Lag (ARDL) approach for cointegrated series. Annual data spanning from 1980 to 2017 for the Unemployment rate (unemp), inflation rate (inf), economic growth rate (growth), real effective exchange rate (reer) and broad money is used in this study. Data used for this study was downloaded from the South African Reserve Bank (SARB) website, World development indicators (World Bank) and the International Monetary fund database. Graphs below explicitly show the behavior of each and every variable in their level form for the period covered by this study. Inflation shows a downward trend although with a big upward shock during the period of the 2007-2008world financial crisis. Unemployment shows an upward trend just before the inception of the inflation targeting monetary policy in 2000 although showing a decreasing trend a few years after IT before it starts to increase again. Economic growth has no consistent trend it is following but it shows that the rate it has been growing since the new monetary policy is less than before the new policy was put in place. The real

effective exchange rate does show continuous depreciation especially after the introduction of the monetary policy and the interest rate fluctuates between 5 and 7 % for the rest of the period after the new monetary policy.



Graph 1: Source; Author's own calculation.

As mentioned above, this work uses the ARDL as the main methodology for estimating the unemployment equation. The model is adapted from the work of Pesaran, Shin and Smith (1996) and the modified version of the previous work by Pesaran and Shin (1999). We decided to use this methodology because (1) no work to the best of our knowledge has used it to investigate this kind of relationship in the case of South Africa (2) it allows the researcher to model variables that are of different orders of integration meaning that it can mix those variables stationary in their levels I(0) and those stationary after first differencing I(1). The basic ARDL model for cointegration testing that this paper will use is shown below in equation 1.

$\Delta X_t = \delta_{0i} + \sum_{i=1}^{k} \alpha_i \, \Delta X_{t-1} + \sum_{i=1}^{k} \alpha_2 \, \Delta Y_{t-i} + \delta_1 X_{t-1} + \delta_2 Y_{t-1} + V_{it}$ .... (1)

k is the ARDL model maximum lag order and chosen by the user. The F-statistic is carried out on the joint null hypothesis that the coefficients of the lagged variables ($\delta 1 X t{-}1$ $\delta 1 Y t{-}1$ or $\delta 1 Y t{-}1$ $\delta 1 X t{-}1$) are zero. ($\delta 1$ – $\delta 2$) correspond to the long-run relationship, while ($\alpha 1$ – $\alpha 2$) represent the short-run dynamics of the model.
The hypothesis that the coefficients of the lag level variables are zero is to be tested.
The null of the non-existence of the long-run relationship is defined by;

Ho: δ1 = δ2= 0 (null, i.e. the long run relationship does not exist)
H1: δ1 ≠ δ2 ≠ 0 (Alternative, i.e. the long run relationship exists)

The first step that we take when dealing with the time series data that we have is to check its stationarity. Using the Augmented Dickey Fuller (ADF) we find that all the variables are nonstationary in their levels and they only get stationary after first difference I(1). We did the second unit root tests to confirm the results of the ADF using the Phillips Perron (PP). Also the PP confirms that we do not have a variable that is stationary in its levels but they all become stationary after they have been differenced once I(1). Before running the

employment equation using the ARDL, it is a basic requirement that one has to start by conducting the bounds test to observe if the dependent variable is cointegrated with its regressors or explanatory variables. However, we cannot run this test if our dependent variable is stationary in its levels (Pesaran and Shin, 1996). It is not a problem if the explanatory variable is I(0) as long as the dependent variable is I(1). In addition, we cannot run a bounds test if we have any of our variables getting stationary after second difference I(2) since the assumption of the bounds testing assumes that the variables are either I(0) or I(1). The long-run relationship between variables is observed after we have computed the W-statistic and F-statistic for testing the significance of the lagged variables in their level form in the error correction form of the underlying ARDL model. We are using yearly data spanning from 1980 to 2017 so we allowed the system to choose the number of the lags and it chose 4 lags.

Table 2: Unit root test results, 2005

	Levels		**First difference**		
Variable and test	Constant	Constant and trend	Constant	Constant and trend	Level of stationarity
ADF test					
Unemp	-2.203	*-2.406*	-6.592	-6.704	I(1)
Inf	*-1.487*	-1.101	-2.732	-4.976	I(1)
Lreer	-1.452	-3.633	-5.169	-5.101	I(1)
Growth	-4.309	-4.395	-7.042	-6.939	I(1)
Interest	-5.477	-5.141	-8.654	-8.457	I(1)
Phillips Peron					
Unemp	-2.387	-2.356	-6.698	-7.643	I(1)
Inf	-1.455	-2.805	-7.999	-9.111	I(1)
Lneer	-1.133	-2.476	-5.818	-6.052	I(1)
Growth	-4.321	-4.393	-8.906	-8.619	I(1)
Interest	-5.297	-5.051	-11.887	-12.218	I(1)

Source: Author

The table below shows the results of the bounds testing results and using the F-statistic, we conclude that there exists a long-run relationship amongst the dependent variable and the explanatory variables. We made such a conclusion because we know that according to Pesaran and Shin (1996), as long as the F-statistic lies outside the upper bound then there is a long-run relationship. When the F-statistic is outside the upper bound, the null hypothesis that there is no relationship is rejected. Therefore, inflation, growth, lreer and interest can be said that they are the long-run facilitating variables and they can help to explain unemployment.

Table 3: Bounds Test Results

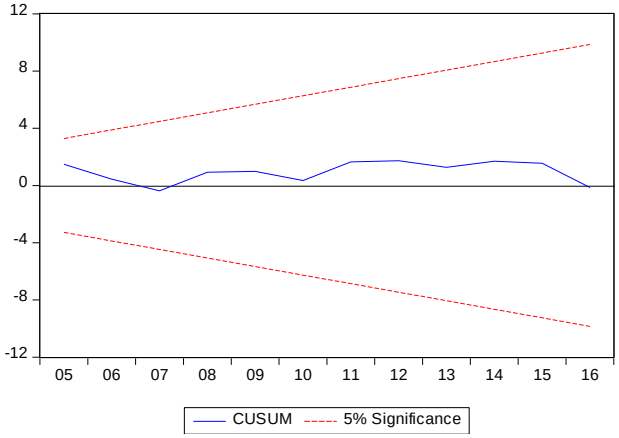
t-Bounds Test		**Null Hypothesis is: No levels relationship**	
Test Statistic	*Signif.*	I(0)	I(1)
10.661 (F-statistic)	10%	3.03	4.06
	5%	3.47	4.57
-6.145 (W-statistic)	10%	-2.57	-3.86
	5%	-2.86	-4.19

Source: Author's own calculation

After the bounds test we identify that there exists a long-run relationship between the dependent variable and the independent variable and this allows us to continue to run our ARDL model. The ARDL is lag sensitive and each variable will have the appropriate number of lags. Using the AIC the system chose the appropriate number of lags for each variable and only the significant ones will be available as the insignificant ones will automatically be removed from the system. When we ran our unemployment model, the ARDL system chose (1, 4, 3, 2, 2) and this means that 1 lag for the dependent variable (Unemp), 4 lags for inflation (Inf). 3 lags for logged real effective exchange rate (Lreer), 2 lags for economic growth rate (growth) and 2 lags for the

monetary policy dummy variable (IT dummy). We will have a look at the diagnostic tests of this model to see if our model is stable using the Cusum test.

Model Stability test (Cusum test): The instruments we used to do the diagnostic checks for our (1, 4, 3, 4, 2, 2) model indicates that there is no serial correlation and also the model is stable since there is nothing that is outside the borders of the cusum test. After knowing that our model satisfied the pre-estimation conditions, we then took the (1, 4, 3, 2, 2) model as our long-run equation to see the long-run relations of the variables when they are in their level form.



4. Research Findings

The long-run relationship in the level form of the ARDL for the unemployment equation is presented in the table below. We find that exchange rate and growth are also significant variables in our model together with the dummy controlling variable for the structural break 1980 -1999 pre-inflation targeting period and 2000-2017 inflation targeting period. We find a negative relationship between unemployment and inflation although it is weakly significant. This can be interpreted by stating that decreases in inflation may lead to increases in the unemployment rate. This does not agree with the basis of the monetary policy because it assumes that when inflation is low, that creates a conducive environment for investment that will create jobs. So low inflation should lead to low unemployment but this is not the case for South Africa since low inflation is facing increasing unemployment. There are certain inflation rates as eluded by Epstein (2002), that allows an economy to grow and according to his findings, any inflation rate until 20% is not detrimental to the macroeconomic environment of a certain economy. However, we find a contrary result to that. We find a positive relationship between the REER and unemployment. This may mean that when the rand depreciates, unemployment is increasing probably caused by continuous increases in prices of imported intermediate goods. Producers find it expensive to procure inputs hence there are high possibilities of expenditure switching where final products are imported for resale and that negatively affect employment. Economic growth is found to be significant although it is not an important variable in this case it is a variable that represents the behavior of the economy in terms of its capacity to create jobs.

Table 4: Estimated long-run coefficients of the ARDL (1, 4, 3, 2, 2) unemployment equation

Dependent variable: Unemployment				
	Coefficient	Std. Error	T-Ratio	Prob
Inf	**-0.3245*	0.1685	-1.76	0.0780*
Lreer	16.7183	4.4612	3.7474	0.0022***
Growth	-0.3800	0.1893	-2.0069	0.0645*
IT Dummy	6.9369	2.1394	3.2424	0.0059***
Trend	0.2303	0.1315	1.7508	0.1019*

Source: Research results

In this case real variables are affected by real factors like reducing inequality, improving technology, increasing public investment, reducing corruption and many others. Our study does not conform to the notion that in the short-run monetary policy affect real variables. South Africa has also adopted a freely floating exchange rate opening the economy to the world and letting the value of the rand be determined by the market. In our research we have found the exchange rate highly significant whilst having a positive effect on unemployment in the long-run.

Table 5: Error correction representation of the ARDL (1, 4, 3, 2,2) unemployment equation

Dependent variable: dUemp				
	Coefficient	Std. Error	T-Ratio	Prob
dInf	*-0.3245*	0.1426	-2.1368	0.0539**
dLReer	16.7183	3.6988	4.5199	0.0005***
dGrowth	-0.3800	0.1137	-3.3416	0.0048***
Trend	0.2303	0.0399	5.7607	0.0000***
Ecm	-0.9033	0.1091	-8.2784	0.0000***

R-square= 0.831526 *Adjusted R-squared= 0.700490*
S.E of regression= 1.1872 *F-statistic= 6.345799*
Mean dependent var= 0.430303 *S.D dependent var= 2.169459*
Sum Squared resid= 25.37387 *Log likelihood= -42.48898*
AIC= 3.484180 *SBC= 4.164411*
DW statistic= 2.482097

Source: Research results
Note: "d" indicates the first difference, while "L" denotes the logarithm of the variable

Table 5 above show the findings of the error correction model of the (1, 4, 3, 2, 2) including all the model statistics that are relevant to be mentioned in this research. We find that changes in the current lags of inflation (inf) have negative effects on changes in unemployment (Unemp) and significant. The opposite goes to changes in positive current lags of the exchange rate (dLReer) that have positive and statistically significant effects on changes in unemployment (Unemp). This is a sign that when the rand depreciates it is causing harm to domestic industries basically through increases in prices of intermediary goods and they respond by cutting down employment in the short-run. We find that the speed of adjustment or our error correction coefficient (ECT) is highly significant and it holds the expected sign. The ECT is also within the range of (0 to -1) reducing doubts of us mis-specifying our model. The error correction term suggests a high speed of convergence to the long-run equilibrium because we see that almost 91% of the previous year's shock quickly adjusts back to the long-run equilibrium in the current year

5. Discussion and Conclusion

Our study confirms the long-run neutrality of money theory which states that changes in the quantity of money in a certain economy in the long-run are reflected only by changes in general price level not in "real" variables like unemployment and output. In our analysis we find that inflation does affect unemployment in the long-run and this suggests that South African Reserve Bank's policy remains doubtful in terms of its impact on unemployment. Since the inception of this monetary policy, unemployment has been increasing on a yearly basis whilst the rand has been losing value. The continuous depreciation of the rand is detrimental to local businesses that rely on importing their raw materials from foreign markets. The exchange rate pass-through strongly affect unemployment negatively. The rand depreciation was supposed to facilitate an increase in the volume of exports the country pushes into the global market as per a priori expectations but the quantity of exports South Africa is pushing continue to disappoint. It is only recently when world commodity prices have been sticky because of lack of demand on the world market that might somehow justify why export growth has been so weak to help curb unemployment in South Africa. Economic growth has the expected sign but very low in terms of its significance in explaining unemployment in the country. This implies that the economy has not been growing much for it to be able to highly impact unemployment. There is a need for a policy shift in South Africa if the economy is to start recovering to grow significantly for it to create sustainable jobs for the majority of unemployed people especially the youth.

The detrimental effect of having a youth population which is unemployed is the risk of having an inexperienced future generation and it also exacerbates crime rate in the country and at the moment South Africa has the highest inmates in Africa and the majority of those are the youths. We could not find strong empirical evidence that explains the relationship between inflation and economic growth and then later affecting unemployment in South Africa. Basing on the findings of this paper we observe that a lot of things are not making theoretical sense economically. First, the rand has been depreciating but the country's exports have not been convincingly growing, inflation has been kept around 6% but foreign direct investment (FDI) has not been increasing and we find a very weak relationship between FDI and unemployment. Also another interesting finding of our study is that FDI is not causing economic growth but economic growth cause FDI meaning to say that foreign investments follow an economy which is already doing well and not the reverse. This is not the case for South Africa because the economy has been growing by less than 3% for the past six to seven years hence it is justified why the economy has been failing to attract huge FDI inflows. Having observed that, we suggest that the Bank revise its monetary policy and widen its objectives and get involved in objectives that directly affect the social aspects of the economy. We are still acknowledging that it is the role of the fiscal policy in traditional economics but South Africa has become one of the most unequal economies in the world and the poverty and unemployment levels especially amongst the youth is a worrying factor demanding a huge policy shift. The Bank has enough manpower and capacity to research the best way it can target indicators like unemployment but at the same time not allowing inflation to go beyond a certain level. If the central bank can help to target and halve unemployment in the country, uncomfortable statistics of inequality and poverty in the country can be brought down to sustainable levels.

Another problem with the current monetary policy which can be one reason why it is failing to help to combat poverty and inequality is the fact that for it to sustain the inflation bandit has to use the interest rate. The South African interest rate is very high and unsustainable given the levels of poverty, inequality and unemployment in the country. This made us propose that maybe the inflation that the Bank is targeting is too low for the economy and the interest is too high. Comparing South Africa with its BRICS compatriots, South Africa is the only one with double-digit unemployment levels yet again the one with the highest interest rate. So the problem we see here is that South African policymakers want to benchmark the economy with economies that have better social problems than it has. We maintain that the right and appropriate money policy tailor-made for South Africa can be made and we propose targeting unemployment. This conclusion is in line with the findings of this study which has found a negative relationship between inflation and unemployment in South Africa as well as a positive relationship with the depreciation of the rand and unemployment. Finishing off, we would like to mention that our analysis might have some limitations. To start with we would like to acknowledge the fact that there are other variables that affect unemployment that were not included in this paper so our analysis is based on the variables we have included. Another factor is that different methodologies have been used by other scholars, the ones that capture structural shocks like the Vector Autoregressive (VAR) but our objective was to find the kind of relationship that exists between inflation and unemployment in the long-run. With that in mind, future studies can use other methodologies to continue exploring this interesting area.

References

Alexius, A. & Holmlund, B. (2007). Monetary Policy and Swedish Unemployment Fluctuations. Economics Discussion Paper No. 2007-34. Available at SSRN: https://ssrn.com/abstract=1716637 or http://dx.doi.org/10.2139/ssrn.1716637

Blinder, A. S. (2000). Central-bank credibility: Why do we care? how do we build it? *American Economic Review*, 90(5), 1421-1431.

Christiano, L. J., Eichenbaum, M. & Evans, C. L. (1999). Monetary policy shocks: What have we learned and to what end? *Handbook of Macroeconomics*, 1, 65-148.

Daboussi, M. O. (2014). Economic performance and inflation targeting in developing economies. *Journal of World and Research*, 3(1), 1-7.

Epstein, G. (2002). Employment-oriented central bank policy in an integrated world economy: A reform proposal for South Africa.

Epstein, G. & Yeldan, E. (2006). Developing policy alternatives to inflation targeting, the new façade of neoliberal conditionality: an introduction, Amherst, MA: University of Massachusetts Amherst.

Epstein, G. (2007). Central banks, inflation targeting and employment creation, International Labor Office Group, W. B. (2017). World Development Indicators 2017, World Bank.

Kabundi, A. & Schaling, E. (2013). Inflation and inflation expectations in South Africa: an attempt at explanation. *South African Journal of Economics*, 81(3), 346-355.

Leeper, E. M., Sims, C. A., Zha, T., Hall, R. E. & Bernanke, B. S. (1996). What does monetary policy do? *Brookings papers on economic activity*, (2), 1-78.

Mboweni, T. (2003). African economic integration–keynote address at the 5th annual African development finance conference. South Africa. 9 October 2003.

Ngalawa, H. P. (2009). paper presented at the 14th Annual Conference of the African Econometric Society, 8-10 July 2009. Dynamic effects of monetary policy shocks in Malawi, Abuja, Nigeria.

Parsley, D. C. (2012). Exchange rate pass-through in South Africa: Panel evidence from individual goods and services. *Journal of Development Studies*, 48(7), 832-846.

Pesaran, M. H., Shin, Y. & Smith, R. J. (1996). Testing for the Existence of a Long-run Relationship, Faculty of Economics, University of Cambridge.

Pesaran, M. H., Shin, Y. & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621-634.

South African Reserve Bank (2016). Experience of Inflation targeting in S.A. SARB Quarterly Bulletin, (December 2016), 242-103.

South African Reserve Bank. (2004). Financial stability review. SARB Working Paper WP/02/04. Pretoria: South Africa.

Stats, SA. (2017). Quarterly labor force survey in South Africa, 2017 report, Pretoria, South Africa.

Walsh, C. E. (2009). Inflation targeting: what have we learned? *International Finance*, 12(2), 195-233.

World Bank. (2017). World development indicators, 2017 report, WDI56888, Volume 1. New York, USA.

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Relationship between Social Media Collaboration and Ecosystem Management in Enugu State, Nigeria

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Abstract: This study was done on the relationship between social media collaborations and ecosystem management in Enugu state. The study was premised on the case of herdsmen-farmers/villagers clash over grazing fields and farmlands in Enugu State being the ecology-related issue. Survey research design was adopted for the study. A sample of 100 social media group participants was selected using snowball sampling technique. The questionnaire was used for data collection. Content validity was used as a method for testing the validity of the questionnaire while Cronbach's alpha method was used for testing the internal consistency of the items on the questionnaire. Pearson's Product Moment Correlation was used to test the hypothesis formulated for the study. Findings revealed that social media collaborations via Facebook, WhatsApp and Twitter have a significant relationship with ecosystem management. It was recommended that government and ecologically concerned agencies should employ social media collaborations as the policy for ecosystem management.

Keywords: *Social Media, Social Media Collaboration, Ecosystem Management*

1. Introduction

Shortly after the emergence of internet usage in Nigeria, social media gained an earth-shaking wave of subscribers in the country with people starting to admire staying online, wanting to share information and communicate with one another through the then desktop computers accessed through Internet Cafes in the neighbourhoods. Yahoo mail, Yahoo messenger, Hotmail and Ask.com were the commonest social media app existing as at then but today, scores of social media networks and applications have sprung up ranging from Facebook, WhatsApp, 2go, YouTube, Twitter, LinkedIn, Snap chat etc. Internet-enabled mobile smartphones and portable browsing gadgets like Tablets that are recently introduced also contributed to this enormous growth in the social media usage. It all began in the early days of Blackberry messenger which connected users in intertwines of social networks or community-based networks using PINs. Apple too was in the game of bringing people into a closed circuit of the social network through its own iPad, iphone, iTunes, etc. The unfortunate part of these miniature developments was that, the social network was restricted only to users of the mobile gadget carriers of the network which were very expensive. However, the arrival of Android Jelly Bean application brought billions of people in the world to the light of social networks. Today, nearly all users of smartphones are now subscribers to one social media platform or the other (especially Facebook and WhatsApp) with the aid of the Android operating system.

With the continued growth in social media networks, collaboration started to emerge as users of the social media are able to form groups on their networks, chat together, share contents and relate with one another even to as many people as possible at a time unlike when it was one on one connection (Meredith, 2014). Through group chats, information about anything or occurrences travels at the speed of light across the networks and from persons to persons. For believability, contents too are shared both in the picture or video formats. This development further attracts huge research concerns because it continues to shrink the world into a complex web of networks thereby providing collaborative information access for users and group participants (Tamine, 2016). Therefore, as part of the socializing features of the networks, scores of researchers have spotted the collaborative functional roles of social media networks for managing ecologically related issues. In the Western United States, one extant study captured how social media collaborations could be used to manage four (4) ecologically related issues (Keough, and Blahna, 2005). Another extant study from the central Stockholm County, Sweden, was done to show how web-based collaborations among 25 municipalities related to the management of 408 wetlands across the county (Kininmonth, and Bergsten, 2015). In actual fact, extant studies make it known that ecological resources are not independent of each other, instead they are interconnected, and their well-being is often critically dependent on upholding ecological connectivity, especially in times of change and disturbances.

Therefore, coordination and collaboration among managing actors, each managing their own piece of the puzzle, is essentially a requirement for effective management (Kininmonth, and Bergsten, 2015). Building on this, a growing number of ecosystem-related issues are discussed on a regular basis via the social media networks by group members. Similar to the case of Malpai Borderlands Group (ecoregional range-management issue) reported in Keough and Blahna's (2005) study, in almost all parts of Nigeria today, there have been serious conflicts between the herdsmen and farmers arising due to the declining grazing fields for cattle consequent to the widening development in human ecology. Now, using the cattle grazing fields that are now increasingly converted to farmlands and for human settlements as the ecological resource, this has become a trendy topical issue discussed on the social media groups. As the only available option for the herdsmen, they want to feed their livestock (cattle) on farmers' cultivated land but in retribution, this results in serial killings. Take for instance in Nsukka, Enugu state alone, about seven villages (Nimbo, Ngwoko, Ugwuijoro, Ekwuru, Ebor, Enugu Nimbo, Umuome and Ugwuachara) were attacked by the herdsmen leaving scores of lives in a bloodbath. Despite the increasing research efforts on the connectivity between social media collaborations and ecosystem contextual managements, one growing concern bothers on how the collaboration is done on social media networks which eventually can lead to ecosystem management considering the fact that most groups on social media networks are set up for education, politics, football and several other affairs.

Some restrict posting of irrelevant messages but on groups like 'Old Students Classmates', informal posts which may include ecosystem related issues are allowed. In addition, while this actually forms the basis this current study, some proponents argue that collaboration pattern on social media networks goes beyond public involvement, and before decisions relating to how well ecosystem resources are managed, inclusiveness, interactions, and joint decision making through consensus-based approaches are such collaborative frameworks required for ecosystem resource management (Walker and Daniels, 1996; Gray, 1989). Moreover, considering also that such social media group does not include one participant dominating (at the expense) over others (Keough, and Blahna, 2005). Building upon this premise, however this study will be of immense benefit to humanities and of course the people of Enugu state in particular because of it X-ray and proffer solutions to the herdsmen-farmers/villagers clash over grazing fields and farmlands in the region, through the use of social media collaboration. While it seeks to assess the relationship between social media collaborations and ecosystem management utilizing the participation in Facebook group chats, WhatsApp group chats, Twitter group chats and Linked in group chat as variables to the management of herdsmen – farmers' conflict in Enugu, Nigeria.

Statement of the Problem: Social media networks are internet enabled websites and applications that allow users to create and share content. They exist in two versions – desktop and mobile versions. Most commonly in Nigeria, these include Facebook, WhatsApp, 2go, Twitter, LinkedIn, YouTube, etc. Not only are these media used for social networking, users now use them for diverse collaborating functions because it allows for groups creation, group chats, and group information and content sharing. Some use it as a platform for education while some use it for social bonding. In the light of these, there has been a growing academic research concern on the governance of interactions via these social media groups (Kemmis, 1990) because, in some groups, members would just post any unruly information that is not educative on the platform (especially for those groups that were set-up purposely for education collaboration) but, as for groups that were set-up freely among friends for social bonding collaborations, anecdotal evidence provides that members barely make any serious discussion on the platform not to talk of debating or deliberating over ecosystem management related issues.

Among extant studies, there seem to be some mixed results regarding this collaborating function of social media and ecosystem management issue. Some studies like Rathwell and Peterson (2012) argue that the municipalities of Montreal, Quebec, Canada do not collaborate directly with one another over the watershed governance and water quality management issue that caused conflicts between amenity and agricultural activities whereas, in studies like Kininmonth and Bergsten (2015), it is argued that there is a good social and ecological alignment i.e. there is a governed structure that align collaborations to ecological processes among 25 municipalities which help to manage 408 wetlands in central Sweden. Meanwhile, of all the studies carried out in the past, there is still a paucity of this type of research study in Nigeria. Now, presenting the herdsmen/farmers or villagers' clash in Enugu communities over the grazing field and farmlands as pressing

the ecological issue in this study, it becomes worrisome to empirically address whether the various collaborations on social media groups today are focused or directed toward managing ecosystem related issues at all.

Objective of the Study: The main objective of this study is to assess the relationship between social media collaborations and ecosystem management. The specific objective therefore includes;

- To determine the relationship between the use/participation in Facebook group chats and management of herdsmen-farmers conflicts in Enugu state, Nigeria.
- To determine the relationship between the use/participation in WhatsApp group chats and management of herdsmen-farmers conflicts in Enugu state, Nigeria.
- To determine the relationship between the use/participation in Twitter group chats and management of herdsmen-farmers conflicts in Enugu state, Nigeria.
- To determine the relationship between the use/participation in LinkedIn group chats and management of herdsmen-farmers conflicts in Enugu state, Nigeria.

Research Questions: What is the relationship between using social media and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.

Research Hypothesis

H_1: There is a significant relationship between using Facebook group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.

H_2: There is a significant relationship between using of WhatsApp group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.

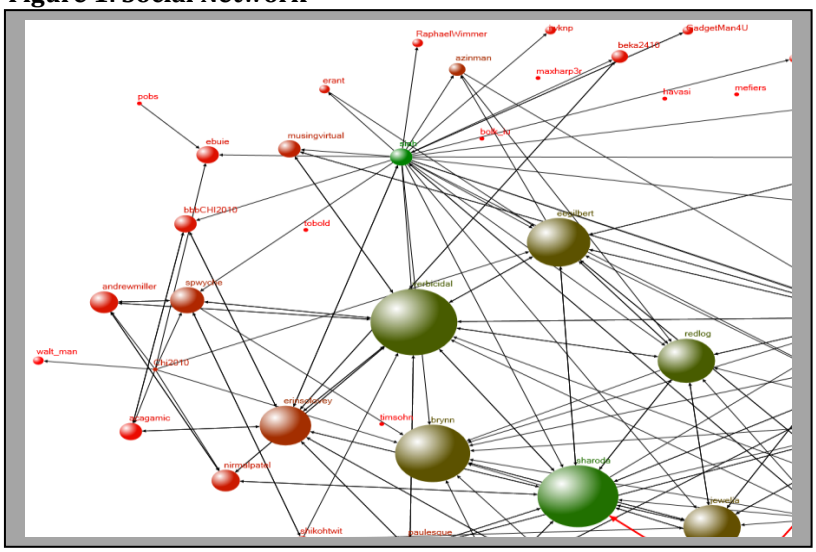
H_3: There is a significant relationship between using Twitter group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.

H_{04}: There is no significant relationship between using of LinkedIn group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.

2. Literature Review

Conceptualizations: The concepts of social media and ecosystem management have been used widely in diverse contemporary discourses, but here in this study, the emphasis is on the connectivity between two terms – i.e. social media collaboration and ecosystem management.

Figure 1: Social Network



Source: Dolwick, J.S. (2009).

Social Media Collaboration: The term Social Media comprises of two separate concepts; social and media. Jointly defined, it refers simply to the means or medium through which members of a society intermingle. Generally, social media is described as a set of online communication channels. It is an online community dedicated for social interaction, sharing of pleasantries, all manner of social contents and ultimately for collaboration. From the meaning of 'social media' given above, the term Social Network can be meaningfully inferred as an internet-based services that allow individuals to (i) construct a public or semi-public profile within a bounded system, (ii) articulate a list of users with whom they share a connection, and (iii) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site. While the term "Social Network Site" appears to have been widely employed to describe this emerging phenomenon (Tang et al., 2012; Baden et al., 2009), it also appears in most public discourses, and the two terms: Social Network Site and Social Networking Site seem to be often used interchangeably. Here in this study, the term network suffixing 'social media' would be employed and not "networking" simply for two reasons: emphasis and scope. "Networking" emphasizes relationship initiation, often between strangers and while it may be possible on some sites, it might not be the primary purpose of many of others, nor is it what differentiates them from other forms of computer-mediated communication (CMC) (Dolwick, 2009).

What makes social network sites unique is not only that they allow individuals to meet strangers as demonstrated on Figure 1 above, but rather that they enable users to articulate and make visible their social networks. This can result in connections between individuals that would not otherwise have been made, but that is often not the primary goal, and these meetings are frequently between "latent ties" (Haythornthwaite, 2005) who share some offline connection. Meanwhile, on many of the large social network sites [SNSs], many participants are not necessarily "networking" or looking to meet new people; instead, they are primarily communicating with people who are already a part of their extended social network (Keitzmann and Kristopher, 2011). Having described the term 'social media network', the concept of social media collaboration therefore, can be drawn from the intertwining relationship between people on the networks.

Carr and Ebrary (2014) define social media collaboration as the processes of bringing groups of people together to interact and share information in order to achieve common goals. This process presents the 'natural' environment on the internet, where collaboration and social dissemination of information are made easier through current innovations through social networks like WhatsApp, 2go, Facebook, LinkedIn, Twitter, etc. Oftentimes, the information sharing feature of groups on social media networks facilitates "brainstorming" because new ideas emerge from time to time due to the varied contributions of the participants. The participants come from different spheres of life, different cultures and different age groups. One crucial concept behind social media collaboration is that ideas flow every angle and from persons to persons across groups. Individuals are able to share their ideas in an unrestricted environment as anyone can get involved and the discussion is not limited to only those who have domain knowledge.

Ecosystem and Ecosystem Management: The term 'ecosystem' refers simply to the house (environments) of all living things. It is the biological community of all lives whether animals or plants (TEEB, 2010). The term also refers to 'Ecology' which is the study of the ecosystem. It refers to the geographical space where all living things live and interact with one another. For clarity purpose, ecosystem refers to all living things interacting with one another and with the environments – the water, soil, weather, climate and the sun including the atmosphere. In the context of this current study, ecosystem refers to the interaction between humans (herdsmen and farmers), cattle and the environment (the grazing fields). The grazing fields are bush (fertile lands or undeveloped lands). They represent the environment while the cattle, herdsmen and the indigenes of Enugu state, Nigeria whose villages were enraged are the living things. Therefore, the interaction between these and the environment is the ecosystem referred to in this study. In the past, there was a vast area of undeveloped lands across Nigeria – no farmlands, no buildings, and no village settlements.

The herdsmen roam about with their cattle to feed them with grasses on these undeveloped lands. As time went on, developments in human ecology expanded with farmlands and village settlements replacing the vast area of undeveloped lands which the cattle were once fed on. This then leaves the herdsmen with no option but to feed the cattle with the crops on the cultivated lands hence, degenerating to bloody conflicts. Now, the concept of ecosystem management is defined as the process of conserving and restoring the natural resources

yet meeting the needs of the current and future generations of living things (World Bank, 2009). Blending this definitive meaning to the context of this study, it, therefore, refers to the process conserving the ecological resources (human lives, cattle, and the lands) thereby managing the conflict between the herdsmen and the farmers or indigenes of the attacked villages. To achieve this, increasing development in human ecology (settlements) would be curtailed,and the wandering rate of the herdsmen and their cattle would also be curtailed.

Figure 2: Research Model

Fig. 1: Research Model
Source: Researcher's Intuitive Illustration

Figure 2 above represents the research model guiding this current study. The model (especially the factors aiding ecosystem management) is adapted from Keough and Blahna (2005). This model is proposed for the study of the relationship between social media collaboration processes and the management of herdsmen/farmers clashes over grazing fields and farmlands – which is the ecosystem in the context of this study. From the model, it is proposed that, if social media collaborations (topical issues discussed) are organized to conform to the five (5) ecosystem management aiding factors, this will lead to a positive relationship with the ecosystem management.

Empirical Reviews: Quite a number of studies have been done in the past on how social media collaborations can be used to manage ecosystem related issues, For instance, Keough and Blahna (2005) did a study titled Achieving Integrative, Collaborative Ecosystem Management, and focused on four cases relating to ecological management issues from the Western United States including – the Malpai Borderlands Group (ecoregional range-management issue); the Red Cliffs Desert Reserve (landscape –level endangered species issue); Maguire's primrose protection in Logan Canyon (landscape-level recreation and threatened plant conflict), and lastly, protecting the Moab Sand Flats (site- and landscape-level recreation and vegetation management issue). Findings revealed that creating an integrated balance between socioeconomic, and ecological goals can be possible so far one participant in the social media collaborating group does not dominate at the expense of the others. Another similar extant study is Kininmonth and Bergsten (2015) titled closing the collaborative gap: Aligning social and ecological connectivity for better management of interconnected wetlands. The study sought to understand how governance structures align to ecological processes in a landscape which is essential for effective management of ecological resources.

Findings showed a good social and ecological alignment however with a high prevalence of coordination through third parties. Olsson et al. (2003) also studied Social Networks for Ecosystem Management: A Case Study of Kristianstads Vattenrike, Sweden using the case study of Kristianstad's Wetland in Vattenrike, Sweden. The conclusion drawn from the study was that social networks play a crucial role in the dynamic relationship between key individuals, social memory, and resilience. They operate with a range of actors at different levels of society and create nodes of expertise and a diversity of experiences and ideas for solving new problems. Another similar extant study is Tamine et al. (2016) titled Social Media-Based Collaborative Information Access: Analysis of Online Crisis-Related Twitter Conversations. The study sought to better understand either implicit or explicit collaboration by studying Twitter, one of the most popular and widely used social networks. Findings showed that there is massive critical collaboration and is limited to small-sized flat networks, with or without an influential user; users are active as members of weakly overlapping

groups and engage in numerous collaborative search and sharing tasks dealing with different topics; and lastly, collaborative group ties evolve within the time-span of conversations.

Gaps: From the reviewed extant studies, it is deduced that there is a paucity of similar research studies in Nigerian contexts. It does not mean that no ecological issues are happening around Nigerian environments. Several kinds exist out of which the herdsmen and farmers' clash over grazing fields and farmlands is one. Another identified gap from extant studies is from the scope covered. Fewer or no studies were extensive to capture Facebook, WhatsApp, 2go, LinkedIn, and YouTube which are common with Nigerians. Only Tamine et al. (2016) was able captured Twitter social media groups, and this study was not carried out in Nigeria.

Theoretical Framework: The concepts of social media collaboration and ecosystem management have been extensively conceptualized in the preceding section. In discussing the theoretical link between the two concepts, some theoretical approaches have been suggested in the past studies. For instance, as cited in Keough and Blahna (2005), Lee (1993) describes ecosystem management as a trade-off activity for easing the heat and tension created by the key actors (herdsmen and the farmers/indigenes) in the conflict by balancing the competing needs of these key actors over the land through democratic process. Meff et al. (2002) adopt the concept of integration for decision-making towards balancing ecological and socioeconomic factors. To them, they believe ecosystem management must be brought to the institutional context where managers, politicians, doctors, teachers, security, etc. should strive for win-win partnerships through collaborative approaches. Kininmonth and Bergsten (2015) adopt the common-pool resource theory which is about the natural resource sharing dilemma. To adapt these theoretical discourses to this present study, first, the competing need of the herdsmen and the farmers/indigenes is upon the land.

The herdsmen want to feed their cattle with the crops/grasses on the lands whereas the farmers/villagers/indigenes want to cultivate the lands for agricultural produces. Both actors seek commercial ends. Now, in balancing they're competing for their needs from the opinion of Lee (1993), Meff et al. (2002) suggest institutional integration for decision-making where managers, politicians, doctors, teachers, security, etc. including the aggrieved parties strive for win-win partnerships over the ecological resources through a collaborative approach. In this regard, it means that the conflict between the herdsmen and the farmers/villagers or indigenes in Enugu state over the ecological space can be resolved through a collaborative approach via the social media since the social media groups consist of participants who come from different spheres of life, different cultures, and different age groups. A growing research contention now is how the collaboration can be done efficiently to achieve management of the ecosystem that generates the conflict between herdsmen and the farmers/villagers. Keough and Blahna (2005) suggest eight (8) factors that are significant for achieving integrative and collaborative ecosystem management.

- Integrated and Balanced Goals
- Inclusive Public Involvement
- Stakeholder Influence
- Consensus Group Approach
- Collaborative Stewardship
- Monitoring and Adaptive Management
- Multidisciplinary Data
- Economic Incentives

In expatiating these eight factors, only the first five (5) factors are considered useful in this current study. They include; Integrated and Balanced Goals which refers to the bringing of herdsmen's goals and farmer's/villagers' goals to an agreeable point that is ecologically sustainable. The Inclusive Public Involvement refers to the bringing together of all concerned publics (Fulanis-Hausas, Igbos, and Yorubas) together in a social media group through which issues appertaining to the ensuing conflict is addressed. The Stakeholder Influence refers to the information input from each stakeholder and how impactful it is on the final decisions. The Consensus Group Approach refers to whether the social media group participants use a consensus-based approach for reaching an agreeable position or opinion. The Collaborative Stewardship

refers to whether each participant has a sense of ownership for and become personally involved in the plan or decision reached

3. Methodology

Survey research design methodology was utilized for this study. The study was carried out in Enugu state, Nigeria specifically among lecturers, civil servants, and bankers including students all of whom are members of one social media group or the other. While the population of the subscribers remains infinite, the researchers captured a sample of 100 using both purposive and snowball sampling techniques. Data was collected using a questionnaire on a 5-point Likert scale. The questionnaire was validated using content validity method while Cronbach's alpha method was utilized for reliability/internal consistency. Pearson's Product Moment Correlation (PPMC) was used to test for the strength of the relationships that exist between variables.

Presentation of Results: Since the questionnaire copies were self-administered, 93 copies were supplied with complete data. Only seven copies could not be fully completed. Altogether, the survey had a success response rate of 93%. Obot (2004) in Nwosu and Wilson (2004) notes that in resolving conflict in modern societies, the media, to a great extent, provide rendezvous for all the interest groups or the aggrieved parties to sit and express their minds on issues in contention. This would be possible by providing and guaranteeing every citizen, easy access to media facilities. Ndolo (2005) found out that the media gain insight into the circumstances of others, they identify with others and gain a sense of belonging, thus, and they are so useful in times of crisis. Through the collaborative functional roles of social media networks will help in managing ecologically related issues. Mass media facilitate the creation of meaningful communication between conflicting parties. It is infused with social responsibility and could provide tools and strategies to manage and process the rhythms, images, collective memories, fears and needs that shape positive perceptions about conflict management. The demographic data of the social media group participants are presented in table 1 below.

Table 1: Respondents' Demographic Data

	Freq.	Percent		Freq.	Percent
Gender			**Education Background**		
Male	54	58.1%	None	0	0.0%
Female	39	41.9%	FSL Cert.	0	0.0%
	93	100.0%	O'Level	8	8.6%
Yrs of Experience			NCE/OND	21	22.6%
< 5years	52	55.9%	BSc/HND	19	20.4%
5 – 9years	11	11.8%	Postgraduate	45	48.4%
10 – 14years	23	24.7%		93	100.0%
≥ 10years	7	7.5%			
	93	100.0%			

Source: Field Study, 2018

Table 1 above presents the demographic data of the social media group participants who were captured in the survey for this study. The table shows the gender distribution, education background and years of experience in participating in the social media group. On gender distribution, 54(58.1%) of them are males while 39(41.9%) others are females. On education background, 8(8.6%) said they have O'Level; 19(20.4%) said they have NCE/OND certificate while 21(22.6%) said they have BSc/HND certificate and 45(48.4%) others indicated that they hold postgraduate certificates. As for their years of experience in participating in social media groups, 52(55.9%) of them indicated that they have been participating in it for less than 5years; 11(11.8%) of them indicated 5 – 9years; 23(24.7%) of them indicated 10 – 14years while 7(7.5%) others indicated ≥15years.

Test of Hypotheses: To test the hypothesis, the data gathered on social media collaborations and ecosystem management in the context of herdsmen/farmers' clash over grazing lands and farmlands in Enugu state

were subjected to test using Pearson's Product Moment Correlation method. The result of the test is presented in table 2 below.

Table 2: Pearson's Product Moment Correlation Test Result

	Social Media Collaborations through:				
Ecosystem Management	**Facebook**	**WhatsApp**	**2go**	**Twitter**	**LinkedIn**
Integrated and Balanced Goals	.887**	.928**	.133	.451*	.201
	.000	.001	.129	.000	.093
Inclusive Public Involvement	.535**	.771**	-.294	.233*	.139
	.000	.012	.102	.007	.255
Stakeholder Influences	.813**	.982**	.111	.601**	.304*
	.019	.000	.021	.004	.016
Consensus Group Approach	.662**	.693**	.104	.644**	.337*
	.000	.003	.319	.011	.014
Collaboration Stewardship	.882**	.545**	.217	.406*	.116
	.003	.000	.114	.011	.092

*Correlation is significant at 5%, **correlation is significant at 1%

The result presented in Table 2 above represents the outcome of the Pearson's product moment correlation test. It can be deduced that collaborations via Facebook, WhatsApp, and Twitter have significant ($p < 0.05$) relationship with ecosystem management issues using the five (5) factors aiding the ecosystem management. 2go and LinkedIn have no significant ($p > 0.05$) relationship with ecosystem management. Based on this result, the null hypotheses (H_1, H_2, and H_3) would be rejected while their corresponding alternate hypotheses (H_1, H_2, and H_3) would be accepted but as for the remaining hypotheses, their null hypotheses (H_{04} and H_{05}) would be accepted while alternate hypotheses would be rejected.

4. Findings and Discussion

The findings can now be summarized as follows;

- There is a significant relationship between using Facebook group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.
- There is a significant relationship between using of WhatsApp group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.
- There is a significant relationship between using Twitter group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.
- However,
- There is a significant relationship between using of LinkedIn group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.
- There is a significant relationship between using of 2go group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria.

The above findings imply that Facebook, WhatsApp, and Twitter are the most widely used social media groups among the participants captured in Enugu state. Group discussions are sometimes directed toward any trendy ecological issues with particular reference to the recent herdsmen and farmers/villagers clash in Enugu villages. This result is consistent with Tamine et al. (2016) and Keough and Blahna (2006). The study also found out that there is a significant relationship between using of Facebook group chats for collaboration and management of herdsmen-farmers, a significant relationship between using of WhatsApp group chats for collaboration and management of herdsmen-farmers' conflicts and significant relationship between using of Twitter group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria. The findings align with Hoffmann (2013); Best (2013b) that social media enables people to engage in their initiatives for peace and allows for interactive dialogue. USIP (2011); Kelly and souter, (2014); Oatley (2011); Hoffmann (2013); Welch et al. (2013), Schoemaker (2014); Smyth and best (2013)and schoemaker (2013) found out that in some cases social media and other new media tools have been used to hold

governments accountable to it citizens, mutually to protest violence, coordinate relief hard work, empower citizens, provide information to reduce tensions, and build bridges of understanding across boundaries.

In addition, Oatley (2011) Gagliardone et al. (2015) discover a positive but unreliable evidence that social media can contribute to peacebuilding by improving knowledge for conflict prevention and increasing contact and understanding between opposing groups. Welch (2015); Best (2013b); Smyth and Best (2013) states that Social media has been used to crowdsource information in conflict hotspots as part of various conflicts prevention measures in other countries like Kenya and Nigeria, especially during electioneering period. Social media has opened up new opportunities for public engagement and interactive dialogue and changed the relationship between government and citizens (Kelly and Souter, 2014; Best, 2013b; Schoemaker, 2014; Schoemaker, 2013). However, Pillay, van Niekerk, and Maharaj (2010); Coyle and Meier (2009) also establish that social media has proven to be a practical tool in advocacy and emergency communications. Mobile phones were a critical communications tool for social media in the aftermath of the 2004 Indian Ocean tsunami; this however was also the first time social media facility on mobile phones was used as a fund-raising tool. According to the study, social media also played a significant role in the aftermath of the 2011 Japanese earthquake and tsunami: more than 1,200 Twitter messages per hour were emanating from Tokyo within an hour of the earthquake (Vinson, 2011). Twitter was used to provide information on available shelters for stranded people and to raise funds (Vinson, 2011).

Ushahidi Community (2012) found out that Kenyan organization, Ushahidi developed free, open source platforms that crowdsource information during times of crisis. It operates with Twitter, mobile Short Message Service (SMS), and Google Maps was used successfully in many nations for both natural disasters and tracking political violence, including being used to track racist graffiti in the Middle East. Okoro and Diri (2009) found out that it is through the social media collaboration that the populace can participate freely in discussions relevant to their lives and their environment. It, therefore, implies that social media serves real tools that can be directed to headsmen management in south East-Nigeria. Individuals, groups, organizations, and nations are taking advantage of the opportunities provided by social media to organize millions of people to support and advance their course. In the political sphere, it has become a veritable tool for interacting and mobilizing citizens towards active contribution in the political process and democratic projects. The television, however, has greater political relevance, including the collection, organization, and transmission of news and information, the formation of opinion, and, in more or less open societies, some contribution to public debate (Ojo, 2003). The growing trend of social media surfing around the world extends to Enugu communities in Nigeria. Facebook, WhatsApp, and Twitter are the most widely used social media for group collaborations that can use to cub herdsmen-farmers' conflicts in Enugu state, Nigeria through quality reporting and collaboration of individual at all level.

5. Conclusion

This study sorts for the relationship between Social Media Collaboration and Ecosystem Management in Enugu State, Nigeria. However, herdsmen-farmers' clash knows as Fulani pastoralists migrating into Northern Nigeria from the Senegambia region around the thirteenth or fourteenth century (Adebayo, 1995; Abbass, 2001). After the Uthman dan Fodio jihad the Fulani became integrated into the Hausa culture of Northern Nigeria. After that, during the dry season, Fulani pastoralists began to drive their cattle into the middle belt zone dominated by non-Hausa groups returning to the north at the onset of the rainy season. However, while managing the herd and driving cattle, cattle grazing on farmlands sometimes occur leading to the decimation of yields and turning into a wellspring of contention. Nigeria's usage of the land utilizes act of 1978 permitted the state or federal government the privilege to allocate and rent arrive and furthermore gave indigenes the privilege to apply and be given an authentication of inhabitance to assert responsibility for genealogical terrains (Okello, 2014).

This put the pastoral Fulani in a troublesome position in light of the fact that most did not have any significant bearing for grounds of inhabitance of their brushing courses and repeating transhumance development will prompt infringement of the properties of others. The Nigeria government composed a few zones as grazing routes. However, this has not lessened conflicts. From 1996 to 2006 around 121 persons lost their lives in Bauchi and Gombe states because of contentions amongst pastoralists and ranchers. Mayah (2016) report

that 300 villagers were reportedly massacred in the killing spree with heavy casualties recorded in communities like Aila, Okokolo, Akwu, Adagbo, Odugbehon and Odejo. Also, on the March 5th, 2016 the rampaging herdsmen killed about 500 people following an attack on Agatu local government region of Benue state. These people groups incorporate; Aila, Akwu, Adagbo, Okokolo, Ugboju, Odugbeho, Ogbaulu, Egba, and Obagaji. April twelfth, 2016: Fulani herders assaulted two towns in Gashaka Local Government Area of Taraba state on and murdered 15 individuals, April nineteenth, 2016: Twenty-five local government territories in Delta State grounded exercises on the Benin-Asaba Expressway.

They reported that the herdsmen purportedly murdered more than 23 people. noticeably, the police recuperated 20 AK-47 rifles, 70 Dane weapons, 30 twofold barrel firearms and more than 1,000 live ammo, for the most part from Fulani herders amid this period, April 21st, 2016: Farmers in Lagun, Iyana Offa, Offa, Atagba, Lapata and their encompassing networks in Lagelu Local Council Area of Ibadan, Oyo State, charged that a gathering of Fulani equipped men assaulted their networks during the evening, harmed a protect and trucked away assets, April 25th, 2016: Fulani herders assault seven towns in Nimbo in Uzo-Uwani Local Government Area of Enugu State. Around 40 people were supposedly executed, June sixteenth, 2016: Gunmen shotted a 45-year-old renowned farmer suspected to be Fulani herdsmen in Ossissa community in Ndokwa East local government area of Delta state, and June 20th, 2016: At Least 59 Deaths have been recorded following recent attacks on Benue communities such as Ugondo, Turan, Gabo Nenzev – in the Logo Local Government Area by Suspected Herdsmen. This was reported through social media collaboration. The study, therefore, concluded that median social collaboration vs. Facebook, WhatsApp and Twitter can help cub herdsmen-farmers' conflicts in Enugu state, Nigeria.

Recommendations: The study recommended that government and ecologically concerned agencies should employ social media like the Facebook group chats for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria. WhatsApp group chats should also be used collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria. Twitter group chats should also be used for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria. However, Users of LinkedIn group chats should use it for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria. Moreover, users of 2go group chats should as well use it for collaboration and management of herdsmen-farmers' conflicts in Enugu state, Nigeria. The media should cease from advancing biased generalizations about gatherings and people through specific detailing not bolstered by statistical data points. The media should interface more with all intrigue gatherings, people, and stakeholders, so no feeling or intrigue is underestimated. The media, in general, should be pluralistic and mirror the assorted variety of their general public, offering access to different perspectives and the privilege to answer. Likewise, the media, as the principal partner and purveyor of data, should add to the upkeep of peace and compromise in the nation by revealing clashes and emergencies inside the setting of the Code of Ethics in light of believable, genuine, adjusted and objective reporting.

References

Abbass, I. M. (2001). No Retreat no Surrender Conflict for Survival between Fulani Pastoralists and Farmers in Northern Nigeria. *European Scientific Journal*, 8(1), 1857–7881.

Adebayo, A. G. (1995). Of Man and Cattle: A Reconsideration of the Tradition of Origin of Pastoral Fulani of Nigeria. *History of Africa*, 18, 1-21.

Baden, R., Bender, A., Spring, N., Bhattacharjee, B. & Starin, D. (2009). Persona: An Online Social Network with User-Defined Privacy. University of Maryland.

Best, M. (2013b). Emerging markets peacebuilding in a networked world. *Communications of the ACM,* 56 (4), 30-32.

Carr, D. F. & Ebrary, I. (2014). Social Collaboration for Dummies (1st ed.). Hoboken, Conference, and Managing Conflict: When Talk and Structure Collide. *Society and Natural Resources,* 9, 77–91

Coyle, I. & Meier, P. (2009). New technologies in emergencies and conflicts: The role of information and social networks. United Nation Foundation.

Dolwick, J. S. (2009). The 'Social' and Beyond: Introducing Actor-Network: A Synthesis of the Approach, Conclusions and Recommendations of TEEB. Journal of Economics of Nature.

Gagliardone, I., Kalemera, A., Kogen, L., Nalwoga, L., Stremlau, N. & Wairagala, W. (2015). In Search of Local Knowledge on ICTs in Africa. ICTs, State building and Peacebuilding in Africa. Retrieved from http://repository.upenn.edu/africaictresearch/4.

Gray, B. (1989). Collaborating: finding common ground for multiparty problems. Jossey Bass, San Francisco.

Haythornthwaite, C. (2005). Social networks and Internet connectivity effects. *Information, Communication, & Society,* 8(2), 125-147.

Hoffmann, J. (2013). UNPEACE Open Knowledge Network Occasional Working Papers No. 1.

Kelly, T. & Souter, D. (2014). The World Bank, Washington, D.C. http://elibrary.worldbank.org/doi/pdf/10.1596/978-1-4648-0074-0

Kemmis, D. (1990). Community and the Politics of Place. University of Oklahoma Press, Norman.

Keough, H. L. & Blahna, D. J. (2005). Achieving Integrative, Collaborative Ecosystem Management. *Conservation Biology*, 20(5), 1373–1382.

Kininmonth, S. & Bergsten, A. (2015). Closing the collaborative gap: Aligning social and ecological connectivity for better management of interconnected wetlands. *AMBIO*, 44(1), 138–148.

Lee, K. N. (1993). Compass and Gyroscope: Integrating Science and Politics for the Management: Adaptive, Community-based conservation. Island Press, Washington, D.C.

Mayah, E. (2016). Special report: Inside Agatu killing field: blood on the streets, charred bodies everywhere. Premium times. https://www.premiumtimesng.com/news/headlines/200369-special-report-inside-agatu-killing-field-blood-on-the-streets-charred-bodies-everywhere.html.

Meffe, G. K., Nielsen, L. A., Knight, R. L. & Schenborn, D. A. (2002). Ecosystem Management: Adaptive, Community-Based Conservation. Science for a changing world. Island Press, 1718 Connecticut Avenue NW Suite 300 Washington, DC 20009 USA.

Meredith, R. M. (2014). Social Networking Site Use by Mothers of Young Children. CSCW 2014. Parents and Children Baltimore, MD, USA.

Ndolo, I. E. (2005). Mass media system and the society, Enugu: RhyceKerex Publishers.

Nwosu, I. E. & Wilson, D. (2004). Communication, mass media, and conflict management in Nigeria. Enugu: ACCE (Nigeria Chapter).

Oatley, N. (2011). Search for Common Ground & United States Institute of Peace http://cu-csds.org/wp-content/uploads/2009/10/usip2011vdk.pdf.

Obot, C. (2004). Mass media and conflict management. In Nwosu and Wilson's (Eds) Communication, media and conflict management in Nigeria. Enugu: Prime Targets Limited.

Ojo, E. (2003). The Mass Media and the Challenges of Democratic Values in Nigeria: Possibilities and Limitations. London, SAGE Publications.

Okello, M. A. (2014). Identifying motivators for state-pastoralist dialogue: Exploring the relationships between livestock services, self-organisation and conflict in Nigeria's pastoralist Fulani. Pastoralism.

Okoro, N. & Diri, C. (2009) Public sphere and civic journalism: A fulcrum for effective political communication in Nigeria. Journal of political economy, Vol. 3 No. 1&2. Nsukka: Department of political science.

Olsson, P., Schultz, L., Folke, C. & Hahn, T. (2003). Social networks for ecosystem management: a case study of Kristianstads Vattenrike, Sweden. The Centre for Transdisciplinary Environmental Research (CTM) Stockholm University, SE-106 91 Stockholm, Sweden

Pillay, K., van Niekerk, B. & Maharaj, M. (2010). Web 2.0 and its implications for the military. In J. Phahlamohlaka, L. Leenen, N. Veerasmay, M. Modise, & R. van Heerden (Eds.), Workshop on the uses of ICT in warfare and the safeguarding of peace (pp. 50–57). Bela-Bela, South Africa: Council for Scientific Research.

Rathwell, K. J. & Peterson, G. D. (2012). Connecting Social Networks with Ecosystem Reputation in Social Media: A Dynamic Structural Model. *Journal of Management Information Systems,* 29, 41-75.

Schoemaker, E. (2013). (WP1278). Media and fragile states. Wilton Park. https://www.wiltonpark.org.uk/wp-content/uploads/WP1278-Report.pdf

Schoemaker, E. & Stremlau, N. (2014) Media and conflict: An assessment of the evidence. *Progress in Development Studies*, 14(2), 181–195.

Smyth, T. & Best, M. L. (2013). Tweet to Trust: Social Media and Elections in West Africa. Presented at the Sixth International Conference on Information and Communication Technologies and Development (ICTD2013), Cape Town, South Africa.

Tamine, L., Soulier, L., Paris, F., Jabeur, L., Ben, Amblard, F., Cedex, T. & Roth, C. (2016). Social Media-Based Collaborative Information Access: Analysis of Online Crisis-Related Twitter Conversations. *Halifax, NS, Canada*, 16, 159–168. *Social Anthropology*, 3(2), 451-459.

Tang, Q., GU, B. & Whinston, A. B. (2012). Content Contribution for Revenue Sharing and Reputation in Social Media: A Dynamic Structural Model. *Journal of Management Information Systems*, 29 (2), 41-76.

TEEB. (2010). The Economics of Ecosystems and Biodiversity: Mainstreaming the Services for Watershed Governance: A Social-Ecological Network Perspective Highlights the Critical Role of Bridging Organizations. *Ecology and Society*, 17(2).

Ushahidi. (2012). Deployments. Retrieved from http://community.ushahidi.com/deployments

USIP. (2011). The Impact of New Media on Peacebuilding and Conflict Management. United States institutes for Peace. https://www.usip.org/publications/2011/09/impact-new-media-peacebuilding-and-conflict-management

Vinson, J. (2011). Social networks become preferred lines of communication during Japan earthquake.WebProNews.com. Retrieved on October 30, 2016 from http://www.webpronews.com/japan-earthquake-social-networkin-2011-03

Walker, G. B. & Daniels, S. E. (1996). The Clinton administration, the Northwest Forest Conference, and conflict management: when talk and structure collide. *Society and Natural Resources*, 9, 77-91.

Welch, J. R. Halford, S. & Weal, M. (2015). Conceptualizing the web for post-conflict governance building. *Peacebuilding*, 3(1), 58-74.

World Bank. (2009). Convenient Solutions to an Inconvenient Truth: Ecosystem-based Approaches to Climate Change. Environment Department. The World Bank.

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Migrant Remittance Patterns in South Africa: A Micro-Level Analysis

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Abstract: Migrant remittances increasingly constitute a significant source of financial inflows into emerging markets. Hitherto, extant studies have focused nearly exclusively on the macroeconomic benefits of remittances. Such studies have documented that the top benefits that accrue to the receiving country of remittances include: savings mobilisation, fostering intermediation, investment, sustenance of families and the enabling of access to health care and education by households who ordinarily would not afford to pay for these services. This study departs from the norm and investigated the migrant remittance patterns from a micro-level perspective by focusing on South Africa which is one of the top twenty remittance receiving countries in the world. The South Africa-National Income Dynamics Study dataset was employed in this study. Firstly, this study established that remittances constitute a significant source of income for households in South Africa. Secondly, it was established that the remittance variable is positively related to the household income variable and the result was highly statistically significant. Thirdly, the results of this study confirmed that the level of remittances is dependent on the level of education of the household member, with the inclination of the highly educated migrant worker to send more money to support their household. The South African government should consider as a policy instrument encouraging migrant workers in the diaspora to remit more money back into the country through the facilitation of ease of access of financial services.

Keywords: *Migrant worker; household income; education; diaspora*

1. Introduction

Migrant worker remittances into a country can inject the much-needed liquidity to stimulate economic activity. Remittances have increasingly become a great source of financial inflows outside foreign direct investments (FDI), for developing countries that have experienced high levels of emigration over the years (Sibindi, 2014). According to Ratha, Eigen-Zucchi and Plaza (2016), in 2015 worldwide remittances flows were estimated to be $601 billion of which amount $441 billion (nearly three times the value of official development assistance) was channelled to the developing countries. The importance of remittances is multifaceted. Firstly, they help foster the liquidity of financial markets. This results in the provision of more credit and hence enhancing the intermediation process. Secondly, remittances are a source of savings, with the migrant workers sending their money from the host country to their home country to save in their bank accounts for future consumption. Thirdly, migrant labor might invest in their home countries by channelling their remittances to invest in bonds, stocks or other such instruments. Fourthly, remittances are used to sustain families back in the recipient country. It could be that the breadwinner is the one who emigrated abroad in order to fend for the family and as such would then remit back the money to take care of the needs of the family, such as food, healthcare and education. Extant studies have been conducted to investigate the nexus between remittances and economic growth, or the relationship between remittances and financial development at a macro-level. Notwithstanding, to the best of the researchers' knowledge the remittance phenomenon has not been studied extensively at a micro-level.

The impetus behind selecting South Africa as a country of focus for this study is that it is one of the top remittance receiving countries in the world. South Africa received remittances of approximately $1 billion in 2015 and ranked in the top of five African countries that received remittances (Ratha et al., 2016). As such, the motivation to explore the remittance patterns at a household level in South Africa was to unravel the dynamics behind such a distribution. The aim of this study was to establish the remittance patterns of South African migrant workers and to ascertain whether remittances constitute an important source of household income. Central to this study was to resolve the twin research questions: Does migrant worker remittance constitute a significant source of household income in South Africa? Is there a relationship between the level of education and the amount remitted? This study employed descriptive and inferential statistics analysis by utilizing the South African National Income Dynamic Study dataset. The results of this study confirmed that

there is a positive relationship between household income and migrant worker remittances. A positive relationship was also documented to exist between the level of education and the quantum of remittances.

The importance of such a study is that it can inform the ANC government as it crafts policy which is premised on the much vaunted 'radical economic social transformation' mantra. The policy imperatives that flow from this study are that the government must consider spending more on higher education and training in order to create an enabling environment for South Africans to attain a higher level of education. The government must also consider implementing policies that encourage the workers in the diaspora to send money back home. This can be achieved through the creation of an enabling environment that is unencumbered by unnecessary requirements and enhancing ease of access of financial services. The rest of the paper is arranged as follows: Section 2 reviews the related literature. Section 3 outlines the methodology used. Section 4 presents and discusses the empirical results and Section 5 concludes.

2. Literature of Review

The importance of migrant worker remittances is premised on the finance- economic growth nexus theory. Extant studies have been conducted that constitute the building blocks of the finance- economic growth theory. This theory can be can be traced to the seminal works of Schumpeter (1912) and later McKinnon (1973). Schumpeter (1912) postulated that financial institutions play a critical economic role in spurring technological innovation and economic activities. On the other hand, McKinnon (1973) contends that financial development is impeded by restrictive government regulations and economic interventions. Hitherto, extant studies that have interrogated the finance-growth nexus have mainly focused on the stock markets and the banking sector. There is limited research that focuses on the worker remittances-financial development nexus. Moreover, such studies have mainly focused on the macro-level benefits of remittances. The first strand of literature has been dedicated to establishing the relationship between remittances and economic growth (see for instance, Siddique, Selvanathan & Selvanathan 2012; Jawaid, & Raza, 2012 and Mundaca, 2009). Principally there are four hypotheses that have been tested from this vantage point. Firstly, whether remittances and economic growth are positively related? Secondly, whether remittances and economic growth are negatively related? Thirdly, whether there is a bi-directional relationship between remittances and economic growth.

Lastly, if there is no relationship between remittances and economic growth. In the majority of the documented studies any of the first three hypotheses have been validated. Among others, Salahuddin and Gow, (2015) examined the empirical link between remittances and economic growth by employing a panel of the largest remittances receiving countries namely; Bangladesh, India, Pakistan and Philippines for the period 1977 to 2012. They controlled for cross-sectional dependence for both variables and found that a positive relationship existed between remittances and economic growth in the long run. Bayar (2015) set out to determine if remittances have a significant impact on the economic growth in the transition economies of the European Union. He investigated the causality between economic growth, remittances and net FDI inflows for the period 1996 to 2013 by testing for causality. It was established that there is unidirectional causality running from remittances to economic growth as well as unidirectional causality running from net FDI inflows to economic growth. Bayar (2015) reasoned that remittances influenced economic growth by contributing to the national savings and meeting the foreign exchange requirements of the country partially. The second strand of literature focuses on the relationship between remittances and financial development (see for instance Aggarwal, Demirgüc-Kunt & Perîa, 2011 and Brown, Carmignani, & Fayad, 2013).

The relationships that have been documented to exist between remittances and financial development are analogous to those that exist between remittances and economic growth as enumerated in the foregoing. Karikari, Mensah and Harvey (2016) sought to establish whether remittances promoted financial development by employing a panel of 50 African countries for the period 1990 to 2011. They employed fixed effects and random effects models as well as a vector error correction model to estimate the relationship. Their results documented that remittances have a positive effect on financial development in the short-run but a negative effect in the long-run. Their results indicated that remittances positively and significantly influenced certain aspects of financial development such as bank deposits and money supply. Whereas, Coulibaly (2015) explored the causal link between remittances and financial development in Sub-Saharan

African countries and the documented results were mixed. On the one hand, the results of their study corroborated the positive causal relationship running from remittances to financial development, for some of the countries namely; Niger, Sudan, Senegal and Sierra Leone. On the other, hand the causal relationship running from financial development to remittances was established only for Sudan.

Another strand of empirical studies has focused on probing the relationship between remittances, financial development and economic growth (see for instance Nyamongo, Misati, Kipyegon, & Ndirangu, 2010 and Uddin, & Sjö, 2013). Amongst other empirical studies, Guiliano and Ruiz-Arranz (2009) employed a sample of 100 developing countries to study the link between remittances, financial development and economic growth for the period 1975 to 2002. They found that remittances had promoted growth in less financially developed countries by providing an alternative way to finance investment. They reasoned that by becoming a substitute for inefficient or non-existent credit markets, remittances help alleviate credit constraints contributing to improve the allocation of capital and to boost economic growth. Similarly, Adenutsi (2011) examined the financial development-remittances-growth nexus in the case of Ghana by specifying a dynamic equilibrium-correction model for the period 1987 to 2007. The results documented that although financial development is detrimental to endogenous growth, it is crucial for mobilising remittances from international migrants. The results also revealed a bi-directional causality existing between financial development and international migrant remittances and a unidirectional causality running from remittances to economic growth. A growing body of studies has also been dedicated to examining the impact of remittances on human capital development.

The empirical evidence on the relationship between remittances and the level of education is rather mixed. On the one hand, a positive relationship is found to subsist between migrant remittances and the level of education of a recipient household member. Ngoma and Ismail (2013) examined the impact of migrant remittances on human capital formation in 89 developing countries using the GMM (generalised method of moments) estimator on aggregate level data between period 1970 and 2010. Their results reveal that migrant remittances have the potential to promote human capital formation among remittance recipients by alleviating income constraints and promoting more years of schooling at both the secondary and tertiary school levels. Salas (2014) investigated the effect of international migration on children left behind in Peru using a two-step estimation method by utilising data ranging from 2007 to 2010. Their empirical results document that international remittances have a positive effect on the likelihood to send children to private schools controlling for absenteeism of parents. Naanwaab and Yeboah (2013) investigated the effect of migrant remittance on human capital investments by using a panel dataset comprising of 71 countries drawn from the World Bank's six regions of: East Asia and Pacific; Europe and Central Asia; Latin America and the Caribbean; Middle East and North Africa; South Asia and Sub-Saharan Africa using a systems approach.

They employed a three three-stage least squares regression with annual data ranging from 1998 and 2010. Their results showed that remittances have a positive impact on human capital development, specifically on educational and healthcare investment. On the other hand, a negative relationship is found to obtain between migrant remittances and the level of education of a recipient household member. For instance, the relationship between remittances and school attainment of household members left behind was examined by Kalaj (2015) who utilised cross-sectional data for Albania for the period 2002 to 2005 and estimated the Cox proportional hazard model. Their results documented that receiving remittances from household members working abroad increases the 'hazard' of leaving school after the completion of secondary education by a member of the recipient household. The foregoing demonstrates the importance of migrant worker remittances to an economy. Arguably these benefits cascade down to the micro (household) level.

3. Research Methodology

In this paper both descriptive and inferential statistics were employed to analyse the migrant remittances trends in South Africa. The Stata version 14 software was employed to analyse the data. The variables employed are discussed in the next sub-section.

Data Description and Variable Definition: In this study the National Income Dynamics Survey (NIDS) database was utilised. The wave 1 of 2008 NIDS dataset was employed. The wave 1 dataset was preferred as

it also allowed the analysis to factor in the effects of the 2007 to 2009 global financial crises. The variables used in this study are summarised in the table below. The derived variable refers to the renamed variable as referred to in this study. In the first instance, hypotheses testing was conducted by applying inferential statistics. This study conducted a bivariate analysis to test the relationship between remittances and household income as well as to test the relationship between remittances and the level of education. The Pearson's chi-squared test was employed to test for the independence of the categorical variables in order to discern if a relationship exists in each instance.

Table 1: A Description of the Variables Used in this Study

Name of Variable	Description of the Variable	Derived Variable
Remittances *(w1_hhremitt)*	This variable measures household monthly income from remittances.	*hhremitt*
Household income *(w1_hhincome)*	This variable measures the household monthly income with full imputations from other sources of income.	*hhincome*
Race *(w1_best_race)*	This variable measures the race of the respondent whether African, white, coloured or Indian/Asian.	*Race*
Province *(w1_hhprov)*	This variable relates to the province where the respondent resides.	*hhprov*
Highest education *(w1_r_b7)*	This variable relates to the highest education achieved by a household member.	*hiedu*

Quantitative Analysis: In this study the quantitative research approach was employed. Descriptive statistics were employed to illustrate the trends in household remittances in South Africa using demographic factors. The measures of central tendency that is; the mean, median and standard deviation were utilised to achieve this goal. The null hypotheses for this study are as specified as follows:

Hypothesis 1: Household income is not dependent on remittances
Hypothesis 2: Remittances are not dependent on the level of education of the remitting member of the household.

Secondly, correlation analysis was conducted. In the last instance regression analysis was conducted to test the relationship between household income and remittances. The model is specified as follows:

$$hhincome_i = hhremit_i + \varphi_i \quad (1)$$

where: $hhincome_i$= average monthly household income for the *i-th* household
$hhremit_i$ = average monthly household remittances for the *i-th* household
φ_i = error term

4. Empirical Results

In this section the empirical results of the study are presented and discussed. The descriptive statistics are presented first followed by inferential statistical analysis.

Descriptive Statistics: The summary statistics are presented in this section. Table 2 documents the distribution of household monthly income from remittances as well as total household monthly income. On average a household in South Africa received R1230 in remittances monthly. The median monthly remittance figure of R500 is a pittance as compared to the mean of R1230. Table 2 also documents the trends in the distribution of household income. The mean household monthly income is R4500 roughly as compared to the median value of R2065.

Table 2: A Summary of the Distribution of Household Remittances in 2008

Variable	Mean	Median	Standard deviation	Number of observations
Remittances	R1230	R500	R4456	1046
Household income	R4474	R2065	R8041	7305

The provincial distribution of remittances is documented in Figure 1. KwaZulu-Natal province receives the most remittances, accounting for 25.43%, whereas Free State province receives the least remittances accounting for just close to 4% of the total. Eastern Cape Province is the second highest in the ranking accounting for close to 18% of the total. The trends in remittances received among the South African racial groups are documented in Figure 2. Africans accounted for the most of remittances sent with close to 69%. The whites rank second receiving roughly 22% of the remittances. The coloureds are ranked third and the Indians/Asians rank last.

Figure 1: Provincial Distribution of Household Monthly Remittances in 2008

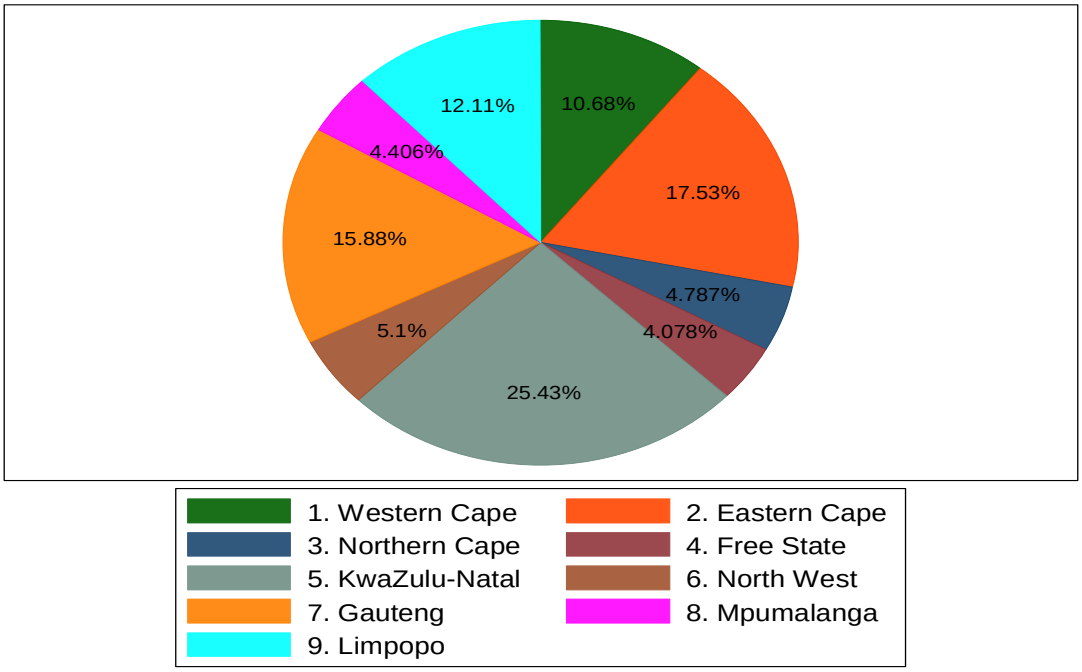

Figure 2: Distribution of Household Monthly Remittances among the Racial Groups in 2008

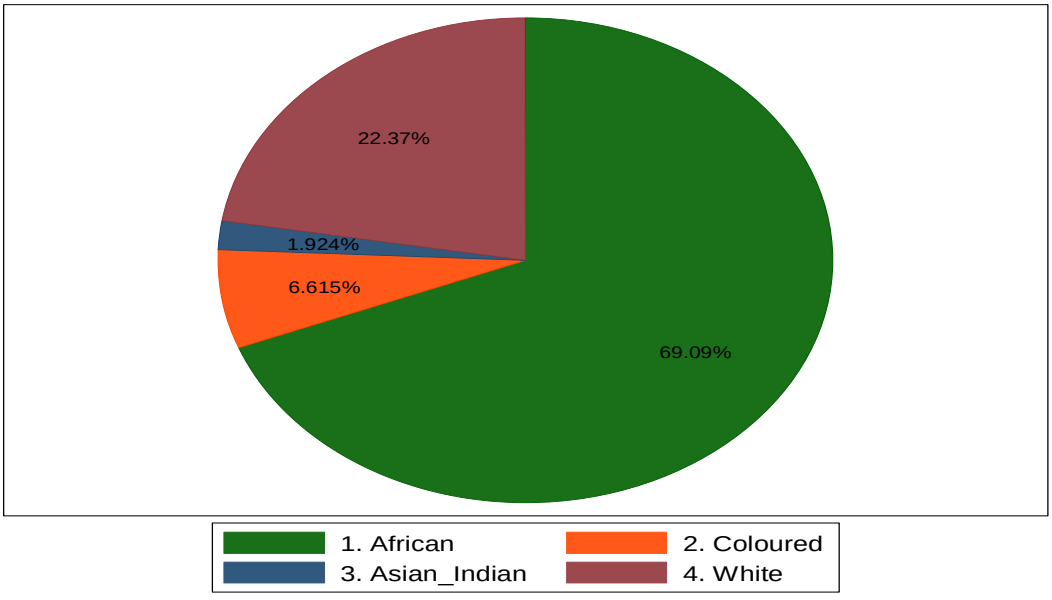

Table 3 presents the distribution of average household monthly remittances. On average a household in Gauteng province receive the highest monthly remittances of close to R2500 and a household in North West province receives the least with an average of roughly R863 per month. On average any household is South Africa receives an amount of R1230 in monthly remittances.

Table 3: The distribution of average household monthly remittances by province

Province	Average household monthly remittances (R)
Eastern Cape	1393
Free State	920
Gauteng	2491
KwaZulu Natal	1124
Mpumalanga	961
North West	863
Northern Cape	1044
Western Cape	1387
Average	1230

Table 4: Trends in monthly household remittances and the level of education attained

Level of education	Average household monthly remittances (R)
No schooling	1005
Grade 1	-
Grade 2	500
Grade 3	630
Grade 4	575
Grade 5	494
Grade 6	550
Grade 7	1871
Grade 8	762
Grade 9	1455
Grade 10	1130
Grade 11	1020
Grade 12	1683
National Technical Certificate 1	500
National Technical Certificate 2	1875
National Technical Certificate 3	550
Certificate with less than grade 12	1980
Diploma with less than grade 12	2085
Certificate with grade 12	1270
Bachelor degree	1697
Bachelor degree and diploma	2644
Honours degree	1175
Higher degree (Masters or doctorate)	2033
Other	1700
Average	1230

Inferential Analysis: In the first instance, a bivariate analysis was conducted to determine if there was any significant relationship between remittances and the highest level of education attained by a household member. The results are presented in the Tables 5. The null hypothesis of the independence of the remittances variable from the education variable is rejected in favour of the alternative hypotheses of a significant relationship subsisting between the remittances and education variable. The Pearson's chi-squared statistic is significant at the 1% level of significance.

Table 5: Remittances and level of education contingency table

Categorical level of education variable	**Categorical remittances variable** (low, medium and high)			**Total**
	R0-R500	R501-R1000	R1001+	
No schooling	66	31	26	123
Grade 1	3	0	2	5
Grade 2	7	2	2	11
Grade 3	11	10	3	24
Grade 4	26	7	5	38
Grade 5	20	9	3	32
Grade 6	33	5	7	45
Grade 7	46	21	16	83
Grade 8	47	14	24	85
Grade 9	57	20	18	95
Grade 10	66	21	31	118
Grade 11	81	28	33	142
Grade 12	85	41	57	183
National Technical Certificate 1	2	0	0	2
Certificate with less than grade 12	0	1	3	4
Diploma with less than grade 12	1	0	1	2
Certificate with grade 12	12	2	3	17
Diploma with grade 12	3	8	10	21
Bachelor degree	4	1	3	8
Bachelor degree and diploma	0	1	2	3
Honours degree	0	0	1	1
Total	570	222	250	1042
Pearson's chi-squared (40) = 68.48Probability = 0.003				

In the second instance bivariate analysis was conducted to determine if there was any significant relationship between the remittances and the household income variables. The results are documented in Table 6. Similarly, the null hypothesis of the independence of household income on the remittances is rejected in favour of a relationship subsisting between household income and remittances. The Pearson's test statistic is highly significant at the 1% level of significance.

Table 6: Household income and remittances contingency table

Categorical household income variable (low, medium and high)	**Categorical remittances variable** (low, medium and high)			**Total**
	R0-R500	R501-R1000	R1001+	
R0-R500	56	0	0	56
	100.00	0.00	0.00	100.00
R501-R1000	105	38	0	143
	73.43	26.57	0.00	100.00
R1001+	411	186	250	847
	48.52	21.96	29.52	100.00
Total	572	224	250	1046
	54.68	21.41	23.90	100.00
Pearson's chi-squared (4) = 108.72	**Probability = 0.0000**			

The correlation matrix of the variables of interest is documented in Table 7. The household variable is highly correlated to the remittances variable which is further evidence of the strong relationship that exists between household income and remittances. Education is lowly correlated to the remittance as well as the income variables.

Table 7: Correlation Matrix

Variable	Household income	Remittances	Level of education
Household income	1.0000		
Remittances	0.6355	1.0000	
Level of education	0.0645	0.0308	1.0000

Finally, a linear regression model was estimated with the household income variable regressed on the remittances variable. The results are documented in Table 8. It was established that the remittances variable is positively related to the household income variable and the results is highly statistically significant at the 1% level of significance.

Table 8: Regression Analysis

household income	coefficient	t-statistic	p-value
Remittances	1.052	26.5	0.000
Constant	200.9	5.24	0.000
Adjusted R-squared	0.4047		
F-statistic	354.87		
Number of observations	1042		

5. Conclusion and Policy Recommendations

The present article seeks to establish the relative importance of remittances at a micro-level in South Africa. It was demonstrated that remittances constitute a significant source of income for households in South Africa. Their importance is highest amongst the African households and the least amongst the Indian households. Further, it was established that KwaZulu-Natal Province receives the most remittances, accounting for 25.43%, whereas Free State Province receives the least remittances accounting for just close to 4% of the total. It was also demonstrated that household income is dependent on migrant worker remittance. Further it was also established that the quantum of remittances is dependent on the level of education of the household member who is remitting. Though not strong, it seems that there is a weak relationship between the level of education attained by a member of a household and the level of remittances received. We have reason to believe that the highly educated the migrant worker, the more they can afford to remit. In light of the foregoing, it is imperative that by way of policy advice, the South African government pursue policies that will further buttress migrant worker remittances. Arguably, promoting access to financial services and the streamlining of regulations can be a viable policy instrument that will induce inward remittances into South Africa. The other policy instrument to consider is to create an environment that facilitates the attainment of tertiary education. Arguably, with higher levels of educational attainment, South African labour would become competitive in the diaspora and hence incentivising migration. The higher the level of education of the migrant labour, the higher the level of remittances they will be able to channel back to the South African economy.

References

Adenutsi, D. E. (2011). Financial development, international migrant remittances and endogenous growth in Ghana. *Studies in Economics and Finance*, 28(1), 68-89.

Aggarwal, R., Demirgüç-Kunt, A. & Pería, M. S. M. (2011). Do remittances promote financial development? *Journal of Development Economics,* 96(2), 255-264.

Bayar, Y. (2015). Impact of Remittances on the Economic Growth in the Transitional Economies of the European Union. *Economic Insights-Trends & Challenges*, 67(3), 1-10.

Brown, R. P., Carmignani, F. & Fayad, G. (2013). Migrants' Remittances and Financial Development: Macro-and Micro-Level Evidence of a Perverse Relationship. *The World Economy,* 36(5), 636-660.

Coulibaly, D. (2015). Remittances and financial development in Sub-Saharan African countries: A system approach. *Economic Modelling*, 45, 249-258.

Giuliano, P. & Ruiz-Arranz, M. (2009). Remittances, financial development and growth. *Journal of Development Economics*, 90(1), 144-152.

Jawaid, S. T. & Raza, S. A. (2012). Workers' remittances and economic growth in China and Korea: an empirical analysis. *Journal of Chinese Economic and Foreign Trade Studies,* 5(3), 185-193.

Kalaj, E. H. (2015). Effects of remittance flows on the school attainment of household members left behind. *Academic Journal of Interdisciplinary Studies*, 3(6), 527.

Karikari, N. K., Mensah, S. & Harvey, S. K. (2016). Do remittances promote financial development in Africa? *Springer Plus*, 5(1), 1-21.

McKinnon, R. I. (1973). Money and capital in economic development. Brookings Institution Press.

Mundaca, B. G. (2009). Remittances, financial market development, and economic growth: the case of Latin America and the Caribbean. *Review of Development Economics,* 13(2), 288-303.

Naanwaab, C. & Yeboah, O. A. (2013). Migrant remittances and human capital investments. *Review of Applied Socio-Economic Research*, *6*(2), 191-202.

Ngoma, A. L. & Ismail, N. W. (2013). Do migrant remittances promote human capital formation? Evidence from 89 developing countries. *Migration and Development*, 2(1), 106-116.

Nyamongo, E. M., Misati, R. N., Kipyegon, L. & Ndirangu, L. (2012). Remittances, financial development and economic growth in Africa. *Journal of Economics and Business,* 64(3), 240-260.

Ratha, D., Eigen-Zucchi, C. & Plaza, S. (2016). Migration and Remittances Factbook 2016. World Bank Publications.

Salahuddin, M. & Gow, J. (2015). The relationship between economic growth and remittances in the presence of cross-sectional dependence. *The Journal of Developing Areas*, 49(1), 207-221.

Salas, V. B. (2014). International remittances and human capital formation. *World Development*, 59, 224-237.

Schumpeter, J. A. (1912). The theory of economic development, Joseph Alois Schumpeter, 61-116.

Sibindi, A. B. (2014). Remittances, financial development and economic growth: empirical evidence from Lesotho. *Journal of Governance and Regulation*, 3(4),116-124.

Siddique, A., Selvanathan, E. A. & Selvanathan, S. (2012). Remittances and economic growth: empirical evidence from Bangladesh, India and Sri Lanka. *Journal of Development Studies,* 48(8), 1045-1062.

Uddin, G. S. & Sjö, B. (2013). Remittances, financial development and economic growth in Bangladesh. *South Asia Economic Journal,* 14(2), 261-273.

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Integration of Information and Communication Technology into Women Entrepreneurship in Uyo, Nigeria

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Abstract: Globally, entrepreneurship has steadily become the leading trend associated with growth regionally as well as nationally. It has lent itself to the significant and sustainable development of locally available resources and of human and social capital. More so, the establishment of microenterprises, together with small and medium scale businesses by women, is the most recognizable route to job creation, poverty alleviation, family well-being and women empowerment; apart from the social benefits accrued and direct impact to the community and environment. Unfortunately, despite the substantial resources invested by national and regional governments, international development organizations and other stakeholders for the enhancement of women entrepreneurship, several constraints still prevent women from attaining optimal performance in terms of business growth, annual turnover, and market capitalization. The use of information and communications technologies (ICT) has been suggested as another appropriate medium to assist with some of these challenges. A total number of 50 targeted female entrepreneurs in Uyo metropolis, Nigeria, were purposively sampled to take part in this study. Quantitative research design using semi-structured questionnaires was used to explore the influence of ICT on the entrepreneurial activities of female entrepreneurs. Descriptive and inferential statistics were adopted to interpret the primary data. Binary Logistics Regression resulted in Wald value =1.353 and p=.245, which is >> .05. The Wald chi-square test led to the rejection of the null hypothesis because of the *p*-value. Therefore, the leveraging of ICT tools did not have a significant effect on entrepreneurial activities among women entrepreneurs in the educational sector.

Keywords: *Gender ICT use, Women entrepreneurship, Enterprise development, SMEs, Information Communication Technology*

1. Introduction

The interplay of market forces and human entrepreneurial activities brings about enterprise formation. The enterprises that are created lead to economic development, employment opportunities, poverty alleviation, wealth generation and accumulation, social inclusion together with the economic well-being of the citizenry (UNCTAD, 2011). Gaps resulting from these dynamic activities lead entrepreneurs to innovatively invent products and/or services to exploit inherent opportunities in the marketplace. Unfortunately, in less developed economies (those of Latin America and the Caribbean, sub-Saharan Africa, North Africa and the Middle East, Eastern Europe and Central Asia), women entrepreneurship has underperformed despite available institutional support (Du Rietz & Henrekson, 2000; Anna et al.,1999; Vossenberg, 2013). Statistically, women see no compelling motivation to be entrepreneurs (ADB, 2014), but when they eventually do, they aggregate to the informal sector, stay small in size, generating less income with fewer staff under their employment (ADB 2014; Carter & Shaw, 2006; Sabarwal & Terrell, 2008; Vossenberg, 2013).

Globally, women entrepreneurship is growing at a faster rate compared to their male counterparts (Global Entrepreneurship 2014 Women's Report cited by Pofeldt in Forbes, 2015). In advanced economies such as Canada, the aggregate contribution of female majority-owned SMEs in 2012 resulted in a CD$130billion net economic activity, or 7% of GDP (Cooper, 2013) as reported in RBC Economics (2013), but then 86% of female-owned SMEs are in certain sectors (professional services, accommodation and food services). A 2011 Survey on Financing SMEs (fewer than 500 employees and between CD$ 30,000 and CD$500 million in revenues) found that women were more likely to own smaller businesses (1-99 employees), than medium-sized ones (Toronto-Dominion, 2015). Undoubtedly, therefore, the improvement of entrepreneurial uptake among women can assist countries to increase their GDP, numbers of people underemployment, and the rapid bridging of the gender divide (ADB, 2014). Thus there is evidence that women-owned businesses contribute substantially to a nation's GDP.

Rather disappointingly, women continue to be under-represented in business environments (looking at the self-employed or as owners of SMEs), have a lower turnover in terms of revenues and number of employees [typically 1-4] (Toronto-Dominion, 2015). According to RBC Economics (2013), this under-representation is as a result of (1) the inability to 'maintain sufficient cash flow'; (2) not recruiting and retaining skilled staff; (3) rising cost of inputs and instability of customer demand. Owing to these, developing economies, Nigeria included, will not derive the full benefits accruing from entrepreneurship (National Policy on MSMEs 2015). Even though these challenges are experienced by both men and women entrepreneurs, unfortunately, women entrepreneurs experience far greater challenges than men (Carter & Shaw 2006; Ekpenyong, 2014; KSC, 2010; Matsoso & Iwu, 2016; Mandipaka, 2014), in all aspects of enterprise operation. The "mobile revolution," brought about by information and communication technology (ICT) is responsible for the 'knowledge economy' which has transformed information into an asset to be traded and bought (Modinogale & Kroeze, 2011).

The high growth in the US economy during the 1990s is reported to have been due to the early introduction of ICT (Lucchetti & Sterlacchini, 2004), and proper leveraging of ICT is a driver of economic growth (Galloway & Mochrie, 2005; Handzic, 2004). On the whole, information becomes an asset enabling small and medium scale businesses to become competitive (Mutula & Van Brakel, 2006) in the new economy. However, SMEs in developing economies are disadvantaged owing to lack of proper ICT infrastructure, together with the necessary skills and expertise required to properly integrate ICT tools into daily business operations. Mutula and Van Brakel (2006) opine that "the ability of SMEs to survive in an increasingly competitive global environment is largely predicated upon their capacity to leverage information as a resource." In cognizance of this perspective therefore, it becomes imperative for SMEs to leverage ICT tools in the daily operation of their enterprises for maximum benefits. Essentially, the application of ICT in business has assisted in addressing issues of inequality, market access and positioning. Specifically, ICT usage has led to the 'reappraisal' of the traditional role accorded to women in the society (Afrah & Tabiha, 2017; Maier & Reichert, 2008).

Thus, utilizing ICT locally, women can prepare letters and memos, reports, store and retrieve data, analyze and plan their budget, make decisions, and solve problems (Ndubisi & Kahraman, 2005); as well as access information on business development, better production technologies, compliances, market and pricing information, forecast and training (UNCTAD, 2014).Women entrepreneurs who rely on ICT thus become uniquely positioned to overcoming the many constraints [limited mobility, balancing work-life interphase, low skills and management expertise, lack of supportive business information, inadequate training, inability to access finance/credit, lack of previous experiences in business type] (ADB, 2014; UNCTAD, 2014), encountered in business operation. The additional self-confidence makes them counter gender bias and stereotyping due to cultural and traditional misconceptions the society places on women, giving them quick access to the supply chain, customers, financial and legal institutions, and management skills (Hisrich & O'Brien, 1981; Motilewa. Onakoya & Oke, 2015; UNCTAD, 2014).

The integration of ICT into women-owned businesses can however suffer due to lower purchasing power and several other factors. In fact, the Irish Small and Medium Enterprises Association (ISMEA) Report (2015), states that: "Entrepreneurship, science and technology, innovation and inventions are concepts mostly associated with men and male areas making these fields less attractive to women, resulting in women-related ventures, invention and innovation being less recognized as valuable business ideas." Apparently, this "digital divide" means that fewer women are integrated into the 'knowledge economy.' Therefore, in this regard, most female entrepreneurs cannot benefit fully from leveraging ICTs to business venturing due to this limitation. However, several reports (UNCTAD, 2010; UNCTAD, 2014; ADB, 2014) are of the consensus that leveraging ICT tools carry enormous benefits for women.

The Research Problem: ICT encompasses communication devices (television, radio, cellular phones, satellite systems, computer and network software and hardware), together with applications and services that come with them (Rouse 2005). Simply put, it implies any technology that can aid in information capturing, processing and transmission electronically (Ahmed, Ibrahim & Oye, 2011). Dutta and Bilbao-Osorio (2012) opine that ICT involves technology used to handle information and communication. In reference to this study, ICT tools imply TVs, radios, cellular phones, and computers. The target population purposively chosen for this study necessitates the limitation imposed on ICT tools. On the whole, SMEs are being created in developing

economies by both men and women. However, for female entrepreneurs issue arise with daily running of enterprises (Beverley & Atsese, 2004), as well as persistent problems with adaptation of advanced technology into daily business operations (Beverley & Atsese, 2004), leading to lower customer base, lower growth and profitability, diversification into other businesses hampered, questionable sustainability and longevity of the enterprises (Olasanmi, Ayoola & Kareem-Ojo, 2012).

Relatively, only a small number of female entrepreneurs in developing countries do have exposure to ICTs (Tonetti, 2001), statistically implying a lower number of women using ICTs/or are digitally empowered. Some of these predicaments are highlighted below: "Women don't have as much access to the technology, so we have to make a special effort to increase women's access to ICTs" - Jens Karberg (ILO/UNCTAD 2014). "Information is power to a woman entrepreneur, and one of the best tools for a woman entrepreneur is providing internet services, secretarial services and telecenters ... We need special consideration for women's groups, to have specific telecenters which address the needs of women. ... And while women are aware of the challenges they face among themselves, we need men who are policymakers to hear the voices of women." – Achamyelesh Ashenafi, President, Addis Ababa Women Entrepreneurs Association, Ethiopia and Managing Director, Konimix Trading (ILO/UNCTAD 2014). In Nigeria and particularly AkwaIbom State, limited studies detailing the impact of ICTs on women entrepreneurship have been published. Generally, in advanced systems, studies show a positive impact on women entrepreneurial activities. Therefore, this study seeks to explore if the added advantages and benefits from using ICT tools reported in the literature, do have similar effects on female entrepreneurs in Uyo, AkwaIbom State, Nigeria. Considering the above, we asked this pertinent question:

Research question: "Does the use of ICT tools (TVs, radios, mobile phones, and computers) have a positive benefit on business performance indicators," for female entrepreneurs in Uyo, AkwaIbom State, Nigeria? The performance indicator this paper addresses is annual turnover owing to reports that utilization of ICT tools positively impacted finances of businesses in developing economies (UNCTAD, 2014; ADB, 2014). This basically means that ICT tools judiciously utilized in rural communities help female entrepreneurs overcome cultural, institutional and traditional stereotypes that impede entrepreneurial activities including the sourcing of funds.

Research objectives: In a study targeting female entrepreneurs in southern Malaysia, Alam, Jani and Omar (2011), were of the opinion that innovation through ICT usage had no impact or direct bearings on the success of female entrepreneurs in southern Malaysia. They suggested that the nexus between ICT and women's entrepreneurship could be applied to other cultures and nationalities. But in an opposing view Aleke, Ojiako and Wainwright (2011), studying the diffusion of e-commerce technology to small-scale Agribusiness in Nigeria, empirically found among local actors in Agribusinesses, the perception that ICTs influenced the development of business processes and the way existing processes could be further organized and enhanced. Also Moteliwa, Onakoya and Oke (2015) reported (in the Nigerian context), improved access to finance, ability to overcome cultural and educational challenges that impede business performance, freedom from time poverty, and ability of female entrepreneurs to operate "anywhere-anytime' business where time, space and distances were irrelevant due to ICT usage. The technical report by ILO/UNCTAD (2014) numerated possible indicators/measurements for the determination of a successful female entrepreneur to include: (a) ability of any female entrepreneur to overcome the challenge of the time imposed on her due to family responsibilities. Thus she should be able to balance her work-life responsibilities; (b) financial independence through acquired skills free of family pressures and impositions. Independent of family help, she earns enough for herself and family upkeep; (c) easy access to supply chain, customer base and value chain, together with availability of finance for business growth and expansion, (d) increased literacy rate and acquisition of educational skills due to appropriate social networking and business education, (e) global footprint from international contracts and recognition. Therefore, this study set out to achieve the following objectives: Evaluate the extent that women entrepreneurial activities are enhanced/or limited by the utilization of ICT, and What incentives are available to increase and/or improve on the numbers of women integrating ICTs into business venturing.

Research hypothesis: The following hypotheses were tested in this study:

Ho_1 Work-life activities have been significantly improved by the utilization of ICT in business operations. Ho_2 Entrepreneurial activities have been significantly improved by the utilization of ICT in daily enterprise venturing. The next section reviews literature in the following order: we chose our operational definition of SME from the one offered by the Small and Medium Enterprises Development Agency of Nigeria/National Bureau of Statistics (SMEDAN/NBS, 2013) as contained in the National Policy on MSMEs (2015-2025). Women entrepreneurship within the context of Nigeria and their overall features in the SME ecosystem is also examined. Thereafter, we reviewed the literature on ICT and its challenges to female entrepreneurs. This is followed by the section on methodology and analysis. The last section covers limitation of the study and future research areas, conclusion and recommendation.

2. Literature Review

SME definition: The term Small and Medium Enterprises (SMEs) is wide-ranging in definitions and can be described per country and type of economy (Ayyagari, Beck & Demirguc-Kunt, 2007) one is dealing with. Ward (2018) opines that SMEs can also be characterized using a number of employees, annual sales, assets or a combination of the above. Generally, the number of employees, number of working hours, annual turnover, annual balance sheet or production volume, and company independence form the yardstick. However, the number of employees and annual turnover seems to be the criteria adopted by most countries and since it is economy/country dependent, cross country generalization is difficult (Harjula, 2008). For the purpose of this study, the characterization of an SME by the Small and Medium Enterprises Development Agency of Nigeria/National Bureau of Statistics (SMEDAN/NBS, 2013) as contained in the National Policy on MSMEs (2015-2025) suffices: SMEs refer to(1) a micro-enterprise that has less than 10 employees and assets [excluding land and building] less than N5million; (2) small-scale enterprise with less than 99 employees and assets from N5 million to N50 million, (3) medium scale enterprise with 100 to 199 employees and assets of N50 million to less than N500 million.

Women entrepreneurship: Globally, entrepreneurship has been regarded by regional and national governments as the best possible route to economic growth and the sustainable development of locally available resources. The motivation created by way of incentives and legislation by national governments acts as internal stimuli that drive innovation and creativity in the marketplace. This disequilibrium and resultant gaps, introduced into the business environment mean that entrepreneurs (male and female) are incentivized to exploit and maximize business opportunities for their benefits. Unwittingly and unknowingly, women that venture out due to opportunities created and out of necessity, soon discover that society puts a 'dent' on their creative potential. There are limits to their potential and fundamental human rights (Adebayo, 2015; Amuchi & Asotibe, 2015; Ekpenyong, 2014; Mordi & Okafor 2010). A number of studies have enumerated several constraints facing female entrepreneurs in developing countries (Adebayo, 2015; Carter & Shaw 2006; Ekpenyong 2014; Matsoso & Iwu 2016; Mandipaka, 2014; Richardson, Howarth & Finnegan, 2004; Vossenberg, 2013).

Some of these challenges include: lack of access to finance, inadequate training and lack of information on business type, inability to maintain a proper life-work interface, women safety and gender biased violence, lack of societal support and role models, absence of social networks, outright discrimination due to gender bias and stereotyping, poor infrastructure, no proper legal and managerial advise, inability to access skilled and managerial personnel (Adebayo, 2015; Carter and Shaw, 2006; Ekpenyong 2014; Matsoso & Iwu 2016; KSC, 2010; Mandipaka, 2014; Nsengimana 2017; Richardson, Howarth & Fennigan 2004; Vossenberg, 2013).These constraints-[institutional, systematic, customary, cultural practices, beliefs and norms] all impede women in their entrepreneurial activities (KSC 2010; UNCTAD 2014, ADB 2014). Therefore, most women resort to the informal sector where entry requirements are not stringent; running subsistence businesses (UNCTAD 2014; Vossenberg, 2013); consequently, statistics are not available to help national governments ascertain percentage contributions to GDP (UNCTAD 2014). The informal economy, affords then no legal rights nor social protection, status and recognition. In this age of information and data analytics, there is mounting evidence of a 'gender digital divide' (UNCTAD 2014), due to lower literacy rate, poor skills, no access to computers or the internet, resources, and other factors.

They are missing out on the benefits provided by ICTs (UNCTAD 2014). Despite the inherent problems of ICTs integration and exposure by female entrepreneurs, repeated reports (ILO/UNCTAD 2014; ADB 2014); and studies (Afrah & Fabiha 2017; Akomolafe & Adegun, 2013; Olasanmi, Ayoola & Kareem-Ojo, 2012; Papastothopoulos & Beneki, 2010) show accrued benefits to women entrepreneurship. Martinez and Williams (2010), opine that ICT use by entrepreneurs had innovatively brought about e-commerce, while Amit and Zott (2001) claim that utilizing ICT is a potent force in business venturing. ICT offered female entrepreneurs newer and improved opportunities for starting and growing their enterprises despite institutional, cultural, financial and educational constraints (Motilewa, Onakoya & Oke, 2015).Broadly then, Motilewa, Onakoya and Oke (2015) are of the opinion, that balancing family responsibilities and business enterprising is achievable, together with societal norms and geographical distances confronting female entrepreneurs can be circumvented with the use of ICT tools [mobile phones, emails, video calls and conferencing] (Motilewa, Onakoya & Oke, 2015). ICT offers to these women flexibility, time and resource management, independence and "anywhere-anytime" option of enterprise venturing. Cultural constraints prevalent in certain/most communities and a potent force in "destroying the entrepreneurial spirit," can be the 'initiator' of entrepreneurship (Motilewa, Onakoya & Oke, 2015) for women are free to concentrate on businesses acceptable to their communities such as food and confectionaries, weaving and embroidery, pottery, fashion design, and beauty and health spars.

The feature of Nigeria's SMEs: The Nigerian landscape is dotted with micro, small and medium scale businesses which are operated by both genders (male and female). The rapid creation of micro and small-scale enterprises is due to the fact that start-up cost is low in comparison to larger firms; are reliant on local resources which generate employment for the community; has the tendency for adding value to the national GDP, together with stimulating rural and community development, thus acting as a deterrent for local migration to bigger cities. More so these firms spur entrepreneurial activity in rural communities, increasing the use of liquidity from local savings for productive purposes. Also they act as conduits for raw materials to larger firms, and income generation for local communities (Anamekwe, 2001; National Policy on MSMEs 2015). The operational structural problems of SMEs in Nigeria as outlined by Anamekwe (2001), and further reinforced by National Policy on MSMEs (2015) include:

- Management Problems – The tendency to have all important entrepreneurial and operational decisions made by one person (sole proprietorship), together with the notable absence of either training or updating of management and production skills. Additionally, there is usually no succession plan in place for the transition after the demise of the owner.

- Financing- This features highly on the pressing need of SMEs. The low business credibility, the absence of skilled management, inefficient and antiquated production facilities, limited collateral security, high-risk propensity, high failure and exiting rate, make it almost impossible to raise capital from appropriate and regulated channels. They then resort to other lenders at higher interest rates.

- Most operators and owners of SMEs tend to be imitators rather than innovators.

- The tendency to produce non-standardized goods/ or bridge copyright regulations during production.

- Marketing problems, arising from over-saturation and inadequate market analysis. Also offering products/services which may not be suitable to the particular market, due to lack of awareness of market opportunities/skills.

- A greater proportion of SMEs is concentrated in urban centres and could therefore not benefit from local opportunities e.g. cheap labor, access to primary (raw) materials. The probable reason for this is the poor infrastructure that entrepreneurs have to contend with in rural settings for it brings about added cost to enterprise operation.

- Little access to and or inability to apply new technologies e.g. computers or innovative production technologies. Thus, E-commerce is not considered as part of the business culture. This suggests that the owner makes all the decisions and is responsible for the accrued benefits.

ICT definition: The definitions of ICT can always be contextualized (ICTs in education, healthcare. business or libraries), but can represent any of the following:

- ICT is an encompassing terminology that includes any communication device or application encompassing: radio, television, cellular phones, computer and network [hardware and software], satellite systems, as well as video-conferencing and distance learning (Rouse, 2005).
- The study, design, development, application, implementation, support or management of computer-based information systems. More so a synonym for computers and computer networks, but may be extended to telephones and television (Chandler, Daniel, Munday, Rod, 2011).
- ICT is the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware (United Nations Development Program, 2007). ICT then entails the capability to electronically input, process, store, and output, transmit and receive data and information including text, graphics, sound and video, together with the ability to control machines of all kinds electronically.

In summary then, ICT entails computerization and communications equipment and software necessary for the creation, design, storage, transmitting and manipulation of information in various formats. Hence personal computers, laptops, tablets, mobile phones, transport systems, televisions, and network technologies encompass the array of ICT tools (University of Queensland, Australia, 2012). The myriad definitions of ICTs and SMEs reinforce the "uniqueness of SMEs and the adoption of ICT tools." There is no need for generalization but each individual SME is different and ought to be treated as such (Taylor & Murphy, 2004; Martin & Matlay, 2001). Adopting this premise that SMEs in Nigeria have very little access to modern technologies in terms of ICT tools and the internet, it follows that SMEs in Nigeria are challenged in daily operation and service delivery to their respective clientele.

Benefits of ICTs to SMEs: Several numbers of studies (Afrah & Tabiha, 2017; Ndubisi & Kahraman, 2005; Motilewa, Onakoya & Oke, 2015:101-102; Uluma, 2012; UNDP-APDIP, 2005) have alluded to the benefits that SMEs can have by adopting ICT. These may include (1) enhancement of the production processes because of efficient inventory management systems and lower production wastages; (2) improvements in accounting and budgeting practices, and the ease of information flow and better communication between the different units of the organization, which efficiently improve internal business operations; (3) the ease of connectivity to local and international contracts, leading to improved clientele base through the use of e-commerce. Thus, distances are bridged easily and cheaply, geographic barriers are removed and payments affected with point of sale platforms or e-payments; (4) the potential to outsource contracts to local and global supply chains and (5) a simplified approach to dealing with governmental regulations and taxation regimes. Additionally, according to Berranger and Windrum (2002), commercially, SMEs can benefit significantly due to their ability to extend their geographical reach, reacting swiftly to 'customer need;' procurement, production, and logistics can be effectively handled for cost reductions; huge potential for competitive advantage over global players through improvements in management skills and internal communication.

The internet reduces barriers experienced by new entrants and provides opportunities for small firms to re-orientate their supply chain and then map out new strategic alliances in distant markets; ICT technology helps in the creation of newer and better business models, positioning smaller firms to adapt quickly to changing market environments and earn money from multiple sources. The UN (2002) maintains that ICT enables women to work from home; has the advantage to enable women transition from informal to formal economy; improved global outreach for craftswomen through e-commerce; transformation for gender roles in the community; women having the ability to avoid gender bias by adopting gender-opaque mediums; and increased access of rural women to distant learning and distant work programs. In summary then, ICTs can transform SMEs into information-driven enterprises, assisting them to adapt quickly to the knowledge economy. Businesses have presented the means through the integration of ICTs, a cheap and easy route of capturing and processing information often the domain of electronic transactions (Berranger & Windrum, 2002).

Challenges to Female SMEs adopting ICTs: Lal (2007) in a report on the adoption of ICT by SMEs in Nigeria mentioned poor physical infrastructure as the major limiting factor hindering ICT usage and diffusion among SMEs. Peculiar to developing economies challenge to ICT are legal and regulatory issues, weak ICT strategies;

inadequate research and development; excessive or over-dependence on foreign technologies and major weaknesses in ICT integration and implementation initiatives and policies. Adebayo, Balogun and Kareen (2013); Adenikinju (2005); Apulu and Emmanuel (2011); Lal (2007) Sajuyigbe and Alabi (2012) are of the consensus that lack of infrastructure, lack of funding, exorbitant cost of implementation, absence of awareness as to their benefits, absence of appropriate government policies, lack of skills and training, cultural factors, electricity challenges, corruption, illiteracy, low level of education, acted against the adaptation of ICT tools in business management practices in Nigeria. Maintaining these perspectives, female entrepreneurs are unable to fully exploit the benefits that can accrue from adopting ICT, because of advances made during the past decades and ever-growing ICT technologies available.

More so, since most women entrepreneurs are risk-averse and come from a low capital base, the high cost of ICTs and absence of business and technical skills, pose a serious problem to their integration into daily business operations. A Report from the UN (Division for the Advancement of Women/Department of Economic and Social Affairs 2002), details these problems in an attempt to empower women: a larger percentage of women entrepreneurs work in the informal sector, where institutional support is absent or negligible. The informal sector offers them neither protection nor accountability. In most developing economies, the absence of appropriate infrastructure for conducting e-commerce does not form part of the informal sector. Additionally, the absence of gendered access to neither ICT nor ICT training especially in rural communities not being part of government initiatives, language barriers experienced by women where English is not the mother tongue, and inappropriate information explaining the benefits of ICT integration (UN 2002). Some noted observations are the area where women's economic activities are most concentrated in developing countries is in the informal economy- women working at home on handicrafts and sewing or rolling cigarettes, working in cities as street vendors, - working without any contracts or benefits.

In some developing countries ninety percent of economically- active women are in the informal economy. How can ICT empower women in the informal economy? If ICT is to make a difference in alleviating poverty and improving the well-being of women and their families, it seems to me that this is the crucial area for concentration (Nancy Hafkin, USA 2002; in UN-Division for Advancement of Women). Linda Jones, Canada in (UN –Division for Advancement of Women 2002) the whole question of using ICT in the informal sector is a tough one -- there are issues of access, delivery of information, training, local language and content among others. In Pakistan, and other Islamic countries, the issues are exacerbated by the socio-cultural context. However, these are all issues that have been overcome in one way or another, and so represent challenges rather than absolute impediments. For instance, EmenOkon said, “I work in the Niger Delta region in Nigeria. Women’s economic power has been greatly enhanced by the acquisition of ICT skills. This has enabled many women to gain employment into establishment such as the banks, corporate organizations, computer services, data entry and statistics, internet services providers and many others” (UN-Division for the Advancement of Women, 2002).

Women Light Organization, an NGO that works with female workers has turned out about 30 young women between January and now on computer skills and they are all gainfully self-employed Additionally, SMEs in developing economies do experience internal barriers due to organizational structures within the firm [sole proprietorship limits the leeway the business has for the owner makes all the decisions for the adoption of ICT tools into the business—owner/manager characteristics] (Kapurubandara & Lawson 2006). These SMEs are exposed to other sets of impediments arising from infrastructure (technological, economic), legal, political, social and cultural unique to the country forming external barriers to ICT integration (Kapurubandara & Lawson 2006). These two sets of problems must be addressed (organizational issues can be taken care off within the organization) but external barriers may need intervention from the government for these barriers to fall outside the domain of the firm. More so, firm’s characteristics, inappropriate know-how on use of ICT tools, together with cost and return on investment (Chau & Turner, 2001; Knol & Stroeken, 2001) prevent SMEs from the adoption of this technology.

3. Research Methodology

A positivist philosophical paradigm was adopted in this research to quantitatively justify the findings to either accept or reject the hypotheses developed during the study. A descriptive design helps quantify all the

variables that were introduced during the study. The research instrument consisted of semi-structured questionnaires administered to the respondents. Female-owned private education and training organizations located in Uyo constituted the population. Primarily, to be chosen for this study, the female educational entrepreneur ought to have been in business for at least two years; must be involved in the daily running of the establishment; and must have used some form of information communication technology in the management of the business. These criteria limited the number of respondents and a total of 50 respondents, purposively sampled in Uyo metropolis, AkwaIbom State were finally chosen. The research instrument comprised questions relating to characterization variables of age; educational qualifications, computer ownership, daily exposure to ICT tools (Olasanmi, Ayoola & Kareem-Ojo, 2012). Ethical considerations were taken care of during questionnaire administration. For instance, full consent to participate was obtained from the subjects; they were not required to declare their identities, and they were also informed that they were at liberty to withdraw from the study as well as oblige with answers. The study area is Uyo metropolis in AkwaIbom State. The state is in South Eastern part of Nigeria, Uyo being the state and financial capital. Statistically, Uyo has the largest concentration of SMEs in the State (AkwaIbom State Statistical Year Book 2013), though representation of the total number of female entrepreneurs per business type was not available. This problem was circumvented by purposive sampling. More so, other restraining factors such as poor infrastructure, communication, and electricity to enterprise operation, are minimally reduced. The target population was 100 female entrepreneurs and a purposive sampling designed gave (70), with the eventual generation of primary data from only 50 respondents.

Variable measurement: Women entrepreneurs (entrepreneurial activities) is the dependent variable, examined based on educational level, union affiliation (optional), years in business enterprising, age-group and marital status. The use of ICT tools was the independent variable, determined/measured using mobile phones, computerization, radio and TV adverts (Olasanmi, Ayoola & Kareem-Ojo, 2012). These variables were measured with the help of the research instrument comprising semi-structured questionnaires (Olasanmi, Ayoola & Kareem-Ojo, 2012). The questionnaires were administered after formal notification through telephone calls and short messaging service (SMS), ascertaining the appropriate time and date for questionnaire administration. The questionnaires were left with each respondent for completion and collected after one week.

Data analysis: Data was analyzed using IBM SPSS version 25; the descriptive statistics are given below:

4. Results

The demographics indicate ages ranging from 25 to above 64 years. Essentially, the greater number of female entrepreneurs in this sector, fall between 25 years and 64 years (88%); equally reflected is their marital status which ranged from a single (40%), married (42%), divorced (4%) and widowed (14%). A greater number of female entrepreneurs were either single or married with educational qualifications of SSC/NECO (32%), NCE (24%), BA/BSc (22%) and MA/MSc (14%). Their years of working experience showed a variation ranging from two (2) to twenty-five, but a greater number of these women had 2years (25%), 4years (34%) and 6years (76%) working experience. The family size lends credence to their business involvement/activities for the respondents -family sizes were from one (38%), three (12%), four (6%), five (24%), and six (18%). These women were single and when married with children, they had to be able to deal with family responsibilities. Thus, for the effective running of any enterprise they had to be able to balance life/work responsibilities. Years of ownership of the enterprise varied from 2 years (22%), 3 years (28%) and 4 years (24%); with a number of employees falling between 10 (54%), 12 (14%), and 15 (16%). Legal status indicates that most female entrepreneurs operated a family business (42%) acquired through transference and followed by joint ownership/partnership (30%) either with associates/friends, partners or family members and sole proprietorship (28%%).The rationale for starting a venture varied from self-employment (14%), improvement in financial position/financial independence (12%), dissatisfaction with past employment (28%), filling a gap in the marketplace (8%), to family inheritance (38%). These women therefore operated family-owned businesses in the majority of circumstances

Respondents' use of ICT tools: According to the respondents, 44% of businesses were networked while 56% were not. This showed that most of these women operated business ventures without access to

information and therefore may not benefit from e-commerce. However, the reverse was true in their access to the internet (76%) and only (24%) said no. This might be explained on the basis that probably their mobile devices were connected.

Use of ICT tools in teaching/training of pupils/students: ICT tools form part of the media for training/teaching students and recruitment respectively. 64% of the respondent used ICT for teaching/training, while 36% did not. On the other hand, 88% of students/pupils were recruited by using ICT, and only 12% were not. In this regard, they had utilized other methods such as word of mouth, churches/mosques or social networks and acquaintances. 64% of the respondents also advertised on social media. The demographics reported above are in line with previous studies but closely relates to Adeyemi's findings (2007) that the average Nigerian woman entrepreneur is: "aged 41, well-educated, married with children, grows up in an entrepreneurial environment, has previous work experience of about 8 years, runs a small business that has been operating for about nine years, and of which she is likely to be the sole or majority owner, prefers to have her family member as partner or employees, has her first attempt at starting a business, uses mostly her own savings as start-up capital; was motivated by personal factors when she decided to become an entrepreneur, faced start-up problems such as labor, financing and economic but today, faces increasing economic , labor and cost problems, rates her business as moderately successful" and attributes the success of her business to three qualities, that is quality of product/service, quality of human resources and her own personal qualities".

Respondents' use of ICT in business activities: Trying to rationalize the extent of business activities among female entrepreneurs in Uyo metropolis to understand performance (annual turnover), we observed that 44% agreed to ICT facilitating business venturing, while 26% disagreed with the notion; 30% were undecided. Equally, family responsibilities were easier to deal with (50%), and 24% were not in favor; 26% remained neutral. There is a split down the middle: women that were single (38%) and newly married (12%) giving a total of (50%), may not be in a position where the number of children affected business venturing. There was overwhelming agreement from the respondents on the issue of annual turnover. 64% were in agreement that business activities had been affected in one way or the other by leveraging ICT tools, while 26% did not agree with the question. It would seem logical to note that those who had a negative view of the question may be having problems with the introduction of ICT technology or may not be in any position in the foreseeable future to be predisposed to the use of ICT technology. Similarly, the results show that 60% of the respondents' experienced marked improvements in a number of students recruited which then translated into an annual turnover. Unfortunately, 28% were neutral while 12% saw no noticeable benefits.

Institutional support: For support from government and other institutions, 46% were of the consensus that governmental training was adequate and 28% did not. However, 26% were neutral. This result can be understood when the educational status and age group are factored into the equation for younger entrepreneurs are better educated and more access to general information. Additionally, 52% were of the consensus that government should invest more in infrastructure to facilitate business activities; 36% had the opposite opinion.

Table 1a: Classification Table[a, b], and Variables in the equation

		Predicted Q23 Business enterprising has been facilitated with the use of ICT tools		
Observed		**Yes**	**No**	**Percentage Correct**
Q23 Business enterprising has been facilitated with the use of ICT tools	Yes	0	18	.0
	No	0	24	100.0
Overall Percentage				57.1

Table 1a describes the baseline model (the University of Southampton cited in Restore, n. d.) which excludes the explanatory variable [here denoting the independent/predictor variable-measurable or operationalized and use to predict the outcome] (Restore, n. d.). This research showed that the prediction of the baseline

model [here No], due solely from the fact that the participants did not achieve remarkable improvements in business performance –in terms of annual turnover (18 compared to 24). The overall percentage is 57.1%, invariably the predictor is 57.1% of the time correct [chance occurrence] (Restore, n. d.).

Table 1b: Variables in the equation

Variables in the Equation

		B	S.E.	Wald	Df	p-value	Exp(B)
Step 0	Constant	.288	.312	.851	1	.356	1.333

Accordingly, the variables in the equation are not too important but worth noting that B=0.288, Wald chi square=0.851; df=1; *p*=.358, and Exp(B)=1.333.

Where *p=.356>>0.005.*

Using the *p*-value of .356 above, the study showed that the use of ICT tools significantly does not statistically affect business performance (annual turnover). Therefore, the model is simply a constant predictor of the expected outcome. On the other hand, if we use the results from the variables not in the equation, *p*=.240 which is by far greater than the significant *p*-value of 0.005, there is no significant improvement to the predictor in the baseline model.

Variables not in the Equation

			Score	df	p-value
Step 0	Variables	Use of ICT tools has made business operations easier on me	1.383	1	.240
	Overall Statistics		1.383	1	.240

Table 1c: Omnibus Tests of Model Coefficients and Model Summary

Omnibus Tests of Model Coefficients

		Chi-square	Df	p-value
Step 1	Step	1.397	1	.237
	Block	1.397	1	.237
	Model	1.397	1	.237

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	55.968[a]	.033	.044

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

A new regression model developed which included the exploratory (IV) variable resulted in the Omnibus Tests together with model summary above (Table 1c). The Chi-square values are all similar (1.397) and *p* values of 0 .237 [Cox & Snell R Square= 3.3% and Nagelkerke R Square= 4.4%]. This result shows that there is no significant difference between the Log-likelihoods (-2LLs) of the original and the new model (Restore, n.d.). The model row in Omnibus test compares the new model to the baseline, while the step and block row become relevant when we step-wisely or in a hierarchical manner add the exploratory variables to the original model. Therefore, the omnibus tests show no significant difference between the new and original model and Nagelkerke's $R^2$of 4.4% give outcome variation (Restore, n. d.).

Table 1d: Hosmer and Lemeshow Test

Hosmer and Lemeshow Test

Step	Chi-square	Df	p-value
1	1.955	3	.582

Another result utilizing Hosmer and Leme show test showed a good fit for the model with *p*=.582>>.005. However, Chi-square is sample dependent and *p*-value may change when interaction is performed on our data (Restore, n. d.).

Contingency Table for Hosmer and Lemeshow Test

		Q23 Business enterprising has been facilitated with the use of ICT tools = Yes		Q23 Business enterprising has been facilitated with the use of ICT tools = No		
		Observed	Expected	Observed	Expected	Total
Step 1	1	5	5.573	5	4.427	10
	2	3	2.896	3	3.104	6
	3	7	5.315	6	7.685	13
	4	2	3.389	8	6.611	10
	5	1	.826	2	2.174	3

On the whole, logistic regression on the sample showed no marked significance statistically when ICT was integrated into business venturing.

Table 2: Nonparametric Correlation

Correlations

			Use of ICT has made it possible to operate "anywhere-anytime" business.	Family responsibilities are easier to deal with	I can reach my clients better and easier	I can recruit students easier/better	My financial inheritance/capital outflows are adequate for the daily operations of the business	I have made yearly profits
Spearman's rho	Use of ICT has made it possible to operate "anywhere-anytime" business.	Correlation Coefficient	1.000	.136	.272	.563**	.120	.068
		p-value (2-tailed)	.	.345	.056	.000	.407	.637
		N	50	50	50	50	50	50
	Family responsibilities are easier to deal with	Correlation Coefficient	.136	1.000	.264	.119	.060	.203
		p-value (2-tailed)	.345	.	.064	.412	.681	.158
		N	50	50	50	50	50	50
	I can reach my clients better and easier	Correlation Coefficient	.272	.264	1.000	.389**	-.353*	.178

	p-value (2-tailed)	.056	.064	.	.005	.012	.216
	N	50	50	50	50	50	50
I can recruit students easier/better	Correlation Coefficient	.563**	.119	.389**	1.000	-.202	.298*
	p-value (2-tailed)	.000	.412	.005	.	.159	.036
	N	50	50	50	50	50	50
My financial inheritance/capital outflows are adequate for daily operations of the business	Correlation Coefficient	.120	.060	-.353*	-.202	1.000	-.062
	p-value (2-tailed)	.407	.681	.012	.159	.	.669
	N	50	50	50	50	50	50
I have made yearly profits	Correlation Coefficient	.068	.203	.178	.298*	-.062	1.000
	p-value (2-tailed)	.637	.158	.216	.036	.669	.
	N	50	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Variables in the Equation

		B	S.E.	Wald	df	p-value	Exp(B)
Step 1[a]	Use of ICT tools has made business operations easier on me	.299	.257	1.353	1	.245	1.349
	Constant	-.530	.763	.481	1	.488	.589

a. Variable(s) entered on step 1: Use of ICT tools has made business operations easier on me.

The questionnaire developed to determine the correlation between the dependent variable (women entrepreneurial activities) in AkwaIbom State in relation to the independent variable (leveraging of ICT tools to business venturing) was binary (Yes and No) in nature, hence it was rather not appropriate to use Pearson Correlation Coefficient, r, for this analysis. Rather we performed a nonparametric correlation test and observed two important correlation coefficients at 0.565**, p-value 0.000 moderate correlation (between

ability for recruiting of students and use of ICT tools), and a weak correlation 0.389**; p-value (2-tailed) = 0.005.Due to this limitation, Binary Logistic Regression was used instead of simple linear regression for the study because of the imposition of dichotomy on the dependent variable (Statistics Solutions) Logistic regression normally becomes the acceptable statistical method employed to predict any relationship existing between predictors (independent variables) and a predicted variable (dependent variable which is binary in nature—here Yes/No).

Logistic Regression: Furthermore, the coefficient for the constant (intercept) in the model is .299; the standard error around the coefficient =.257; the Wald chi-square test for the null hypothesis is 1.353; the degrees of freedom is one (1), due to one predictor in the model, here the constant. The "Sig' or p=.245; while the exponentiation of the B coefficient (odds ratio) =1.349. The null hypothesis is rejected because p=.245 which is much greater than .05. (Stats.stackexchange.com) the Wald test ['Wald column], for each independent variable determines the statistical significance (Statistics Laerd), found in the "Sig.' column or *p*-value. Results show that the use of ICT tools for business venturing [Wald=1.353, p=0.245], did not add significantly to the model/prediction. In summary: a logistic regression was carried out to determine the effect of leveraging ICT tools on business venturing among female entrepreneurs in AkwaIbom State, Nigeria; as a result of the introduction of a dichotomy into the question. The logistic regression model was not statistically significant; p=.245 which is >>.05.

Null Hypothesis

r=0 null hypothesis, and
r<>0 alternate hypothesis.

The correlation tests the null hypothesis that the population correlation is zero. In the study, the primary data was generated from 50 samples taken from a larger population. Normally sample outcomes may inherently be different from population outcomes, so finding a non-zero correlation in the sample does not prove that the 2 variables are correlated in the entire population.

Discussion: Results from descriptive statistics on data generated from female entrepreneurs in the educational sector showed a modest benefit from leveraging of ICT tools to business venturing. The rationale for these results can be interpreted from the notion that most of these entrepreneurs were not networked and had ICT tools improperly integrated and functional. The study group consisted of elements much younger in age (below 40 years); 48% family owned, and 30% joint ownership. The respondents were limited in training, per the use of ICT tools, not sensitized enough to know the possible benefits that could accrue to them from the proper integration of ICT. 28% of the businesses were a sole proprietorship, which bestows the element of "uniqueness of SMEs and the adaptation of ICT technology" (Taylor & Murphy, 2004; Martin & Matlay, 2001); here the owner makes all the decisions. On the whole, Lal (2007) cites the major factors limiting ICT usage and diffusion among SMEs in Nigeria as legal and regulatory, weak ICT strategies, major weaknesses in ICT integration and implementation initiatives/policies, lack of funding, lack of adequate infrastructure, the exorbitant cost of implementation.

Additionally, Adebayo, Balogun and Kareen (2013); Adenikinju (2005); Apulu and Emmanuel (2011), opine that absence of awareness as to their potential benefits, absence of appropriate governmental policies, lack of skills and training, cultural factors, electricity challenges, low level of training, acted against the use of ICT tools in business policies in Nigeria. If these perspectives are generally accepted, then the results obtained above do not contradict these observations. It follows then, that a majority of female entrepreneurs are unable to proactively exploit the benefits of ICT technologies. These female entrepreneurs wanted more institutional support from the government by way of investments in infrastructure to enable businesses to thrive and grow remarkably in AkwaIbom State. There should be a standing policy from the government to try to support women in business. The two hypotheses developed to test the significance of this relationship however, were not supported by the Spearman correlation coefficient values generated. Therefore, the alternate hypotheses hold. The limitation of this study was the imposition of certain criteria to be included in the survey group [sample] and concentration of the study on one sector of the economy.

5. Conclusion and Recommendations

This study set out to investigate how female educational entrepreneurs in AkwaIbom State can meaningfully leverage ICT. ICT has been reported in the literature to assist business owners in strategizing and meeting the needs of targeted groups in the market place. Women entrepreneurship has specifically benefited from the leveraging of ICT tools (UNCTAD 2014; ADB 2014) to business venturing. The fact that there was no remarkable correlation between business performance (annual turnover) measured by the number of student intake at the various institutions, does not negate the importance of ICT to business operations. Women entrepreneurship has been part of the public domain for a while now. Governments, researchers, and other stakeholders are beginning to show interest in matters pertaining to female entrepreneurs in developing economies (Etim & Iwu, 2018) ostensibly because of the realization that a vibrant economy calls for inputs from all segments of society. The contributory role of female entrepreneurs to the socio-economic development of their communities therefore calls for continuous attention. We recommend further studies targeting female entrepreneurs in other sectors of the economy before we can generalize any conclusion of ICT to the population. Also, the government and other stakeholders should listen to the plea of women and enact legislation or institute incentives that will spur greater entrepreneurial activities for women in AkwaIbom State. Leveraging of ICT tools (Motilewa, Onakoya & Oke, 2015; UNCTAD, 2014; ADB, 2014) have shown to catalyze women entrepreneurship. Future research could cover male-owned business (male entrepreneurs) in AkwaIbom State. For instance, would ICT enhance or limit male-owned businesses in AkwaIbom State? Studies on the quality of social networks (Aldrich, 1989) can determine business types and disparity between male-owned and female-owned businesses, as well as actual usage of social networks to improve on business performance (Oke, 2013) for female-owned enterprises. The adoption and use of social media for the enhancement of business processes could form a future line of research.

References

Adebayo, O. S., Balogun, O. J. & Kareem, T. S. (2013). An investigative study of the factors affecting the adoption of information and communication technology in small and medium scale enterprises in Oyo State, Nigeria. *International Journal of Business and Management Invention,* 2(9), 13-18.

Adebayo, P. O. (2015). Impact of social-cultural values and individual attributes on women entrepreneurship. *International Journal Management Science and Business Research*, 4(12), 1-12.

Adenikinj, A. (2005). Analysis of the cost of infrastructure failures in a developing economy: the case of the electricity sector in Nigeria. Department of Economics and Centre for Economics and Allied Research, University of Ibadan, Nigeria. AERC Research Paper 148 African Economic Research Consortium, Nairobi.

Adeyemi, S. L. (2007). Nigerian women entrepreneurs and their personality traits. Center Point. *Journal of Intellectual Scientific and Cultural Interests, University of Ilorin, Humanities Edition*, 7, 179-188.

Afrah, S. H. & Fabiha, S. T. (2017). Empowering women entrepreneurs through information and communication technology (ICT). A case study of Bangladesh. *Management,* 7 (1), 1-6.

Ahmed, M. S., Ibrahim, I. & Oye, N. D. (2011). Role of information communication technology (ICT): Implications on unemployment and Nigerian GDP. *Journal of International Academic Research,* 11(1), 1-9.

Akomolafe, C. O. & Adegun, O. A. (2013). Promoting ICT opportunities for women empowerment in Nigeria: Issues and strategies. Retrieved from .http//www.oasis.col.org/bilstream/..../2013_Akomolafe%26Adegun_PromotingICT.pdf.

Alam, S. S., Jani, M. F. M. & Omar, N. A. (2011). An empirical study of success factors of women entrepreneurs in Southern Region in Malaysia. *International Journal of Economics and Finance*, 3 (2), 1-10.

Aldrich, H. (1989). Networking among women entrepreneurs. Hagan, Rivchun, C., & Sexton, D. Eds, Praeger, New York.

Aleke, B., Ojiako, U., & Wainwright, D. W. (2011). ICT adoption in developing countries: Perspectives from small-scale Agribusinesses. *Journal of Enterprise Information Management*, 24(1), 68-84.

Amit, R. & Zott, C. (2001). Value creation in e-business. *Strategic Management Journal*, 22, 493-520.

Amuichie, A. A. & Asotibe, N. P. (2015). Stimulating women potentials through entrepreneurship for national development in Nigeria. *Journal of Poverty, Investment and Developmen*t, 8, 89-93.

Anamekwe, C. (2001). Micro and small-scale industries in Nigeria: Problems and prospects. Paper; presented at workshop on Grassroots Advocacy and Economic Development. September 11-13.

Anna, A. L., Chandler, G. N, Jensen, E., & Mero, N. P. (1999). Women business owners in traditional and non-traditional industries. *Journal of Business Venturing*, 15(3), 270-303.

Apulu, I. & Emmanuel, O. I. (2011). Are Nigerian SMEs effectively utilizing ICT? *International Journal of Business and Management*, 6 (6), 208 – 210.

Asian Development Bank [ADB]. (2014). Information and communication technologies for women entrepreneurs. Prospects and potential in Azerbaijan, Kazakhstan, the Kyrgyz Republic, and Uzbekistan. Retrieved fromhttp://www.adb.org.

Ayyagari, M., Beck, T. & Demirgue-Kunt, A. (2007). Small and medium enterprises across the globe. *Small Business Economics,* 29, 415-434.

Berranger, P. D. & Windrum, P. (2002). Factors affecting the adoption of intranets and extranets by SMEs a UK study. (1st. Ed.) Manchester Metropolitan University, Manchester, ISBN: 1478-8209.

Beverly, M. K. & Atsese, W. (2004). Female entrepreneurs in transitional economies: A comparative study of businesswomen in Nigeria and China, in Proceedings of Hawaii International Conference on Business, 21-24 June, Honolulu, Hawaii, (pp. 4-26).

Carter, S. L. & Shaw, E. (2006). Women business ownership: recent research and policy development [Report] Retrieved from http://strathprints.strath.ac.uk/8962.

Chandler, D. & Munday, R. (2011). A dictionary of media and communication (1st Ed.). Oxford University Press. ISBN-13 9750199568758. Online Version (2016) eISBN: 9780191727979.

Chau, S. B. & Turner P. (2001). A Framework for analyzing factors influencing small to medium-sized enterprises (SMEs) ability to derive benefit from the conduct of web-based' electronic commerce (EC)- 34 Australian case studies, (pp. 623-639). ECIS 2002, June 6-8 Gdansk, Poland.

Cooper, L. (2013). Canadian women grabbing the baton.' Royal Bank of Canada Research. Retrieved from http://www.rbc.com/newsroom/_assets-custom/pdf/women-and-sme-10-2013.pdf.

Du Rietz, A. & Henrekson, M. (2000). Testing the female underperformance hypothesis. *Small Business Economics,* 14(1), 1-10.

Dutta, S., & Bibao-Osorio, B. (2012). The global information technology Report 2012: Living in a hyper-connected world. World Economic Forum. Retrieved from http://www3.weforum.org/docs/Global_IT_Report_2012.pdf.

Ekpenyong, S. N. (2014). Women entrepreneurship in micro, small and medium scale enterprises in AkwaIbom State. *Journal of Business and Management*, 16 (3), 08-13.

Etim, E. S. & Iwu, C. G. (2018). A descriptive review of the continued marginalization of female entrepreneurs in sub-Saharan Africa. (in press).

Galloway, L. & Mochrie, R. (2005). The use of ICT in rural firms: A policy-orientated review. *Emerald Group Publishing Limited*, 7(3), 33-46.

Global Entrepreneurship Monitor. (2012). Global Report (2012) Retrieved from http://www.gemconsortium.org/report.

Global Entrepreneurship Women's Report. (2014). Women's entrepreneurship and innovation surge globally cited by Pofeldt Elaine in Forbes, 2015. Retrieved from https:www.forbes.com/sites/elainepofeldt/2015/11/27/womens-entrepreneurship-and-innovation-surge-globally/#6734d7e70e7a.

Goswami, A. & Dutta, S. (2015). ICT in women entrepreneurial firms. A literature review. *Journal of Business and Management,* 17(2), 38-41.

Handzic, M. (2004). Knowledge management: Through the technology looking glass. World Scientific, Singapore, 2004.

Harjula, H. (2008). Scoping study on the inclusion of release and transfers from small and medium-sized enterprises (SMEs) in PRTRs, environment and directorate. OECD, Paris, France.

Hisrich, R. D. & O'Brien, M. (1981). The woman entrepreneur from a business and sociological perspective. Proceedings of the Conference on Entrepreneurship, Babson College, Wellesley, MA. 1981

ILO/UNCTAD Report. (2014). Empowering women entrepreneurs through information and communications technologies A practical guide.

ISME Report. (2015). Irish Small and Medium Enterprises Association: Women entrepreneurs, women in technology, skills need and balanced regional development. ISME Presentation to Joint committee on

Jobs, Enterprise and Innovation. Retrieved from: https://www.isme.ie/assets/15041-joc-Presentation-Women-ent-etc-pdf.

Kapurubandara, M. & Lawson, R. (2006). Barriers to adopting ICT and e-commerce with SMEs in developing countries: An exploratory study in Sri Lanka. Proceedings of the 2006 Collector.

Knol, W. H. C. & Stroeken, J. H. M. (2001). The diffusion and adoption of information technology in small- and medium-sized enterprises through IT Scenarios. *Journal Technology Analysis & Strategic Management,* 13(2), 227-246.

Lal, K. (2007). Globalization and adoption of ICTs in Nigerian SMEs, *Science, Technology Society*, 12(2), 217-244.

Lucchetti, R. & Sterlacchini, A. (2004). The adoption of ICT among SMEs. Evidence from an Italian survey. *Small Business Economics,* 23(2), 151-168.

Maier, S. & Reichert, U. N. (2008). Empowering women through ICT-based business initiatives: An overview of best practices in e-commerce/e-retailing projects. *MIT Press,* 4(2), 43-60.

Mandipaka, F. (2014). An investigation of the challenges faced by women entrepreneurs in developing countries: A case of King Williams' Town, South Africa. *Mediterranean Journal of Social Sciences,* 5(27), 1187-1193.

Martin, L. M. & Matlay, H. (2001). '"Blanket" Approaches to promoting ICT in small firms: Some lessons from the DTI Ladder Adoption Model in the UK,' *Internet Research: Electronic Networking Application and Policy,* 11(5), 399-410.

Martinez, C. A. & Williams, C. (2010). National institutions. Entrepreneurship and global ICT adoption: A cross-country test of competing theories. *Journal of Electronic Commerce Research,* 11(1), 73-91.

Matsoso, M. L. & Iwu, C. G. (2016). Women and small-scale entrepreneurship: Perspective from the SADEC region. eBook*, Sense Publications*, 197-213.

Modinogale, L. & Kroeze, J. H. (2011). The role of ICT within small and medium enterprises in Gauteng Communications of the IBIMA Vol. 2011 Article ID 369288, pp. 12 Retrieved from http://www.ibimapublishing.com/journals/CIBIMA/cibima.html.

Mordi, C. & Okafor, C. (2010). Women Entrepreneurship Development in Nigeria: the effect of environmental factors. The *Petroleum-Gas University of Ploiesti*, (4), 43-52.

Mutula, S, & Van Brakel, P. (2006). Readiness of SMEs in the ICT sector in Botswana with respect to information access. Emerald. Retrieved from https//www.emeraldinsight.com/.../published/emeraldfulltextarticle/pdf/2630240310_ref.html

Motilewa, B. D., Onakoya, A. O. & Oke, A. O. (2015). ICT and gender-specific challenges faced by female entrepreneurs in Nigeria. International Journal of Business and Social Sciences, 6(3), 97-105.

Ndubisi, N. O. & Kahraman, C. (2005). Malaysian women entrepreneurs: understanding the ICT usage behaviors and drivers*. Journal of Enterprise Information Management*, 18(6), 721-739.

Nsegimana, S. (2017). Challenges to women entrepreneurship in Kigali, Rwanda. MTech Thesis. Cape Peninsula University of Technology, South Africa.

Oke, D. F. (2013). The effect of social network on women entrepreneurs in Nigeria: A case study of Ado-Ekiti Small Scale Enterprise. *International Journal of Education and Research,* 1(11), 1-14.

Olasanmi, O. O., Ayoola, T. & Kareem-Ojo, M. J. (2012). Evaluation of ICT use among women entrepreneurs in the Nigerian Garment Industry. *International Journal of Management & Business Studies*, 2(1), 7-12.

Papastathopoulos, A. & Beneki C. (2010). Does entrepreneurial experience and strategy really matter for ICT performance? A Greek cross-border empirical study, *The Electronic Journal Information Systems Evaluation,* 13(2), 177-186.

Pofeldt, E. (2015). Women's entrepreneurship and innovation surge globally in Forbes. Available at; https://www.forbes.com/sites/elainepofeldt/2015/11/27/women-entrepreneurship-and-innovation-surge-globsslly/#76bfda4c70e7.

Richardson, P., Howarth, R. & Finnegan, G. (2004). SEED Working Paper No 47. The challenges of growing small businesses: Insights from women entrepreneurs in Africa, International Labor Office, Geneva.

Rouse, M. (2005). ICT definition. Retrieved from https://collegeassignments.wordpress.com.

RBC Economics. (2013). Canadian women grabbing the baton. Retrieved from https://www.rbc.com/economics/economicreports/pdf/otherreports/canadianwomengrabbingthebaton.pdf.

Restore, (n. d.). Using statistical regression methods in education research. Retrieved from www.restore.ac.uk/srme/www/fac/soc/wie/research-new/srme/modules/mod4/12/index.html

Sajuyigbe, A. S. & Alabi, E. (2012). Impact of information and communication technology in selected small and medium enterprises in Osogbo metropolis, Nigeria. *Journal of School of Communication and Information Technology*, *Federal Polytechnic, Offa, Osun State*, 3(1).

Sebarwal, S. & Terreli, K. (2008). Does gender matter for firm performance? Evidence from Eastern Europe and Central Asia, IZA Discussion Paper No 3758.

SMEDAN/NBS. (2013). Small and Medium Enterprises Development Agency of Nigeria and National Bureau of Statistics, in Nigeria's National Policy on MSMES 2015-2025.

Southern, A. & Tilley, F. (2000). Small firms and information and communication technologies (ICTs): Toward a typology of ICTs usage, *New Technology, Work and Employment*, 15(2), 138-154.

Statistics Laerd. Available at: www statisticslaerd.com.

Statistics Solution. Available at www.statisticssolution.com/spss

Taylor, M. & Murphy, A. (2004). SMEs and e-business. *Journal of Small Business and Enterprise Development,* 11(3), 280-289.

The University of Queensland, Australia. (2012). Available at: http://www.uq.edu.au/ICT/what-is-ICT.

Tonetti, B. R. (2001). ICT for women entrepreneurship in Asia-Pacific. Expert Group Meeting on ICT policy from a gender perspective. December 18th -19th, Asian Pacific Centre for Transfer of Technology (APCTT).

Toronto-Dominion (TD) Bank, Canada. (2015). Canadian women leading the charge into entrepreneurship. TD Special Report, 2015. Retrieved from https://www.td.com/document/PDF/economics/special/WomenEntrepreneurs.pdf

Uluma, N. B. (2012). Extent of ICT utilization among women in Mumias Division, Kenya, *International Journal of Social Science and Humanities,* 1(1), 22-25.

UNCTAD, (2010). World Investment/Trade and Development Report, New York, and Geneva.

UNDP-APDIP, (2005). United Nations Development Program-Asia Pacific Development Information Program. Initiated jointly by UNDP's Asia-Pacific Development Information Program (APDIP) and Asia-Pacific Regional Human Development Reports Initiative (APRI), the Report makes a significant contribution to our understanding of the potential and challenges of using ICTs to achieve human development

United Nations Conference on Trade and Development (UNCTAD). (2011). Information Economy Report 2011: ICTs as an enabler for private sector development, 2011. Geneva. Available at http://unctad.org/en/ Publications Library/ier2011_en.pdf.

UNCTAD, 2014. Empowering women entrepreneurs through information and communications technologies. A practical guide. UNCTAD/DTL/STICT/2013/2/Rev.1. 2014 Retrieved at unctad.org/en/Publications Library/dtlstict2013d2_en.pdf.

UN-Division for the Advancement of Women [On line Discussion]. (2002). Information and communication technologies and their impact on and use as an instrument for the advancement and empowerment of women. Available at https//www.un.org/womenwatch/daw/egm/ict2002/report/weel1.html

USAID Knowledge Services Center [KSC]. (2010). Constraints to Female Entrepreneurship in Sub-Saharan Africa, June 17, 2010.

Vossenberg, S. (2013). Women Entrepreneurship Promotion in Developing Countries: What explains the gender gap in entrepreneurship and how to close it? Maastricht School of Management, PO Box 1203, 6201 BE Maastricht, Nederland.

Ward, S. (2018). What are SMEs? Available at: https://www.thebalance.com/sme-small-to-medium-enterprise-definition-2947962.

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Efficiency Estimates of Public Health Center II Facilities in Southwestern Uganda

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Abstract: The study estimates the efficiency of public health centre II (HCII) facilities in Southwestern Uganda. Specifically, it determines the level of technical efficiency (TE), scale efficiency (SE) and estimates the economic savings required to make inefficient public health facilities efficient. An output-oriented Data Envelopment Analysis (DEA) is employed in the estimation of TE and SE. It was found out that 73 % of the HCIIs were technically inefficient while 27% were technically efficient. Mean TE stood at 72.3% implying that an average HCII could potentially improve its efficiency by increasing its outputs by 27.7%. In addition, 77% of the facilities were SE implying that they obtained the most productive scale size given the input-output combination. 23% of the facilities were scaled inefficient implying that they have more input waste attributable to their size. There is great potential for economic savings shown by different magnitudes of input reductions and output augmentations required to make inefficient facilities efficient. The study has important policy implications. The health sector should embark on rigorous periodic research and development to enhance healthcare delivery efficiently. Since the health units are small, there is a need to augment their scale sizes and improve on their management practices so as to enhance their overall productivity and efficiency. Stakeholders should scale up efforts to attract, align skills with needs and improve retention and motivation of the health workforce. Holistic investment in resource inputs is essential. A comprehensive monitoring and evaluation plan with key verifiable indicators to monitor the overall health sector performance is required.

Keywords: *Technical Efficiency, Scale Efficiency, Economic Savings, Health Center II, DEA*

1. Introduction

"Health is wealth" …. asserts the common saying. Health is a human right that has an intrinsic value and the economic case for investing in health is robust. Globally, a significant proportion of the nation's wealth is devoted to health. This is because improving health status and reducing exposure to diseases, maintaining and promoting mental and physical abilities are considered as necessary and sufficient conditions for improving human welfare (Makheti, 2017). Health plays an important role in the growth and economic development of countries through improving labor productivity, reducing the financial burden of diseases and saving health care resources (Bahadori et al., 2016). The major constraint facing most countries' health care system is the shortage of health resource inputs arising from their high costs and thus there is urgent need to ensure that the allocated resources are efficiently utilized (Farzianpour et al., 2016; Bundi, 2018). Thus a key policy challenge for the countries is to improve the outcomes of the healthcare system while containing costs of healthcare. Doing so requires measuring health system efficiency and assessing how better the health system resources are employed to produce health services (Molem et al., 2017).

However, WHO (2010) estimates indicate that about the US $300 billion (40% of health spending) is wasted annually due to health system inefficiencies suggesting that substantial cost-saving and service expansion could occur if improving efficiency was prioritized. Efficiency measurement and reporting are important responses to public accountability (Nistor et al., 2017). Therefore apart from equity and financial protection, the pursuit of efficiency is a key policy objective that informs policy decisions in most health systems (Mujasi et al., 2016). In Africa particularly Sub Saharan Africa (SSA), it is a known reality that population is characterized by poor health. The African health systems are critically resource constrained in extending health services of acceptable quality to the population. It is urged that increasing public health-care expenditure may not significantly affect health outcomes if the efficiency of resource use is low (Grigoli, & Kapsoli, 2018). Inefficiency in the allocation and use of health sector resources is one of the inherent problems of the health systems in the region. In addition, studies done by Jehu-Appiah et al. (2014) show that the ability to adequately meet healthcare needs is exacerbated by extensive inefficiencies.

Assessing the efficiency of the health care system is recommended by the World Health Organization (WHO) as an on-going research program. Since the year 2000, WHO in response to the recommendation developed an econometric methodology for estimating the efficiency of national health care systems. It has presented rankings of countries' healthcare systems by their estimated efficiency, generating much debate, both political and academic (Oglobin, 2011). Therefore the emphasis for efficiency improvement in the healthcare industry continues to draw the attention of international bodies, governments, policymakers and researchers towards estimating efficiency (Mahajan et al., 2018). With a population of 34.9 million people (UBOS, 2014), Uganda has 112 districts in the four regions of Northern, Eastern, Southern and Western. The country's healthcare delivery system is arranged and structured from the largest to the smallest health facilities as follows; (I) National Referral Hospital, (ii) Regional Referral Hospital, (iii) District Hospital, (iv) Health Center IV, (v) Health Center III, (vi) Health Center II, (vii) Health Center I (Village Health Team-VHT). Whereas a Health Center IV facility is located in each sub-district, a Health Center III is located in each sub-county and Health Center II facility is located in each parish, according to the Ugandan district local government administrative system. The VHT located in each village is the first contact of healthcare service, composed of a team of trained volunteers and community medicine distributors.

The country's public healthcare delivery system is comprised of 1696 health centre IIs, 937 health centre IIIs, 170 health centre IVs and 64 hospitals (MoH, 2015). According to the policy, a health centre II (HCII) facility provides community-based preventive and promote healthcare services. It provides outpatient clinic, antenatal services, deliveries, immunizations, family planning, laboratory and community outreaches. It is headed by an enrolled nurse, working with a midwife, two nursing assistants and a health assistant. An HCII serves a population of about 5,000 people. Such basic health facilities serve as a backbone in healthcare delivery by making services easily accessible at the community, family and individual level (Abbas et al., 2011). However, Uganda's health care delivery system remains too inadequate to meet the needs of the ever-growing population. It increasingly faces critical resource constraints in its efforts in providing healthcare services of acceptable quality to its population (Mujasi et al., 2016).This constraint of healthcare resources is partly attributed to among other factors; rapid growth of the population, an upsurge in diseases such as malaria, HIV/AIDS epidemic, poor macroeconomic performance and cutbacks in public spending (MoH, 2015).

The combined impact of these factors causes the country to record the world's poor health services and outcomes. Empirical evidence shows that Ugandan health facilities lose a lot of resources annually to waste, register persistent stock outs and leakages of medical inputs, drugs and medical supplies, under-utilization, shortage of hospital equipment and infrastructure, thus complicating health care and service delivery (Okwero et al., 2010; Basaasa et al., 2013; Kasule, & Agwu, 2015). Knowing that health facilities are generally inefficient is a necessary condition but not sufficient unless the level and magnitude of each health facility's inefficiency are identified. Most published studies in Uganda routinely analyze and report on the efficiency of national, regional referral and district hospitals, excluding lower level and rural health units particularly HCII facilities. However, the analysis explores efficiency only in a general sense using ratio indicators and ignores other factor inputs such as operational budget, essential medicines and health supplies (drugs), medical and non-medical staff used by health centres in the production of health outputs. In addition there are limited recently published health facility efficiency studies in Uganda (Mujasi et al., 2016; Mulumba et al., 2017).

Therefore, the importance of this study is to contribute to addressing these gaps and efficiency concerns on raised questions about public health resources and how these meagre resources are utilized in HCII facilities. The study provides a detailed understanding of efficiency for healthcare managers, staff, policymakers, the academia, government and development partners. In an effort to bridge the gaps and generate meaningful results, the specific objectives of the study are to; (i) determine the level of technical and scale efficiency of public health center II facilities in Southwestern Uganda, (ii) estimate the economic savings arising from input reductions and output increases (augmentations) required to make inefficient public health center II facilities efficient. The rest of the study is structured as follows; the next section presents the review of the literature, followed by methodology, results and discussion, conclusion and policy implications. The concept of efficiency can be defined as the relationship between scarce factor inputs and outputs. It examines how well scarce resources are used to produce outputs or services.

2. Literature Review

Empirical literature shows that most efficiency studies have been estimated using parametric (Stochastic Frontier Analysis-SFA) and non-parametric techniques (Data Envelopment Analysis-DEA). DEA employs linear programming in its methodology that makes it particularly powerful compared with other productivity measurement techniques. This technique is critical in situations where there are multiple outputs and inputs, which cannot be readily analyzed with other techniques (Coelli et al., 1998). Thus literature suggests DEA as the best measurement technique of efficiency. Farrell (1957) suggested that the efficiency of a decision-making unit (DMU) consist of technical and a locative efficiency. Technical efficiency (TE) reflects the ability of a DMU to obtain maximum output from a given set of inputs. TE identifies in physical terms, the best possible combination of factor inputs required to produce given outputs (Nunamaker, 1985). It measures the ability of a DMU to avoid waste by producing as much output as resource input usage would allow, or employing as little inputs as output level allows.

The need to further analyze the effect of the size of DMU on efficiency motivates the estimation of scale efficiency (Grigoli,& Kapsoli, 2018). Scale efficiency (SE) estimates show that a DMU may be conducting a range of activities that contribute to higher the minimum average costs. Whereas some health facilities could be operating at too large scale to maximize their productive inputs, others may be too small, thus exhibiting higher average cost of production. Health facilities with higher SE scores have fewer input wastes attributable to their size (Mogha et al., 2016). Thus improvement in TE and SE measurements in public health facilities may result in large potential economic savings in the healthcare expenditures which could be devoted to expanding accessibility to promotive, preventive, curative and rehabilitative services all aimed at improving not only the quantity but also the quality of health care. An assessment conducted by Aristovnik (2015) estimated the healthcare system efficiency of 15 old and 13 new member states in the European Union (EU) for a total of 151 countries using an output-oriented DEA technique. It was found out that 27 percent and 53 percent of the EU 15 member states were technically efficient based on CRS and VRS DEA models respectively.

The study concludes that there was a potential for improving most of the inefficient regions of the EU by the optimum use of their health inputs. Other empirical studies by Grigoli (2012) and Borisov et al. (2012) compared the performance of the health system across some of the Central and Eastern Europe (CEE) and OECD countries. It was found that CEE countries in comparison to the OECD member states achieve low health outcomes with high real input resource combinations. Related findings have been found by Chu et al. (2015) in the Northeast Asian medical system. In a study to establish the efficiency levels of public hospitals in Malaysia, Samsudin (2016) employed the DEA model and found that TE and SE estimates for the two classifications of hospitals decreased in 2010 compared to 2008, implying that hospitals used more resource inputs in the latter than the former period to produce the same combination of healthcare outputs. Another study done in Latin America by Hernandez and Sebastian (2014) applied the DEA estimation approach using the sample of 34 health units from 19 districts in Alter-Verapaz in Guatemala to estimate the TE of health posts. DEA-based Malmquist productivity index was employed to estimate the productivity changes for the study period.

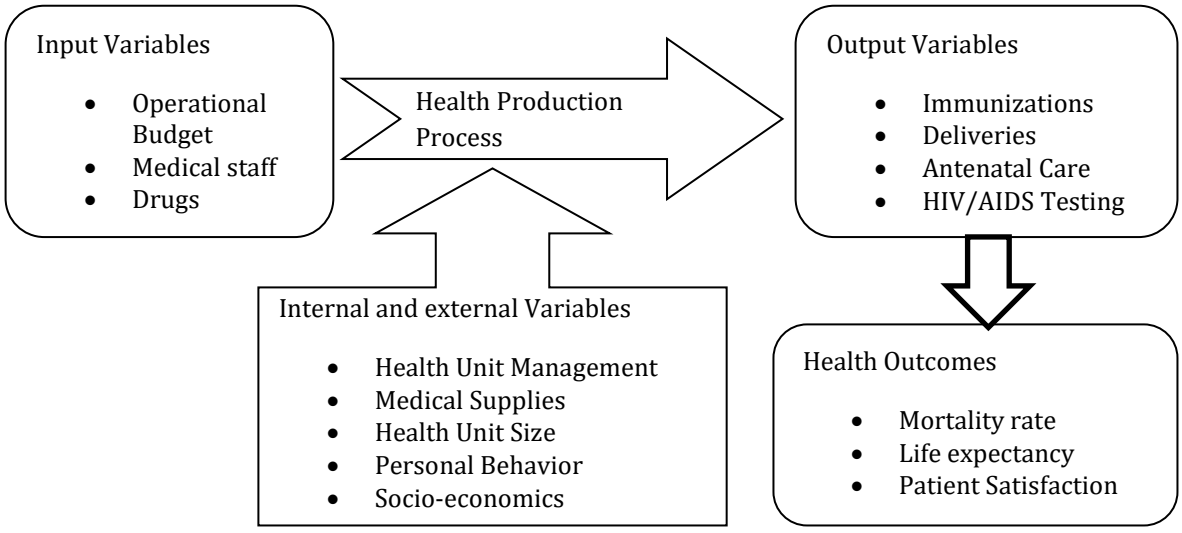
It was established that TE of the health units varied over time and the average TE score was 78 percent in 2008, while the average TE score for 2009 was 75 percent. Results of the Malmquist index indicated that the overall productivity of the health posts increased by 4 percent during the period under study mainly due to an increase in healthcare service outputs. In a study of efficiency in the pharmaceutical industry, Mahajan et al. (2018) find that the overall efficiency is lower because of the inefficient conversion of resource inputs into outputs. Using DEA and adopting the VRS technology in Ethiopian selected hospitals, Ali et al. (2017) indicated that 50%, 42%, 25%, 25%, 33% and 25% of the health facilities were technically inefficient while 75%, 75%, 58%, 58%, 58% and 67% of health units were scaled inefficient between 2008 and 2013 respectively. A growing number of countries in Africa continue to undertake efficiency studies using DEA technique to guide them to reduce wastage of limited resources (Zamo-Akono et al., 2013; Jarjue et al., 2015; Mujasi et al., 2016; Molem Christopher et al., 2017; Bundi, 2018). The non-parametric technique has been applied in analyzing the efficiency of health systems in Kenya where Kirigia et al. (2004) evaluated the technical efficiency of 32 public health centres.

Results showed that 56 percent of the public health centres were found to be technically inefficient, while the remaining 44 percent were technically efficient. Further empirical studies by Kirigia et al. (2011) employed the DEA technique to estimate the relative technical efficiency of 36 maternal and child health posts , 22 community health centres and 21 community health posts in Sierra Leone, using cross-sectional data for the year 2008. Results indicate that there were significant variations in TE and SE across and within the health posts. In Ethiopia, a study by Gebresilassie and Nyatanga (2017) indicates that there is a significant variation in TE and SE estimates across a sample of health posts. Findings show that overall health posts registered better average technical and pure TE estimates of 58 percent and 79.6 percent respectively. This implies that if they were operating at optimal scale size, they would have produced at least 42 and 20.4 percent more outputs with the same level of health inputs under CRS and VRS assumptions respectively.

A study of productivity and efficiency by Xenos et al. (2016) finds that 91 percent of public health facilities obtained a score less than unity. In Seychelles, a health centre level study by Kirigia et al. (2007) estimated the relative efficiency and productivity of 17 health centres for the period 2001 to 2004 using the DEA technology and the DEA-based Malmquist productivity index. Results indicate that there were significant variations in TE and SE scores across health centres. Overall, the average TE and SE estimates of health centres were 93 percent and 91 percent during the study periods respectively. In the estimation of efficiency and equity in medical service systems, Ding et al. (2018) find that efficiency scores of provincial level facilities varied significantly from one another. Related estimates in Meru county in Kenya by Makheti (2017) indicates that the mean technical efficiency from the sampled public health facilities was 45.2% suggesting that the existing health services can be augmented by 54.8% without the provision of additional input resources.

Similarly in a study to estimate the efficiency of public health dispensaries in Kenya, Bundi (2018) found that 41% were inefficient with average VRS efficiency at 70%, the CRS and scale efficiencies averaged 55% and 80% respectively. In another technical efficiency study of referral health facilities in Uganda, Mulumba et al. (2017) indicate that long-run inefficiency varied overtime and more than 50 percent of the inefficiencies that were observed are related to scale factors. The study recommended that inefficient health units should use efficient ones as benchmarks or role models to improve their efficiency. In general most of the empirical literature on efficiency of public healthcare facilities particularly in developing countries indicates higher and significant variations of inefficiency both technical and scale, therefore recommending for efficiency improvements to change the status quo (MoH, 2010; Kirigia et al., 2011; Borisov et al., 2012; Stierman et al., 2013; Ozcan, 2014; Nanyingi et al., 2015; Adil et al., 2016; Ahmad et al., 2017; Mwihia et al., 2018)

Figure 1: A Conceptual Model of Healthcare Production



Source: Author (2018)

Conceptual Framework: The study is guided by the conceptual framework that provides a basic, useful and a detailed understanding of the drivers of efficiency in health service delivery. Efficiency is an attribute of performance that is measured by examining the relationship between the resources used to produce a commodity (inputs) and the specific commodity of the health care system (output). A health care system is efficient if it is able to maximize output for a given set of inputs or to minimize inputs used to produce a given level of output. This relationship is presented by the interactions in the variables as shown in figure 1 above. Health facilities employ multiple health system inputs to produce multiple health service outputs through a health production process. Health inputs (operational budget, doctors, nurses, medicines and health supplies, non-medical staff) are combined with medical and surgical care to produce healthcare outputs (immunizations, deliveries, antenatal care attendances, HIV/AIDS counselling and testing, laboratory procedures). These outputs, in turn affect the levels of health outcomes in the population (life expectancy, mortality rates, health status improvement, and patient satisfaction). Whereas the ultimate output (health outcomes) of health care is the marginal change in health status, this is difficult to measure in most data sets, and therefore intermediate outputs (episodes of care) usually become the primary study outputs. It is important to note that the production process for healthcare can be influenced by a number of variables both internal and external to the health facility which may influence how efficiently the production process occurs (Coelli et al., 2005). Some of these factors are usually considered to be outside the control of health facility managers.

They are theorized either to affect the production process itself or to influence directly the efficiency of the health production process (Kumbhakar, & Lovell, 2000). When health inputs are optimized, the desired health outputs (and ultimately health outcomes) should be produced at the lowest possible cost both in terms of public resources, and in terms of private (out-of-pocket) spending. It is through the lens of this conceptual framework that this study is designed to estimate the efficiency of health service delivery as directly related to resource inputs, outputs and the health outcomes they produce.

3. Methodology

Data Envelopment Analysis (DEA) Model: The most widely used DEA models are CCR named after Charnes, Cooper and Rhodes, and BCC named after Banker, Charnes, and Cooper. These models of analysis are classified as input-oriented and output-oriented. The CCR model, developed by Charnes et al. (1978)is input-oriented and assumes that production is constant returns to scale (CRS). The BCC model, employed by Banker et al. (1984) assumes that production is variable returns to scale (VRS). Both models elaborated the efficiency concept introduced by Farrell (1957). The input-oriented models determine how much resource input quantities may be reduced while holding constant the quantities of healthcare outputs that are produced. On the other hand, the output-oriented model specifies the quantities of healthcare outputs that may be expanded without changing quantities of resource inputs. Therefore, the selection of the orientation of the model is dependent on the level to which a decision-making unit (health centre II facility) controls and manages its healthcare inputs or healthcare outputs (Jacobs et al., 2006; Ozcan, 2014; VanderWielen, & Ozcan, 2015). This study therefore adopts an output-oriented DEA model in estimating TE and SE of health centre II facilities.

Research Design: This study employed a cross-sectional research design involving both qualitative and quantitative approaches. According to Pope et al. (2000), these two approaches play complementary roles in research. The two approaches provide an in-depth understanding of the current healthcare system in terms of technical and scale efficiency levels and how they influence the day to day operations of health facilities in Southwestern Uganda. The approach employed in this study is generated from the submission of other researchers on technical and scale efficiency estimation (Zere et al., 2006; Akazili et al., 2008; Torabipour et al., 2014). The quantitative aspect of the study requires data on the operations of health facilities with respect to the composition of health input and output resources derived from each public health facility.

Data Type and Sources: This study employs cross-sectional secondary data for the financial year 2015/16. Secondary data was obtained from the Health Management Information System (HMIS) of the Ugandan Ministry of Health. The secondary sources possessed inputs and outputs data, administrative and operational

information on all public health centre II facilities in southwestern Uganda. It was supplemented by the published works from the Ministry of Health, resource centres, libraries, journals and internet sources.

Selection of Input and Output Variables: In this study, two types of variables are most important in estimating the efficiency of public health centre II facilities. They are the input and output variables. The choice of healthcare input and output variables is a key step for the successful application of the DEA technique (De Almeida et al., 2012). Therefore, the choice of the health resource input and output variables to estimate the efficiency levels of public health facilities was guided by the availability of comprehensive data routinely compiled in the HMIS and the review of previous empirical DEA studies (Renner et al., 2005; San Sebastian, & Lemma, 2010; Hernandez, & Sebastian, 2014). Therefore, the study measures the level of technical and scale efficiency of the public health centre II facilities using four major health inputs and five major output variables. The four major health inputs employed are; Operational Budget, Medical Staff, Drugs and Non-medical staff. The five major health outputs produced among all these public health centre II facilities are; Immunizations, Child Deliveries, Antenatal care Attendances, HIV/AIDS Counseling and Testing, and Laboratory services. These outputs composed the major health facility activities. Note that the inputs of medical equipment as key variable were excluded from the study because of non-availability of current data. The input and output variables are defined and measured in table 1 below.

Table 1: Definition and Measurement of Input and Output Variables

X_i	**Input Variable (X)**	**Definition and Measurement**
X_1	Operational Budget	Annual total amount of funds given to the facility in the financial year
X_2	Medical staff	Total number of medical practitioners (nurses, midwives, health assistants)
X_3	Drugs	Measured by the total annual allocations of funds for drugs
X_4	Other staff	Total number of active workers other than medical staff
Y_i	**Output Variable (Y)**	
Y_1	Immunizations	Annual total number of children immunized
Y_2	Deliveries	Annual total number of child deliveries in the health facility
Y_3	Antenatal Care	Total number of pregnant women attending antenatal services
Y_4	HIV/AIDS Testing	Total number of counselled and tested patients on HIV/AIDS
Y_5	Laboratory services	Total number of laboratory procedures conducted

Study Area and Population: All public health centre II(HCII) facilities operating in Southwestern Uganda constitute the population of the study. There are 84 public HCII facilities in the region. The selection of this population of health facilities is justified on the grounds that they comprise the largest number of health units that are located in rural areas where they serve more than 75 percent of the total population in the region. This large population of health units also consumes a substantial amount of the ministry of the health budget. The study area is chosen because of its highest population density of 300 persons/km^2, highest disease burden, the influx of the population from the neighboring countries of Rwanda, DR Congo and Tanzania, all of which have serious implications on healthcare resources for the region.

Sample Size Selection and Determination: The selection of the sample size, number of health resource inputs and the number of healthcare outputs was justified by the DEA convention (rule of thumb) that the minimum number of DMUs is greater or equal to three times the number of inputs plus outputs as suggested by Banker et al. (1989) that;

$$n \geq 3(m + s) \qquad (1)$$

Where; n = number of DMUs included in the sample
m = number of inputs included in the study
s = number of outputs included in the study
Since m = 4 inputs and s = 5 outputs, the sample size for HCII facilities is determined to be;

$$n \geq 3(4 + 5) \qquad (2)$$

$$n \geq 27 \qquad (3)$$

According to McKillop et al. (1999) and Gannon (2005) the operation of health facilities may vary according to classification and therefore the estimation of efficiency was done based on the classification of HCII level of facilities. Therefore, this study adopts a sample of 30 HCII facilities. In order to avoid biased sampling, the sample size from which this study is drawn was selected based on the population density where these health

facilities are located. The mean population density and standard deviation were estimated to determine whether a public health facility was located in the population area of 'Less Dense', 'Moderate Dense', and 'High Dense'. The mean population density (Mean) was estimated at 265 persons per square kilometer with a standard deviation (SD) of 70. The table below presents how the sample was selected from the population

Table 2: Sample Size Selection of Health Facilities

Mean and Definition		HCII Facilities	Total Sample Size
Mean	Population Area	84	
Mean-SD (<195)	Less Dense	5	
338 ≤ Mean ≥ 195	Moderate	20	30
Mean+SD (>338)	High Dense	5	

In an effort to avoid biased estimates of technical and scale efficiency, the study randomly selected 5 HCIIs from less dense population area and 5 from high dense population area. The rest 20 health facilities were also randomly selected from the areas of moderate population density. The total sample for the study is therefore 30 HCII facilities.

Data Analysis and Estimation Technique: The data collected on resource inputs and healthcare outputs were entered into a computer and exported into DEA program designed by Coelli et al. (1998); Coelli et al. (2005) installed in STATA 13. Then, DEA was employed to estimate the values of efficiency for the sample, where an output-oriented DEA model was run with variable returns to scale (VRS) technology. The VRS model was applied in the estimation of technical and scale efficiency scores for each of the sampled healthcare facilities. It is from the VRS model that the health production function exhibited either increasing returns to scale (IRS) or CRS for the individual DMUs in the sample. The VRS model was adopted basing on the assumption that in real life situations the returns to scale do significantly vary and not all public health facilities are operating at an optimal scale (Mujasi et al., 2016).

DEA Model Specification: When DMUs are given a fixed quantity of resource inputs and required to produce as much outputs as possible, an output-orientation is more appropriate and justified (Coelli et al., 2005). In Uganda public health centre II facilities receive a fixed quantity of resource inputs and health unit managers and employees are required to produce as much healthcare outputs as possible using the given health resource inputs. For example, the operational budget, medical staff, drugs and other health supplies as well as non-medical staff (other staff) of each DMU is centrally determined by the district local government and Ministry of Health. Individual health facilities do not have any control over the amount and quantity of the health resource inputs. Even when health service inputs are underutilized, health care administrators and managers have no powers to dispose them off. In this study, an output orientation is adopted based on the following arguments;

- The Ugandan health centre II facilities face shortages of resource inputs specifically human, financial resources and medical supplies
- The availability of health resource inputs is limited by government budget that is annually allocated to the health ministry
- The total population does not have full access to all the health services. Thus, productivity enhancements could be best channelled towards increasing health service outputs

The DEA technique that is employed in this analysis defines the output-oriented BCC model that takes the form below;

Maximize:

$$\Phi - \varepsilon\left(\sum_{j=1}^{p} S_j^- + \sum_{r=1}^{s} S_r^+\right) \qquad (4)$$

Subject to:

$$\sum_{i=1}^{n} \psi_i x_{ij} + S_j^- = x_{jo} j = 1, 2, \ldots\ldots p; \quad (5)$$

$$\sum_{i=1}^{n} \psi_i y_{ri} - S_r^+ = \Phi y_{ro} r = 1, 2, \ldots\ldots S; \quad (6)$$

$$\sum_{i=1}^{n} \psi_i = 1$$

$\psi_i, S_j^-, S_r^+ \geq 0 \quad \forall_{i,\ j,\ r}$

Where n refers to the number of HCII facilities (i =1, 2, ……n), p represents health resource input sx_{ij} (j=1, 2, …….p), s defines the number of healthcare outputs y_{ri} (r =1,2,…..s),$\Phi$is defined as output–oriented estimate of efficiency, ψ_i (i=1,2, …n) refers to nonnegative scalars, S^- and S^+define the excess of resource inputs and shortfalls of healthcare outputs respectively. A health unit is taken to be performing efficiently ifΦ^*=1 and the values of efficiency slacks defined to be$S_j^{-*} = S_r^{+*} = 0$, $\forall_{j,r}$. Alternatively, in case where$\Phi^* < 1$, the health unit is regarded to be performing inefficiently.

Descriptive Statistics of Input and Output Variables: Table 3 below presents the descriptive analysis for each of the resource input and output measures from the sample of 30 public HCII facilities. It shows the mean, standard deviation, minimum and maximum values for the inputs and outputs variables in the sample during the financial year 2015/16.

Table 3: Descriptive Statistics of Input and Output Variables

DMUs	Input Variables				Output Variables				
(N=30)	X_1	X_2	X_3	X_4	Y_1	Y_2	Y_3	Y_4	Y_5
Mean	1491515	2.5	9920273	1.8	1049.5	6.4	4.1	43.9	541.8
St.Dev.	424875.9	0.8	1868817	0.6	618.2	14.5	6.2	78.1	317.0
Min	1239612	1.0	7427474	1.0	201.0	0.0	0.0	0.0	70.0
Max	2184250	4.0	1.46E+07	3.0	3169.0	68.0	27.0	400.0	1817.0

Exchange Rate at the time of data collection ($1 = Uganda shillings-Ushs 3,600)

As shown in the table above, it is observed that the 30 HCII facilities were able to produce an average of 1050 immunizations, 6 child deliveries, 4 antenatal care attendances, 44 HIV/AIDS tests, and 542 laboratory procedures. The respective standard deviations are shown in the table. These outputs were produced using an average operational budget of 1,491,515 (approximately $414), 3 medical staff, expenditure on drugs worth 9,920,273 (approximately $2,756) and about 2 members of other staff (non-medical staff). The input and output measures varied widely as shown by the respective means, minimum and maximum values. This suggests that there are substantial variations across the sample in relation to the input-output combination.

4. Results and Discussion

Technical and Scale Efficiency Results: The study adopted the output-oriented model of DEA and assumed the VRS technology to estimate the level of technical and scale efficiency scores for the 30 HCII facilities. It is paramount to note that efficiency scores range from 0 (totally inefficient) to 100% (efficient). Table 4below presents a summary of the results from the sample. Only eight (27 percent) HCIIs were found to be operating efficiently. The remaining twenty-two (73 percent) health facilities had TE estimates less than 100 percent implying they were found technically inefficient. The most inefficient HCII was DMU85 which scored 27.9 percent. This implies that such a facility would need to potentially expand its health service outputs by 72.1 percent to attain efficiency. Overall the level of TE-averaged 72.3 percent meaning that an average HCII could potentially improve its efficiency by increasing the outputs it produces by 27.7 percent. These health facilities

registered a significant variation in TE with the lowest at 27.9 percent and highest at 100 percent. Based on the CRS assumption the average efficiency score was 71.9 per cent suggesting a slight reduction in efficiency with similar variations as technical efficiency. The inefficient HCIIs under the VRS assumption imply that they have the potential for increasing their health care outputs using the given quantities of current healthcare inputs. In order to estimate the impact of the size of health facility on efficiency, SE and the types of RTS were estimated.

Table 4: Technical and Scale Efficiency Results for the Sample of HCII Facilities

S/N	DMU(n=30)	Rank	TE	CRS_TE	VRS_TE	SCALE	RTS	Benchmark	λ
1	DMU41	16	0.707	0.707	0.707	1.000	CRS	DMU91	0.690
2	DMU47	23	0.523	0.523	0.523	1.000	CRS	DMU91	0.216
3	DMU49	11	0.954	0.954	0.954	1.000	IRS	DMU91	0.622
4	DMU50	20	0.597	0.597	0.597	1.000	CRS	DMU109	0.289
5	DMU54	1	1.000	1.000	1.000	1.000	CRS		
6	DMU56	17	0.678	0.678	0.678	1.000	CRS	DMU91	0.469
7	DMU63	28	0.325	0.325	0.325	1.000	CRS	DMU109	0.211
8	DMU68	12	0.849	0.849	0.849	1.000	CRS	DMU91	0.680
9	DMU69	19	0.669	0.658	0.669	0.983	IRS	DMU109	0.156
10	DMU72	29	0.293	0.293	0.293	1.000	CRS	DMU109	0.252
11	DMU75	18	0.677	0.669	0.677	0.989	IRS	DMU87	0.442
12	DMU77	24	0.473	0.471	0.473	0.996	IRS	DMU87	0.315
13	DMU81	25	0.395	0.395	0.395	1.000	CRS	DMU109	0.199
14	DMU85	30	0.279	0.279	0.279	1.000	CRS	DMU87	0.120
15	DMU86	22	0.545	0.545	0.545	1.000	CRS	DMU109	0.256
16	DMU87	1	1.000	1.000	1.000	1.000	CRS		
17	DMU88	27	0.358	0.358	0.358	1.000	CRS	DMU87	0.119
18	DMU89	26	0.395	0.395	0.395	1.000	CRS	DMU109	0.283
19	DMU91	1	1.000	1.000	1.000	1.000	CRS		
20	DMU92	1	1.000	1.000	1.000	1.000	CRS		
21	DMU93	1	1.000	1.000	1.000	1.000	CRS		
22	DMU97	13	0.835	0.835	0.835	1.000	CRS	DMU93	0.527
23	DMU104	10	0.955	0.936	0.955	0.980	IRS	DMU93	0.519
24	DMU106	9	0.995	0.954	0.995	0.959	IRS	DMU93	0.516
25	DMU107	1	1.000	1.000	1.000	1.000	CRS		
26	DMU109	1	1.000	1.000	1.000	1.000	CRS		
27	DMU110	21	0.545	0.545	0.545	1.000	CRS	DMU109	0.375
28	DMU111	14	0.829	0.807	0.829	0.974	IRS	DMU109	0.272
29	DMU120	1	1.000	1.000	1.000	1.000	CRS		
30	DMU122	15	0.811	0.791	0.811	0.975	IRS	DMU93	0.342
	Mean		0.723	0.719	0.723	0.995			
	Std. Dev.		0.257	0.255	0.257	0.010			
	Minimum		0.279	0.279	0.279	0.959			
	Maximum		1.000	1.000	1.000	1.000			

Table 4 also presents corresponding VRS mean scores of efficiency using the same estimation and it is observed that these scores are slightly higher than CRS scores but equivalent to the TE scores. This implies a slight increase in the number of health facilities that tend to approach on the frontier under the VRS technology than under the CRS technology. Twenty-three (77 percent) health facilities scored SE of 100% which implies that they were found to have obtained the most productive scale size (MPSS) for the given input-output combination or mix. Stated differently, health facilities with higher SE estimates have less input wastage that is attributable to their size. The rest seven (23 percent) HCIIs had SE scores less than unity and therefore they were regarded as scale inefficient. This means that such facilities with lower SE estimates have more inputs wastage that is attributed to their sizes. It is paramount to note that the inefficiency of a health facility may arise due to the fact that it operates under decreasing returns to scale (DRS), increasing returns to scale (IRS) or constant returns to scale (CRS). Results show that twenty-two (73 percent) HCIIs were operating under CRS which implies that an increase in health service inputs would lead to an equal increase in health service outputs.

The remaining eight (27 percent) HCIIs were found to be operating at IRS implying that an increase in healthcare inputs results in a more than increase in healthcare outputs. Therefore, to produce healthcare services at the MPSS, any health unit exhibiting IRS should scale up both its health service inputs and health service outputs. This exploration could be applicable in reallocating health resource inputs from DMUs which operate at CRS to those that operate at IRS. In Table 4 the second last column shows the benchmarks or peers or reference units for the respective DMUs and their corresponding weights (λ) which should be emulated by the inefficient HCIIs for them to be efficient. For example, DMU41 should emulate DMU91 (with the highest λ weight of 0.690) for it to be efficient. The best reference or role model health unit for DMU50, DMU63, DMU69, DMU72, DMU81, DMU86 and DMU89 is DMU109 with the highest lambda weight of 0.289, 0.211, 0.156, 0.252, 0.199, 0.256 and 0.283 respectively. Recall that DMU109 is a role model because it is 100 percent efficient. All benchmark health facilities have TE score of 1 and are therefore on the efficiency frontier.

Economic Savings from Efficiency Improvement by Health Center II facilities: The economic savings arising from efficiency improvement are the input reductions and output increases required to make inefficient health center II facilities efficient. Table 5 provides the magnitudes by which specific health service inputs and outputs per inefficient health facility ought to be reduced and or increased respectively. When policymakers and healthcare managers are equipped with the magnitudes by which they should be adjusted, they could significantly improve the functioning and therefore the efficiency of the health care delivery system.

Table 5: Input Reductions and Output augmentations needed to make inefficient Health Center II facilities efficient

S/N	DMU	Input Slacks				Output Slacks				
	(n=30)	X_1	X_2	X_3	X_4	Y_1	Y_2	Y_3	Y_4	Y_5
1	DMU41	0.0	1.0	2910901.0	0.0	0.0	0.0	6.9	51.4	0.0
2	DMU47	0.0	0.0	385421.0	0.0	0.0	0.0	0.5	40.2	0.0
3	DMU49	1671.7	0.0	1964.0	0.0	0.0	6.4	6.5	145.1	0.0
4	DMU50	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	351.0
5	DMU54	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	DMU56	0.0	0.7	1070212.0	0.0	0.0	1.2	1.9	80.3	0.0
7	DMU63	0.0	0.0	2013745.0	0.5	0.0	4.2	0.2	35.0	0.0
8	DMU68	0.0	0.8	1.6	0.1	0.0	1.9	6.9	84.1	0.0
9	DMU69	21838.3	0.0	1052637.0	0.0	0.0	6.9	0.0	67.6	0.0
10	DMU72	0.0	0.0	22959.9	0.0	0.0	5.0	0.7	24.3	0.0
11	DMU75	350155.0	0.0	371745.0	0.6	0.0	0.0	1.3	37.7	98.3
12	DMU77	225733.0	0.0	175011.0	0.0	0.0	0.1	0.8	26.4	118.7

13	DMU81	631612.0	0.8	921888.0	0.0	0.0	4.0	0.2	79.3	0.0
14	DMU85	205751.0	0.1	0.0	0.2	0.0	2.3	0.1	53.5	0.0
15	DMU86	800378.0	1.0	1148926.0	0.0	0.0	5.1	0.3	104.5	0.0
16	DMU87	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	DMU88	309270.0	0.0	282.0	0.0	0.0	1.6	0.5	39.8	0.0
18	DMU89	511469.0	0.6	0.0	0.2	19.4	5.7	0.3	113.2	0.0
19	DMU91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	DMU92	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	DMU93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	DMU97	0.0	1.7	403.6	0.3	90.2	0.0	12.5	106.6	0.0
23	DMU104	3153.9	0.8	2761714.0	0.1	0.0	34.3	0.0	18.3	4.6
24	DMU106	265594.0	0.0	2552679.0	0.0	292.5	25.6	0.0	0.0	245.9
25	DMU107	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	DMU109	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	DMU110	0.0	0.5	85684.8	0.0	0.0	0.0	0.3	69.1	0.0
28	DMU111	384994.0	0.0	3219643.0	0.8	0.0	3.4	0.0	117.2	0.0
29	DMU120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	DMU122	39833.3	0.0	1881839.0	0.1	0.0	26.0	0.0	69.1	0.0

Names of DMUs are in Appendix, Exchange Rate at the time of data collection ($1 = Uganda shillings-Ushs 3,600)

It is observed that DMUs which were found 100 percent efficient (see Table 4) have zero input and output slacks (see Table 5) and these include DMU54, DMU87, DMU91, DMU92, DMU93, DMU107, DMU109 and DMU120. This is because such health facilities are neither required to reduce their inputs nor augment their output. In other words, slacks exist only for those health centres identified as inefficient. It is evident that for example health facility DMU41 needs to reduce on its medical staff by one employee and cut down expenditure on drugs by Ushs2,910,901 (approximately $801), increase on ANC attendances by about 7 and HIV/AIDS tests by about 51 patients. In addition, DMU86 is required to reduce spending on its operational budget by Ugshs800,378 ($222), medical staff by 1 employee, expenditure on drugs by Ushs1,148,926 ($319) while augmenting on its health service outputs by 5 child deliveries and 105 HIV/AIDS counselling and none on laboratory tests. On the other hand, DMU106 can reduce on its operational budget and expenditure on drugs by Ushs265,594 ($74) and 2,552,679 ($709) respectively while augmenting by 293 child immunizations, 26 child deliveries, none of ANC attendances and HIV/AIDS counselling and testing, and 246 laboratory procedures.

Discussion: In Africa, it is not uncommon to find that most public health facilities are not very technical and scale efficient (Marschall, & Flessa, 2009; Kirigia et al., 2011; Zamo-Akono et al., 2013; Jarjue et al., 2015; Adil et al., 2016; Molem Christopher et al., 2017; Bundi, 2018). These prior studies compare well with the findings of the present study where mean technical and scale efficiency estimates were 0.723 and 0.995 respectively for health centre II facilities. According to Gebresilassie and Nyatanga (2017) most of the previous DEA studies done in the low and middle-income countries report a significant proportion of health facilities that are technically inefficient. For example a study by Kirigia et al. (2011) found that about 67 percent of the estimated community health centres in Sierre Leone were technically inefficient. In Kenya a related study by Kirigia et al. (2004) analyzed the TE of public health centres where results indicated that 56 percent of health centres were technically inefficient.

Another study in Latin America by Hernandez and Sebastian (2014) investigated the TE of health posts and found that about 53 and 29 percent were technically efficient in 2008 and 2009 respectively. A similar study by San Sebastian and Lemma (2010) estimated the efficiency of health posts in Ethiopia at a micro-regional level and showed that 75 percent of the health posts were technically inefficient while indicating significant

variations in technical efficiency scores across the health posts. In a comparison of other DEA studies with the present study, there is strong evidence of a large percentage of technically inefficient public health facilities in southwestern Uganda with significant variations in efficiency estimates. Most of the previous empirical DEA studies particularly in developing countries have indicated a very large proportion of scale inefficient health facilities. Results from the present study are closely related to the findings in the Gambia where 90 percent of the health centres were found to be scale inefficient (Jarjue et al., 2015). In Guatemala, about 44 percent of the health posts in 2008, and 65 percent of the health posts in 2009 were found to be scale inefficient according to Hernandez and Sebastian (2014). In Sierra Leone, it was found that only 36 percent of the health posts were scale inefficient (Kirigia et al., 2011). Another study by Renner et al. (2005) also in Sierra Leone finds that 65 percent of the health units were scale inefficient. More recent empirical findings in the Ethiopian health extension program by Gebresilassie and Nyatanga (2017) also agree with most studies in low-income countries where 91.3 percent of the health posts were found to be scale inefficient. Thus the findings from other countries are in agreement with the results of the present study of health centre II facilities in southwestern Uganda.

5. Conclusion

The study employed an output-oriented DEA to estimate levels of efficiency of 30 public HCII facilities in southwestern Uganda using cross-sectional data for the financial year 2015/16. The findings from the study indicate that there is mass inefficiency within public HCII facilities and as a result they incur high costs of production than if they were fully efficient. The study also estimated the amount of input reductions and output augmentations (economic savings) required to make inefficient HCII facilities efficient. The study found that there is a great potential for efficiency savings. The study further identified the inefficient and efficient HCII facilities with the purpose of benchmarking the efficient ones as role models for the inefficient ones. This helps in restructuring their operations and management because an improvement in performance enables better allocation and utilization of resources, minimizes costs of health production process and improves access to medical care. Apart from the significant contribution of this study to the limited literature on estimation of efficiency in Uganda, its application to the country's health service sector has potential policy implications. Since the majority of the health units are small, there is a need to augment their scale sizes and improve on their management practices so as to enhance their overall productivity and efficiency. The health sector should embark on rigorous, periodic research and development and enhance on the provision of basic healthcare services while utilizing the health input resources in an efficient manner.

This would lead health facilities to significantly improve on their efficiency and ensure universal health coverage across all communities in the region. There is a need for further analysis of health facility performance trends and more support to poorly performing health facilities using corrective measures which may range from increasing the amount of input resources both financial and non-financial in addition to more regular and frequent support supervision visits. All stakeholders should scale up efforts to attract, recruit, and align skills with needs and improve retention and motivation of the health workforce in a sustainable and comprehensive manner. Additionally, consolidated efforts in raising capacity and management of essential medicines and health supplies are needed. There is a need for comprehensive monitoring and evaluation (M & E) of the health sector development plan. In order for the implementation of the health sector plans, the Ministry of Health needs to develop M & E programs with key verifiable indicators and targets to monitor overall health sector performance. Therefore, a study of this nature serves as a powerful tool for guiding policy actions towards achieving the desired healthcare outcomes while maximizing returns from the present investment.

References

Abbas, T., Awan, M. S., Aslam, M. A. & Waqas, M. (2011). Analyzing the Efficiency Differences among Basic Health Units in Sargodha District. *Journal of Economics and Behavioral Studies*, 3(1), 42-50.

Adil, R., Abbas, M. & Yaseen, A. (2016). Determinants of Efficiency in Health Sector: Dea Approach and Second Stage Analysis. *Journal of Accounting and Finance in Emerging Economies,* 2(2), 83-92.

Ahmad, M. F., Ishtiaq, M., Hamid, K., Khurram, M. U. & Nawaz, A. (2017). Data Envelopment Analysis and Tobit Analysis for Firm Efficiency in Perspective of Working Capital Management in Manufacturing Sector of Pakistan. *International Journal of Economics and Financial Issues,* 7(2), 706-713.

Akazili, J., Adjuik, M., Jehu-Appiah, C. & Zere, E. (2008). Using Data Envelopment Analysis to Measure the Extent of Technical Efficiency of Public Health Centres in Ghana. *BMC International Health and Human Rights,* 8(1), 11.

Ali, M., Debela, M. & Bamud, T. (2017). Technical Efficiency of Selected Hospitals in Eastern Ethiopia. *Health Economics Review,* 7(1), 24.

Aristovnik, A. (2015). Regional Performance Measurement of Healthcare Systems in the European Union: A Non-Parametric Approach. *Lex Localis,* 13(3), 579.

Bahadori, M., Izadi, A. R., Ghardashi, F., Ravangard, R. & Hosseini, S. M. (2016). The Evaluation of Hospital Performance in Iran: A Systematic Review Article. *Iranian Journal of Public Health,* 45(7), 855.

Banker, R. D., Charnes, A. & Cooper, W. W. (1984). Some Models for Estimating Technical and Scale Inefficiencies in Data Envelopment Analysis. *Management Science,* 30(9), 1078-1092.

Banker, R. D., Charnes, A., Cooper, W. W., Swarts, J. & Thomas, D. (1989). An Introduction to Data Envelopment Analysis with Some of its Models and their Uses. *Research in Governmental and Nonprofit Accounting,* 5, 125-163.

Basaasa, M. M., Ondoa, C. J. & Basheka, B. C. (2013). Institutional Dynamics and Health Service Delivery in Regional Referral Hospitals in Uganda: What Lessons from a Case of Jinja Regional Hospital? *African Journal of Governance and Development,* 2(1), 40-56.

Borisov, D., Cicea, C. & Turlea, C. (2012). Dea Model for Assessing Efficiency in Providing Health Care and Management Decisions. *Management Research and Practice,* 4(1), 5.

Bundi, E. (2018). Technical Efficiency in Public Health Dispensaries: Evidence from Imenti-South Sub-County, Kenya. *International Journal of Education and Research,* 6(1).

Charnes, A., Cooper, W. W. & Rhodes, E. (1978). Measuring the Efficiency of Decision Making Units. *European Journal of Operational Research,* 2(6), 429-444.

Chu, K., Zhang, N. & Chen, Z. (2015). The Efficiency and Its Determinants for China's Medical Care System: Some Policy Implications for Northeast Asia. *Sustainability,* 7(10), 14092-14111.

Coelli, Rao, D. & Battese, G. (1998). An Introduction to Efficiency and Productivity Analysis, Kluwer, Boston.

Coelli, Rao, D. S. P., O'Donnell, C. J. & Battese, G. E. (2005). An Introduction to Efficiency and Productivity Analysis: Springer Science & Business Media.

De Almeida, A. T., Ferreira, F. J. & Quintino, A. (2012). Technical and Economical Considerations on Super High-Efficiency Three-Phase Motors.Paper presented at the Industrial & Commercial Power Systems Technical Conference (I&CPS), 2012 IEEE/IAS 48th.

Ding, J., Hu, X., Zhang, X., Shang, L., Yu, M. & Chen, H. (2018). Equity and Efficiency of Medical Service Systems at the Provincial Level of China's Mainland: A Comparative Study from 2009 to 2014. *BMC Public Health,* 18(1), 214.

Farrell, M. J. (1957). The Measurement of Productive Efficiency. *Journal of the Royal Statistical Society. Series A (General),* 120(3), 253-290.

Farzianpour, F., Emami, A. H., Foroushani, A. R. & Ghiasi, A. (2016). Determining the Technical Efficiency of Hospitals in Tabriz City Using Data Envelopment Analysis for 2013-2014. *Global Journal of Health Science,* 9(5), 42.

Gannon, B. (2005). Testing for Variation in Technical Efficiency of Hospitals in Ireland. *The Economic and Social Review*, 36(3), 273-294.

Gebresilassie, Y. H. & Nyatanga, P. (2017). Efficiency of the Ethiopian Health Extension Program; an Application of Data Envelopment Analysis. *Eurasian Journal of Business and Economics,* 10(19), 99-126.

Grigoli, F. (2012). Public Expenditure in the Slovak Republic: Composition and Technical Efficiency. IMF Working Paper , 12/173.

Grigoli, F. & Kapsoli, J. (2018). Waste Not, Want Not: The Efficiency of Health Expenditure in Emerging and Developing Economies. *Review of Development Economics,* 22(1), 384-403.

Hernandez, A. R. & Sebastian, M. S. (2014). Assessing the Technical Efficiency of Health Posts in Rural Guatemala: A Data Envelopment Analysis. *Global Health Action,* 7(1), 23190.

Jacobs, R., Smith, P. C. & Street, A. (2006). Measuring Efficiency in Health Care: Analytic Techniques and Health Policy: Cambridge University Press.

Jarjue, G., Nor, N. M., Ghani, J. A. & Jalil, S. H. (2015). Technical Efficiency of Secondary Health Care Service Delivery in the Gambia. *International Journal of Economics & Management,* 9(1).

Jehu-Appiah, C., Sekidde, S., Adjuik, M., Akazili, J., Almeida, S. D., Nyonator, F. & Kirigia, J. M. (2014). Ownership and Technical Efficiency of Hospitals: Evidence from Ghana Using Data Envelopment Analysis. *Cost Effectiveness and Resource Allocation,* 12(1), 9.

Kasule, A. & Agwu, E. (2015). Health Budget Shortfalls and Inefficient Communication Systems as Setback to Efficient Management and Control of Infectious Diseases in Bushenyi District, Uganda. *Special Pathogens Review Journal,(SPRJ),* 1(1), 0012-0017.

Kirigia, J. M., Emrouznejad, A., Gama Vaz, R., Bastiene, H. & Padayachy, J. (2007). A Comparative Assessment of Performance and Productivity of Health Centres in Seychelles. *International Journal of Productivity and Performance Management,* 57(1), 72-92.

Kirigia, J. M., Emrouznejad, A., Sambo, L. G., Munguti, N. & Liambila, W. (2004). Using Data Envelopment Analysis to Measure the Technical Efficiency of Public Health Centers in Kenya. *Journal of Medical Systems,* 28(2), 155-166.

Kirigia, J. M., Sambo, L. G., Renner, A., Alemu, W., Seasa, S. & Bah, Y. (2011). Technical Efficiency of Primary Health Units in Kailahun and Kenema Districts of Sierra Leone. *International Archives of Medicine,* 4(1), 15.

Kumbhakar, S. & Lovell, C. (2000). Stochastic Frontier Analysis. Cambridge University Press, Cambridge, United Kingdom.

Mahajan, V., Nauriyal, D. & Singh, S. (2018). Efficiency and Its Determinants: Panel Data Evidence from the Indian Pharmaceutical Industry. *Margin: The Journal of Applied Economic Research,* 12(1), 19-40.

Makheti. (2017). Technical Efficiency in Public Health Facilities in Meru County. Dea Analysis. Health Economics and Outcome Research: Open Access.

Marschall, P. & Flessa, S. (2009). Assessing the Efficiency of Rural Health Centres in Burkina Faso: An Application of Data Envelopment Analysis. *Journal of Public Health,* 17(2), 87.

McKillop, D. G., Glass, J. C., Kerr, C. A. & McCallion, G. (1999). Efficiency in Northern Ireland Hospitals: A Non-Parametric Analysis. *The Economic and Social Review*, 30(2), 175-196.

Mogha, S. K., Yadav, S. P. & Singh, S. (2016). Estimating Technical Efficiency of Public Sector Hospitals of Uttarakhand (India). *International Journal of Operational Research,* 25(3), 371-399.

MoH. (2010). Annual Health Sector Perfornance Report 2009-10. Kampala, Uganda.

MoH. (2015). Annual Health Sector Performance Report 2014-15. Kampala, Uganda.

Molem Christopher, S., Beri Parfait, B. & Ntangsi Max, M. (2017). Determinants of the Inefficiency of Public Hospitals in Cameroon. *International Journal of Academic Research in Business and Social Sciences,* 7(6), 404-419.

Molem, C. S., Parfait, B. B. & Ntangsi, M. M. (2017). Determinants of the Inefficiency of Public Hospitals in Cameroon. *International Journal of Academic Research in Business and Social Sciences,* 7(6), 404-419.

Mujasi, P. N., Asbu, E. Z. & Puig-Junoy, J. (2016). How Efficient Are Referral Hospitals in Uganda? A Data Envelopment Analysis and Tobit Regression Approach. *BMC Health Services Research,* 16(1), 230.

Mulumba, Z. M., Nalubanga, L., Nankanja, C., Manasseh, K., Mansson, J. & Hollén, J. (2017). Technical Efficiency Decomposed–The Case of Ugandan Referral Hospitals. *The Central European Review of Economics and Management,* 1(4), 117-146.

Mwihia, F. K., M'Imunya, J. M., Mwabu, G., Kioko, U. M. & Estambale, B. B. (2018). Technical Efficiency in Public Hospitals in Kenya: A Two–Stage Data Envelopment Analysis. *International Journal of Economics and Finance,* 10(6), 141.

Nanyingi, M., Kazungu, J., Katongole, S. P., Wampande, L. N. & Anguyo, R. D. (2015). The State of Mortuary and Mortuary Services in Public Health Facilities of South Western Uganda.*International Journal of Public Health Research,* 3(6), 360-369.

Nistor, C. S., Ştefănescu, C. A. & Crişan, A. R. (2017). Performance through Efficiency in the Public Healthcare System–a Dea Approach in an Emergent Country. *Studia Universitatis Babes-Bolyai Oeconomica,* 62(1), 31-49.

Nunamaker, T. R. (1985). Using Data Envelopment Analysis to Measure the Efficiency of Non-Profit Organizations: A Critical Evaluation. *Managerial and Decision Economics,* 6(1), 50-58.

Oglobin, C. (2011). Health Care Efficiency across Countries: A Stochastic Frontier Analysis. *Applied Econometrics and International Development,* 11(1), 5-14.

Okwero, P., Tandon, A., Sparkes, S., McLaughlin, J. & Hoogeveen, J. G. (2010). Fiscal Space for Health in Uganda. World Bank Publications, 186.

Ozcan, Y. A. (2014). Evaluation of Performance in Health Care. Health Care Benchmarking and Performance Evaluation.Springer, 3-14.

Pope, C., Ziebland, S. & Mays, N. (2000). Qualitative Research in Health Care: Analysing Qualitative Data. *BMJ: British Medical Journal,* 320(7227), 114.

Renner, A., Kirigia, J. M., Zere, E. A., Barry, S. P., Kirigia, D. G., Kamara, C. & Muthuri, L. H. (2005). Technical Efficiency of Peripheral Health Units in Pujehun District of Sierra Leone: A Dea Application. *BMC Health Services Research,* 5(1), 77.

Samsudin, S. (2016). Are Public Hospitals in Malaysia Efficient? An Application of Dea and Tobit Analysis. *Southeast Asian Journal of Economics,* 4(2), 1-20.

San Sebastian, M. & Lemma, H. (2010). Efficiency of the Health Extension Programme in Tigray, Ethiopia: A Data Envelopment Analysis. *BMC International Health and Human Rights,* 10(1), 16.

Stierman, E., Ssengooba, F. & Bennett, S. (2013). Aid Alignment: A Longer Term Lens on Trends in Development Assistance for Health in Uganda. *Globalization and Health,* 9(1), 7.

Torabipour, A., Najarzadeh, M., Mohammad, A., Farzianpour, F. & Ghasemzadeh, R. (2014). Hospitals Productivity Measurement Using Data Envelopment Analysis Technique. *Iranian Journal of Public Health,* 43(11), 1576.

UBOS. (2014). The National Population and Housing Census 2014. Kampala, Uganda.

VanderWielen, L. M. & Ozcan, Y. A. (2015). An Assessment of the Health Care Safety Net: Performance Evaluation of Free Clinics. *Nonprofit and Voluntary Sector Quarterly,* 44(3), 474-486.

WHO. (2010). World Healh Report, Health Systems Financing: The Path to Universal Coverage World Health Organization.

Xenos, P., Nektarios, M., Constantopoulos, A. & Yfantopoulos, J. (2016). Two-Stage Hospital Efficiency Analysis Including Qualitative Evidence: A Greek Case. *Journal of Hospital Administration,* 5(3), 1.

Zamo-Akono, C., Ndjokou, M. M. & Song-Ntamack, S. (2013). Institutions and Hospital Efficiency in Cameroon: A Data Envelope Analysis. *Journal of African Development,* 15(1), 45-71.

Zere, E., Mbeeli, T., Shangula, K., Mandlhate, C., Mutirua, K., Tjivambi, B. & Kapenambili, W. (2006). Technical Efficiency of District Hospitals: Evidence from Namibia Using Data Envelopment Analysis. *Cost Effectiveness and Resource Allocation,* 4(1), 5.

APPENDIX: Population of Public Health Center II Facilities in Southwestern Uganda (N=84)

S/N	DMU No	HEALTH FACILITY NAME	RANK	TE	CRS TE	VRS TE	SCALE	RTS
1	DMU51	Katenga HCII	1	1.000	0.864	1.000	0.864	IRS
2	DMU54	KDA St Clinic HCII	1	1.000	1.000	1.000	1.000	CRS
3	DMU55	Kijurera HCII	1	1.000	0.851	1.000	0.851	IRS
4	DMU59	KMC St Clinic HCII	1	1.000	1.000	1.000	1.000	CRS
5	DMU65	Nyabushabi HCII	1	1.000	1.000	1.000	1.000	CRS
6	DMU67	Police Barracks HCII	1	1.000	1.000	1.000	1.000	CRS
7	DMU73	Bunagana HCII	1	1.000	1.000	1.000	1.000	CRS
8	DMU78	Gasovu HCII	1	1.000	0.901	1.000	0.901	IRS
9	DMU87	Nyakabande HCII	1	1.000	1.000	1.000	1.000	CRS
10	DMU90	Kaara HCII	1	1.000	1.000	1.000	1.000	CRS
11	DMU91	Butare HCII	1	1.000	1.000	1.000	1.000	CRS
12	DMU92	Ihunga HCII	1	1.000	1.000	1.000	1.000	CRS
13	DMU93	Ikamiro HCII	1	1.000	1.000	1.000	1.000	CRS
14	DMU95	Kagarama HCII	1	1.000	1.000	1.000	1.000	CRS
15	DMU96	Kashaasha HCII	1	1.000	1.000	1.000	1.000	CRS

16	DMU98	Kibuzigye HCII	1	1.000	1.000	1.000	1.000	CRS
17	DMU100	Kiyebe HCII	1	1.000	1.000	1.000	1.000	CRS
18	DMU101	Mpungu HCII	1	1.000	1.000	1.000	1.000	CRS
19	DMU107	Nyaruhanga HCII	1	1.000	1.000	1.000	1.000	CRS
20	DMU109	Bucundura HCII	1	1.000	1.000	1.000	1.000	CRS
21	DMU115	Kibanda HCII	1	1.000	1.000	1.000	1.000	CRS
22	DMU120	Kyerero HCII	1	1.000	1.000	1.000	1.000	CRS
23	DMU106	Nyamabare HCII	23	0.995	0.954	0.995	0.959	IRS
24	DMU45	Kahondo HCII	24	0.964	0.860	0.964	0.892	IRS
25	DMU104	Mushanje HCII	25	0.955	0.936	0.955	0.98	IRS
26	DMU49	Karujanga HCII	26	0.954	0.954	0.954	1.000	IRS
27	DMU79	Gisozi HCII	27	0.934	0.934	0.934	1.000	CRS
28	DMU103	Nangara HCII	28	0.931	0.931	0.931	1.000	CRS
29	DMU117	Kitojo HCII	29	0.886	0.886	0.886	1.000	CRS
30	DMU68	Nyamiryango HCII	30	0.849	0.849	0.849	1.000	CRS
31	DMU97	Kagunga HCII	75	0.835	0.835	0.835	1.000	CRS
32	DMU44	Kafunjo HCII	32	0.834	0.834	0.834	1.000	CRS
33	DMU111	Ibumba HCII	33	0.829	0.807	0.829	0.974	IRS
34	DMU122	Noozi HCII	34	0.811	0.791	0.811	0.975	IRS
35	DMU102	Mugyera HCII	35	0.810	0.810	0.810	1.000	CRS
36	DMU52	Kavu HCII	36	0.792	0.792	0.792	1.000	CRS
37	DMU84	Bigungiro HCII	37	0.785	0.785	0.785	1.000	CRS
38	DMU74	Chibumba HCII	38	0.761	0.720	0.761	0.946	IRS
39	DMU48	Kasheregyenyi HCII	39	0.743	0.708	0.743	0.952	IRS
40	DMU94	Kabere HCII	40	0.738	0.738	0.738	1.000	CRS
41	DMU76	Gapfurizo HCII	41	0.726	0.726	0.726	1.000	CRS
42	DMU41	Buramba HCII	42	0.707	0.707	0.707	1.000	CRS
43	DMU56	Kigata HCII	43	0.678	0.678	0.678	1.000	CRS
44	DMU75	Busengo HCII	44	0.677	0.669	0.677	0.989	IRS
45	DMU61	Kyobugombe HCII	45	0.673	0.638	0.673	0.948	IRS
46	DMU69	Nyanja HCII	46	0.669	0.658	0.669	0.983	IRS
47	DMU70	Rusikizi HCII	47	0.667	0.667	0.667	1.000	CRS
48	DMU42	Habubale HCII	48	0.660	0.660	0.660	1.000	CRS
49	DMU105	Shebeya HCII	49	0.642	0.639	0.642	0.995	IRS
50	DMU82	Maregamo HCII	50	0.610	0.610	0.610	1.000	CRS
51	DMU50	Karweru HCII	51	0.597	0.597	0.597	1.000	CRS
52	DMU116	Kitanga HCII	52	0.589	0.589	0.589	1.000	CRS
53	DMU121	Rwanjura HCII	53	0.579	0.579	0.579	1.000	CRS
54	DMU66	Nyakasharara HCII	54	0.564	0.564	0.564	1.000	CRS
55	DMU46	Kanjobe HCII	55	0.553	0.553	0.553	1.000	CRS
56	DMU86	Mulehe HCII	57	0.545	0.545	0.545	1.000	CRS

57	DMU110	Ibugwe HCII	56	0.545	0.545	0.545	1.000	CRS
58	DMU99	Kigazi HCII	58	0.528	0.528	0.528	1.000	CRS
59	DMU47	Kahungye HCII	59	0.523	0.523	0.523	1.000	CRS
60	DMU83	Mburabuturo HCII	60	0.499	0.499	0.499	1.000	CRS
61	DMU62	Mwanjari HCII	61	0.497	0.497	0.497	1.000	CRS
62	DMU60	Kyasano HCII	62	0.496	0.496	0.496	1.000	CRS
63	DMU77	Chihe HCII	63	0.473	0.471	0.473	0.996	IRS
64	DMU43	Kabindi HCII	64	0.450	0.450	0.450	1.000	CRS
65	DMU113	Kandago HCII	65	0.437	0.437	0.437	1.000	CRS
66	DMU118	Kitunga HCII	66	0.434	0.434	0.434	1.000	CRS
67	DMU119	Mukyogo HCII	67	0.427	0.419	0.427	0.98	IRS
68	DMU71	Rwene HCII	68	0.419	0.406	0.419	0.969	IRS
69	DMU114	Karorwa HCII	69	0.405	0.405	0.405	1.000	CRS
70	DMU81	Kalehe HCII	70	0.395	0.395	0.395	1.000	CRS
71	DMU89	Zindiro HCII	71	0.395	0.395	0.395	1.000	CRS
72	DMU123	Rwenyangye HCII	72	0.392	0.392	0.392	1.000	CRS
73	DMU108	Kaf-Nyakarmbi HCII	73	0.387	0.372	0.387	0.961	IRS
74	DMU112	Kahama HCII	74	0.385	0.385	0.385	1.000	CRS
75	DMU80	Kagunga HCII	31	0.384	0.384	0.384	1.000	CRS
76	DMU88	Nyamatsinda HCII	76	0.358	0.358	0.358	1.000	CRS
77	DMU58	Kitooma HCII	77	0.353	0.345	0.353	0.978	IRS
78	DMU63	Muyumbu HCII	78	0.325	0.325	0.325	1.000	CRS
79	DMU72	Rutooma HCII	79	0.293	0.293	0.293	1.000	CRS
80	DMU85	Muganza HCII	80	0.279	0.279	0.279	1.000	CRS
81	DMU57	Kisaasa HCII	81	0.277	0.264	0.277	0.955	IRS
82	DMU40	Burambira HCII	82	0.250	0.250	0.250	1.000	CRS
83	DMU53	Kicumbi HCII	83	0.243	0.243	0.243	1.000	CRS
84	DMU64	Ndorwa Prison HCII	84	0.165	0.165	0.165	1.000	CRS

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The Impact of FDI Inflows, Exports and Domestic Investment on Economic Growth in Africa

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Abstract: The topic regarding the impact of foreign direct investment net inflows, exports and domestic investment on economic growth has resulted in mixed research findings across the globe. Literature related to the above variables in five selected African countries drawn from the five sub-regions is critically reviewed in this article. Furthermore, an econometric analysis of these variables is done to ascertain their impact on economic growth. The findings are compared to previous findings in other studies. The researcher found similar results in some variables when compared to previous researches in other countries. The study found that the independent statistical variables significantly predicted gross domestic product, with F (3, 63) = 5.84, $P > F$ 0.0014, R^2 = 0.2176, a*djusted* R^2 = 0.1804 and *root mean squared error (RMSE)* = 0.54976. The independent variables added significantly to the prediction of $p < 0.05$. The researcher challenges the notion that the impact of foreign direct investment net inflows, exports and domestic investment on economic growth should always be positive and significant. This study provides a refreshed appreciation of the relationship between foreign direct investment net inflows, exports, domestic investment and economic growth in light of rapid socioeconomic changes in the sampled countries. The article also proposes some critical considerations regarding this relationship.

Keywords: *Gross Domestic Product; Exports; Foreign Direct Investment; Domestic Investment; Economic Growth*

1. Introduction

Research the world over has penned many different conclusions regarding the impact of FDI net inflows, exports and domestic investment on economic growth. The relationship between these variables has come in different forms. The research findings the world over have not been consistent over the years causing serious disagreements between various authors regarding the impact of these variables on economic growth. Research results range from positive, negative and to no relationship at all. Some dependent variables turned out to influence some explanatory variables in other instances.

After 10 years of high growth, an increasing number of countries in Africa will move into 'middle-income' status (at least USD1,000 per capita income) if current growth rates are maintained (WorldBank, 2012). According to August (2013), Africa is the world's fastest-growing continent at 5.6% a year with this growth trajectory expected to rise by an average of over 6% till 2023. African Development Bank (AfDB, 2018), however, argues that domestic and global shocks in 2016 slowed down the rate of economic growth in Africa, though economic recovery signs already manifested in 2017. To AfDB (2018) the real output growth increased by 3.6% in 2017, up from 2.2% in 2016, before an expected estimated acceleration growth of 4.1% in 2018 and 2019. This growth trajectory has been supported by not-resource-intensive countries thereby, underscoring Africa's economic resistance (AfDB, 2018). This study contrasted these economic developments with an assumption in mind that any combination of the three variables must have influenced this trend.

AfDB (2018) argues that economic resilience and fundamentals have enriched many African countries over the years with some countries` local resource enlistment exceeding that of some Latin American and Asian peers. These resources are, however, inadequate to finance human capital and infrastructure development (AfDB, 2018). Domestic resource mobilization has placed many African economies in a better position to curb the harsh external conditions than ever before. However, Africa`s overreliance on primary exports has suffered a major blow due to commodity price fluctuations which negatively undermined planned investments. Natural resource-dependent economies suffered fiscal vulnerability exposure due to weaker external conditions. Because of all this, it is imperative to invest in innovation and high-technology industries to cushion economies against such eventualities. Internal and external factors are therefore critical for the economic growth trajectory of the continent.

United Nations Conference on Trade and Development (UNCTAD)(2017) forecasts an increase in global flows of almost USD0.05 trillion in 2018 from USD1.8 trillion in 2017 – though below the 2007 peak. (UNCTAD, 2017) argues that there is a likelihood of significant effect on cross-border investment that could hamper economic recovery due to (1) tax policy changes, (2) geopolitical risk and, (3) uncertainty in policy. UNCTAD(2017) further argues that there would be a push in FDI net inflows to Africa as a result of advances in regional integration and an anticipated rise in oil prices. UNCTAD (2017) states that foreign investment to North Africa has increased as a result of robust FDI net inflows to Egypt. However, the sluggishness of prices of commodities has reduced economic expectations in sub-Saharan Africa with the effect of scaring away investors in the sub-region. FDI net inflows to countries such as Angola were restrained (UNCTAD, 2017) with some diversified producers of East Africa such as Ethiopia registering strong FDI net inflows than ever before in 2016. AfDB (2018) argues that countries in Africa need to reinforce their economic pliability and vitality to boost their economies to new levels of growth steadiness through productivity and innovation supported by natural resource extraction and value addition.

However, with all that being said about Africa, this study seeks to examine the relationship that exists between FDI net inflows, exports and domestic investment and economic growth in five selected African countries spanning across Africa`s five sub-regions. Furthermore, the study seeks to provide a better appreciation and understanding of this relationship from an African perspective. The study is going to examine the benefits and challenges faced by Africa in regard to these macroeconomic fundamentals. The study is therefore critical for economic growth and development in Africa. It also provides critical insights and trends that will help foster future economic growth. This study will go a long way towards influencing policy formulation and implementation. This study is being done whilst policymakers are being seized by the role of technology in economic development the world over. These technological developments at international level require policymakers in Africa to make an assessment of their implications for investment and services trade. More importantly, the study has come at an opportune time for governments, policy-makers, and researchers. The remainder of the article will be: Section 2 - literature review, Section 3 - methodology, Section 4–data analysis and interpretation, Section 5–conclusion and finally Section 6 - references.

2. Literature Review

The study examined the impact of exports, domestic investment and FDI net inflows on economic growth (GDP) in five selected African countries drawn from North Africa, Southern Africa, East Africa, West Africa and Central Africa. Economic growth was measured by gross domestic product. Why gross domestic product (GDP) was used? Jain, Nair, & Jian(2015) state that "GDP is a very strong measure to gauge the economic health of a country and it reflects the sum total of the production of a country and as such comprises all purchases of goods and services produced by a country and services used by individuals, firms, foreigners and the governing bodies."However, other authorities such as (Qian, 2009) are calling for the adoption of the Gross National Happiness which is considered a more complete approach that is based on four pillars of preservation and promotion of cultural values, conservation of the natural environment, sustainable development, and good governance. GDP is used as an indicator of economic growth by most governments and economic planners and policy formulators. To Jain, Nair, & Jian(2015), "GDP enables one to judge whether the economy is contracting or expanding, whether it needs a boost or restraint, and if a threat such as a recession or inflation looms on the horizon." Various economic sectors' contributions to GDP are considered for future planning. Simon Kuznets was the first to develop GDP in a US Congress report in 1934 (Jain, Nair, & Jian, 2015). GDP accounts for all domestic production, regardless of whether the income accrues to domestic or foreign institutions (Jain, Nair, & Jian, 2015).

Macroeconomic Performance Across Africa's Sub-Regions: GDP in Africa although growing in real terms since 1997, there have been some challenges that continue to affect this growth trajectory chief among them being the fluctuations in commodity prices such as the ones experienced in 2013–15. However, GDP growth in percentage terms shows some significant fluctuations as depicted in figure 3 below. Growth performance varied widely across countries in the sub-regions.

East Africa. With an estimated growth of 5.6% in 2017 up from 4.9% in 2016, East Africa remains the fastest-growing sub-region in Africa (AfDB, 2018). This trend is expected to remain resilient, reaching 5.9% in 2018 and is expected to reach 6.1% in 2019 (AfDB, 2018). AfDB (2018) further provides that the increased economic growth is prevalent in the sub-region, with a number of economies growing by 5% or more. This growth is being supported by construction activities, ICT and an expected rebound in agriculture. FDI net inflows have increased significantly in Ethiopia since 2013 (figure 1) as well as gross capital formation which increased from USD10 billion in 2011 to USD29 billion in 2016 (table 2). UNCTAD (2017) states that East Africa received USD7.1 billion in FDI in 2016, 13% more than in 2015. Infrastructural investments helped to propel flows to Ethiopia with an increase by 46% to USD3.2 billion (UNCTAD, 2017). UNCTAD (2017) further states that despite reforms in investment and a supportive domestic policy environment FDI into Kenya declined by 36% to USD394 million in 2016. These reforms in Kenya managed to sustain cross-border mergers and acquisitions (M & As), with the private equity fund Helios (United Kingdom) acquiring 70% of Telkom (Kenya) from Orange (France) (UNCTAD, 2017).

North Africa. According to AfDB (2018), North Africa recorded a GDP of 5% in 2017 is an increase from 3.3% in 2016 and was the second- highest. (AfDB, 2018) further projects the sub-region`s growth to increase to 5.1% in 2018, before declining to 4.5% in 2019 underpinned by oil production recovery in Libya. Libya`s GDP rose by 55.1% in 2017, after several declines in the previous years—though production never the less remains lower than before the Arab revolution in 2011 (AfDB, 2018). Egypt recorded a steady economic growth of 4.1% in 2017, a slight decline from 4.3% in 2016 (figure 3). The return of net exports together with positive FDI as well as the depreciation of the real exchange rate after its liberalization positively affect growth (AfDB, 2018). Robust FDI to Egypt in 2006, 2007, 2008 and its rebound in 2015 and 2016 continues to boost inflows to North Africa (figure 1). UNCTAD (2017) argues that reforms in foreign investment and discoveries in new gas have helped increase investment flows into North Africa which increased by 11%, to USD14.5 billion. Growth in 2015 was mainly as a result of investments in Egypt, which recorded an increase in FDI inflows of 17% to USD8.1 billion (UNCTAD, 2017). Furthermore, the discovery of gas reserves by Shell of the Netherlands in Egypt`s the Western Desert has helped to drive investment into the hydrocarbons sector (UNCTAD, 2017). FDI flows to the rest of North Africa have remained subdued due to continued conflicts and low oil prices.

Southern Africa. According to AfDB (2018), the region`s economy nearly folded in 2017 to 1.6%, an upward increase from 0.9% in 2016 as a result of better performance by South Africa and Zambia - two main commodity exporters (South Africa, which doubled its growth, though still low, at 0.9%); and Zambia, which grew 4.1%). Southern Africa`s growth in 2018 and 2019 is forecasted to increase by 2% and 2.4% respectively (AfDB, 2018). This growth is reinforced by expansion in mining, services and agriculture in the sub-region. These figures are lower than the African average, mainly because of slow growth in South Africa. This had strong neighborhood spillover effects (through trade and revenues sharing) on the sub-region's customs union (AfDB, 2018). South Africa`s policy uncertainty is becoming worrisome. Current developments in Zimbabwe point towards significant economic growth which might have positive effects in the sub-region with Mozambique, Mauritius, Lesotho and Malawi also expected to grow by 4% or more, though their contribution to the sub-region's GDP is small (AfDB, 2018). FDI inflows to the sub-region contracted by 18% to USD21.2 billion. Flows to Mozambique, however, declined by 20% though remains large at USD3 billion (AfDB, 2018). Mozambique's commodity sector`s long-term value has caused investors to remain positive despite the serious financial crunch and this has seen Eni (Italy) approving a USD8 billion offshore gas exploration at the end of 2016 with ExxonMobil (United States) buying a multibillion-dollar stake in Eni (Italy) during the same period (AfDB, 2018).

According to (AfDB, 2018), "flows to Zambia fell sharply, dropping 70% to USD469 million, amid low commodity prices with South Africa, the economic powerhouse on the continent, continues to underperform, with a paltry FDI of USD2.3 billion in 2016; that was up 31% from a record low in 2015 but still well off its past average." Nonetheless, an investment of USD759 million into a vehicle-production facility by state-owned Beijing Automotive International Corporation (China) has become the largest investment in four decades in the country (AfDB, 2018).

West Africa. AfDB (2018) projects an accelerated growth of 3.6% in 2018 and 3.8% in 2019 for West Africa. This growth is reinforced by increased output growth in agriculture and oil production. Other large economies accounting for the growth include Ghana, Senegal and Cote d'Ivoire; while smaller economies (Togo, Sierra Leone, Benin and Burkina Faso) are anticipated to grow by 5% or more (AfDB, 2018). Ghana has recorded significant growth in GDP since 2005 (table 3).

In 2016 the country recorded a gross capital formation of USD10 billion from a low of USD2 billion in 1997. Ghana`s GDP per capita increased from USD391.36 in 1997 to USD1 513.46 in 2016 though lower than that of Angola and Egypt at USD3 308.70 and USD3 477.85 respectively (table 1). The improving investment into Nigeria has helped to drive FDI net inflows into West Africa which has since increased by 12% to USD11.4 billion in 2016(AfDB, 2018). On the other hand, FDI net inflows increased by 9% to USD3.5 billion in Ghana (UNCTAD, 2017). The partnership between Vitol Group (Netherlands), Eni (Italy) and Ghana's National Petroleum Corporation, has continued development on the offshore oil and natural gas project in West Ghana valued at USD7 billion (UNCTAD, 2017). The industrial policy efforts by Ghana and Côte d'Ivoire to combine cocoa processing bode well for future investments in the region (UNCTAD, 2017). However, Côte d'Ivoire experienced a minor decline (-3%) in FDI inflows in 2016 (UNCTAD, 2017).

Central Africa. AfDB (2018) argue that even with the recovery in oil prices, the region continued to underperform as output contracted sharply in Equatorial Guinea (-7.3%) and Republic of Congo (-4.0%), slowing down the region's overall 2017 economic growth to 0.9% (AfDB, 2018). The sub-region has experienced an economic decline due to (1) its fixed exchange rate, (2) its deep-seated dependence on oil, and (3) lack of independent monetary policy levers to adjust to changing economic conditions (as all five countries are members of the Central African Economic and Monetary Community [CEMAC]) (AfDB, 2018). Central Africa`s FDI net inflows dropped by 15% in 2016, to USD5.1 billion (AfDB, 2018). DRC`s FDI declined by 28% to USD1.2 billion in 2016, with investment trickling only into the country`s mineral sector (UNCTAD, 2017). However, Equatorial Guinea suffered a considerable decrease in FDI inflows (-77% to USD54 million), with Chad remaining constant, while Gabon managed to increase its flows by 13% to USD703 million (UNCTAD, 2017). Inflows into the DRC have been due to continued investments by the Chinese firms working in copper and cobalt extraction (UNCTAD, 2017).

Improving domestic revenue mobilization is critical for African countries as they eye economic transformation. The upsurge in domestic savings for the past decade bodes very well with the domestic resource mobilization (AfDB, 2018). Developed economies such as the USA, UK and France remained the largest investors in Africa in 2015 (UNCTAD, 2017). However, half of the top ten major investors in Africa were from developing economies (UNCTAD, 2017). The period 2010 and 2015 saw China`s FDI stock increasing in the region by almost threefold (UNCTAD, 2017). UNCTAD(2017) states that investors from developing economies have continued buying assets held by MNEs in Africa. Cross-border M&As declined by 54% to USD9.7 billion in 2016 in the continent (UNCTAD, 2017). MNEs from developing economies, especially in China acquired assets worth USD2 billion from developed countries' MNEs (UNCTAD, 2017). For example, Freeport-McMoRan DRC Holdings (United States) sold its entire share capital to Molybdenum (China) for USD2.8 billion to supply cobalt, which is critical for the production of Tesla batteries (UNCTAD, 2017). There has been a number of acquisitions by African MNEs located in Africa with Barclay's (United Kingdom), for example, selling its 150-year-old affiliate in Egypt to Morocco's Attijariwafa Bank for USD500 million (UNCTAD, 2017). Econet Wireless (Zimbabwe)'s Liquid Telecom also bought South Africa`s fixed-line operator Neotel (where India's Tata Communications is the major shareholder) for USD430 million, in a deal that was deemed to create the continent's biggest broadband network (UNCTAD, 2017).

Africa's Economic Outlook Across Selected Countries: Africa`s economic performance since 1997 has been marred with fluctuations due to a number of divergent reasons. Figure 1 below depicts FDI net inflows in United States dollars as a percentage of GDP from 1997 to 2016 for five selected African countries, which are, Angola, Egypt, Ethiopia, Ghana and Zimbabwe. Egypt recorded the highest FDI net inflows in 2006 (USD10 billion) and 2007 (USD12 billion) followed by Angola with USD9 billion in 2015. Zimbabwe recorded a high of USD473 million in 2014, being the lowest among the five countries due to the economic meltdown experienced since 2000 when the country embarked on her land reform program. Exports of goods and services are shown in figure 2. Angola topped the list since 2004 with the highest exports of USD72 billion

attained in 2012 followed by Egypt which recorded a high of USD54 billion in 2008. At the bottom is Zimbabwe with an average of USD3 billion per year from 1997 to 2016. In Table 1 GDP per capita is shown for the same period, 1997 to 2016. Angola recorded an average GDP per capita of USD2 373.40 per year for the period, followed by Egypt with an average of USD2 026.36, Ghana USD916.41, Zimbabwe USD660.06 and Ethiopia USD294.43. Table 2 also shows gross capital formation formerly known as the gross domestic investment.

Figure 1: FDI net Inflows

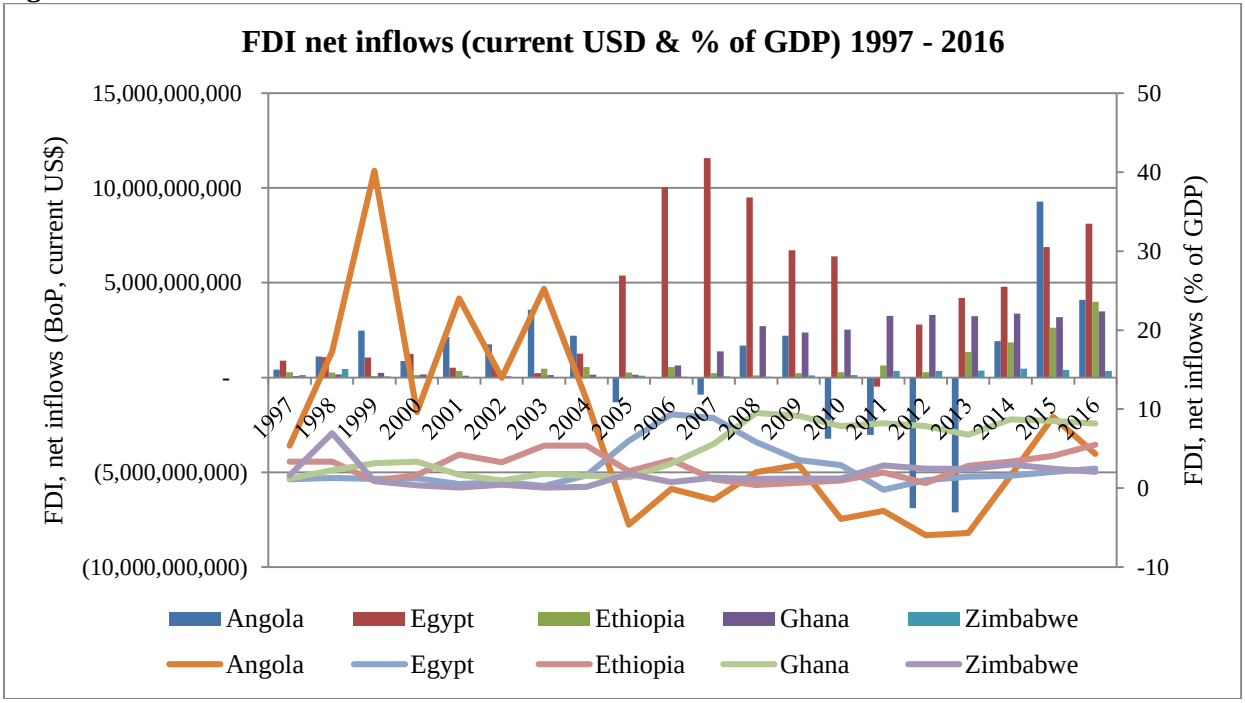


Figure 1: FDI, net inflows (current USD & % of GDP) from 1997 – 2016.
Source: World Development Indicators updated 03/01/2018.

Table 1: GDP Per Capita (Current USD) From 1997 - 2016

Year	Angola	Egypt	Ethiopia	Ghana	Zimbabwe
1997	506.88	1,185.72	140.86	391.36	728.40
1998	415.69	1,259.00	124.51	414.77	538.28
1999	385.77	1,321.80	119.13	417.77	568.44
2000	555.30	1,428.18	123.88	263.11	547.36
2001	526.17	1,370.72	120.18	273.66	548.06
2002	711.18	1,210.23	111.36	309.48	507.35
2003	779.47	1,120.87	118.87	373.28	453.35
2004	1,041.09	1,045.94	135.76	423.19	454.36
2005	1,443.99	1,168.12	161.63	498.17	444.76
2006	2,062.42	1,375.20	193.79	922.94	414.80
2007	2,878.84	1,640.48	243.30	1,090.69	397.00
2008	3,868.58	2,011.25	325.38	1,224.40	325.68
2009	3,347.84	2,291.67	379.76	1,086.77	624.27
2010	3,529.05	2,602.48	341.31	1,312.61	719.98
2011	4,299.01	2,747.48	354.85	1,574.98	840.95
2012	4,598.25	3,181.44	468.51	1,629.80	968.16

2013	4,804.62	3,213.39	502.15	1,814.49	1,026.39
2014	4,709.31	3,327.75	571.16	1,432.23	1,031.10
2015	3,695.79	3,547.71	645.47	1,361.11	1,033.42
2016	3,308.70	3,477.85	706.76	1,513.46	1,029.08

Source: World Development Indicators updated 03/01/2018.

Table 2: Gross Capital Formation (Current USD) From 1997 To 2016

Year	Angola	Egypt	Ethiopia	Ghana	Zimbabwe
1997	1,947,257,412	13,775,811,209	-	1,709,472,656	1,546,744,200
1998	2,291,105,191	18,240,850,059	-	1,728,806,228	1,328,437,900
1999	1,771,594,609	19,610,734,297	-	1,621,105,776	987,298,800
2000	1,374,327,902	19,521,503,009	-	1,195,856,120	907,788,700
2001	1,217,840,320	17,827,980,403	-	1,413,735,306	695,798,400
2002	1,477,273,249	15,812,659,402	-	1,214,767,037	317,105,800
2003	1,822,285,786	14,002,820,426	-	1,750,639,594	458,207,300
2004	1,800,436,670	13,354,778,964	-	2,520,310,951	261,781,100
2005	2,478,708,477	16,121,779,391	-	3,112,403,619	87,777,200
2006	6,419,450,006	20,132,593,224	-	4,415,678,669	85,532,400
2007	8,163,614,106	27,206,474,896	-	4,978,445,252	376,244,600
2008	13,652,746,643	36,454,545,455	-	6,119,678,609	226,433,100
2009	11,496,781,725	36,266,047,726	-	5,369,791,170	1,232,079,529
2010	11,902,689,387	42,685,581,598	-	8,364,124,179	2,259,412,007
2011	13,436,930,123	40,363,529,959	10,259,286,600	10,461,362,614	2,453,419,093
2012	17,230,756,332	44,774,376,512	16,067,394,958	13,330,439,748	1,687,006,841
2013	18,359,875,796	41,013,867,775	16,239,043,212	13,257,368,047	1,758,183,494
2014	19,448,121,307	41,683,999,139	21,129,157,230	10,480,287,588	1,879,216,750
2015	9,834,745,136	47,538,015,438	26,218,552,261	9,246,164,759	2,003,427,020
2016	8,010,311,497	50,072,869,043	28,833,223,856	9,750,607,184	2,026,381,291

Source: World Development Indicators updated 03/01/2018.

Figure 2: Exports of Goods and Services

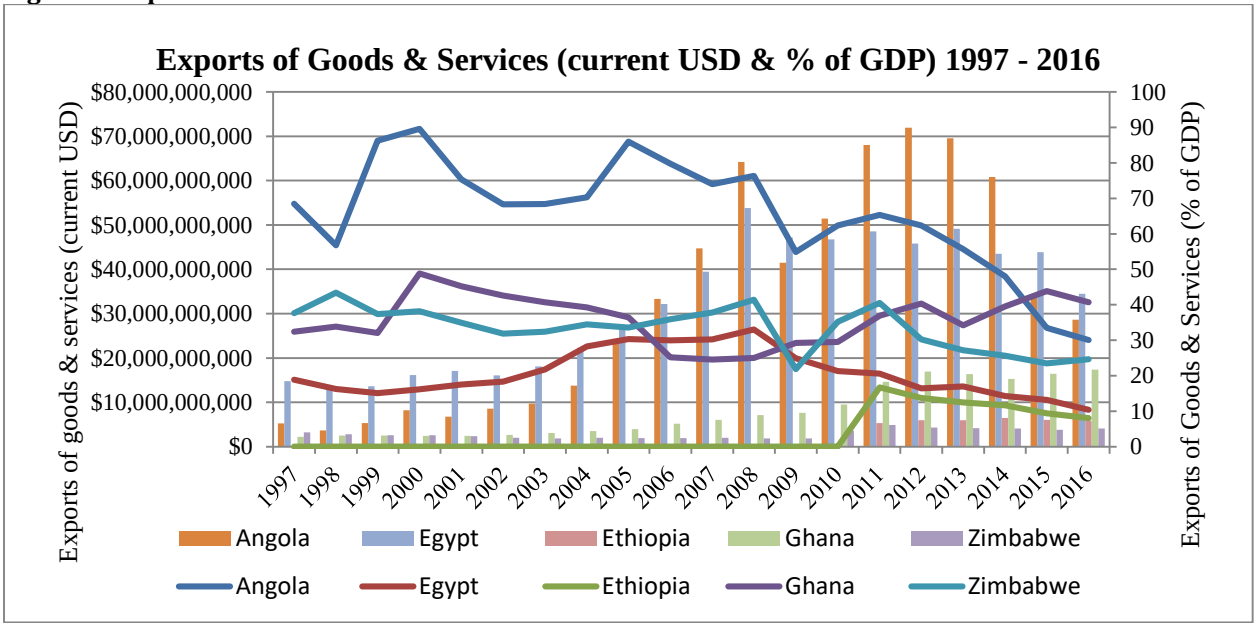


Figure 2: Exports of goods and services (current USD & % of GDP) from 1997 – 2016.
Source: World Development Indicators updated 03/01/2018.

Figure 3: GDP Growth

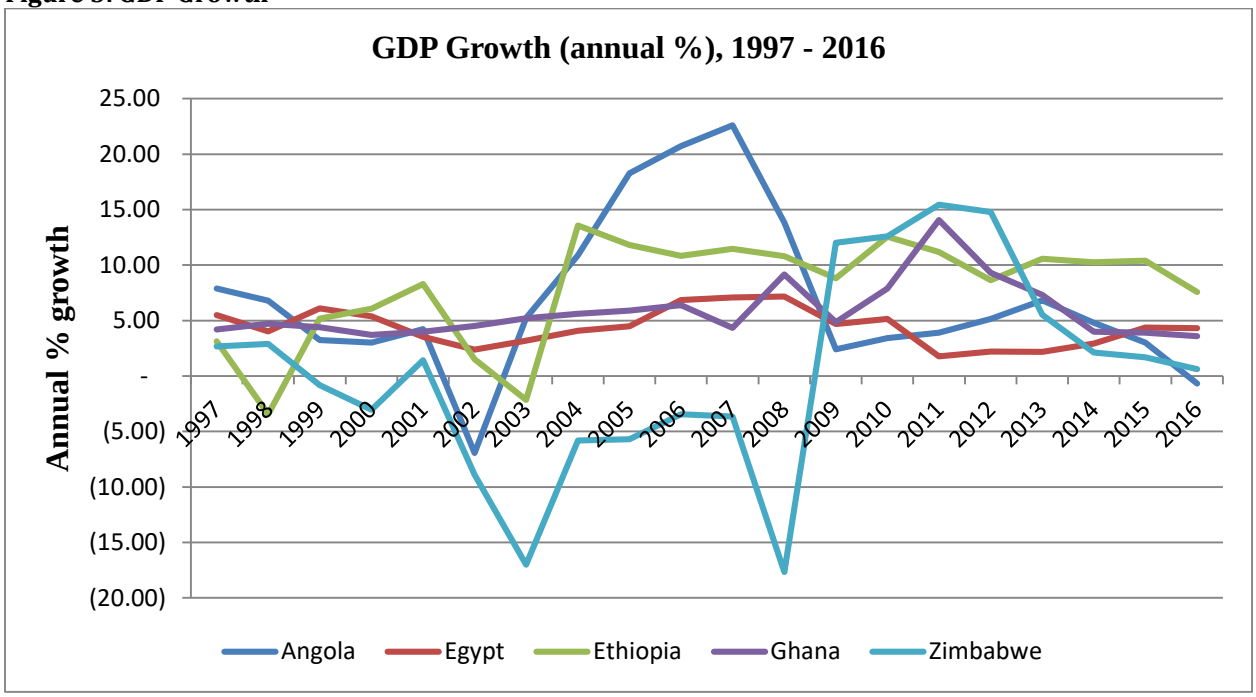


Figure 3: GDP growth (annual %) from 1997 – 2016.

Table 3: GDP (current USD) from 1997 to 2016

Year	Angola	Egypt	Ethiopia	Ghana	Zimbabwe
1997	7,648,377,412.83	78,436,578,171.09	8,589,211,390.50	6,891,308,593.75	8,529,571,600.00
1998	6,445,041,824.67	84,828,807,556.08	7,818,224,905.55	7,480,968,858.13	6,401,968,200.00
1999	6,152,922,942.98	90,710,704,806.84	7,700,833,482.01	7,719,354,838.71	6,858,013,100.00
2000	9,129,594,818.61	99,838,543,960.08	8,242,392,103.68	4,983,024,408.15	6,689,957,600.00
2001	8,936,063,723.20	97,632,008,709.85	8,231,326,016.47	5,314,909,953.93	6,777,384,700.00
2002	12,497,346,669.67	87,850,683,978.67	7,850,809,498.17	6,166,330,136.29	6,342,116,400.00
2003	14,188,949,190.62	82,924,503,942.64	8,623,691,300.04	7,632,406,552.84	5,727,591,800.00
2004	19,640,848,728.89	78,845,185,293.50	10,131,187,261.4	8,881,368,538.08	5,805,598,400.00
2005	28,233,712,830.90	89,685,725,230.25	12,401,139,453.9	10,731,634,116.7	5,755,215,200.00
2006	41,789,478,661.31	107,484,034,870.9	15,280,861,834.6	20,409,257,610.4	5,443,896,500.00
2007	60,448,921,272.23	130,478,960,092.5	19,707,616,772.8	24,758,819,717.7	5,291,950,100.00
2008	84,178,032,716.10	162,818,181,818.1	27,066,912,635.2	28,526,891,010.4	4,415,702,800.00
2009	75,492,384,801.37	188,982,374,700.8	32,437,389,116.0	25,977,847,813.7	8,621,573,608.35
2010	82,470,913,120.73	218,888,324,504.7	29,933,790,334.3	32,174,772,955.9	10,141,859,709.6
2011	104,115,923,082.7	236,001,858,960.0	31,952,763,089.3	39,566,292,432.8	12,098,450,748.8
2012	115,398,371,427.6	279,372,758,361.8	43,310,721,414.0	41,939,728,978.7	14,242,490,252.4
2013	124,912,063,308.2	288,586,231,501.8	47,648,211,133.2	47,805,069,494.9	15,451,768,658.5
2014	126,776,874,216.7	305,529,656,458.4	55,612,228,233.5	38,616,536,131.6	15,891,049,235.9
2015	102,962,245,246.7	332,698,041,030.8	64,464,547,915.2	37,543,361,203.5	16,304,667,807.0
2016	95,335,111,741.20	332,791,045,963.8	72,374,224,249.4	42,689,783,733.8	16,619,960,401.9

Source: World Development Indicators updated 03/01/2018

Empirical Overview: A number of studies have been carried out globally in relation to the impact of FDI, exports, domestic investment on economic growth with various results. However, a study by Tsaurai & Odhiambo (2012) provides a paradigm shift regarding these relationships. Tsaurai & Odhiambo (2012) drew some critical analysis regarding the relationship between FDI and economic growth and concluded that there are four views regarding the relationship. Their study went into detail explaining each view, the studies carried out under each view and the findings thereof. A study by Bakari (2017) provides empirical evidence regarding the impact of export, import and domestic investment on GDP. Bakari (2017) cites empirical evidence from researchers such as (Sumei, Selvanathan, & Selvanathan, 2008), (Andrews, 2015), (Saaed & Hussain, 2015), (Bader, 2016) and (Albiman & Suleiman, 2016) regarding the relationship that exists between the four variables. In the study, (Bakari, 2017) finds out that there was no correlation between imports, exports, domestic investment and economic growth. The empirical results on one hand indicate that imports, exports and domestic investment have no effect on GDP in Egypt. On the other hand, the results of the causality test show that domestic investment, exports and imports causes economic growth. These results assert that imports and domestic investment are the sources of economic growth in Egypt. Fotopoulos & Louri (2004) examine a model which consists of five variables, that is, GDP, FDI, labor force, and gross capital formation as a percentage of GDP, and found that Pakistan's capacity to progress on economic development depends on performance in attracting FDI.

Sumei, Selvanathan, & Selvana than (2008) cited by Jain, Nair, & Jian (2015) shows "that while there was a bi-directional causality between domestic investment and economic growth, there was only single-directional causality from FDI to domestic investment and to economic growth. Rather than crowding out domestic investment, FDI was found to be complementary with domestic investment. Thus, FDI had not only assisted in overcoming the shortage of capital, it had also stimulated economic growth through complementing domestic investment in China." Elboiashi (2002) investigates the causal relationships between domestic investment, FDI and economic growth in Tunisian, Egyptian, and Moroccan economies. The findings show that FDI negatively affected domestic investment and GDP in the short-run and had positive effects in the long-run. Additionally, the results show a uni-directional causality between GDP and FDI in Morocco and Egypt, and bi-directional causality between GDP and FDI in Tunisia. Domestic investment`s role was greater than GDP in driving FDI into these countries. It was also noted that FDI was more effective in promoting growth than domestic investment. FDI was also found to be more influential for enhancing domestic investment than GDP. More so, the results showed that FDI has a crowd-out effect on domestic investment in the short-run and a crowd-in effect on domestic investment in the long-run. The study by Dreger & Herzer (2013) which used more sophisticated and detailed comparison techniques had quite interesting and very relevant findings to this article.

The two examined the impact of export-growth on economic growth in developing countries. The two reached three conclusions in their study; "i) in the short–run export growth does have an impact on GDP growth and vice-versa, for example, the two both have an effect on growing each other, ii) that in the long run the growth of exports tends to have a negative effect on the growth of a country's GDP and it also acknowledges that iii) there is a wide variation among the correlation in individual countries caused by a variety of different scenarios." Li, Chen, & San (2010) examined the impact of foreign trade on economic growth in East China. The study covered the period spanning from 1981 to 2008, during this time period economic growth rose from USD146.1 billion to USD 3,300 billion, while exports also rose from USD15.7 billion to USD 1,425 billion. Li, Chen, & San (2010) find that foreign trade was the long and short-term source of GDP growth in East China. They also found that there was a mutual causality between the two measures. East China experienced an increase in export trade from 10.74% to 43.17% over the course of 28 years. Li, Chen, & San (2010) believe that much of the period's economic growth was credited to rapid increases in exports. These authors adopted aco-integration analysis with vector error correction model to test time series data. Li, Chen, & San (2010) recommended that since the correlation between GDP and exports is not constant, the East Chinese government should focus on meeting international environmental standards, boosting emerging technologies, and ensuring a healthy trade environment so as to uphold a competitive environment that enhances exports thereby increasing the overall economic growth. Gross Capital Formation was used as a proxy for domestic investment.

3. Methodology

Data Sources and Research Approach: This article examined the impact of FDI net inflows, exports and domestic investment on economic growth in five selected African countries (Angola, Egypt, Ghana, Ethiopia and Zimbabwe) through an econometric regression model. Data was obtained from the World Bank official website, that is, the World Development Indicators 2018 database. The period 1997 to 2016 was selected due to the availability of data. The regression model was influenced by a growing interest in the use of econometric regression models for applied economic analysis. Multiple regression analysis models are useful for investigating the dynamic effects between variables. Econometric regression model fits well with the purpose of this article that seeks to examine the impact of FDI net inflows, exports and domestic investment on GDP as there is no *priori* theory regarding the relationship in the mentioned five African countries as drawn from the five sub-regions. FDI net inflows, exports and domestic investment were used as independent variables while GDP a proxy for economic growth was the dependent variable.

Natural Logarithms Transformation: Following Brooks (2008), the variables under consideration were first transformed into natural logarithms before they were used in the econometric model. The use of natural logarithms has become a standard in econometrics according to Brooks (2008). Durbin–Watson test (test for autocorrelation and lack of independence of residuals), test statistic (*t-test & f-test),* heteroscedasticity test factor analysis, skewness and kurtosis normality test and stepwise regression (to determine variables with the greatest effect on economic growth) were some of the tests performed before running the regression model in Stata/SE 12.0. Maune (2017) suggests the need to express the regression model equation in double logarithmic form. According to Brooks (2008), "this means that both the dependent and the independent variables are transformed into natural logarithms, thereby rendering the coefficient estimates elasticities." Maune (2017) argues that the use of logarithms guards against compromising the regression model`s significance.

The econometric model: The econometric model took the following reduced form:

$$\ln Y_{it} = \alpha_t + \beta_1 \ln X_{it} + \beta_2 \ln X_{it} + \cdots + \beta_k \ln X_{kt} + u_{it}, \qquad i = 1,\ldots,K;\ t = 1,\ldots,T \qquad (1)$$

Now let $\beta_1 = \ln\beta_1$, $Y_{it} = \ln Y_{it}$, $X_{it} = \ln X_{it}$, $X_{it} = \ln X_{it}$ *and* $X_{kt} = \ln X_{kt}$

$$Y_{it} = \alpha_t + \beta_1 X_{it} + \beta_2 X_{it} + \ldots \beta_k X_{kt} + u_{it}, \qquad (2)$$

Where the variables $x_{it}, x_{it}, \ldots, x_{kt}$ are a set of $k - 1$ explanatory variables which influence y_{it}, and the coefficient estimates $\beta_1, \beta_2, \ldots, \beta_k$ are the parameters which quantify the effect of each of these explanatory variables on y_{it} and to make the model more realistic, a random disturbance term, denoted by u_{it}, is added to the equation to represent unobserved shocks in each time period. Each coefficient is known as a partial regression coefficient, interpreted as representing the partial effect of the given independent variable on the dependent variable, after holding constant, or eliminating the effect of, all other independent variables. The *i* subscript, therefore, denotes the cross-section dimension whereas *t* denotes the time-series dimension, $\alpha$is a scalar and β *is K*1* and X_{it} is the it^{th} observation on *K* explanatory variables. The presence of the parameters α_t, which represent different intercepts in each year, allows for aggregate economic growth to change over time.

The following multiple regression model was obtained after replacing the variables:

$$GDP_{it} = \alpha_t + \beta_1 FDI_{it} + \beta_2 EXP_{it} + \beta_3 GCF_{it} + u_{it} \qquad (3)$$

Where GDP = Gross Domestic Product (annual %)
FDI = Foreign Direct Investment net inflows (% of GDP)
EXP = Exports of goods and services (% of GDP)
GCF = Gross Capital Formation (% of GDP)

4. Data Analysis and Interpretation

The study examined the impact of FDI net inflows, exports and domestic investment on GDP in five selected African countries through an econometric regression analysis. FDI net inflows, exports, domestic investment were used as independent variables while GDP was used as the dependent variable. The findings of the regression model are as shown in table 4 below. The independent variables statistically significantly predicted GDP, with F (3, 63) = 5.84, $P > F$ 0.0014, R^2 = 0.2176, *Adjusted* R^2 = 0.1804 and *Root Mean Squared Error (RMSE)* = 0.54976. The study also found that the independent variables added statistically significantly to the prediction of $p < 0.05$. The independent variables accounted for 18.04% of the dependent variability in GDP in five selected African countries for the period 1997 to 2016 with the remaining 81.96% unexplained variation represented by other variables not included in the model. Prob > F of 0.0014 shows the reliability of the results of the model. Therefore, there are only 0.0014 chances that the regression output was merely a chance of occurrence. After inputting the coefficients, the multiple linear regression equation will be:

$$GDP_{it} = -0.5108 + 0.0933FDI_{it} - 0.0210EXP_{it} + 0.7003GCF_{it} + u_{it} \quad (4)$$

The partial regression coefficients are interpreted as representing the partial effect of the given independent variable on the dependent variable, after holding constant, or eliminating the effect of, all other independent variables. For example, the coefficient of exports measures the effect of exports on GDP after eliminating the effects of other variables in the equation. In this case each coefficient measures the average change in the dependent variable per unit change in a given independent variable, holding all other independent variables constant at their average values. Results of the study show that gross capital formation or domestic investment has a positive significant influence on economic growth as denoted by a p-value of 0.001 that is less than 0.05 at 5% level of significance. However, the other variables are not significant as their p-values are greater than 0.05 at 5% level of significance. Of the three variables only exports has a negative influence on GDP which is in contrast with literature and other research findings.

The study findings further showed a significant positive impact of gross capital formation, that is, domestic investment on economic growth. The results are in line with literature and other empirical evidence by Sumei, Selvanathan, & Selvanathan(2008) among other prior studies. However, results by Bakari(2017) show that domestic investment had no effect on economic growth in Egypt. FDI net inflows show a positive coefficient that has an insignificant influence on GDP.

Tsaurai & Odhiambo (2012) drew some critical analysis regarding the relationship between FDI and economic growth and concluded that there are four views regarding this relationship. The study used an econometric regression statistical model to analyzes data obtained from the World Bank official website, that is, the World Development Indicators 2018 database for the period 1997 to 2016. Some data tests were carried out before running the regression model. The current study used natural logarithms with the regression equation expressed in 'double logarithmic form' thereby translating the coefficient estimates elastic. This was done to guard against compromising the regression model`s significance. Contrary to some of the previous studies, the current study shows that the independent variables statistically significantly predicted GDP, with F (3, 63) = 5.84, $P > F$ 0.0014, R^2 = 0.2176, *Adjusted* R^2 = 0.1804 and *Root Mean Squared Error (RMSE)* = 0.54976. The independent variables added statistically significantly to the prediction of $p < 0.05$. The study findings further showed a significant positive impact of gross capital formation, that is, domestic investment on economic growth. The results are in line with literature and other empirical evidence by Sumei, Selvanathan, & Selvanathan(2008) among other prior studies. However, results by Bakari(2017) show that domestic investment had no effect on economic growth in Egypt. This study, however, recommends that African countries must pursue policies that promote economic growth, that is, policies that promote, the attraction of FDI, exports and domestic investment as these play a critical role towards economic development. The study further recommends that African countries must promote innovation, creativity and talent building as these have become critical in the Fourth Industrial Revolution era as having natural resources alone is proving inadequate.

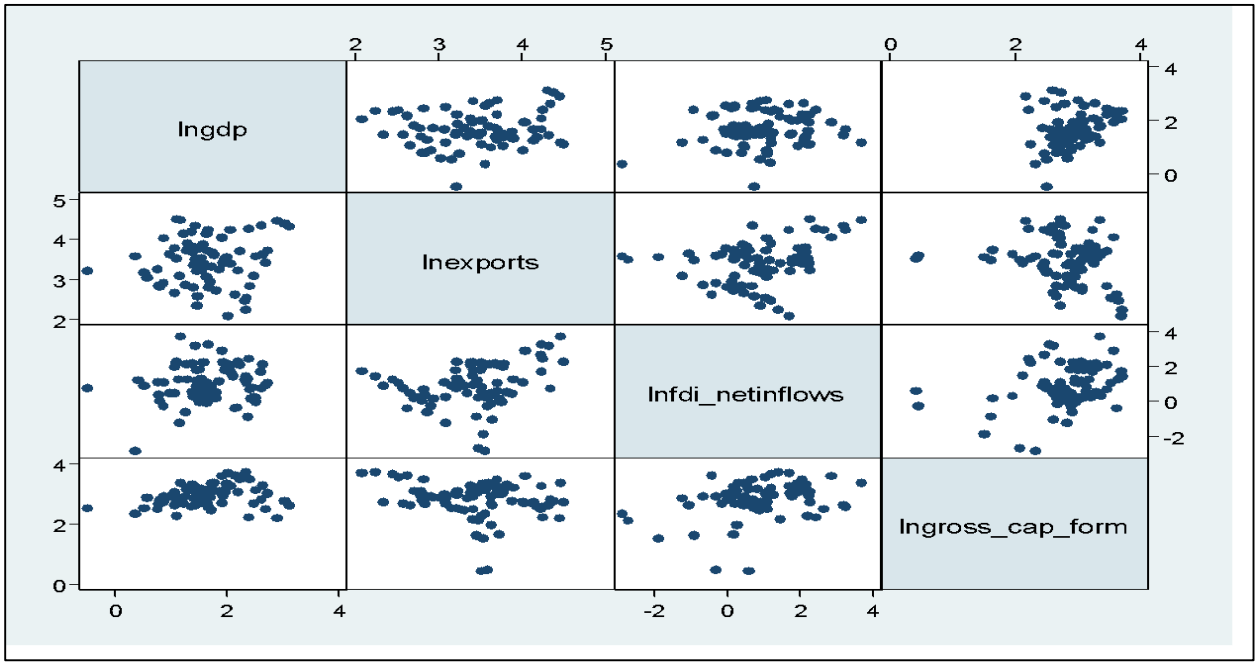
Table 4: Regression analysis, impact of FDI net inflows, exports and domestic investment on GDP in Africa, 1997-2016

```
. reg lngdp lnexports lnfdi_netinflows lngross_cap_form

      Source |       SS       df       MS              Number of obs =      67
-------------+------------------------------           F(  3,    63) =    5.84
       Model |  5.29609164     3  1.76536388            Prob > F      =  0.0014
    Residual |  19.0406314    63  .302232244            R-squared     =  0.2176
-------------+------------------------------           Adj R-squared =  0.1804
       Total |   24.336723    66  .368738227            Root MSE      =  .54976

------------------------------------------------------------------------------
       lngdp |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   lnexports |  -.0209728   .1409375    -0.15   0.882    -.3026138    .2606682
lnfdi_netin~s |   .0932515   .0704579     1.32   0.190    -.0475474    .2340503
lngross_cap_~m |   .7002572   .2021395     3.46   0.001     .2963137    1.104201
       _cons |    -.51075   .8381081    -0.61   0.544    -2.185575    1.164075
------------------------------------------------------------------------------
```

Source: Multiple linear regression analysis output from Stata/SE 12.0

Figure 4 below is a scatter graph showing the correlation between the variables, FDI net inflows, exports, domestic investment and GDP.

Figure 4: Scatter graph showing the relationship between FDI, exports and domestic investment on GDP



Source: Multiple linear regression analysis output from Stata/SE 12.0.

5. Conclusion

This study has examined the impact of FDI net inflows, exports and domestic investment on economic growth in five selected African countries for the period 1997-2016. Previous researches have spurred an unending debate due to irresolute findings and the frequent changes in the socioeconomic context. Research the world over has penned many different conclusions regarding the impact of FDI net inflows, exports and domestic investment on economic growth. Literature shows that although economic growth in Africa has been growing in real terms since 1997, there have been some challenges that continue to affect this growth trajectory chief among them being the fluctuations in commodity prices such as the ones experienced in 2013–15. However, GDP growth in percentage terms has shown some significant fluctuations. Growth performance varied widely across many African countries in the sub-regions. Improving domestic revenue mobilization is critical for African countries as they eye economic transformation. Africa`s economic performance since 1997 has been marred with fluctuations due to a number of divergent reasons. A number of studies have been carried out globally in relation to the impact of FDI, exports, domestic investment on economic growth with various results with a study by Tsaurai & Odhiambo (2012) providing a paradigm shift regarding these relationships.

References

AfDB. (2018). African Economic Outlook 2018. Abidjan: African Development Bank.

Albiman, M. & Suleiman, N. (2016). The Relationship among Export, Import, Capital Formation and Economic Growth in Malaysia. Journal of Global Economics, 186.

Andrews, A. (2015). Exports, Imports, and Economic Growth in Liberia: Evidence from Causality and Cointegration Analysis. Journal of Management Policy and Practice, 2, 95.

August, O. (2013, March 2). The Economist. Retrieved May 25, 2018, from The Economist: https://www.economist.com

Bader, S. (2016). The Effect of Exports and Imports on Economic Growth in the Arab Countries: A Panel Data Approach. Journal of Economics Bibliography, 100-107.

Bakari, S. (2017, February 8). The relationship between Export, Import, Domestic Investment and Economic Growth in Egypt: Empirical Analysis. Munich Personal RePEc Archive, pp. 1-13.

Balasubramanyam, V., Salisu, M. & Sapsford, D. (1996). Foreign Direct Investment and Growth in EP and IS countries. Economic Journal, 92-115.

Bashir, A. (1999). Foreign Direct Investment and Economic Growth in Some MENA Countries: Theory and Evidence. MEEA & Allied Social Sciences Associations. New York: MEEA.

Brooks, C. (2008). Introductory Econometrics for Finance (2nd ed). New York: Cambridge University Press.

Carkovic, M. & Levine, R. (2005). Does Foreign Direct Investment accelerate economic growth? In T. Moran, E. Graham, & M. Blomstrom, Does Foreign Direct Investment promote development? (pp. 195-220). New York: Columbia University Press.

Dreger, C. & Herzer, D. (2013). A Further Examination of the Export-Led Growth Hypothesis. Empirical Economics, 39-60.

Elboiashi, H. (2002). The causal relationships between Foreign Direct Investment, Domestic Investment and Economic Growth in North African non-oil producing Countries: Empirical Evidence from Cointegration Analysis. Advances in Management.

Fotopoulos, G. & Louri, H. (2004). Firm growth and FDI: Are multinationals stimulating local industrial development. Journal of Industry, Competition and Trade, 163-189.

Hanson, H. & Rand, J. (2004). On the Causal Link between FDI and Growth in Developing Countries. University of Copenhagen.

Jain, D., Nair, K. & Jian, V. (2015). Factors affecting GDP (Manufacturing, Services, Industry): An Indian Perspective. Annual Research Journal of SCMS, Pune, 38-56.

Kumar, N. (1996). Foreign Direct Investments and Technology Transfers in Development: A Perspective on Recent Literature. Helsinki: United Nations University.

Li, Y., Chen, Z. & San, C. (2010). Research on the Relationship between Foreign Trade and the GDP Growth of East China--Empirical Analysis based on Causality. Modern Economy, 118-124.

Lipsey, R. (2002). Home and Host Country Effects of FDI. Cambridge: National Bureau for Economic Research.

Maher, M. & Christiansen, H. (2001). Growth, Technology Transfer and Foreign Direct Investment. New Horizons and Policy Challenges for FDI in the 21st Century. Mexico City: OECD.

Maune, A. (2017). The Role of Competitive Intelligence in Trade Facilitation in an Emerging Economy. Journal of Economics and Behavioral Studies, 132-148.

Moyo, T. (2013). The Impact of Foreign Direct Investment on Economic Growth: The Case of Zimbabwe (2009- 2012). International Journal of Economics, Finance and Management Sciences, 323-329.

Qian, J. (2009, May 11). Gross Domestic Product Not Sole Indicator of Progress. Retrieved June 26, 2018, from The World Bank: http://blogs.worldbank.org

Saaed, A. & Hussain, M. (2015). Impact of exports and imports on economic growth: Evidence from Tunisia. Journal of Emerging Trends in Economics and Management Sciences, 13.

Sumei, T., Selvanathan, E. & Selvanathan, S. (2008). Sumei Tang & E. A. SelvanathaForeign Direct Investment, Domestic Investment and Economic Growth in China: A Time Series Analysis. Wiley Blackwell, 1292-1309.

Tsaurai, K. & Odhiambo, N. (2012). Foreign direct investment and economic growth in Zimbabwe: a dynamic causality test. International Journal of Economic Policy in Emerging Economies, 183-196.

UNCTAD. (2017). World Investment Report: Investment and the digital economy. New York & Geneva: United Nations.

WorldBank. (2012, October 4). Despite Global Slowdown, African Economies Growing Strongly— New Oil, Gas, and Mineral Wealth an Opportunity for Inclusive Development. Retrieved May 24, 2018, from The World Bank: http://www.worldbank.org

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An Econometric Analysis of the Relationship between Changes in Government Bonds, Exchange Rate and Inflation Dynamics in South Africa

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Abstract: The study examined the dynamic interaction between government bonds, exchange rate and inflation in South Africa. The study follows a quantitative research method, using monthly time series data from 2007 to 2017 within the framework of a Vector Autoregressive Analysis (VAR). Evidence from the empirical analysis shows that government bond accounts for significant variation in the exchange rate and inflation rate within the study period. The causality test also suggests the presence of uni-directional causal relationships from government bonds to exchange rate, and also to the inflation rate. The principal conclusion that emanates from the empirical analysis is that government bonds are an important policy instrument in the management of the exchange rate and the inflation rate in South Africa. The study recommends that the South African Reserve Bank is a coordinator of government bond and should carry out an in-depth analysis of the economic conditions before issuing the government bonds, taking into account its impeding effects on the exchange rate and inflation rate and many other macroeconomic variables.

Keywords: *Exchange Rate; Government Bonds; Inflation; South Africa*

1. Introduction

Due to increased government spending over the years, and with the inability of the revenue to match the upward trend in government spending, the government usually raises funds to finance the deficits through several means such as bond issuing, and seigniorage amongst others. However, financing government spending by means of seigniorage mostly has a deteriorating effect on the economy (Roubini & Sala-i-Martin, 1995; Holman & Neanidis, 2006). Seigniorage leads to increased money supply, which causes rising inflation (De Resende, 2007; Sanusi & Akinlo, 2016). Rising inflation affects the total population but also the poor because they inexplicably are inclined to have cash rather than assets which are more negatively impacted by inflation (Gaffney, 2009). As a result, government bond becomes more appealing as an important debt security instrument issued by a government to finance government spending. In the case where government issues bonds to finance its deficit, it could result in stable and low inflation (Kalderen, 1997; Borensztein & Mauro, 2004). Meanwhile, there exists a theoretical position in economic literature that increased government bonds imply an increase in demand for loanable funds which increase domestic interest rate (Gurley & Shaw, 1995; Engen & Hubbard, 2004; Lastrapes, 1998).

An increase in domestic interest rate may result to exchange rate appreciation if the interest rate rises above the world interest rate. This is due to the fact that if the interest rate rises above the world average interest rate, foreign investors would be motivated, thereby placing pressures on demand for domestic currency (Obstfeld & Rogoff, 1995; Calvo & Reinhart, 2002; Frankel, 2006; Gavin, 1989). On the other hand, an economy with large public debts perhaps by means of uncontrolled high government spending or leakages, is unattractive to foreign investors. This is because debt encourages high inflation which makes debt to be serviced and eventually paid off with cheaper real dollars in the future (Koller, Goedhart & Wessels, 2010; Cavallo & Fernández-Arias, 2013). Most of the existing available studies have largely examined the relationship between external debt and exchange rate (Neaime, 2009; Ezirim & Muoghalu, 2006; Draz & Ahmad, 2015). However, the majority of these empirical studies did not consider the roles of the internal debt in exchange rate behavior and the resultant effect on inflation was also not given much attention. This study considers the role of internal debt by making use of government bond which captures both internal and external indebtedness of government. The study also differs from existing studies by looking at the relationship between government bonds, exchange rate and inflation, and the possibility of feedbacks amongst the variables. The rest of the study is structured as follows: section two synthesizes the existing literature. Section three introduces the empirical approach while section four presents the results. The concluding remark is contained in section five.

2. Literature Review

Neaime (2009) investigated the relationship between exchange rate behavior and external debt in five MENA countries (Jordon, Morocco, Egypt, Tunisia, and Turkey). Empirical findings suggest a positive relationship between external debt and exchange rate depreciation. Ajayi (1991) examined the relationship between the size of the external debt, world oil price and exchange rate. He employed a two-stage least squares simultaneous equation model, and empirical results showed that the size of the external debt had a negative, but the statistically insignificant impact on the external value of the Naira. This is consistent with the findings of Ezirim and Muoghalu (2006) who argued that the cost of external debt did put negative pressures on the exchange rate crisis instead of aggravating it. Similarly, Draz and Ahmad (2015) focused on the impact of external debt and world oil prices on the exchange rate. The results indicated that the exchange rate was significantly influenced by the external debt while no such evidence was found for the world oil prices. Also, Awan, Asghar and Rehman (2011) examined the impact of fiscal deficit, depreciation and unfavorable terms of trade on external debt. They argued that there is a significant long-run relationship between external debt and exchange rate.

Perri, Cavallo, Kisselev and Roubini (2004) worried why countries experiencing currency problem with high levels of foreign debt tended to experience large real exchange rate overshooting and consequently investigated the relationship among the variables. The evidence showed countries with severe foreign debt burden after currency crises experienced real exchange rate appreciation. In another dimension, Reza, Siregar and Pontines (2005) seek to investigate if the rapid accumulation of external debts is responsible for exchange rate problems of the four East Asian Currencies, the Indonesian Rupiah, Philippines Peso and Thai Baht and Korean Won. They conclude that external debts accumulation in the four economies were partly responsible for the increasing and worsening of exchange rate problems of the local currency. Sonoma (2013) explore the relationship between exchange rate depreciation and debts accumulation. The results show that in the pre-default periods, exchange rate depreciation triggers more debt accumulation and default. Whereas in the post-default periods, exchange rate experienced depreciation as a result of output costs of defaulting and loss of market access. Masuku (2001) probed the impacts of external debt on exchange rate fluctuations in Kenya. The study finds that that external debt had significant positive effects on the exchange rate. Conclusively, evidence from the literature shows that empirical studies aiming at the resultants effects of government bond and exchange rate nexus on inflation, and the possibility of feedbacks among the variables have not received adequate attention and consequently this study.

3. Methodology

The study follows a quantitative research method, using monthly time series data from 2007 to 2017 within the framework of a Vector Autoregressive Analysis (VAR). It is common in an empirical context to examine the dynamic relationship among macroeconomic variables using a VAR model. The model comprises of three variables which are government bonds (GB), exchange rate (ER) and inflation (INF). In terms of the model, $X_t$denotes aseries of endogenously determined variables. The specified model is indicated in equation (1):

$X_t = (GB_t \pi_t e_t)$ ……(1)

where all the variables are expressed in logarithms. GB_t is the government bond, $\pi_t$is the inflation rate and e_t is the exchange rate. Following Kim and Roubini (2008), the real exchange rate is used rather than nominal exchange rate. The empirical application is to model and estimate the dynamic relationship amongst the variables in the estimated model. It is presumed that the model is made up of three endogenous variables and the model is consistent with a dynamically linear stochastic model. This can be specified as follows:

$D(L)\Delta X_t = \mu_t$ ……(2)

Where L represents the shift operator, μ_t is a stochastic term which is in the form of a vector, and D_i are vectors of 3 by 3 matrixes of determinate coefficients. Each component of μ_t means an exogenous shocks. The second moment of the distribution forming the data are abridged by the below World moving average:

$X_t = (I + D_1(L) + D_2(L^2) + D_3(L^3)) = D(L)\mu_t$ ……(3)

The$E(\mu_t \mu_t) = \Sigma$. Assuming the means of generating data for X_t is stationary and also covariance, then $limit_{s\to\infty} D_s = 0$. Also, assuming$D(L)$ is invertible, the $D(L)$ coefficient and theΣ coefficient can both be obtained directly from the below specified VAR representation:

$A(L)X_t = C(L)^{-1}X_t = v_t$ ……(4)

It should be noted that $A(L)$ is a k^{th} matrix system which is specified in the form of the lag operator L while the system has all the roots inside the unit circle and v_t represents a vector with mean being a positive integer. The v_t is also an independently and identically distributed shocks and the covariance matrix is represented asΣ. Also, if X_t is non stationary at level with absence of long run cointegration, F_{ls} will congregates to a limiting distribution and of course is the sum of χ^2 and as well the unit root distribution. Lin (2008) argued that it is better to difference X_t and test causality for differenced VAR since it would produce a more efficient estimates.

4. Data, Econometric Procedures and Results

Table 1 offers the brief of the correlation coefficients amongst the three variables. The results indicate a strong, positive and statistically significant relationship between inflation (INF) and the exchange rate (ER). In addition, a weak, but statistically significant positive relationship exists between government bonds (GB) and exchange rate (ER). Interestingly, a negative but non-significant correlation exists between government bonds (GB) and inflation (INF).

Table 1: Correlation Analysis

Probability	INF	ER	GB
INF	1.0000		

ER	0.8565	1.0000	
	18.2573	-----	
	0.0000*	-----	
GB	-0.0569	0.1821	1.0000
	-0.6279	2.0379	-----
	0.5312	0.0437*	-----

Note: * denotes significance at 5%.

The variables are in liner form i. e in logarithmic form. This is because conclusions made from VAR models could be sensitive to the order of the integration and the presence or otherwise of the trend. The order of integration of the variables was evaluated using the Augmented Dickey-Fuller test (ADF). The results show that all the variables are I (1) or first difference. The Johansen (1988) cointegration test was used to determine the presence or otherwise of long-run cointegration among the variables. The result is presented in Table 2. The empirical results suggest that there exists no cointegration relationship among the estimated variables.

Table 2: Johansen Cointegration Test

Hypothesized No of $CE_{(s)}$	Eigen Value	Trace. Stat	0.05 Critical Val.	Prob.
None	0.130081	24.52488	29.79707	0.1791
1	0.057863	7.941617	15.49471	0.4717
2	0.007107	0.848786	3.841466	0.5690

Note: Trace statistics indicates no cointegration relationship amongst the variables.

Hamilon (1994) argued theoretically argued that the VAR methodology is constructed on the assumption that the lag order is known. However, in empirical studies and applications, the optimal lag order not known. Consequently, it has to be determined using lag order criteria. The following lag order criteria AIC, FPE, and LR tests suggest a lag order of 3. This of course is assumed to produce a stable VAR model. Methodically, the required task is whether to estimate a differenced VAR model or a VECM in levels. Given the absence of cointegration among the variables, Hamilton (1994) argued that estimating VECM at first difference is serious mis-specification which would produce a biased result. Hamilton (1994) consequently submits that the VAR estimation should be implemented at first difference among non-cointegrated series. Since the variables are not cointegrated substantiates the adoption of differenced VAR. The results of cointegration are presented in

Table 3. Evidence from the VAR estimates shows that the first lag of INF has positive and significant effect on the current value. While the first lag and second lag of GB has a positive and significant effect on INF. Also, the first lag of ER has a positive and significant effect on the current value of ER. The second lag of GB is also found to have a negative but significant effect on ER. Interestingly, neither INF nor ER is found to have a significant effect on GB. This is not surprising as the rising expenditure and fall in government revenue have been the foremost drivers of government in most economies.

Table 3: VAR Estimates (Standard Errors in ( ) & t-Statistics in [ ])

	D_INF	D_ER	D_GB
D_INF(-1)	0.340431	-0.114439	-0.041355
	(0.09207)	(0.11178)	(0.13196)
	[3.69762]*	[-1.02379]	[-0.31339]
D_INF(-2)	-0.175761	-0.012340	-0.028990
	(0.08853)	(0.10748)	(0.12689)
	[-1.98536]*	[-0.11481]	[-0.22847]
D_ER(-1)	0.085693	0.253573	-0.207657
	(0.08238)	(0.10002)	(0.11808)
	[1.04016]	[2.53513]*	[-1.75860]
D_ER(-2)	-0.093314	0.041340	-0.036325
	(0.08084)	(0.09815)	(0.11587)
	[-1.15424]	[0.42117]	[-0.31348]
D_GB(-1)	0.189850	0.097826	-0.194432
	(0.06981)	(0.08476)	(0.10006)
	[2.71937]*	[1.15412]	[-1.94308]
D_GB(-2)	0.199721	-0.190233	-0.017806
	(0.06953)	(0.08442)	(0.09966)
	[2.87246]*	[-2.25350]*	[-0.17868]
C	0.323015	0.081633	0.050266
	(0.04923)	(0.05977)	(0.07056)
	[6.56125]	[1.36575]	[0.71237]

Note: * denotes a t-stat significance at 5%.

The main focus of the study is to analyze how inflation and exchange rate responds to changes in government bonds in South Africa. Consequently, we trace the response of one variable to a standard deviation shock to government bonds using impulse response analysis. Tables4 to 6 depict the impulse response functions of the variables in the model, adopting ten periods as time horizon. This enables us to examine the issues concerning the implications of government bonds for inflation and exchange rate in South Africa. As a result, the response of inflation and exchange rate to government bonds are examined. The first task has to do with how does inflation rate and exchange rate responds to government bonds in South Africa. This provides relevant information on the efficacy of government bonds in containing or managing exchange rate fluctuation and high inflation episodes in South Africa. Table 4 shows the impulse response functions of inflation to shocks to government bonds and exchange rate. The empirical evidence shows that following an expansionary fiscal policy with a shock to government bonds, inflation rate did not immediately respond to

the shock in the first period but begins to rise in the second period. The upward trend in inflation due to shocks to government bonds continued to the fourth period and began to decline by the fifth period.
The effect of the shocks began to fizzle out towards the tenth period. Also, the response of inflation rate to shocks in exchange rate fluctuates between the second and seventh period before fading away towards the tenth period. While the response of inflation to its own shocks fluctuates between first and seventh month before fading away toward the tenth period.

Table 4: Response of Inflation (D (INF))

PERIOD	D(INF)	D(ER)	D(GB)
1	0.0037	0.0000	0.0000
2	0.0013	0.0006	0.0010
3	0.0002	0.0001	0.0011
4	0.0002	0.0003	0.0002
5	0.0001	0.0001	0.0001
6	0.0001	0.0003	0.0001
7	2.73E05	-5.25E-06	-5.20E-05
8	4.61E-06	-9.65E-06	-8.303E-05
9	1.74E-05	1.20E-06	-2.06E-05
10	1.06E-05	4.39E-06	-5.03E-06

Table 5 displays the impulse response functions of the exchange rate to government bonds and inflation shocks. It is clear that after an expansionary fiscal policy with a shock to government bond, there was a positive change in the exchange rate in the second period and response becomes negative in the third period. The negative response continued to period seven. The effect of the shocks began to fizzle out towards the tenth period. Also, the response of the exchange rate to shocks in inflation fluctuates between the first and eight period and consequently fizzles out towards the tenth period. The response of exchange rate to its own shocks fluctuates between positive and negative from the first to the eight-period and begin to fade away in subsequent months.

Table 5: Response of Exchange Rate (D (ER))

PERIOD	D(INF)	D(ER)	D(GB)
1	-0.0043	0.0339	0.0000
2	-0.0002	0.0106	0.0003
3	-0.0005	4.09E-05	-0.0101
4	0.0019	-0.0021	-0.0059
5	0.0013	0.0011	-0.0014
6	0.0010	-0.0005	-0.0004
7	0.0004	-0.0007	-0.0005
8	0.0001	-0.0002	2.18E-05
9	5.49E-06	9.12E-05	0.0001
10	3.08E-05	-1.38E-06	9.24E-05

Table 6 displays the impulse response functions of government bonds to inflation and exchange rate shocks. It is clear that consequent upon a shock to the inflation rate, there is a positive response from government bonds and the response becomes negative by the second period up to the 8th period and the effect begins to fizzle out by the tenth period. The exchange rate oscillates from the first up to the eight-period before the effect begins to fade away towards the tenth period. The response of government bond to its own shocks oscillates between positive and negative from the first to the eight-period and begin to fade away in succeeding periods. The study recommends that South African Reserve Bank, as a coordinator of government bonds, should carry out an adequate x-ray of the economic conditions before issuing the government bonds, especially its impeding effects on the exchange rate and inflation rate as it has important implications for exchange rate and inflation rate behaviour. Appropriate mechanisms must also be put in place such as

blocking of leakages, avoidance of wastefulness so as to ensure judicious and efficient use of income raised from bonds. This would ensure that the probable negative feedbacks of bond raising on inflation and exchange rate are lessened.

Table 6: Response of Government Bonds (D (GB))

PERIOD	D(INF)	D(ER)	D(GB)
1	0.0046	0.0197	0.0462
2	-0.0016	-0.0125	-0.0093
3	-7.19E-05	-0.0048	0.0040
4	-0.0020	0.0060	0.0036
5	-0.0005	2.39E-05	0.0015
6	-0.0007	0.0001	-0.0007
7	-3.40E-06	-9.42E-05	-0.0002
8	-2.37E-05	0.0004	-4.00E-06
9	7.79E-05	-9.63E-05	-5.71E-05
10	2.64E-05	-6.79E-05	-0.0001

Aside from the impulse response analysis, variance decomposition analysis was also evaluated. The impulse response analyses focus on the effects of shocks to the variable on other endogenous variables whereas the variance decomposition splits the variation in an endogenous variable into the component shocks. Consequently, the variance decomposition gives information on the relative importance of each random innovation affecting other variables in our VAR model. The share of the forecast error variance of each variable accounted for by the shocks to each of the variables are reported in tables 7A, 7B and 7C. The tables display the percentage of the forecast error variance for each variable that can be associated to its own shocks and to shocks in the other variables. Reflecting on the results from earlier studies, the principal causes of deviation in all the variables in the VAR system are "own" shocks.

Government bonds are a vital source of the variation in the inflation rate as it accounts for about 13 percent of change, followed by the exchange rate, which accounts for about 3 percent variance for most of the time. Government bond is also found to be a chief source of variance in the exchange rate. It is responsible for less than 1 percent in the first two periods, but consequently account for more than 9 percent variance in the longer period. While the inflation rate determines about 1 percent variance throughout time horizons. Remarkably, the exchange rate is found to be a prime source of changes in government bonds. The exchange rate is responsible for more 15 percent variation in the first two periods and more than 20 percent in the longer time horizon. The inflation rate on the other hand is found to be responsible for less than 1 percent up to the fifth period and subsequently accounts for about 1 percent forecast error variance for the remaining time horizon.

Table 7A: Variance Decomposition Analysis of Inflation (D (INF))

PERIOD	D(INF)	D(ER)	D(GB)
1	100.0000	0.000000	0.000000
2	91.31679	2.794471	5.888735
3	84.47969	2.678672	12.84163
4	83.67381	3.291826	13.03436
5	83.45854	3.388613	13.15284
6	83.00632	3.868186	13.12549
7	82.99502	3.867621	13.13736
8	82.96638	3.866774	13.16685
9	82.96479	3.866633	13.16858
10	82.96470	3.866702	13.16860

The VAR Granger Causality PairWise Tests shows that there exists a strong causality running from government bonds to inflation, while bi-causality were found between government bonds and the exchange rate. Inflation is found to not cause changes in government bonds rather government bond is to be an important variable causing both the exchange rate and the inflation rate in South Africa. The overriding pictures that emerge from this study are that government bonds are an important policy instrument in the management of exchange rate and the inflation rate in South Africa.

Table 7B: Variance Decomposition Analysis of Exchange Rate (D(ER))

PERIOD	D(INF)	D(ER)	D(GB)
1	1.616087	98.38391	0.000000
2	1.480695	98.50692	0.012389
3	1.389538	91.19145	7.419011
4	1.617987	88.74067	9.641348
5	1.746628	88.50047	9.752903
6	1.823186	88.42003	9.756783
7	1.833610	88.39756	9.768832
8	1.835992	88.39591	9.768093
9	1.835939	88.39383	9.770227
10	1.835993	88.39325	9.770754

Table 7C: Variance Decomposition Analysis of Government Bonds (D (GB))

PERIOD	D(INF)	D(ER)	D(GB)
1	0.852241	15.31578	83.83198
2	0.873252	19.56467	79.56208
3	0.861129	20.13120	79.00767
4	0.987317	21.02625	77.98644
5	0.997980	21.00627	77.99575
6	1.016898	20.99854	77.98456
7	1.016879	20.99845	77.98468
8	1.016841	21.00292	77.98024
9	1.017043	21.00311	77.97985
10	1.017062	21.00315	77.97979

This finding furthers buttress the fact that government bonds are found to be an important and predominant source of forecast error variance in both inflation rate and exchange rate in South Africa. Lastly, it was also found that exchange rate causes changes in inflation of significance to the discussion is the testing of causality between the variables.

Table 8: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
INF does not Granger Cause GB	116	0.46481	0.8579
GB does not Granger Cause INF		3.10909	0.0050*
ER does not Granger Cause GB	116	2.28657	0.0333*
GB does not Granger Cause ER		2.49644	0.0209*
ER does not Granger Cause INF	116	2.77644	0.0111*
INF does not Granger Cause ER		0.92428	0.4911

Note: * denotes significance at 5%.

5. Conclusion and Recommendations

Economic researchers and practitioners across the globe, especially in developing countries, often recommend government bonds as a means of raising revenue in order to reduce the continued fiscal gap largely due to rising expenditure. However, the raising of bonds by government often hinders the performance of other economic fundamentals such as inflation and exchange rate among others as encapsulated in the theoretical literature. This study therefore empirically investigates the dynamic interaction among government bonds, exchange rate and inflation in South Africa using a monthly time series data. Empirical results show that government bonds account for significant variation in the exchange rate and inflation rate within the study period. The causality test also shows the evidence of causality running from government bond to exchange rate, and also to inflation.

References

Ajayi, R. A. (1991). On the Simultaneous Interactions of External Debt, Exchange Rates, and Other Macroeconomic Variables: The Case of Nigeria (No. 91). Center for Economic Research on Africa, Department of Economics, School of Business Administration, Montclair State College.

Awan, A., Asghar, N. & Rehman, H. U. (2011). The impact of exchange rate, fiscal deficit and terms of trade on external debt of Pakistan. *Australian Journal of Business and Management Research*, 1(3), 10-24.

Asonuma, T. (2013). External Debt, Defaults and Exchange Rate Dynamics. http://www.osipp.osaka-u.ac.jp/ja/event/Aug.01.2013_IPP.pdf. Date of access: 21 June 2018.

Borensztein, E. & Mauro, P. (2004). The case for GDP-indexed bonds. *Economic Policy*, 19(38), 166-216.

Calvo, G. A. & Reinhart, C. M. (2002). Fear of floating. *The Quarterly Journal of Economics*, 117(2), 379-408.

Cavallo, E. & Fernández-Arias, E. (2013). Coping with Financial Crises: Latin American Answers to European Questions. *International Development Policy,* 4(4.2), 7-28.

De Resende, C. (2007). Cross-country estimates of the degree of fiscal dominance and central bank independence. *Bank of Canada Working Papers,* 36, 1-36.

Draz, M. U. & Ahmad, F. (2015). External debts and exchange rates of oil-producing and non-oil-producing nations: Evidence from Nigeria and Pakistan. *Journal of Advanced Management Science*, 3(1), 8-12.

Engen, E. M. & Hubbard, R. G. (2004). Federal government debt and interest rates. *NBER Macroeconomics Annual*, 19, 83-138.

Ezirim, C. B. & Muoghalu, M. I. (2006). Exchange rate determination, foreign investment burden and external debt crisis in less-developed countries: Nigerian experience. *International Journal of Business and Economics Perspectives,* 1(1), 1-15.

Frankel, J. (2006). On the Yuan: The choice between adjustment under a fixed exchange rate and adjustment under a flexible rate. *CESI of Economic Studies*, 52(2), 246-275.

Gaffney, M. (2009). Money, Credit, and Crisis. *American Journal of Economics and Sociology*, 68(4), 983-1038.

Gavin, M. (1989). The stock market and exchange rate dynamics. *Journal of International Money and Finance,* 8(2), 181-200.

Gurley, J. G. & Shaw, E. S. (1955). Financial aspects of economic development. *The American Economic Review,* 45(4), 515-538.

Hamilton, J. (1994). Time series econometrics. New York: Princeton University Press.

Holman, J. A. & Neanidis, K. C. (2006). Financing government expenditures in an open economy. *Journal of Economic Dynamics and Control*, 30(8), 1315-1337.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control,* 12(2-3), 231-254.

Kalderen, L. (1997). Debt management functions and their location. Coordinating Public Debt and Monetary Management. Washington DC: International Monetary Fund, 79-95.

Kim, S. & Roubini, N. (2008). Twin deficit or twin divergence? Fiscal policy, current account, and real exchange rate in the US. *Journal of International Economics*, 74(2), 362-383.

Koller, T., Goedhart, M. & Wessels, D. (2010). Valuation: measuring and managing the value of companies. John Wiley and Sons: New Jersey.

Lastrapes, W. D. (1998). International evidence on equity prices, interest rates and money. *Journal of International Money and Finance,* 17(3), 377-406.

Lin, J. L. (2008). Notes on testing causality. Institute of Economics, Academia Sinica, Department of Economics, National Chengchi University.http://faculty.ndhu.edu.tw/~jlin/files/causality_slide.pdf. Date of access: 25 June 2018.

Masuku, J. N. (2001). An Investigation of the Effects of Kenya's External Debt On Exchange Rate Fluctuations. Dissertation submitted to the University.

Neaime, S. (2009). Sustainability of exchange rate policies and external public debt in the Mena region. *Journal of Economics and International Finance,* 1(2), 59-72.

Obstfeld, M. & Rogoff, K. (1995). The mirage of fixed exchange rates. *Journal of Economic Perspectives*, 9(4), 73-96.

Perri, F., Cavallo, M., Kisselev, K. & Roubini, N. (2004). Exchange rate overshooting and the costs of floating. In Federal Reserve Bank of San Francisco Proceedings. FRB of San Francisco Working Paper No. 2005-07. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=741205. Date of access: 2 July 2018.

Reza, Y., Siregar, Y. R. & Pontines, V. (2005). External Debt and Exchange Rate Overshooting: The Case of Selected East Asian Countries. Centre for International Economic Studies. Discussion Paper, No. 0520. International Macro and Finance Program. University of Adelaide, Australia.

Roubini, N. & Sala-i-Martin, X. (1995). A growth model of inflation, tax evasion, and financial repression. *Journal of Monetary Economics,* 35(2), 275-301.

Sanusi, K. A. & Akinlo, A. E. (2016). Investigating Fiscal Dominance in Nigeria. *European Journal of Sustainable Development,* 8(1), 125-131.

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Work-Life Conflict of Native and Immigrant Entrepreneurs in South Africa

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Abstract: Work life conflict negatively impacts entrepreneurs and the economic performance of their businesses. The study explored the work-life conflict (WLC) of native and immigrant entrepreneurs in South Africa. Also, the study examined the effect of gender and work-related factors (long working hours and work overload) on the WLC of native and immigrant entrepreneurs. The study adopted the survey method (self-administered questionnaires) for data collection. The participants in the study were identified through convenience and snowballing sampling methods. The methods of data analysis included descriptive statistics, T-test, Pearson correlation and regression analysis. The results showed high levels of WLC for both native and immigrant entrepreneurs. Native entrepreneurs have a higher level of WLC compared to immigrant entrepreneurs, however the difference is not statistically significant. Male entrepreneurs have a lower level of WLC compared to female entrepreneurs. Long working hours and work overload significantly impact on the WLC of native and immigrant entrepreneurs. Recommendations to reduce WLC include goal setting, scheduling and delegation of work by entrepreneurs.

Keywords: *Work life conflict, native, immigrants, entrepreneurs, South Africa*

1. Introduction

Small and medium enterprises (SMEs) contribute significantly to the economic growth of many countries including South Africa (Chinomona & Pooe, 2013). SMEs help both developing and developed countries to sustain socio-economic development (Organisation for Economic Co-operation and Development, 2014). The contribution of SMEs to the gross domestic product of South Africa is between 27-34%. In addition, 72% of private sector jobs in South Africa is created by SMEs (Department of Trade and Industry, 2008). The unemployment rate in South Africa is very high and currently stands at 27.2%. Furthermore, South Africa is confronted by high levels of income inequality, poverty and crime. The sustainability of SMEs can help to overcome the development challenges facing South Africa (Abor & Quartey, 2010; Statistics South Africa, 2018). The small enterprise sector in South Africa includes both native and immigrant entrepreneurs. The motivation for entrepreneurship in South Africa is influenced by pulls and push factors. One of the push factors for entrepreneurship is work-life balance (Liedeman, Charman, Piper & Petersen, 2013; Zimmerman & Chu 2013; Charles & Gherman, 2013). Conflicting work and family roles can be managed by self-employment (Craig, Powell & Cortis, 2012). Work-life balance (WLB) is one of the drivers of an entrepreneurial career (Nordenmark, Vinberg & Strandh, 2012). WLB helps an individual to manage many role demands (Fleetwood, 2007). According to Annink, den Dulk & Steijn, (2015), the combination of work, family and other individual responsibilities is an issue confronting many entrepreneurs. These different roles are not always mutually compatible and can lead to work-life conflict (WLC).

The term WLC is an opposite or a contradiction of WLB. WLC arises when the time and energy to satisfy one particular role make it difficult to achieve other roles. There is a significant negative relationship between WLC and individual and firm performance (Nadeem & Abbas, 2009; Cegarra-Leiva, Sánchez-Vidal & Cegarra-Navarro, 2012). This suggests that the reduction of WLC of employees and entrepreneurs can help to improve the performance and ultimately reduce the high failure rate of SMEs in South (Can't & Wiid, 2013). Some empirical studies have addressed WLC in South Africa (Downes & Koekemoer, 2011; Kotecha, Ukpere & Geldenhuys, 2014). An exhaustive review of the literature by the researcher shows that no study has investigated empirically the WLC of both native and immigrant entrepreneurs. Also, the findings of studies on the effect of gender on WLC are inconclusive (Emslie & Kunt, 2009). In addition, WLC is affected by both personal and work-related factors (Singh & Kumar, 2011). The purpose of this study is to examine the WLC of native and immigrant entrepreneurs. Thus, care should be applied in generalising the findings of the study. Other studies can investigate the effect of WLC on the performance of native and immigrant entrepreneurs. In addition, the effect of family support on the WLC of female entrepreneurs can be examined.

Research Questions

- What is the WLC of native and immigrant entrepreneurs?
- Is there a significant difference in the WLC of native and immigrant entrepreneurs?
- Is there a significant gender difference in the WLC of native and immigrant entrepreneurs?
- What is the relationship between work-related factors (long working hours and work overload) and the WLC of native and immigrant entrepreneurs?

2. Literature Review

Immigrant and Native Entrepreneur: Nieman & Nieuwenhuizen, (2009) remark that an entrepreneur is an individual that identifies an opportunity, pulls resources together, and creates a sustainable business that meets the needs of customers. Small business owners are often called entrepreneurs (Lucky & Olusegun, 2012). Both native and immigrant entrepreneurs operate in many countries. A native entrepreneur is an individual that was born in a country and starts a business in that particular country. An immigrant entrepreneur is an individual that arrives in another country from his country of birth and starts a business in the host country (Vinogradov, 2008). Both native and immigrant entrepreneurs contribute significantly to the economic development of host countries (Khosa & Kalitanyi, 2014; Fatoki, 2015). The failure rates of businesses owned by native and immigrant entrepreneurs are very high. Native entrepreneurs are challenged by lack of management skills and inaccessibility to external finance (Cant & Wiid, 2013). The challenges faced by immigrant entrepreneurs include language, xenophobia and inadequate access to finance (Liedeman et al. 2013; Chinomona & Maziriri, 2015). Another problem that can impact on the performance of entrepreneurs and their organisations is WLC (Bell, Rajendran & Theiler, 2012). This study will make a contribution to the literature on small business development and WLC from the context of native and immigrant entrepreneurs. The study is guided by the following research questions.

Definition of Work Life Conflict: Work life balance (WLB) can be regarded as the opposite of work life conflict (WLC) (Nadeem & Abbas, 2009). The concept WLB has been labelled in the literature as work-personal balance, work-family balance and work-family fit (Bell, Rajendran & Theiler, 2012). However, because of the recognition that family is not the only important non-work function, the term WLB is generally used (Skinner & Pocock, 2008; Bell et al. 2012). WLB has been defined in many ways by researchers (Kalliath & Brough, 2008). Greenhaus, Collins & Shaw (2003) and Greenhaus & Allen (2011), describe WLB as the way an individual is involved and satisfied with his/her work and family role. Also, WLB can be positive or negative. A positive balance depicts high levels of satisfaction with work and non-work roles leading to WLB. A negative balance depicts low levels of satisfaction with work and non-work roles leading to WLC (Greenhaus et al. 2003; Carlson & Grzywacz, 2008; Simmons, 2012). Frone, (2003) points out that WLC depicts a high level of inter-role conflict. Bell et al. (2012) refer to WLC as the conflict between work and personal or family roles. Individuals have many roles and WLC occurs when demands from one role interfere with other demands. Greenhous and Beutell, (1985) and Ahmad (2008) agree that WLC is caused by inter-role conflict and can be time-based, stress-based and behaviour-based.

Theoretical Foundation of Work-Life Conflict: The concept of WLB can be explained theoretically by the Conflict Hypothesis by Goode, (1960), Role theory by Kahn, Wolfe, Quinn Snoek & Rosenthal, (1964), the Enhancement Hypothesis (Marks, 1977; Sieber, 1974) and the Social Identity theory by Lobel, (1991). The Conflict Hypothesis argues that individuals have several roles with different demands. This can lead to conflict because of the limited resources and time to meet the demands. The Role theory postulates that inter-role conflict is triggered by the expectations of the different roles performed by individuals. There is pressure on an individual to meet expectations from work, personal and family roles. The Enhancement Hypothesis contends that the multiple roles performed by an individual provide benefits such as security, privileges, personal growth and status. The Social Identity theory by Lobel, (1991) suggests that an individual can take part in numerous roles and reduce WLC by separating and managing the conflicting identities of these roles.

Work-Life Conflict of Native and Immigrant Entrepreneurs: A low level of WLC has many advantages for an entrepreneur. A low level of WLC can lead to increased well-being, decreased job stress and decreased burnout of employees, improved productivity and positive organisational performance. WLC can negatively

impact on business performance. A high level of WLC is linked to lower organisational commitment, lower job satisfaction, lower career satisfaction and lower productivity and performance. WLC is one of the major stressors in the workplace (Bell et al. 2012; Annink et al. 2015). Chan (2008) establishes that immigrant entrepreneurs have to work long hours to be successful in host countries. Many immigrant entrepreneurs need to take care of family members in the home and host countries and this demands hard work (Forson, 2013). Hard work and long working hours are also critical to the survival and success of native entrepreneurs. Entrepreneurs are often addicted to their business and often find it difficult to meet other role demands (Gorgievski, Arnold & Schaufeli, 2010; Antonites & Govindasamy, 2013). This suggests that both native and immigrant entrepreneurs will experience high levels of WLC. It is hypothesised that there is no significant difference in the WLC of native and immigrant entrepreneurs.

Gender and Work-Life Conflict: Empirical findings of the effect of gender on WLC are inconclusive (Emslie & Kunt, 2009). A study by Winslow, (2005) finds that there is no significant difference in the levels of WLC of males and females. Singh& Kumar, (2011) reveal that female employees have higher levels of WLC compared to male employees. Women have more household responsibilities compared to men. Women retain the primary responsibility for home care (Emslie & Kunt, 2009). WLB is not gender neutral. Female entrepreneurs often have to combine work with home and other responsibilities (Bianchi & Milkie, 2010). It is hypothesised that there is a significant difference in the WLC of male and female entrepreneurs.

Determinants of Work-Life Conflict: Factors impacting on WLC can be examined from home and work perspectives. Home-related factors include the allocation of household chores and childcare. Work-related factors include long working hours and work overload (Singh & Kumar, 2011).

Long Working Hours: Skinner & Pocock (2008) remark that there is no generally accepted definition of long working hours in the literature. The meaning of long working hours differs across countries, industries and occupations. However, long working hours can be described as working more than 45 hours per week. In South Africa, Section 9 of the Basic Conditions of Employment Act that applies to employers and employees expects people to ordinarily work 45 hours per week (Government Gazette, 1997). However, passion for work is one of the attributes of an entrepreneur (Antonites & Govindasamy, 2013). Self-employed individuals tend to work longer hours than employees (Gorgievskia et al. 2010). Long working hours may be incompatible with other life issues and can negatively affect the personal and social life of an entrepreneur (Annink et al. 2015). It is hypothesised that there is a significant positive relationship between long working hours and WLC.

Work Overload: Salam (2014) describes work overload as a situation where an employer or an employee has too many works to do with too little time. Many entrepreneurs are financially constrained and run their businesses without adequate human resources. This can lead to work overload (Kerr & Nanda, 2009). There are many dimensions to work overload. These include time pressure, high speed of work and quantity of work (Skinner & Pocock, 2008). Individuals with high workload are likely to experience fatigue and exhaustion. This may negatively affect the ability of such individuals to respond to other live domains (Razak, Yunus & Nasurdin, 2011). It is hypothesised that there is a significant positive relationship between work overload and WLC.

3. Research Methodology

The study adopted the quantitative research approach. The survey method was used for data collection. The study area was the Central Business District of Johannesburg in the Gauteng province of South Africa. The study area contains a large number of native and immigrant entrepreneurs. The respondents were conveniently sampled because of the lack of a database of native and immigrant entrepreneurs in the study area. The study focused on entrepreneurs in the retail business. This helped to control for the influence of industry on WLC. The research instrument was pre-tested in a pilot study of twenty native and twenty immigrant entrepreneurs. This helped to improve face and content validity. Owners were assured of anonymity and confidentiality. The questionnaire was divided into four parts (1) biographical information (2) work-life conflict (3) long working hours and (4) work overload. The Cronbach's alpha was used as a measure

of internal consistency. Descriptive statistics, T-test, Pearson Correlation and regression analysis were used for data analysis.

Operationalisation of Variables: Work life conflict: The researcher developed the questions to measure WLC from previous empirical studies (Konig et al. 2012**;** Nanda, 2015). The two studies measured WLC with high degrees of reliability as indicated by the Cronbach's alpha coefficients. The Cronbach's alpha coefficient of Konig et al. (2012) was 0.73 and that of Nanda, (2015) was 0.89. A five-point Likert scale ranging from '1 strongly disagrees to 5 strongly agree' was used to word the questions. WLC was measured by the following questions. (1) My job does not allow me to spend the amount of time that I like with my family, partner, spouse or other life activities. (2) My private life does not allow me to spend the amount of time that I like on my job. (3) I regularly think about the things that I need to do at work when I am at home (4) I often think about things that I need to do at home or other life activities when I am at work. The number of hours worked in a typical week was used to measure long working hours. The question items to measure long working hours included 'Working less than 45 hours (1), 45-54 hours (2) 55-64 hours (3), 65-74 hours in a week (4), 75-84 hours (5) 84-94 hours (6) above 94 hours' (7). This is consistent with the previous empirical literature on long working hours (Valcour, 2007; Annink et al. 2015). Work overload was measured by a 4-item scale the scale adopted from Thiagarajan, Chakrabarty & Taylor, 2006). The scale by Thiagarajan et al. (2006) had a Cronbach's alpha was .89 and was a revision of an earlier 13-item scale by Reilly (1982). A five-point Likert scale ranging from '1 = strongly disagree, to 5 = strongly agree' was used. The question items were (1) I have to do things at work that I do not have the time and energy for (2) I need more hours at work every day to do all the things that are expected of me (3) I cannot seem to catch up with all the things that I need to do at work (4) I do not ever seem to have any time for myself. Razak, Yunus & Nasurdin, (2011) and Taştan, (2014) also used a similar scale to measure work overload.

4. Results and Discussion

Biographical Details: Two hundred and fifty questionnaires were distributed to native entrepreneurs and one hundred and one questionnaires were returned. The response rate for native entrepreneurs was 40.4%. For immigrant entrepreneurs, two hundred and fifty questionnaires were also distributed and one hundred and five questionnaires were returned. The response rate for immigrant entrepreneurs was 42%.

Table 1: Biographical Information of the Respondents

Biographical characteristics	Native Frequency (N=101)	Immigrant Frequency (N=105)
Educational qualification of owner		
Matric equivalent or below	62	36
Post-Matric qualifications	39	69
Gender		
Female	43	39
Male	58	66
Age of the owner (year)		
Less than 20	0	2
20-30	37	31
31-40	49	65
41-50	11	5
Above 50	4	2
Age of the firm (year)		
Less than one	3	6
1-5	38	54
6-10	57	44
Above ten years	3	1
Number of employees		
No employees	28	41
1-4 employees	65	63

5-9 employees	8	1
10-49 employees	0	0
50-99 employees	0	0

Table 1 shows that out of 102 native-owned businesses that participated in the survey, there were 58 males and 43 females. In addition, the majority of the participants have Matric or below qualifications, in the 31-40 age group and have been in operation for between six and ten years. In addition, the majority of the respondents have between one and four employees and can be classified as micro businesses. For immigrant-owned businesses that participated in the survey, 69 males and 36 females participated in the survey. In addition, the majority of the respondents are males with post-matric qualifications. The majority of the respondents have been in business for1-5 years and are in the 31-40 age group. The majority of the participants in the study are micro-enterprises with between one and four employees.

Descriptive Statistics and T-Test Results: The section below shows the results of the descriptive statistics and the T-test for immigrant and native entrepreneurs.

Comparison of Immigrant and Native Entrepreneurs

Table 2: Descriptive Statistics and T-Test Results

WLB variables	Immigrant Mean	Standard deviation	Native Mean	Standard deviation	T	Df	Sig.
My job does not allow me prevents me from spending the amount of time that I like with my partner, spouse or family or other life activities	3.76	0.984	4.12	0.974	2.720	9.01	0.522
My private life does not allow me to spend the amount of time that I like on my job.	3.42	1.009	4.08	0.921	2.524	15.02	0.091
I often think about the things that I need to do at work when I am at home	3.65	1.002	4.03	0.944	2.111	11.04	0.240
I often think about things that I need to do at home or other life activities when I am at work	3.80	1.010	3.86	1.024	1.997	13.06	0.680
Scale mean	3.66	0.999	4.02	0.979	2.007	11.29	0.224
Cronbach's alpha	0.744		0.717				

Sig.<0.05

Table 2 shows the results of the descriptive statistics and independent samples T-test for the WLC of native and immigrant entrepreneurs. The scale means for immigrant and native entrepreneurs are 3.66 and 4.02 respectively. The Cronbach's alpha is 0.744 for immigrant entrepreneurs and 0.717 for native entrepreneurs indicating the reliability of the scale used to measure WLC. Both immigrant and native entrepreneurs have high levels of WLC as indicated by the means. The results also indicate that immigrant entrepreneurs (3.84) have a slightly lower WLC compared to native entrepreneurs. However, the results of the T-test (T 2.007, df 11.29 sig. =0.224) does not indicate a significant difference in the WLC of immigrant and native entrepreneurs. The higher level of WLC of native entrepreneurs can be attributed to the effect of family and social interaction. The extended family of immigrant entrepreneurs may be in their host countries necessitating less family time. Immigrant entrepreneurs have fewer social links. The social integration of immigrant entrepreneurs in host countries takes time (Danes et al. 2008; Kushnirovich, 2016). The results indicate a significant positive relationship between long working hours and WLC for native and immigrant entrepreneurs. This suggests that long working hours can lead to WLC as there is little time for other

activities. Individuals have many roles to play, such as an employer, manager, caregiver, parent, partner and child (Theiler, 2012).

Long Working Hours: However, long working hours can be described as working more 45 or more hours per week. Out of the 101 native entrepreneurs that participated in the study, 8 between work between 45-54 hours in a week, 31 work between 55-64 hours in a week, 60 work between 65-74 hours in a week and 2 work between 75-84 hours in a week. The results are consistent with the findings of Perks, (2010) and Mutyenyoka and Madzivhandila, (2014) that small business owners in South Africa work long hours. Out of 105 immigrant entrepreneurs that participated in the study, 4 work between 55-64 hours in a week 89 work between 65-74 hours in a week and 12 works for between 75-84 hours in a week. In addition, most of the immigrant entrepreneurs open for business on Sundays. Compared to salaried employees, entrepreneurs tend to work long hours and this may be incompatible with other life issues (Gorgievskia et al. 2014; (Annink et al. 2015).

Gender Difference

Table 3: Gender difference

WLB variables	**Immigrant Mean**	**T**	**Sig.**	**Native Mean**	**T**	**Sig.**
My job does not allow me prevents me to spend the amount of time that I like with my partner, spouse or family or other life activities						
Male						
Female	3.56			3.90		
	3.95	1.047	0.681	4.33	1.206	0.230
My private life does not allow me to spend the amount of time that I like on my job.						
Male	3.22					
Female	3.61	1.421	0.451	3.75	1.302	0.110
				4.38		
I often think about the things that I need to do at work when I am at home						
Male	3.95			4.33		
Female	3.35	2.008	0.061	3.72	1.841	0.034
I often think about things that I need to do at home or other life activities when I am at work						
Male	3.75	1.885	0.282	3.74	1.241	0.184
Female	3.84			3.97		
Scale mean						
Male	3.62			3.93		
Female	3.69	2.007	0.129	4.10	1.208	0.193

Sig., <0.05

The results as depicted in Table 3 indicate that females (scale mean 3.69) have a slightly higher level of WLC than males (scale mean 3.62) for immigrant entrepreneurs. For native entrepreneurs, females ((scale mean 4.10) have a higher WLC than males (scale mean 3.93). The T-test does not indicate a statistically significant difference between male and female respondents for both native and immigrant entrepreneurs. For the four measures of WLC, females have higher means than males in three. The only variables where males have a higher mean are the items "when I am at home, I often think about the things that I need to do at work". The T-test is statistically significant for this variable for native entrepreneurs. The results are consistent with the findings of Bianchi & Milkie, (2010) that women have a higher level of WLC when compared to men.

Work Overload: The mean for work overload for a native entrepreneur is 3.84 and for immigrant entrepreneurs 3.64. The results indicate a higher level of work overload for native entrepreneurs compared to immigrant entrepreneurs. The Cronbach's alpha coefficients for native and immigrant entrepreneurs are 0.71 and 0.70 respectively indicating the internal consistency of measures. The T-test results (t= 8, df 2.82, sig. = 0.22) does not indicate any significant difference in work overload of native and immigrant entrepreneurs. The results are consistent with the findings of Kalitanyi & Visser, (2010) and Zhang, (2010) that immigrant entrepreneurs work long hours in host countries.

Correlation and Regression Results

Table 4: Correlation Results of Long Working Hours, Work Overload and WLC

	Native entrepreneurs		Immigrant entrepreneurs	
Variable	**R**	**Sig**	**R**	**Sig.**
Long working hours	0.71	0.04	0.76	0.02
Work overload	0.69	0.01	0.71	0.04

Sig.< 0.05

Table 5: Regression Result of Long Working Hours and WLC

Native entrepreneur

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
Constant	125.103	4.208		1.428	.000
Long working hours	1.105	.078	.766	10.305	.000

N=101, R= 822, R square =.714, Adjusted R square =.701, Sig. 0.05

Immigrant entrepreneur

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	108.111	3.041		1.726	.004
Long working hours	1.006	.0682	.702	10.008	.000

N=105, R= 0.777, R square .688, Adjusted R square =.674, Sig.< 0.05

Sig<0.05

Table 6: Regression Result of Work Overload and WLC

Native entrepreneur

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
Constant	102.008	3.401		1.091	.000
Work overload	1.105	.078	.688	11.207	.001
N=101, R= .705, R square =.648, Adjusted R square =.633, Sig. 0.05					
Immigrant entrepreneur					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	102.108	3.888		1.726	.002
Work overload	1.241	.0594	.620	10.925	.000
N=105, R= .701, R square .624, Adjusted R square =.644, Sig.< 0.05					

Sig<0.05

The relationship between long working hours and WLC was examined using the Pearson correlation and regression. Tables 4, 5 and 6 summarise the results of correlation and regression for the WLC (dependent variable) and working long hours and work overload (independent variables). Long working hours: The results (r =0.71, n=101, sig. < 0.05) for native entrepreneurs and (r=0.76, n=105, sig. < 0.05) for immigrant entrepreneurs indicate a significant positive relationship between long working hours and WLC. For native entrepreneurs, the coefficient of determination R square is .714. This indicates that 70.4% of the variation in WLC is explained by long working hours.

The Beta is 0.766 and the level of significance is less than 0.05. For immigrant entrepreneurs (Rsquare=0.688, Beta=0.682, sig < 0.05). Passion for work is one of the attributes of an entrepreneur (Gorgievski et al. 2010; Antonites & Govindasamy, 2013). Work overload: The results (r =0.69, n=101, sig<0.05) for native entrepreneurs and (r=0.71, n=105. Sig<0.05) and regression (R square .648, Beta .688, sig<0.05) for native entrepreneurs and (R square .624, Beta .620, sig<0.05) for immigrant entrepreneurs indicate a significant positive relationship between WLC and work overload. The high workload can contribute to feelings of exhaustion and strain. This may negatively affect the ability of such individuals to respond to other live domains (Skinner & Pocock, 2008; Razak et al. 2011).

5. Conclusion and Recommendations

The study examined the WLC of native and immigrant entrepreneurs in South Africa. The study also investigated if there is a significant gender difference in the WLC of entrepreneurs. Furthermore, the study investigated the relationship between work-related factors (long working hours and work overload and WLC. The results indicated that both immigrant and native entrepreneurs have high levels of WLC. Immigrant entrepreneurs have a slightly lower WLC compared to native entrepreneurs. The higher level of WLC of native entrepreneurs can be attributed to the effect of family and social interaction. Native entrepreneurs often have kinships and extended family bonds. Compared to native entrepreneurs, immigrant entrepreneurs have fewer social links in host countries. The results indicated that male entrepreneurs have a lower level of WLC compared to female entrepreneurs. The results are not statistically significant. The results revealed a significant positive relationship between long working hours and WLC for native and immigrant entrepreneurs. The results also indicated a significant positive relationship between work overload and WLC for native and immigrant entrepreneurs. Individuals with high workload are likely to experience fatigue and exhaustion.

Recommendations and Areas for Further Study: WLC has to be managed by both native and immigrant entrepreneurs to improve performance. The findings of the study revealed high levels of WLC by both native

and immigrant entrepreneurs. To manage WLC, both native and immigrant entrepreneurs should set goals that include both work and life activities. This can be achieved by the scheduling of work and life activities and the setting of realistic expectation of daily work achievement. This can also help to manage long working hours and work overload Organisations that support small business development in South Africa such as the Small Enterprise Development Agency should organise training on WLC for both native and immigrant entrepreneurs. The support of the family in reducing the WLC of women entrepreneurs is very important. Women entrepreneurs need to take a proactive approach to improve time management between work and family responsibilities. Training interventions aimed at reducing the high level of WLC of female entrepreneurs should be adopted by government agencies that support small businesses. The study focused on a relatively small sample of native and immigrant entrepreneurs. The bias of a limited number of respondents must be taken into account.

References

Abor, J. & Quartey, P. (2010). Issues in SME Development in Ghana and South Africa. *International Research Journal of Finance and Economics*, 1(39), 218-228.

Ahmad, A. N. (2008). Dead men working: time and space in London's (illegal') migrant economy. *Work, Employment & Society*, 22(2), 301-318.

Annink, A., den Dulk, L. & Steijn, B. (2015). Work-family state support for the self-employed across Europe. *Journal of Entrepreneurship and Public Policy*, 4(2), 187-208.

Antonites, A. & Govindasamy, T. (2013). Critical Success Factors of Indian Entrepreneurs. *The Southern African Journal of Entrepreneurship and Small Business Management*, 6, 115-133.

Bell, A. S., Rajendran, D. & Theiler, S. (2012). Job stress, wellbeing, work-life balance and work-life conflict among Australian academics. Sensoria: *A Journal of Mind, Brain & Culture*, 8(1), 25-37.

Bianchi, S. M. & Milkie, M. A. (2010). Work and family research in the first decade of the 21st century. *Journal of Marriage and Family, 72*(3), 705-725.

Cant, M. C. & Wiid, J. A. (2013). Establishing the Challenges Affecting South African SMEs. *International Business & Economics Research Journal,* 12(6), 707-716.

Carlson, D. S. & Grzywacz, J. G. (2008). Reflections and future directions on measurement in work-family research. In K. Korabik, D. S. Lero & D. L. Whitehead (Eds.), Handbook of work-family integration: research, theory, and best practices, 57-73.

Cegarra-Leiva, D. Sánchez-Vidal, M. E. & Cegarra-Navarro, J. (2012). Understanding the link between work-life balance practices and organisational outcomes in SMEs: The mediating effect of a supportive culture. *Personnel Review*, 41(3), 359-379.

Chan, C. (2008). Border crossing: work-life balance issues with Chinese entrepreneurs in New Zealand. Doctoral dissertation, Auckland University of Technology.

Charles, V. & Gherman, T. (2013). Factors Influencing Peruvian Women to Become Entrepreneurs. *World Applied Sciences Journal*, 27(10), 1345-1354.

Chinomona, E. & Maziriri, E. (2015). Examining the Phenomenon of Xenophobia as Experienced by African Immigrant Entrepreneurs in Johannesburg, South Africa: Intensifying the Spirit of „Ubuntu". *International Journal of Research in Business Studies and Management*, 2(6), 20-31.

Chinomona, R. & Pooe, R. I. D. (2013). The Influence of Logistics Integration on Information Sharing and Business Performance: The Case of Small and Medium Enterprises in South Africa. *Journal of Transport and Supply Chain Management,* 7(1), 1-9.

Craig, L., Powell, A. & Cortis, N. (2012). Self-employment, work-family time and the gender division of labor. *Work, Employment & Society*, 26, 716–734.

Danes, S. M., Lee, J., Stafford, K. & Heck, R. K. Z. (2008). The effects of ethnicity, families and culture on entrepreneurial experience: An extension of sustainable family business theory. *Journal of Developmental Entrepreneurship*, 13(03), 229-268.

Downes, C. & Koekemoer, E. (2011). Work-life balance policies: Challenges and benefits associated with implementing flexitime. *SA Journal of Human Resource Management*, 9(1), 1-13.

Emslie, C. & Hunt, K. (2009). Live to Work or 'Work to Live'? A Qualitative Study of Gender and Work-life Balance among Men and Women in Mid-life. Gender, *Work & Organization*, 16(1), 151-172.

Fatoki, O. (2015). An Investigation into the Ethical Ideology of Immigrant Entrepreneurs in South Africa. *Journal of Social Sciences,* 43(2), 91-96.

Fleetwood, S. (2007). Why work-life balance now? *The International Journal of Human Resource Management,* 18(3), 387-400.

Forson, C. (2013). Contextualising migrant black business women's work-life balance experiences. *International Journal of Entrepreneurial Behaviour & Research,* 19(5), 460-477.

Frone, M. R. (2003). Work-family balance. In J. C. Quick & L. E. Tetrick (Eds.), Handbook of occupational health psychology. Washington: American Psychological Association.

Goode, W. J. (1960). A theory of role strain. *American Sociological Review*, 25, 483-496.

Gorgievski, M. J., Arnold B. B. & Schaufeli, W. B. (2010). Work engagement and work a holism: comparing the self-employed and salaried employees. *The Journal of Positive Psychology,* 5(1), 83–96.

Government Gazette. (1997). Basic Condition of Employment Act.

Government Gazette of the Republic of South Africa. (2003). National Small Business Amendment Act.

Greenhaus, J. & Allen, T. (2011). Work-family balance: A review and extension of the literature. In J. C. Quick and L. E. Tetrick (Eds.), Handbook of occupational health psychology (2nd edition). Washington: American Psychological Association.

Greenhaus, J. H. & Beutell, N. J. (1985). Sources of conflict between work and family roles. *Academy of management review*, 10(1), 76-88.

Greenhaus, J. H., Collins, K. M. & Shaw, J. D. (2003). The relation between work-family balance and quality of life. *Journal of Vocational Behavior,* 63(3), 510-531.

Humbert, A. & Drew, E. (2010). Gender, entrepreneurship and motivational factors in an Irish context. *International Journal of Gender and Entrepreneurship*, 2(2), 173-196.

Kahn, R. L., Wolfe, D. M., Quinn, R., Snoek, J. D. & Rosenthal, R. A. (1964). Organizational stress: Studies in role conflict and ambiguity. New York: John Wiley & Sons.

Kalitanyi, V. & Visser, K. (2010). African immigrants in South Africa: job takers or job creators? *South African Journal of Economic and Management Sciences*, 13(4), 376-390.

Kalliath, T. & Brough, P. (2008). Work-life balance: A review of the meaning of the balance construct. *Journal of Management & Organization*, 14(3), 323-327.

Katua, N. T. (2014). The Role of SMEs in Employment Creation and Economic Growth in Selected Countries. *International Journal of Education and Research*, 2(12), 461-472.

Kerr, W. & Nanda, R. (2009). Financing Constraints and Entrepreneurship.

Khosa, R. M. & Kalitanyi, V. (2014). Challenges in operating micro-enterprises by African foreign entrepreneurs in Cape Town, South Africa. *Mediterranean Journal of Social Sciences*, 5(10), 205-215.

König, S., Langhauser, M., Cesinger, B. & Leicht, R. (2012). Subjective Success in an Entrepreneurial Career–The Case of Work-Life-Balance: Results from a Large-Scale Survey in Germany. Babson College Entrepreneurship Research Conference, Babson College, Wellesley.

Kotecha, K., Ukpere, W. & Geldenhuys, M. (2014). The effect of family relationships on technology-assisted supplemental work and work-life conflict among academics. *Mediterranean Journal of Social Sciences*, 5(10), 516-527.

Kushnirovich, N. (2016). Economic Integration of Immigrant Entrepreneurs. *Entrepreneurial Business and Economics Review,* 3(3), 9-28.

Liedeman, R., Charman, A., Piper, L. & Petersen, L. (2013). Why are foreign-run spaza shops more successful? The rapidly changing spaza sector in South Africa.

Lobel, S. A. (1991). Allocation of investment in work and family roles: Alternative theories and implications for research. *Academy of Management Review*, 16(3), 507-521.

Lucky, E. O. & Olusegun, A. I. (2012). Is Small and Medium Enterprises (SMEs) an Entrepreneurship? *International Journal of Academic Research in Business and Social Sciences*, 2(1), 487-496.

Marks, S. R. (1977). Multiple roles and role strain: some notes on human energy, time and commitment. *American Sociological Review*, 42,921-936.

Mutyenyoka, E. M. & Madzivhandila, T. S. (2014). Employment Creation through Small, Medium and Micro Enterprises (SMMEs) in South Africa: Challenges, Progress and Sustainability. *Mediterranean Journal of Social Sciences*, 5(25), 65-72.

Nadeem, M. S. & Abbas, Q. (2009). The impact of work-life conflict on job satisfaction of employees in Pakistan. *International Journal of Business and Management*, 4(5), 63-83.

Nanda, A. (2015). Work life conflict: the spillover effect. *International Journal of Research in Management and Business Studies,* 2(1), 56-62.

Nieman, G. & Nieuwenhuizen, C. (2009). Entrepreneurship: A South African Perspective. Van Schaik.

Nordenmark, M., Vinberg, S. & Strandh, M. (2012). Job control and demands, work-life balance and wellbeing among self-employed men and women in Europe. *Vulnerable Groups and Inclusion*, 3, 1-18.

Organisation for Economic Co-operation and Development. (2014). Financing SMEs and Entrepreneurs (2014).

Perks, S. (2010). Problem-solving techniques of growing very small businesses. Journal of Enterprising Communities: *People and places in the global economy*, 4(3), 220-233.

Razak, A. Z. A. A., Yunus, N. K. Y. & Nasurdin, M. (2011). The impact of work overload and job involvement on work-family conflict among Malaysian doctors. *Labuan e-Journal*, 5, 1-10.

Reilly, M. D. (1982). Working wives and convenience consumption. *Journal of consumer research*, 4(8), 407-418.

Salam, F. (2014). Work Overload, Work-Family Conflict, Family-Work Conflict and Their Effects on Job Embeddedness: The Moderating Role of Co-worker Support. *Journal of Business and Management,* 16(1), 75-80.

Sieber, S. D. (1974). Toward a theory of role accumulation. *American Sociological Review*, 39, 567-578.

Simmons, S. (2012). Striving for work-life balance. *The American Journal of Nursing*, 112(1), 25-26.

Singh, A. P. & Kumar, A. (2011). Personality as a moderator between Stress State and Job Attitudes. *Indian Journal of Social Science*, 8 (1&2), 149-158

Skinner, N. & Pocock, B. (2008). Work-life conflict: Is work time or work overload more important. *Asia Pacific Journal of Human Resources,* 46(3), 303-315.

Statistics South Africa. (2018). Quarterly Labour Force Survey.

Taştan, S. B. (2014). Predicting Psychological Strain with Job Demands and Organizational Injustice through the Implications of Job Demand-Control Model and Fairness Theory. *Postmodern Openings Deschideri Postmodern,* 5(4), 111-143.

Thiagarajan, P., Chakrabarty, S. & Taylor, R. D. (2006). A confirmatory factor analysis of Reilly's Role Overload Scale. *Educational and psychological measurement*, 66(4), 657-666.

Valcour, M. (2007). Work-based resources as moderators of the relationship between work hours and satisfaction with work-family balance. *Journal of Applied Psychology,* 92(6), 1512-1523.

Vinogradov, E. (2008). Immigrant entrepreneurship in Norway.

Winslow, S. (2005). Work-family conflict, gender, and parenthood. *Journal of Family Issues*, 26(6), 727-755.

Zhang, Z. (2010). The home country's role in shaping Chinese immigrant entrepreneurship. Doctoral dissertation, Auckland University of Technology.

Zimmerman, M. A. & Chu, H. M. (2013). Motivation, Success, and Problems of Entrepreneurs in Venezuela. *Journal of Management Policy and Practice*, 14(2), 76-90.

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Investor-State Dispute Settlement and Indonesian Reform Policy in Mining Downstream Sector

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Abstract: To date, Indonesia has been facing the seventh ISDS (Investor-State Dispute Settlement) lawsuit case in ICSID, the most number of ICSID cases a particular country has in ASEAN. In the meantime, Indonesia had to initiate reform in its minerals mining sector policy since the sector had provided little benefit in Indonesian sustainable economic development thus far–a policy reform which is potentially highly exposed to ISDS lawsuit case. Yet, the reform once issued has no turning back and thus it should move forward. Indonesian reform policy to support more its mining downstream by Minerba Act issuance is intended to benefit from its scarce, limited non-renewable minerals so as to support national development and maintain its long-term interest and economic sustainability. Undoubtfully, the policy reform will be beneficial for Indonesian economy sustainability and thus it should be protected from any potential ISDS claims in the future. This study seeks to address such real, critical current challenges arising from contingent ISDS claims towards Indonesia. This study adopts a descriptive analytical method, which combines literature review, authors' shared expertise in this field, and results of interviews and discussions with several other experts in relevant fields. This study concludes that in addressing ISDS contingent problems threatening Indonesian current reform policy in mining downstream sector, Indonesia should focus the emphasis on the prevention endeavor, those are a review of BITs and IIAs containing ISDS provisions; improvement in investment dispute management; which are mainly supported by continuous bureaucracy reform, capacity building, and better coordination.

Keywords: *ISDS, ICSID, reform policy, mining downstream sector, sustainable economic development*

1. Introduction

As one of the emerging countries, Indonesia has turned into an attractive investment destination for foreign investors. Domestic and foreign investors keep increasing their investment in line with Indonesian government continued efforts to facilitate permits and ensure legal certainty for investment. However, as time passes by the Indonesian government encounters a situation –normally found in other countries –in which it has to change its policy into a new policy for the purpose of national development. New policies or policy reforms - now and then - are found contradictory with bilateral investment treaties (BITs) or international investment agreements (IIAs). Sometimes this new policy will inevitably have to intersect with previous investment project contracts between the government and foreign investor companies, trigger the dispute arising between foreign investors and government. If they cannot find a win-win solution, the threat to sue the government to international arbitration tribunal becomes something common to hear from foreign investors.

The issuance of Law No. 4 of 2009 on Minerals and Coal (Minerba Act) has become a new policy milestone of Indonesia in promoting mining downstream sectors. (Ika, 2017) mentions four urgencies of promoting mineral downstream policy, i.e. to encourage the establishment of domestic smelters, to integrate upstream-downstream-industrial operations, to increase mineral added value, and to boost state revenues. On the other hand, this policy has the potential to trigger new investor-state dispute settlement (ISDS) conflicts with foreign mining companies operating in Indonesia under the Contract of Work. In 2014 PT Newmont Nusa Tenggara filed a lawsuit to the International Centre for Settlement of Investment Disputes (ICSID) which

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fortunately was withdrawn. Furthermore, PT Freeport International (PTFI), a US copper and gold mining company operating in Timika, Irian Jaya, also once threatened to bring the dispute with the Indonesian government into international arbitration. Some of PTFI's objections were the clause to change from KK to IUPK (Special Mining Permit) and to undertake 51 percent divestment–a rational resistance since divestment is an unpopular decision that both damage the reputation and the company image both at home and in the host countries (Resmini & Vittucci, 2016). Unfortunately, the Government of Indonesia remained firm with its stance.

Recent updates inform that Indonesian government and PTFI have reached an agreement as outlined in the Head of Agreement as of July 2018, whereby PTFI approves the above provisions in return for investment contracts to be extended until 2041. Another compromise is the Government also guarantees divestment obligations and changes in KK status to IUPK will not interfere with the business climate and PTFI long-term plan. However, as confirmed by (Losari & Ewing-Chew, 2015), the potential for conflict to arbitration is still open since there is still a long way to go between the two parties until implementation is fully implemented. The case of disputes in the mining sector between foreign investors and government is not Indonesian monopoly. Similar cases also occur in other resource-rich countries such as South Africa (Mohamadieh & Uribe, 2016), Equador, Bolivia, and Venezuela (Berger, 2015). If there is no common ground in the case of an investment dispute, then the investor brings the case into international arbitration for investor-state settlement (ISDS). Those ISDS-related provisions are commonly found in Bilateral Investment Treaties (BITs) and International Investment Agreements (IIAs)[11] i.e. Investment Chapters under various Free Trade Agreements (FTAs). Indonesia took part in 64 BITs and five IIAs, i.e. Investment Chapters of FTAs and were therefore obliged to the ISDS-related rules under the treaties or chapters. Currently, Indonesia is terminating several BITs and reviewing others (Jailani, 2015).

This study has several objectives. The first objective is to briefly describe the history of ISDS scheme existence in international treaties, the emergence of ISDS cases including cases that affect Indonesia. Secondly, this study will analyze the rationale of policy reform in mining downstream sector which potentially triggers ISDS dispute with foreign investors in the mining sector. In the final section, this study will examine the various challenges encountered in benefiting the ISDS mechanism and some of the possible solutions that Indonesia has to anticipate in ISDS dispute in the mining sector. This study adopts a descriptive analytical method, which combines literature review, authors' shared expertise in this field, and results of interviews and discussions with several other experts in relevant fields. Some necessary secondary data is compiled from the Ministry of Finance and PTFI.

2. History of ISDS Mechanism

The use of ISDS mechanisms among countries in their investment treaty was initiated in the late 1960s and early 1970s. Thirty years later the model agreement with the ISDS mechanism has become the standard investment treaty. Foreign investors who object with the host country's policy may file a dispute lawsuit against an international arbitration institution. The most popular tribunal for arbitration is the New York-based International Center for Settlements of Investment Disputes (ICSID). ICSID, which was established in 1966 and domiciled under the World Bank, currently comprises 162 member countries including Indonesia. The ISDS mechanism was seen as a way out at the time for the problems that foreign investors encountered - mostly investors came from European and American countries. Some of the investment was in their former colonies.

Previously without ISDS, foreign investors had two options to reclaim their investment taken over by the host country (UNCTAD, 2014). The first option was to seek justice by filing a lawsuit to a local court or administrative court in the country where the investment was located. But this option was often constrained by the legal protection of local courts over domestic policies issued by the government. It tended biased because local courts saw the government of a sovereign state had privilege and authority over its dosmetic policy as long as it was devoted to national or community interest. Others pointed to the judiciary system in

[11]Subsequently called investment treaty

developing countries that were sometimes not independent and could be intervened by officials or political figures. If this first option failed, there was the second option in which foreign investors might expect diplomatic protection assistance from their government.

This second option could be a powerful weapon when the country of origin of the investor belonged to a group of ''strong'' countries, in their politics, economy, and defense in the world; even more so if the country belonged to a group of superpowers such as the United States, Russia, Britain, France and China. Not all "strong" countries were willing to intervene in the interest of their investors. It was often that the expectation from this second option conflicted with consideration and calculation of greater political interests. Investors with large capital were in a more favorable position than small investors, because they had the capital strength that was expected to influentially direct their home country foreign policy in defending their investment interests. Germany became a pioneer country of the ISDS mechanism, making it prominent as the grandfather of investor-state arbitration (Provost & Kennard, 2015). Germany - in the late 1950s - became the first country to issue the idea of an obligation of investor-state dispute settlement mechanisms existence in investment proposals offered by German investors to developing countries. Germany called the concept of its proposed agreement an "international Magna Carta" - an international charter of constitutional rights protection for private investors. In the 1960s, the German concept was later adopted by the World Bank through the establishment of ICSID. The World Bank decision at the time was not without resistance.

In total 21 World Bank member countries from the developing country group opposed the decision. The opposing group believed that the ISDS mechanism would reduce the country's sovereignty, while the World Bank believed that ICSID would be a fair mechanism for investors willing to invest and in return helping developing country economies. The foreign investment entry would help the developing country create jobs, generate the flow of state revenues in the form of taxes and non-taxes income, and develop the technology. Later in the 1980s, German investors became pioneers by initiating to file lawsuits against dozens of developing countries such as Ghana, Ukraine and the Philippines to ICSID. Indonesia itself does not escape investor claims in ISDS cases. Among ASEAN member countries Indonesia even topped the number of ISDS suits filed in ICSID, above the Philippines with three cases. As indicated in Table 1, the Government of Indonesia itself has received at least seven lawsuits from foreign investors in the direct disputes between foreign investors and Indonesian government (trial at ICSID) and one indirect investment dispute of foreign investors and state-owned enterprises owned by the Indonesian government, the so-called Karaha Bodas case (trial outside ICSID).

Table 1: Indonesia's Involvement in Case before ICSID

No	Case Name	Disputed Matter	Winning Party	Awarded Damages (if any)
1.	Amco Asia v. Indonesia (1981)	Lease and management agreement and investor's license		
	First Award		Investor	US$3,200,000
	Annulment		Government	
	Second Award		Investor	US$2,696,330
2.	Cemex Asia v. Indonesia (2004)	Shares and an option to purchase shares in a state-owned company	Settled between the parties	
3.	East Kalimantan v. PT Kaltim Prima Coal (2009)	Divestment requirements in the concession contract	The tribunal declined jurisdiction	
4.	Rafat Ali v. Indonesia (jurisdiction) (2011)	Shares, loans, and financing agreements in several banks	The tribunal declined jurisdiction	The case is being submitted to the ICSID Annulment Committee. Claim by Rafat Ali was in the amount of US$ 75 million.
5.	Churchill Mining v. Indonesia (2012)	Exploration and exploitation licences over a	The tribunal found jurisdiction and the case is ongoing. Claim of Churchill Mining is in the	

6.	Planet Mining v. Indonesia (2014)	Coal Project Area	amount of US$1.05 billion
7.	Nusa Tenggara Partnership BV and PT Newmont Nusa Tenggara v. Indonesia (ongoing)	Regulation on export ban of raw materials	Registered to the ICSID Secretariat on 15 July 2014. Withdrawn on 25 August 2014.

Source : Losari & Ewing-Chew (2015) and Magiera (2017), compiled.

3. The Rationale of Indonesian Policy Reform in Minerals and Coals Downstream Sectors

Out of the seven disputes in ICSID involving Indonesia until 2016, only the disputes filed by Churcill Mining and Planet Mining that Indonesia won on the dispute subject, while the Hesham Al Waraq and Rafat Ali Rizvi (the owners of Bank Century) lawsuit - ended with the refusal by ICSID. As a country with the largest land area in Southeast Asia, Indonesia is endowed with rich mineral resources such as nickel, gold, silver, bauxite, copper, and tin. But unfortunately, these wealthy resources cannot be managed optimally to boost state revenue and the welfare of Indonesian people. The prime cause is that most mining companies operate in the upstream and export low-value ore or raw minerals. The practice has lasted for more than 40 years, so that Indonesia then gets the nickname as the exporter of a raw material specialist. Then it is realized that Indonesia has the potential to change its mineral resources into an economic value that is beneficial to national development. Thus, the policy strategy that should be pursued is promoting downstream process or value-adding process in the mineral mining sectors. Downstream process or value-adding process by Patunru, (2015) is an attempt to curtail raw materials export and instead encourage domestic industries to add value to raw materials by producing intermediate or final products while creating jobs at the same time. The above reform to promote mining downstream sectors became one of the main policies launched during President Susilo Bambang Yudhoyono second term (2009-2014). Indonesian Government reformed its national mineral management policy by issuing Law No. 4 of 2009 on Minerals and Coal (Minerba Act).

In addition to the Minerba Act, the government also published a related policy package. The Minerba Act was enacted to bring the main mission to encourage the shifting of mineral management from upstream to downstream sectors. The shifting is encouraged by requiring Mining Business License (IUP) and Contract of Work (KK) holders to build a smelter within the country. The shifting obligation also comes with a ban to export raw minerals to mining companies. This prohibition is regulated in the implementation of Minerba Act, namely Government Regulation (PP) no. 23 of 2010, and came into effect on January 12, 2014 or five years since Minerba Act was enacted. The downstream policy plays an important role in the national development as it becomes one of the government fiscal tools to create added value in minerals, boost state revenues, promote economic growth, create jobs, and to make Indonesian people prosper equitably. The success indicator of downstream mineral policy is Indonesian exported goods will be no longer raw materials, yet finished goods which are manufactured from raw materials. Indonesia will be able to export lipstick or chemical blend, not palm oil any longer; export aluminium products to automotive parts instead of bauxite ore or bauxite concentrate. The economic value added of minerals varies depending on their types (Rudenno, 2004). Bauxite ore, for example, its added value increases 12 times or reach 25 percent to 35 percent when processed into alumina. Bauxite added value can be increased again up to 60 percent, even more through metallurgy process or smelting.

Ni (nickel) content in a ton of laterite ore reaches about 2 percent. With the metallurgy (smelting) process, the nickel content in ferronickel can be escalated to 15-30 percent. Another example is copper and gold in Papua Island, Indonesia, under PTFI exploration. The content of copper in a ton of ores is only about 0.15-2 percent, but with smelting process, copper ore content can be escalated to 10-30 times or about 40 percent. The gold content (Au) in a ton of laterite ore only ranges from 1.5-4 grams, whereas through a particular metallurgy process through purification, it can be increased to 99.99 percent. As a mineral resource-rich country, it is an irony that the mining sector in general and mineral mining sector in particular, contributes poorly to state revenues and fails to become an economic pillar for Indonesian people welfare. The relatively small contribution of Indonesian mineral mining sector is not much different from the contribution of its

mining sector in general which only reaches around Rp 60.42 trillion or 6.16 percent of its total state revenue (API, 2013). Kementerian ESDM, (2015) reports that the contribution of minerals sector to Indonesia's exports and Gross Domestic Product (GDP) is only 3.2 percent and 5.12 percent respectively.[12]

Meanwhile, the contribution of the minerals and coal sector to Non-Tax State Revenue (PNBP) only reaches 4.4 percent (Walker, 2015). Let us compare with Chile - the world's largest copper mineral producer - the contribution of the minerals sector to Chile's total exports and GDP has reached 30 percent and 6.7 percent respectively (Saggu & Anukoonwattaka, 2015). In fact, Chile is currently exporting concentrate only, not higher value-added products as Indonesia expects to acquire through the mineral downstream policy. Thus, if the Indonesian reform policy succeeds, Indonesia has potentials to boost its state revenue and increase its relative contribution of minerals sector surpassing Chile. Based on the expertise, previous experience, and analysis, Ika, (2017) concluded that Indonesian reform policy to promote mineral downstream policy is based on four urgencies, i.e. to encourage the establishment of domestic smelters, to integrate upstream-downstream-industrial operations, to increase mineral added value, and to boost state revenues. First urgency, encouraging the establishment of domestic smelters is crucial since the mineral is a non-renewable resource base of national wealth. Because of their non-renewable nature, the management of minerals should be maximized to generate greater value-added for resource owners.

Failure to maximize the wealth of mineral, such as selling only in the form of ores or concentrates, will result in low added value for Indonesia; thus, an obviously big loss to Indonesian people in the long term and inheriting nothing but natural destruction to next generations. To prevent it from happening, the Minerba Act therefore requires mining companies to construct domestic smelters for processing domestic minerals products and prohibits mining companies from exporting ores or raw minerals. The second urgency, the integration of industry-downstream-upstream operations needs to be encouraged in order to keep the balance of overall mining sectors. Given the current lack of added value in the upstream industry, the mining downstream promotion needs to be continuously encouraged in order to contribute greater value added. The challenge is in the upstream-downstream operations integration effort, higher risk factors are found in the downstream compared to upstream risks (see Burmeister (1988), Harquail, (1991) and Ward & McCarthy, (1999). Thus, a special strategy is required. Lessons learned from the efforts of PT. Antam to synergize mining business in the upstream (nickel ore) and the downstream (ferronickel) is that such a combined policy is proven very vulnerable to be affected by the world nickel price fluctuations.

If the ores price drops in the global market, then two sources of Antam's revenue are both eroded, i.e. the revenue from nickel ore sales and the revenue from ferronickel sales. When the price of nickel ore is high, Antam greatly benefits from the rising price of nickel or ferronickel. When the price of nickel ore in the global market reached the highest level in 2007, Antam recorded the highest profit in its history, which was around Rp5.1 trillion. However, when the price of nickel ore dropped dramatically, the price of ferronickel also slumped so that Antam was greatly disadvantaged. After 2007, the price of nickel ore in the international market has continued to decline, so Antam's profit also continues to erode to negative reach in 2014 and 2015 (Antam, 2015). Industry-downstream integration is seen as having a lower risk compared to downstream-upstream integration, as the downstream business risks are not directly related to the business risks in manufacturing industries. If a stainless steel factory does not get ferronickel supplies from a local smelter, this supply can be provided from other smelters or even from abroad as long as it is affordable. The good news is PT Smelting Gresik (PTSG) has now integrated industry-downstream activities. PTSG has a smelter to process copper concentrate into the copper cathode. PTSG does not operate in the upstream of copper, but operates downstream by receiving copper supplies from PTFI and PT Amman to be processed into copper cathode.

PTSG then sells copper cathode products to the cable industry and fertilizer industry (Petrokimia Gresik). The third urgency is to increase the added value of minerals, because the mineral resources, especially metals will be exhausted and non-renewable. Based on the facts, metal mineral resources need to be processed

[12]Kementerian ESDM. Laporan Kinerja Tahun 2015.

domestically to produce higher added value, which in turn it can accelerate national economic growth. Mine-producing areas that successfully diversify the economy from each value chain enjoy more success than those areas that neglect economic diversification and continuously depend on the mine. These evidences are the results of studies conducted by Thomas Michel Power, as quoted by Sembiring, (2009). Power studies further find that areas that rely on upstream mining operations tend to experience economic decline and depression, especially after the mine has been exhausted or entering the post-mining phase. Another study conducted by Stijns, (2001) also asserts that countries that opt to export their natural resources rather than utilize them for domestic and manufacturing industries, their economic growth will significantly suffer from negative impact. Reflecting on Stijns, (2001), Indonesia still has problems in optimizing its mineral resources to boost its manufacturing sector and economic growth. Let us take aluminium as an example. Indonesia has substantial aluminium mineral reserves and the state-owned enterprise which operate the exploration (PT Inalum), but unfortunately this aluminium wealth cannot be utilized and optimized to develop its domestic and manufacturing industry. Different cases are found in Australia, where the country has successfully managed its bauxite reserves. Australia has six aluminium smelters scattered in several states (New South Wales, Queensland, Tasmania and Victoria), managed by big companies Rio Tinto, Alcoa, Pechiney, VAW Aluminium AG and a consortium of Japanese companies. The bauxite mineral mixed with other metallic minerals such as chrome, steel, or nickel, will produce excellent aluminium (alloy), which is heat resistant, strong but flexible, and easy to form, so it can be used for automotive, shipbuilding, and aircraft parts manufacturing industry. With the industry-downstream-upstream integration as Australia undertakes, the economic value added obtained is much greater, and so is the tax contribution to the country.

Following the enactment of Minerba Act, Indonesian reform has progressed. To process mineral ores and give more added value to them, so far Indonesia has built 24 operating smelters, consisting of 15 nickel smelters, four iron smelters, two bauxite smelters, two manganese smelters, and one copper smelter. In addition, many other smelters that are currently under construction will follow the operation. The fourth urgency of mineral downstream policy is to optimize the mineral sector contribution to state revenue, both taxes and non-taxes. The potential for high state revenues from mineral resources can only be realized if the government reforms its mineral management policy. The current dependence on mining operations in the upstream sector by exporting mineral ores (nickel, bauxite, copper and iron) has resulted in low state revenue both in tax and non-tax contribution. Therefore it does make sense that Indonesia then requires mining companies to build smelters and ban the export of raw minerals as stipulated in the Minerba Act. As an illustration, PTFI's total contribution to state revenues (dividends, royalties, as well as taxes and other non-taxes) in 2006 amounted to 1.6 billion US dollars, of which 81 percent came from taxes and non-taxes (Table 2). The declining trend in commodity prices in global markets occurring since 2012 has impacted PTFI's revenue, which has continued to decline and even recorded losses. PTFI cannot pay dividends to its shareholders, including the Indonesian government which owns 9.36 percent of PTFI shares.

Table 2: The contribution of PTFI to State Revenues (USD Millions)

Types	2006	2007	2008	2009	2010	2011	2012	2013	2014
Dividends for Government	259	216	49	213	169	202	-	-	-
Royalty	146	164	121	128	185	188	76	101	118
Taxes and Non-Taxes	1294	1425	1039	1013	1569	1993	904	383	421
Total	**1600**	**1805**	**1209**	**1354**	**1922**	**2383**	**980**	**484**	**539**

Source: Kementerian Keuangan. APBN dan Laporan Realisasi APBN (2006-2014), and Freeport McMoRan Inc. Annual Report, (2006-2014) compiled.

Another illustration is the PT. Antam, which also suffered from decreasing income due to declining mineral prices in the global market. When the nickel price reached its peak in 2007, Antam could earn net profit amounted to Rp5.1 trillion and contributed more than Rp2 trillion to state revenues. After 2007, mineral prices in the global market continued to decline so that PT Antam contribution to state revenues dropped to

only Rp 111 billion in the first half of 2015. All of these are due to PT Antam dependence on the sales of lower grade nickel ore which is vulnerable to commodity price volatility in the global market. Antam has recently changed its strategy and has shifted its business further to the downstream. Antam currently has five operating smelters (three nickel, one alumina and one gold smelters) and is building four other smelters, the Pomalaa Ferronickel Expansion Project (P3FP), the Halon Ferronickel Development Project (P3FH), the SGAR Mempawah Project and the Project Anode Slime & Precious Metals Refinery. Antam has also built a partnership with Inalum for the Smelter Grade Alumina Refinery (SGAR) project in Mampawah, West Kalimantan. Antam will also increase its ferronickel production capacity from 18,000-20,000 TNi to 27,000-30,000 TNi per year through P3FP.

The successful development of Antam entire project will certainly increase its contribution significantly to state revenues. Referring to all the explanation above, it is obvious that Indonesia has adopted a strategic national policy in its mining sectors by issuing the Minerba Act, and deliberately initiated to support its mining downstream sectors. Undoubtfully, the policy reform will be beneficial for Indonesian economy sustainability and thus it should be protected from any potential ISDS claims in the future. As shown in Table 1 in the previous section, six of seven ISDS cases toward Indonesia have taken place in extractive or mining sectors, and only Rafat Ali case is related with other sectors. Out of six ISDS cases in extractive or mining sectors, three cases took place before Minerba Act came into effect and the other three have happened afterwards. The last case – which is still in tribunal process - is specifically related with the implementation regulation of the Minerba Act. The issuance of policy reform in Indonesian mineral mining has clearly triggered one ISDS case, and it is not unlikely that next ISDS cases opposing this law will occur in the near future. Indonesia should anticipate the possibility and it should endeavour to understand thoroughly the upcoming challenges and possible solutions to address such challenges.

4. Challenges in Benefiting ISDS Mechanism

Despite the opposition from many developing countries, the World Bank decision to standardize ISDS adoption in BITs and IIAs is anyhow based on goodwill from the perspective the institution had at the moment. In the absence of common ground, with the existing provision of ISDS schemes, it is hoped that an independent, impartial and fair court forum for investors and government will be established, which does not carry an unnecessary burden of political issues and is able to focus on disputed legal issues. Investors should not be concerned about the existence of partial, unfair local court treatment or the compulsion to influence their home countries to provide political intervention through diplomatic channels. On the other hand, the small investment destination countries with low bargaining power in international diplomacy also need not worry about the political pressure and lobbies of 'strong' home countries, the countries where the investors are domiciled. Currently, ISDS provisions are generally included in the most of international investment agreements (including BITs) and free trade agreements. These provisions provide foreign investors with the right to activate the ISDS system, if they wish to counter the host country's decisions that impact on their investment.

Those supporting ISDS and the participation in ICSID suggest three arguments: 1) the ISDS mechanism still makes the host states accountable under BITs, 2) the provisions in the BITs protect fundamental rights of investors and ensure procedural fairness, and 3) the adjudication through the ISDS involve arbitrators who are not formally connected to the parties to the dispute. It shows that the ISDS mechanism can contribute to the rule of law. However, the looming negative sentiment in European countries and Australian shows contrary facts with the spirit of maintaining the existence of the ISDS mechanism. As a matter of fact, the two EU pillar countries i.e. France and Germany have shown their concerns about the effect of ISDS provisions during the Trans-Atlantic Trade and Investment Partnership (TTIP) negotiations between EU and USA. It is awkward to see that this time France and Germany (the latter is prominently known as the pioneer country of ISDS provisions) wish investor-state dispute resolution (ISDS) provisions removed from TTIP agreement currently under negotiation (Provost & Kennard, 2015).

Australia in the case of a particular IIA also has shown concerns and wishes similar thing (Setiawan, 2018). Those criticizing ISDS show various concerns with the current ISDS practice. The issues vary from financial burden to developing country, corporate profit-seeking from the claim, sovereignty, policy space, uneven

business playing field, to legislative resistance. In current ISDS practice, developing countries are in the disadvantaged party compared to the developed countries. Gallagher & Shrestha, (2011) study shows that in the tribunal verdicts on ISDS disputes, developing countries are potentially exposed to higher financial charges than developed countries. The average financial charges that developing countries have incurred for awarded damages to foreign investors are US$ 99 cents per capita, which is eight times those of developed countries that have incurred only US$ 12 cents per capita. International investment treaty arbitration takes more time and significantly costs more than resolving similar disputes in domestic courts in the United States or in the United Kingdom (Bonnitcha, 2017). Foreign investors currently tend to register a claim benefiting ISDS clause more frequently, and IIAs with ISDS are beginning to have serious repercussions for developing countries (Knoerich & Berger, 2014).

In many cases, foreign investors' motives filing their lawsuit to international arbitration are not only to recover the invested funds, but also for the alleged loss of profits and the loss of "future earnings expectations". On average, one of three cases concluded at ICSID ends with dispute resolution. While the rewarded damages value is often not disclosed in detail, the disputes generally result in huge benefits for investors. The state must pay after the ISDS arbitration decision that wins foreign investors, otherwise the state assets will be the seizure target in almost every country in the world (Provost & Kennard, 2015). Knoerich & Berger, (2014) mentions that the provisions in IIAs may potentially override national legislation and the decisions of international arbitration may possibly supersede the decision of domestic courts. In this context, they regard that the current IIA regime has sometimes appeared to be superior to national law. If not taken carefully, ISDS disputes potentially disrupt a country's sovereignty and its right to regulate in its territory, as foreign investor pressure may force the government to change the law to please the investor. Tobacco companies regularly threaten investment treaty arbitration when governments propose new tobacco control measures, although some countries have proceeded with stricter tobacco control measures amidst such threats (Berger, 2015).

Jailani, (2015) argues that most provisions of the existing IIAs containing ISDS are outdated as they grant extensively broad protections and rights for foreign investors, yet on the other hand leaving little to no policy space to the host state in achieving development goals. The current regime of IIAs is viewed not granting sufficient space for sustainable development. The situation is an impetus that a general modernization is necessary in order to preserve the right of states to exercise their regulations and policy space. He also stated that ISDS provisions seem to be problematic and their benefits are far from clear. Uneven playing fields between national and foreign corporations also take place, meanwhile the inclusion of ISDS provisions will be a highly contentious issue in the ratification process involving legislative. In the context of Indonesia's concerns with ISDS provisions, some legal experts (such as Prof. Hikmahanto from University of Indonesia) and researchers (such as Ina Primiana from LP3E Kadin) have even accorded extreme advice to the Indonesian government to quit the World Bank's ICSID membership, which also means to quit from ISDS mechanism.

Reflecting on some of the ISDS cases in Indonesian experience, ISDS mechanism may potentially be used by 'rogue' and 'naughty investors' who make the case to the international arbitration panel (Birdieni & Kiansantang, 2014)–a similar experience also occurred in South Africa case (Provost & Kennard, 2015). The release of Indonesia from ICSID will allow Indonesia to be free of any legal challenge filed by investors in the forum. Some Latin American countries namely Bolivia, Ecuador, and Venezuela have committed the action first. The ICSID lawsuit trial will cost some compensation (such as lawyer fee) that is not a small one even if Indonesia wins in a case. If Indonesia loses a case, the amount of awarded damages for claimant investors and costs that Indonesia incurs will be even more terrible since it reaches millions of USDs. Losari & Ewing-Chow, (2015) suggests a different perspective. The authors believe that Indonesia should continue to have ISDS mechanisms, either institutional or non-institutional arbitration. The experience of other countries shows that the ISDS mechanisms, including ICSID arbitration, may actually contribute to better governance. In Mexico, local government tends to comply with domestic and international legal obligations after the local regulations trigger investor-state dispute. The concern for arbitration in ISDS has been successful in making host states comply with their IIAs obligations in an effective, neutral, and independent forum for the settlement of investment disputes (Schill, 2015; Mildner, 2015).

Putting out the Fire before It Spreads

In the ICSID forum, Indonesia has been sued by foreign investors in at least seven cases as shown in Table 1. It puts Indonesia in the top rank country of the highest number of international arbitration cases in ASEAN, above the Philippines in the second place with three cases. Such facts forced the Indonesian government to contemplate the right policies to address ISDS problems potentially emerging from foreign investment. Considering all the explanations above, the authors view that the emphasis is on addressing ISDS hidden problems should be focused in prevention endeavour. Policy options necessary to be taken for ISDS cases prevention endeavour are discussed below. Better coordination is necessary among all stakeholders: central and regional governments, relevant ministries, especially when a measure may have impacts on foreign investors. Information technology should be involved in coordination efforts including in compiling and disseminating existing regulations among officials.

A Review of BITs and IIAs Containing ISDS Provisions: Indonesia is currently reviewing comprehensively it's 64 Bilateral Investment Treaties (BITs) as well as five investment chapters under various free trade agreements. The review process involves three steps: discontinuation of existing IIAs, reassessing the provision of the existing IIAs and developing a new treaty model of IIA. The first step taken by Indonesia is to discontinue its existing IIAs and the revoke process so far has reached 17 out of 64 IIAs. The termination takes a gradual approach in order to avoid any unwanted political implications and bilateral backlash that might potentially undermine Indonesia's position. The second step of Indonesia review completely relates to the fact that the core gravity of the review is the reassessment of the existing provisions. Every single IIA is scrutinized to capture the most potential problems in BITs and IIAs provisions, such as the 'scope' and 'definition of investment', the 'Most-Favored-Nation (MFN) Treatment' principle, 'National Treatment (NT)' principle, 'Fair and Equitable Treatment (FET)', 'expropriation' and ISDS. The goals of reassessment are identifying problems and obtaining the most feasible solutions serving as the Government's new position on IIAs, particularly the extent to which those provisions provide protection to the investors and its impact to the policy space of the Government.

The third step is developing a Treaty Model. The goal is to provide a guideline for Indonesian officials in negotiating and concluding investment treaties. Other countries such as India and South Africa have successfully built their own treaty models (Jailani, 2015). Losari & Ewing-Chew, (2015) views that the Indonesian government's BIT review is timely. They argue that there should be a balance between investor protection and national sovereignty in the new BITs. Several clauses in Indonesia's existing BITs need more clarity, which can potentially lead to difficulties for tribunals in interpreting the provisions. For illustration, the purpose of the agreement should be clearly mentioned in favor of not only for investors but also for greater economic cooperation, or extending and intensifying mutual economic relations. Foreign investment protection is not the individual goal of the treaty, but rather a necessary element alongside the overall aim of encouraging foreign investment and extending and intensifying the parties' economic relations. A balance between investor protection and the state's policy space with a view to promoting sustainable development principles should be upheld and translated into the purpose of the agreement.

In taking this review, Indonesia needs no worry losing potential foreign investments. There is no evidence that foreign investors will pack their bags and leave due to their resistance to host country's measure of review on BITs and IIAs containing ISDS provisions. Several countries – both developed and developing countries – have sought to reform their model treaties and either to negotiate more balanced IIAs in future or renegotiate existing ones and this policy option has no impact on the country's attraction to foreign investors (Bonnitcha, 2014a) in Berger, (2015). In reviewing BITs and IIAs, Indonesia needs to undertake a critical evaluation to comprehend the impact of existing IIAs on the Indonesian national economy. The government also needs to formulate a new approach towards IIAs, which will be fine-tuned in favor of its interest in pursuing national development goals. In the diplomatic relation area, Indonesia brings economic diplomatic mission aiming at creating a new regime for investment agreements between Indonesia and other countries. In association with MFN, NT, FET, expropriation, and ISDS, in order to avoid potential dispute with foreign investors, several important clauses adopted in existing IIAs are worth to discuss as possible solutions.

Indonesia needs to protect itself from any potential dispute with foreign investors from several aspects relevant with consistency: inconsistency between central government regulations and local government regulations, between the treaty and GATS, and among chapters (Setiawan, 2018). In order to maintain the consistency between an investment treaty and national measures or local government measures, Indonesia may include such reservations: existing non-conforming measures of all regions of Indonesia" in non-conforming measures (BITs and IIAs) and future measures (only IIAs). Such reservations can be found in some FTA agreements, such as Singapore-US FTA, Japan-Mexico FTA, and Australia-Singapore FTA. It is an important issue since under current Indonesia's laws on decentralisation, local governments have the authority to issue business licenses. Meanwhile, business licensing by local governments has been at the heart of several of Indonesia's arbitration cases (Magiera, 2017). The issue of consistency between the investment treaty with GATS must also be taken carefully by Indonesia. In GATS there is particularly energy services sectors which are possibly related with some issues in extractive sectors, especially oil and gas mining. By adopting a similar clause employed in Singapore-US FTA and Canada-Peru FTA, Indonesia may add some reservations in the non-conforming measures schedule as follows. Reserves the right to adopt or maintain any measure that is not inconsistent with Indonesia's obligations under Article XVI of the General Agreement on Trade in Services. The consistency between chapters in an agreement should also be maintained. As an illustration, the substance in transfer-related provisions may differ between chapters in IIAs that contain chapters such as the Investment Chapter, Trade in Goods Chapter, and Services Chapter. A BOP (Balance of Payment) safeguard clause is also at times found only in one of the chapters, whereas this clause should be included in the three chapters. Transfer and safeguard BOP clauses are critical to being included in the main chapters, given such clauses are crucial for developing countries to protect their economy during the crisis. While clauses in the terminated BITs above can be revised during the next negotiations, this is not the case for existing investment chapters under Free Trade Agreements (FTAs) or Economic Partnership Agreements (EPAs). Indonesia should wait until the FTAs or EPAs comes into general review phase or are terminated consensually. If the scenario takes place, it is recommended that Indonesia includes a clause allowing partial termination of a chapter, particularly the investment chapter in the FTAs or EPAs. Other clause needs attention is the existence of 'survival clause'. This clause allows foreign investors, who have had their investments made or acquired before the date of termination, to benefit prolonged protection for a certain amount of time (usually 10 – 15 years) even after termination of the treaty.

Improvement in Investment Dispute Management: Reflecting the fact that Indonesia topped the country with the most ISDS lawsuits among ASEAN member countries, it is crystal clear that Indonesia needs to improve its management of investment disputes. In that regard, the development of investor-state conflict management, a basis for protocols for dispute avoidance is suggested. These processes are intended to provide ways out for the interests of the parties involved in the early stage of the conflict to eliminate or reduce the source of dissatisfaction. Another way out associated with procedural limitations can be helpful, such as developing a special agreement between the investor and Indonesia if the case should be registered to international arbitration. Establishing an investment dispute management unit has been applied to other countries such as Korea and Peru. Korea created the Office of the Foreign Investment Ombudsman within the Korea Trade-Investment Promotion Agency, an office independent and only accountable to the Prime Minister. The office facilitates foreign investors who face problems or conflicts in several issues, such as taxation, investment procedures and incentives, customs and tariffs, finance, labor, insurance, and visa. In Peru, such an office imposes accountability on the agency which has triggered the dispute by incurring any costs of the process (Losari & Ewing-Chew, 2015).

Indonesia Needs for Continuous Bureaucracy Reform, Capacity Building, Better Coordination: Indonesia bureaucracy reform is still ongoing, yet there are still many weakness identified along the reform process. It should be realized that bureaucracy reform is a never-ending process and this effort should always be a priority and continuously supported by every elected national leader. Politicians may change, but the bureaucracy reform should never stop. Without robust, efficient, and effective bureaucracy, every government program including management of investment disputes and better coordination cannot be achieved successfully. Capacity building for Indonesian officials Indonesia should be prioritized. Processes should be generated to keep bureaucracy system involving those officials aware of reviewing each proposed government's measure, either in state or local government level, that may affect foreign investors, and its compliance with Indonesia's international obligations under its IIAs, before a particular measure becomes

effective. The process should invite public consultation with interested parties, including investors or the society who might be impacted. The government then should take the inputs and comments into consideration for the measure revision. Potentially arising dispute could be prevented effectively in the beginning to assure the investors do not appeal the investment dispute case to international arbitration.

5. Conclusion and Recommendations

ISDS mechanism adoption in BITs and IIAs was initiated in the late 1960s and the beginning of 1970s. Despite 21 developing countries opposition, World Bank decided to support the mechanism and provides a specific tribunal for ISDS by establishing ICSID in 1966. While in the beginning the investors appeal for ISDS was seemingly intended purely to reclaim justice, currently investors in several cases register allegedly frivolous claims to international arbitration. Indonesia does not escape the ISDS lawsuit, and even among ASEAN member countries Indonesia topped the number of ISDS suits filed in ICSID. Indonesian reform policy to support more its mining downstream by Minerba Act issuance is based on its national interest seeking to benefit from its scarce, limited non-renewable minerals so as to support national development and maintain its long-term economic sustainability. To realize the vision, thus, more specifically Indonesia needs to encourage the establishment of domestic smelters, to integrate upstream-downstream-industrial operations, to increase mineral added value, and to boost state revenues. Benefiting from ISDS inclusion in BITs or IIAs has some challenges, since there are some pros and cons toward the ISDS inclusion.

Those who support ISDS inclusions believe ISDS mechanism is good to make host states accountable under BITs, necessary to protect fundamental rights of investors and ensure procedural fairness, and the adjudication involve independent arbitrators. Meanwhile, the parties who oppose believe that ISDS mechanism will be harmful to and put unnecessary big or even huge compensation burden to host countries. Not only developing host country but also developed host country in Europe and Australia in specific BITs or IIAS cases have proposed no ISDS inclusion. ISDS mechanism may potentially override national legislation and the decisions of international arbitration may possibly supersede the decision of domestic courts. The most frequent ISDS claims which Indonesia has received among ASEAN members surely forced the Indonesian government to envisage the right policies to address the problems potentially emerging from foreign investment. The authors view that the emphasis on addressing ISDS contingent problems should be focused on prevention endeavor. As previously explained in more details and more specifically in the above section, authors recommend the prevention endeavor should be undertaken and focused on the review on BITs and IIAs containing ISDS provisions; improvement in investment dispute management; and continuous bureaucracy reform, capacity building, and better coordination. It is suggested that Indonesia proposes to shorten the time period of such a clause, and different survival clause durations for different sectors of investment.

References

Antam (2015). Annual Report, Ikhtisar Kinerja Berkelanjutan Tahun 2015. Jakarta: PT. Antam Tbk (Persero).

Antam (2008). Empat Dasawarsa PT Antam Tbk : Memaknai Alam, Melintasi Masa. Jakarta: PT Antam Tbk. (Persero).

API (2013). Kontribusi Pertambangan Umum Masih Minim. Asosiasi Pertambangan Indonesia. .

Berger, A. (2015). Developing Countries And The Future Of The International Investment Regime. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

Birdieni, B. & Kiansantang, J. (2014). Buron Century Tanpa Kemenangan. Gatra, 24 Desember 2014.

Bonnitcha, J. (2017). Assessing the Impacts of Investment Treaties: Overview of the Evidence. International Institute for Sustainable Development.

Burmeister, B. B. (1988). From Resource to Reality: A Critical Review of the Achievements of New Australian Gold Mining Projects During the Period January 1983 to September 1987 . Macquarie University.

Djafar, F. & Rosdiana, H. (2013). Evaluasi Kebijakan Bea Keluar atas Barang Ekspor Mineral : Tinjauan Terhadap PMK No.75/PMK.011/2012. Jakarta: Fakultas Ilmu Sosial dan Ilmu Politik Universitas Indonesia.

Freeport McMoran, Inc. Annual Reports. (2006-2014).

Gallagher, K. & Shrestha, E. (2011). Investment Treaty Arbitration and Developing Countries: A Re-Appraisal. Global Development and Environment Institute Working Paper No. 11-01.

Harquail, D. (1991). Investing in Junior Mining Companies. Proceedings of the 6th Mineral Economics Symposium of CIM. CIM Montreal Canada.

Ika, S. (2017). Kebijakan Hilirisasi Mineral: Reformasi Kebijakan untuk Meningkatkan Penerimaan Negara. Kajian Ekonomi Keuangan, 1 (1).

Jailani, A. (2015). Indonesia's Perspective on Review of International Investment Agreements. Investment Policy Brief No, 1.

Kementerian ESDM. Laporan Kinerja Tahun. (2015).

Kementerian Keuangan. APBN dan Laporan Realisasi APBN. (2006-2014).

Knoerich, J. & Berger, A. (2014). Friends or Foes? Interactions Between Indonesia's International Investment Agreements and National Investment Law. Studies. Bonn: Deutsches Institut fur Entwicklungspolitik.

Latina, J., Permartini, R. & Ruta, M. (2011). Natural Resurces and Non Cooperative Trade Policy. International Economics Policy, 8.

Losari, J. & Ewing-Chew, M. (2015). Reflective or Reactionary? Indonesia's Approaches to International Investment Agreements and Recommendations for the Future. Transnational Dispute Management, 12.

Magiera, S. L. (2017). International Investment Agreements and Investor-State Disputes: A Review and Evaluation for Indonesia. ERIA Discussion Paper Series.

McCarthy, P. (2013). Managing technical risk for mine feasibility studies in Mining Risk Management. The AusIMM.

Mildner, S. (2015). International Investment Agreements and Investor-State Dispute Settlement: Fears, Facts, Faultlines. BDI – Federation of German Industries.

Miskelly, N. (2004). The International Mining Industry – Linking the Upareams Mineralisation With the Downstream Money. Conference Proceedings, 10-22.

Mohamadieh, K. & Uribe, D. (2016). The Rise of Investor-State Dispute Settlement in The Extractive Sectors: Challenges and Considerations for African Countries. Research Paper, 65.

Patunru, A. A. (2015). Hilirisasi. Kompas 24 Januari 2015.

Provost, C. & Kennard, M. (2015). The obscure legal system that lets corporations sue countries. The Guardian, Wed 10 Jun 2015 (downloaded 19 June 2018).

Rahayu, A. (2010). Pengantar Kebijakan Fiskal. Jakarta: PT Bumi Aksara .

Resmini, L. & Vittucci, G. (2016). Home country bias in divestment decisions of multinational corporations in the EU. Conference Paper. 56th Congress of the ERSA: "Cities & Regions: Smart, Sustainable, Inclusive?" ?", 23-26 August 2016. Vienna, Austria: Econstor and European Regional Science Association (ERSA).

Rudenno, V. (2004). The Mining Valuation Handbook, 2nd edition. Rightbooks an Imprint of John Wiley and Sons Australia, Ltd.

Saggu, A. & Anukoonwattaka, W. (2015). Commodity Price Crash: Risks to Exports and Economic Growth in Asia-Pacific LDCs and LLDCs. United Nations ESCAP.

Schill, S. (2015). Reforming Investor-State Dispute Settlement (ISDS): Conceptual Framework and Options for the Way Forward. E15 Initiative. World Economic Forum and International Centre for Trade and Sustainable Development.

Sembiring, S. F. (2009). Jalan Baru Untuk Tambang : Mengalirkan Berkah Bagi Anak Bangsa. Jakarta: PT Gramedia.

Setiawan, S. (2018). Negative List in Services Liberalization: Pros and Cons for ASEAN Developing Economies. Working Paper.

Stijns, J. C. (2001). Natural Resource Abundance And Human Capital Accumulation. Diakses dari https://ageconsearch.umn.edu/bitstream/25128/1/ uccost01.pdf Tanggal 15 January 2017. University of California at Berkeley.

UNCTAD (2014). Investor-State Dispute Settlement: UNCTAD Series on Issues in International Investment Agreements II: A sequel.

Walker, S. (2015). Gold: New Fundamentals. Engineering & Mining Journal, February 2015.

Ward, D. (1999). Startup Performance of New Base Metal Projects in Adding Value to the Carpentaria Mineral Province. Australian Journal of Mining, April 1999.

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Trade Openness, FDI and Exchange Rate Effects on Job Creation in South Africa's Tradable Sectors

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Abstract: Employment creation remains the pinnacle standard of sound social welfare and economic progress. It is a fundamental driver of economic development for any economy. However, such a pursuit faces tenacious challenges, especially amidst the growing global market integration. This study unravelled the effects of the underlying trade environment mechanisms such as trade openness, foreign direct investment(FDI) and the exchange rate on South Africa's job creation efforts within the tradable sectors. The study employed a quantitative analysis and included time series explanatory variables of trade openness, net-FDI flows and the real effective exchange rate. Employment series of both South Africa's mining and manufacturing tradable sectors served as the dependent variables. The study made use of quarterly observations starting from 1995 to 2016. In doing so, various econometric methods were utilised. These included descriptive analyses, the standard Autoregressive Distributed Lag (ARDL) model, and the Toda-Yamamoto Granger Non-Causality test. Empirical ARDL results of employment in the individual mining sector, established no long-run and short-run relationships with trade openness, the real effective exchange rate and net-FDI. Employment in the manufacturing tradable sector presented significant and negative long-run relationships with trade openness, the real effective exchange rate and net-FDI. Meanwhile, the short-run findings exhibited significant and positive relationships between employment in the manufacturing tradable sector with trade openness, and significantly negative for net-FDI. However short-run results of manufacturing employment and the real effective exchange rate were not significant. Based on these results, South Africa's mining sector seems unresponsive to mechanisms in the trade environment while these relationships are relatively dynamic in the manufacturing sector. Further recommendations were thus provided to improve these interrelationships in promoting job growth and its responsiveness to trade components.

Keywords: *Employment, foreign direct investment, job creation, non-tradable sector, real exchange rate, tradable sector, and trade openness.*

1. Introduction

Foreign trade has emerged as a driving force of various economies in the midst of intensifying globalisation processes. Its ability to maximise national and global welfare encapsulates the analytical advantages of free trade (Karunaratne, 2012). Economies such as the "Asian Tigers" have been characterised by ground-breaking economic breakthroughs, led by active foreign trade participation (Segerstrom, 2013). In spite of its profound acclamations, foreign trade presents potential economic challenges and uncertainty characterised by globalisation and trade liberalisation factors (Cetkovic & Zarkovic, 2012). Such negative effects are exacerbated amongst developing economies due to their lack of efficient and strong economic structures, thus lacking the capacity to manage globalisation (Fernández, 2017). Since the beginning of the post-apartheid regime, South Africa has witnessed more open trade policies. The country's mounting trade exposure has left the government compelled and pressurised to establish neoliberal macroeconomic policy. However, this has instilled the build-up of various ramifications in the form of intensifying unemployment, job insecurity and inequality (Mathekga, 2009). Particularly, South Africa has had a challenging employment sector where job creation patterns are incapable of sustaining the growing job-seeking population as indicated by the low labour absorption-rate (Rogan et al. 2013).

The present study examines the effects of trade-related factors, particularly trade openness, the real effective exchange rate and foreign direct investment (FDI), on South Africa's tradable sector job creation patterns. Theories of comparative and absolute advantage as opined by David Ricardo and Adam Smith, respectively advance the notion that countries can adopt trade welfare gains. The former emphasises that trade benefits may be acquired by a participating country through processes of resource specialisation, whereas the latter makes a case for mutually exclusive or beneficial trade irrespective of owning comparative cost advantages within production processes (Krugman et al., 2014; Schumacher, 2012). Piton (2017) however underscores

that a small open economy suffices as a price-taker in regards to its tradable sector. Thus industries which are less competitive may fail to compete in foreign trade.

Furthermore, the former industries may be forced to concede to prevailing global market prices within international markets. Highly productive export firms are likely to expand their establishment upon the opening of the domestic economy to the global market. Lower productive firms on the other hand, may eventually shut down while some may initiate labour cuts and remain in operation (Itskhoki & Helpman, 2015). Economies characterised by higher trade intensity or trade openness are traditionally viewed to be more receptive to free trade benefits (Squalli & Wilson, 2006). The growth trajectories of such economies are conceived to relatively outweigh those of inward orientated or closed economies (Yanikkaya, 2003). South Africa's unprecedented intensification of the post-apartheid era's foreign trade participate on relative to the apartheid-era necessitates the need to obtain an understanding of trade effects on South Africa's economic sectors. The tradable and non-tradable sectors underline the two dividing parts of job inhabiting economic sectors within the context of international economics (Frocrain & Giraud, 2017). Smith, Ricardo and Heckscher-Ohlin, amongst others, highlighted the importance of free trade in accelerating effective domestic and global market competition towards obtaining increased economic efficiency (Chinembiri, 2010). Nevertheless, the pragmatic effects of foreign trade amidst a country's intensified trade openness, fluctuating exchange rates and FDI inflow and outflow processes may lead to job creation, and/or job destruction in the form of job losses and company closures within economic sectors such as the tradable sector (Chinembiri, 2010).

2. Literature Review

Foreign trade or international economic integration constitutes a salient feature of globalisation (Selimi, 2012) which seeks to consolidate the varying global market entities (Taylor, 2001). Activities amassed within trade processes involve the trade in goods and services, the inflow and outflow of FDI, labour migration, and the growth in foreign multinationals (Margalit, 2012). Common markets, free-trade areas, economic unions and customs unions, account for the various characteristics of international integration (McCarthy, 1996). Accordingly, trade openness, the real effective exchange rate and FDI are just some of the underlying mechanisms encompassing free trade. The tradable sector's high export intensities and import penetration makes a case for being the sector with the most exposure to free trade or the global market (Ngandu, 2009). In the context of the South African economy, numerous scholars such as Mano & Castillo, 2015; Rodrik, 2008; Spence & Hlatshwayo, 2014, suggest that the country's tradable activities include agricultural, manufacturing, mining, hunting, forestry, fishing and energy activities. These activities are noted to have the high export intensity and import penetration and command their nature of tradability in terms of their positioning along the tradability continuum, which characterises activities from perfectly tradable to perfectly non-tradable positions (Ngandu, 2009). The manner in which free trade in regard to the aforementioned trade mechanisms affects job flows is a compelling issue especially in a country where dire unemployment patterns are a constant concern. The corresponding effects of free trade may be identified within job flow analyses, in terms of job creation rates or job destruction rates, which represent the demand-side or employment dynamics of the labour market (Fujita & Nakajima, 2016).

Job Dynamics and Trade Openness: Trade openness reflects the degree of interactions between the domestic economy and the rest of the world (Selimi, 2012). It speaks to the relaxation or removal of trade restrictions to foreign trade (Ulasan, 2012). These include quotas and tariffs amongst others, which serve to hinder or lessen the degree of participation in international trade (Mushtaq et al., 2014). A common measure of trade openness has often been exclusively measured as exports plus imports as a share of GDP (or X+M/GDP). Such a measurement accounts for the share of actual trade activities, classified as imports and exports, in the domestic economy's aggregate output or GDP levels (Arribas et al., 2006). The latter classification expounds the traditional measure of trade openness which has been employed by many researchers (such as Adamu, 2014; Adhikary, 2011). Amongst the studies on job creation effects of trade openness, various studies (such as Ferreira et al., 2010; Menezes-Filho & Muendler 2011; Wacziarg & Wallack, 2004) have conveyed a negative impact of greater trade openness on job creation, particularly towards low-skilled labour within the tradable sector such as manufacturing, and a transfer of highly-skilled labour to non-tradable sectors. Such findings include results by Gaddis and Pieters (2014) who investigated

the impact of trade openness on the labour market in the case of Brazil. Results revealed a loss of employment in the tradable sector, albeit having no effect on total employment as a result of the re-allocation of highly-skilled labour from the tradable to the non-tradable sectors. However, low-skilled labour was negatively affected. In retrospect, trade openness plays a seemingly important role on the re-allocation of labour and other factors of production.

The study by Haltiwanger et al. (2004) in Latin American economies using harmonised measures on job creation and destruction revealed that increased trade openness via tariff reduction is associated with a decrease in net employment growth. Similarly, the study by Menezes-Filho and Muendler (2011) suggested labour displacement effects of trade openness within Brazil's labour market, such that comparative advantage-driven sectors were unable to absorb displaced workers resulting in the loss of employment. Janiak (2006) further associates the failure to absorb labour by remaining firms being a result of the firm's incentive to profit from market power within the goods market, which permits them to absorb higher rent. A further analysis by Asghar et al. (2014) on countries within the South Asian Association for Regional Cooperation (SAARC), namely Sri Lanka, Pakistan, India and Bangladesh, revealed a loss of employment in the manufacturing sector for Pakistan, India, and Bangladesh due to greater trade openness. Meanwhile, the agricultural and informal sectors faced underemployment and low wages. Sri-Lanka, on the one hand, experienced export-led growth, and these results were substantiated by a lack of a competitive advantage in Pakistan, India and Bangladesh within the manufacturing sector as alluded to in the theory of comparative advantage.

In stark contrast to the above findings, various scholars such as Hasan et al., 2012, attribute employment generation as induced by greater trade openness. An empirical examination by Hasan et al. (2012) based on India's labour force survey data, revealed a reduction in unemployment resulting from trade openness within flexible labour market abundant states, including states with high export share sectors. Additionally, results revealed that existing jobs within industries exposed to increased trade liberalisation or openness were less likely to be lost primarily within net export industries and those with flexible labour regulations. The study further provides reinforcement for trade openness alongside domestic policy complementary reforms. A cross-sectional study by Dutt et al. (2009) was conducted on a model where unemployment was conveyed as being a result of search induced principles. On the other hand, trade was considered to be led by relative technological variations proposed by the Ricardian comparative advantage framework and international differences in the Heckscher-Ohlin's (H-O) comparative advantage factor endowments. For both countries, results revealed strong and significant findings of steady-state driven trade estimates led by David Ricardo's comparative advantage. Upon which, unemployment responsiveness to increased trade openness reflected an increase in short-run unemployment and a reversal of a decrease in unemployment in the long-run along a new steady-state.

Following the opening of the Uruguayan economy to foreign trade, Casacuberta et al. (2004) assert that the country's manufacturing sector adopted more capital-intensive technological modifications, accounting for increased average labour and total factor productivity, while gaining exposure to cheaper and enhanced inputs and capital goods. Consequently, the general economy experienced increased net job destruction explained by the downsizing and exiting of firms, nevertheless, this effect was offset by unions as they attempted to mitigate the effects of trade exposure albeit having a negative effect on productivity. Haouas et al. (2005) use industry-level data and panel data estimation techniques in assessing the responsiveness of the labour market to trade liberalisation in Tunisia. Results revealed an increase in the export sector's employment and wages within the short-run, and a decrease of the former and latter within the long-run. The reason for the decrease was substantiated as resulting from "learn-by-doing" and enhanced organisational and production capacity.

Job dynamics and the exchange rate: The exchange rate is a crucial economic mechanism (Rose, 2011) and a potent trade component able to affect the labour market based on appreciation and depreciation channels (Nucci & Pozzolo, 2010). Potential fluctuations present implicating effects on domestic production costs (Ngandu, 2009). Likewise, such effects are perceived to affect the tradable sector based on cost mechanisms (Bhorat et al., 2014). According to Bhorat et al. (2014), relative production costs involved in either the tradable and non-tradable sector impacts the allocation of labour across and within the two sectors. For the

tradable sector, these decisions revolve around production processes and their role in importing production inputs as well as export purposes. Insinuations on labour effects of the exchange rate suggest that a domestic currency appreciation evokes a decrease in demand for local exports and an increase in import absorption leading to costly exports and thus reduced competitiveness in the global market, vice versa (Ribeiro et al., 2004). The issue of extreme exchange rate volatility is often believed to discourage job creation efforts (Belke & Kaas, 2004) due to the high costs of reversing decisions of hiring a worker within the rigid corporate structure (Pindyck, 1990). Exchange rate volatility may interrupt investment flows causing delayed employment decisions by firms (Mpofu, 2013).

Burgess and Knetter (1998) argue that the labour market's responsiveness towards exchange rate movements also relies on the market and regulatory forces. Catão (2007) however outlines that much of the variations in real effective exchange rates across countries are presented by price variations in the tradable goods relative to non-tradable goods. Campa and Goldberg (2001) further propose three channels in which exchange rate movements may affect employment or job flows. These include, firstly; an increase in demand shocks caused by enhanced local market competitiveness leading to an increase in import penetration. Secondly; shocks to competitiveness amid export orientation resulting from an increase in export shares in sector output. Lastly; the utilization of imported inputs, in a manner that any changes in the costs of inputs may cause domestic price and cost changes, where a depreciated currency will thereby raise the cost of inputs or factors of production. Findings by Chen and Dao (2011) suggest that an appreciating real exchange rate corresponds with contracting Chinese employment rate within its tradable and non-tradable sectors.

The former insinuations correspond with findings by Huang et al. (2014) who suggested that a real appreciation of the Canadian dollar led to a decrease in the country's manufacturing sector's employment patterns, whereas employment in non-manufacturing sectors where not affected, thereby suggesting a negative relationship. In contrast to these findings, Rodrik (2008) revealed that Korea's overall employment is positively associated with the real exchange rate. Based on the computable general equilibrium method, findings by Ngandu (2009) exhibited the reallocation of employment from the tradable to the non-tradable sector. Simply, there was a negative association between employment in the tradable sector and a real appreciation in the exchange rate. Lost tradable jobs were however observed to be absorbed within non-tradable sectors and thus a sustained aggregate employment level. Using Autoregressive Distributed Lag (ARDL), Mpofu (2013) established that a real exchange rate appreciation promotes a decrease in the manufacturing sector's employment growth. Based on the stylised model, Bhorat et al. (2014) however established negative effects a real appreciation in the exchange rate towards South Africa's tradable sector employment during the years 1975 to 2009.

Job Dynamics and FDI: Numerous scholars (including Joshi & Ghosal, 2009; Kurtishi-Kastrati, 2013) ascertain the importance of FDI in acceleration processes of economic growth and development. Studies encompassing FDI and employment series have largely sought to unravel the net-employment effects of the former. Kurtishi-Kastrati (2013) opines that FDI tends to stimulate employment mostly within countries with scare capital resources and abundantly labour intensive. In such conditions employment effects can be directly or indirectly induced. The evidence established within empirical findings as presented in the study highlights that the effects of FDI on employment may not be mutually accrued across economic sectors and different countries, such as South Africa. Subsequent to the former assumption, empirical results by Wei (2013) based on time series regression models outlined opposing evidence upon investigating the effects of FDI on employment within China's primary, secondary and tertiary sectors during the period 1985 to 2011. Results established significantly positive employment effects of FDI within the primary sector. Findings in China's tertiary sector were deemed to be negative and significant. However, employment effects of FDI within the secondary sector were found to be non-significant. Using the T-Y procedure, Strat et al. (2015) conducted a study focussing on the short-term causal effects of FDI and unemployment within thirteen European Union (EU) member states during the period 1991 to 2012. Findings suggested causality from FDI to unemployment amongst four countries, and causality from unemployment towards FDI for three other countries. However, the remaining countries established no existing relationship. Meanwhile, Nyen Wong and Cheong Tang (2011) used the Granger-causality test which suggested the occurrence of a bidirectional relationship between employment in Singapore's manufacturing sector and FDI inflows. These results

correspond with findings conducted on the Nigerian economy by Inekwe (2013), whole suggested the presence of unidirectional causality from FDI to manufacturing employment.

3. Methodology

The empirical analysis of the study was estimated based on a quantitative approach and included a quarterly series of two of South Africa's tradable sectors' employment (EMP_t) patterns, namely; mining and manufacturing sectors, as the dependent variable. The study regressors included series of trade openness ($TOPEN_t$), the real effective exchange rate ($REXR_t$) and net-FDI inflows ($NFDI_t$). Employment series and the seasonally adjusted time-series of the real effective exchange rate and net-FDI were retrieved from the South African Reserve Bank (SARB).

The dataset used in gauging South Africa's trade openness included series of real exports, real imports and real GDP and were also obtained from the SARB. The sample period employed a series of 88 quarterly observations ranging from 1995Q1 to 2016Q4. The rationale for the chosen sample period was driven by South Africa's political and economic structures as well as the exclusion of economic embargo's which characterised South Africa's apartheid era. Upon achieving the central objective of the study, various econometric models were employed to establish the short-run and long-run movements. The study estimated the Autoregressive Distributed Lag (ARDL) model to determine the cointegrating vectors amongst the study regressors and the dependent variables. The ARDL model was estimated to capture non-agricultural employment effects within the tradable sectors of the manufacturing and mining sectors. The use of robust time-series econometric models, such as the ARDL approach, is particularly essential in estimating series pertaining to vast econometric landscapes and a changing economy. It was originally presented by Pesaran et al. (1999) and further extended by Pesaran et al. (2001). Unlike the conventional cointegration procedures, the ARDL approach can be a useful means of econometric testing where all variables are considered as endogenous variables and as explanatory variables (Dritsakis, 2011). The model can be employed in conducting econometric estimations irrespective of the variables' order of integration, as either I (0) or I (1) variables (Dube & Zhou, 2013). Further tests employed in the study included the Toda and Yamamoto (1995) Granger non-causality tests, as well as tests for normality, autocorrelation, heteroscedasticity and parameter stability, as means of capturing the diagnostic and stability analyses of the considered model. To establish the bounds testing method, the study employed the ARDL model for the five individual private sectors and thereby expressed in Equation (1) as follows:

$$\Delta LY_{\mathrm{t}} = \alpha_0 + \sum_{i=1}^{k} \beta_i \Delta LY_{t-i} + \sum_{i=0}^{k} \delta_i \Delta LTOPEN_{i-i} + \sum_{i=0}^{k} \sigma_i \Delta LREXR_{t-i} + \sum_{i=0}^{k} \gamma_i \, \Delta LNFDI_{i=1}$$
$$+\eta_1 LNEMP_{t-1} + \eta_2 LTOPEN_{t-1} + \eta_3 LREXR_{t-1} + \eta_4 LFDI_{t-1} + \varepsilon_t (1)$$

Where: Δ denotes the first difference operator of the variables,ΔLY_{t} indicates the natural log of employment in each individual private sector and expressed separately as the dependent variable. Such that$\Delta LY_{\mathrm{t}}$is repeatedly expressed as employment in the manufacturing sector and employment in the mining sector (tradable sectors). Moreover,$LTOPEN$ denotes the natural log of trade openness, $LREXR$ denotes the natural log of the real effective exchange rate, and $LNFDI$ indicates the natural log of net-FDI. Notwithstanding, the latter variables ($LTOPEN$, $LREXR$and$LNFDI$) stay the same in each of the repeated employment equations. Also, e_t indicates the white noise error term, the series$\beta_i, \delta_i, \sigma_i, \gamma_i$ denotes the coefficients for the measurement of the short-run relationships amongst the dependent and explanatory variables, while $\eta_1 \ldots to..\eta_4$ denotes the measurement of the long-run relationships amongst the dependent and explanatory variables. For each of the dependent employment variables of tradable sectors, Equation 1is repeatedly estimated to conduct the test for co-integration amongst the variables based on the following hypotheses:

$\boldsymbol{H_0}: \eta_1 = \eta_2 = \eta_3 = \eta_4 = 0$ (Null; co-integration or long-run relationship does not exist)
$\boldsymbol{H_1}: \eta_1 \neq \eta_2 \neq \eta_3 \neq \eta_4 \neq 0$ (Alternative; co-integration or long-run relationship exists)

The null hypothesis (H_0) indicates the non-existence of co-integration or a long-run relationship amongst the variables. This is estimated by means of conducting the Bounds test where the F-statistic value (coefficient restriction test) is compared to the critical values of the lower and upper bound as established by Pesaran et

al. (2001). If the F-statistic is greater than the critical values of the upper bound, co-integration is deemed present, and therefore the null hypothesis of no co-integration is rejected in favour of the alternative hypothesis. On the contrary, the incidence of a lower F-statistic value than the critical values of both the upper and lower Bound suggests the absence of co-integration amongst the underlying variables, the null hypothesis of no co-integration is therefore not rejected. Nevertheless, having an F-statistic value that lies between the upper and lower bound critical values suggests inconclusive estimations (Dube & Zhou, 2013). Table 1 is a summary of variables as included in the model.

4. Empirical Results

Table 2 reports the correlation analysis of employment in the selected tradable sectors and the considered regressors. Results indicate that employment within the manufacturing tradable sector has a moderately negative and significant relationship with trade openness, while employment within the mining sector exhibits a weak positive and non-significant relationship. Moreover, the results indicate that there is a positive yet weak relationship between the real effective exchange rate and employment within the manufacturing and mining tradable sectors. Lastly, employment within the manufacturing sector is associated with a significant and weak negative relationship, while the relationships established in the mining sector was positive but not significant.

Table 1: Summary of Variable Representation

Logged Variables	**Representation**
Log of employment in the manufacturing sector	LEMAN
Log of employment in the mining sector	LEMIN
Log of trade openness	LTOPEN
Log of the real effective exchange rate	LREXR
Log of net FDI	LNFDI

Table 2: Correlation Analysis

Variable	Manufacturing	Mining
Trade Openness	(-0.5357) [0.0000]**	(0.0618) [0.5675]
Real Effective Exchange Rate	(0.4406) [0.0000]**	(0.4735) [0.0000]**
Net-FDI	(-0.3177) [0.0026]**	0.0276 [0.7987]

Notes: ( ) denotes correlation coefficient, [ ] denotes P-value, & ** denotes significant at 1 percent.

The ARDL approach produces consistent estimators regardless of whether the variables under consideration are of *I* (0) or *I* (1) order of integration. However, such a model is not receptive to variables integrated at *I* (2) or higher series. Prior to estimating cointegration tests, the Augmented Dickey-Fuller (ADF) test was employed to establish the order of integration or the presence of unit root for the series LEMAN, LEMIN, LTOPEN, LREXR and LNFDI. Results are showcased in Table 3 below. The ADF test is based on the null hypothesis of a presence of unit root relative to the alternative hypothesis of a stationary series.

Table 3: Results of the ADF Unit Root Tests

RESULTS OF THE AUGMENTED DICKY FULLER (ADF) TEST							
	Level				First Difference		
	With intercept & without trend		With intercept & trend		Without trend		Order of
VARIABLES	t-stat	P-value	t-stat	P-value	t-stat	P-value	Integration
LEMAN	-1.703	0.426	-1.8707	0.6611	-8.344	0.000***	I(1)
LEMIN	-2.375	0.152	-2.4598	0.3470	-5.107	0.000***	I(1)
LTOPEN	-2.754	0.069	-3.4779	0.0482**	-11.19	0.0001	I(0)
LREXR	-2.442	0.134	-2.5414	0.3080	-8.598	0.000***	I(1)
LNFDI	-9.399	0.000***	-9.3443	0.0000	-8.982	0.000	I(0)

Findings revealed a rejection of the null hypothesis (H_0) of a unit root at first differences with intercept for the series LEMAN, LEMIN and LREXR of order *I* (0) of integration at level with intercept. Series such as LTOPEN and LNFDI were suggested to be integrated at *I*(0) processes. The established results present a mixed set of variables deemed to be stationary and integrated at either *I* (0) or *I* (1) processes, thereby rejecting the null hypothesis of a unit root in both cases. The ARDL approach was considered the best model in testing the current study's established mixed order of integration. Selecting optimal lags based on a suitable information criterion proves crucial when testing for short-run and long-run cointegration. The study was therefore governed by the selection of a homoscedastic model free from serial correction. Accordingly, the Eviews statistical software was utilised in the analysis of long-run and short-run parameters based on the ARDL bounds test in line with the Ordinary Least Squares (OLS) method. According to Narayan (2004), four lags are optimally suitable as the maximum lag specification in the modelling of quarterly data series. The study employed four lags as the maximum lag specification based on the latter narrative for both the dependent variables and study regressors in estimating ARDL (p,q,r,s). Each model was tested by means of the ARDL approach with the Schwarz information criterion (SIC) -based method for the log of employment in the manufacturing sector (1,2,0,0) and the log of employment in the mining sector (2,0,0,0) against the study regressors, taking into account underlying diagnostics in selecting the optimal lag structure. The former specified model was reinforced by Akaike information criterion (AIC) and Hannan-Quinn (HQ) criterions, whereas the latter model was also suggested to be the optimal model by the HQ criterion. A high R-square in each of the ARDL estimations based on the SIC suggests the high explanatory power of the specified model in explaining the extreme variability between the log of employment in both individual tradable sectors against trade openness, the real effective exchange rate and net-FDI. Results of the Bounds test to cointegration are further provided in Table 4 for the long-run ARDL estimations, coupled with corresponding upper and lower bounds critical values for each test. It follows that F-statistic values exceeding lower and upper bounds critical values results in the rejection of the null hypothesis of no cointegration. Findings revealed in testing for employment in the manufacturing sector presents evidence of the rejection of the null hypothesis at 0.05 significance level. This suggests the presence of co-movement or existing long-run relationships between employment in the manufacturing sector and the set independent variables trade openness, the real effective exchange rate and net-FDI.

However, the null cannot be rejected for the log of employment in the mining sector and its independent variables following its lower F-statistic value (1.768689) than the lower and upper bounds critical values, at both 0.05 and 0.1 significance levels. These results therefore present evidence of cointegration for individual tradable sectors only for employment within South Africa's manufacturing sector, whereas results of employment in the mining sector indicate the absence of co-movement with the considered study regressors. Findings of existing relationships between the study regressors and tradable employment in the manufacturing sector correspond with the economic theory of a change in tradable employment resulting from a change in trade openness, the real effective exchange rate and FDI (Alexandre et al., 2011). Alexandre et al. (2011) contend that underlying economic foreign trade factors such as the exchange rate are known to present idiosyncratic effects on each industry based on the manner in which resources are re-allocated. Nonetheless, this is in contrast to employment in the mining sector which did not present any evidence of cointegration with the study regressors.

Table 4: Results of the Bounds Test and F-Statistic Estimation

Estimated models	F-Stat	I0 Bound	I0 Bound	Outcome
(Eq.1) F_{LEMAN}(LEMAN/LTOPEN, LREXR, LNFDI)	4.875**	2.79	3.67	Cointegration
(Eq.2) F_{LEMIN}(LEMIN/LTOPEN, LREXR, LNFDI)	1.769	3.38	4.23	No cointegration

Note: ** denotes significant at 5 percent.

The rejection of the null hypothesis for the log of employment in the manufacturing sector prompts the estimation of short-run analysis based on the Error Correction Model (ECM). Prior to the ECM estimation, the corresponding coefficient of the long-run equation for manufacturing employment is presented in Equation2as follows: LEMAN= 5.7653 - 0.266234*LTOPEN - 0.260954*LREXR - 0.027360*LNFDI+ 0.079942*DUMMY01 (2). In furtherance to the suggested long-run relationship between employment in the manufacturing sector and the study regressors, Equation 2 suggests that the log of employment in the manufacturing sector is negatively associated with the log of trade openness in the long-run. Therefore, a one percent increase in South Africa's trade openness exerts a decrease in employment by 0.2662 percent within the manufacturing sector. These results correspond with the findings by Casacuberta et al. (2004) who found a decrease in Uruguay's manufacturing employment levels due to trade openness.

These results also resonate with findings by Asghar et al. (2014) focusing on Pakistan, India, and Bangladesh. Asghar et al. (2014) explain that the loss of employment was configured by a lack of comparative advantage in these countries. Furthermore, findings of the current study also revealed that a one percentage increase in the real exchange rate of the Rand corresponds with a 0.2609 percent decrease in manufacturing employment, vice versa. These findings however resonate with the assumed negative trade openness effects based on the implied vulnerability of domestic industries exposed to the foreign market as explained by Cavallo and Frankel (2008). These results also correspond with findings by Chipeta et al. (2017) who established that the real exchange rate is negatively associated with South Africa's overall employment patterns.

Moreover, the implied negative association between South Africa's net FDI and employment in the manufacturing sector assumes that a one percent increase in the inflow of FDI leads to a decrease in employment by 0.0271 percent within the manufacturing sector. This is contrary to the implied employment increase led by a potential boom in the tradable sector's FDI patterns as anticipated by economic theory (Kosteletou & Liargovas, 2000). South Africa's negative FDI effects on employment may be explained by its costs to the host economy as outlined by Kurtishi-Kastrati (2013) and Sauvant (2013). The included dummy following any likely instantaneous positive change in the manufacturing sector will induce a 0.0799 percent increase in employment within the manufacturing sector. Evidence of long-run cointegrating vectors suggests a potential existence of short-run adjustment processes which inhibits potential errors or deviations from becoming larger. The suggested long-run cointegration within the manufacturing sector leads to the estimation of further short-run relationships by means of the Error Correction Model (ECM).

The ECM is a convenient method utilised in measuring the correction from disequilibrium of the earlier period, towards potential long-run equilibrium (Brooks, 2014). For such an adjustment to take place, the ECM's error correction term (ECT) needs to be negative and significant (Mukhtar & Rasheed, 2010). The ECT serves as the "equilibrating" error term which corrects the current study's short-run deviations within the employed models from their equilibrium value, given the cointegrated Equation 1 (Gujarati, 2011). Table 5 reports results of the ECM with short-run coefficients of employment in the manufacturing sector and the underlying study regressors. According to Banerjee et al. (1998), a highly significant ECT affirms the suggested long-run cointegration. Accordingly, results reveal a negative ECT of -0.020391 which is highly significant at 0.01 significance level. These results suggest that it takes approximately 49 quarters (1/0.020391) to reach full equilibrium, such that approximately 0.02 percent of the deviations from the long-run equilibrium in trade openness, the real effective exchange rate and net-FDI are corrected / adjusted in each quarter.

Table 5: Results of the ECM of employment in the Manufacturing Sector

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LTOPEN)	-0.008062	0.025745	-0.313138	0.7550
D(LTOPEN(-1))	0.073276	0.024950	2.936924	0.0044***
D(LREXR)	-0.010197	0.016341	-0.623990	0.5345
D(LNFDI)	-0.000879	0.000514	-1.707850	0.0916*
D(DUMMANU)	0.003464	0.002977	1.163500	0.2482
CointEq(-1)	-0.020391	0.003645	-5.594209	0.0000***

Note: * and ** denotes significant at 10% and 1%, respectively.

Despite the ARDL's projection of existing or non-existing long-run cointegration amongst variables, it does not establish causality relationships. The Toda-Yamamoto non-causality test was used to analyse causality between the log of employment in the manufacturing and mining sectors against trade openness, the real effective exchange rate and net-FDI. Results of such estimates are provided in Table 6 below. Under the null-hypothesis of non-causality, the Toda-Yamamoto non-causality test operates under the alternative hypothesis of an existing causal relationship. Based on the established causality estimates, there is an existing bi-directional causal relationship between the log of trade openness and the log of employment in the manufacturing sector. This assumption is supported by a significant p-value in both cases. Results suggest that short-run changes in manufacturing employment cause changes in trade openness, and vice versa. In this case, the null hypothesis non-causality is rejected.

However, results of employment in the manufacturing sector against the real effective exchange rate and net-FDI are not significant at both 0.05 and 0.1 significance levels. These results are contrary to findings by Inekwe (2013) and Nyen Wong and Cheong Tang (2011) conducted in Nigeria and Singapore, respectively. Results by Inekwe (2013) suggested evidence of the existence of a unidirectional relationship from FDI to employment in Nigeria's manufacturing sector. Nyen Wong and Cheong Tang (2011) found a bidirectional causal relationship between employment in the manufacturing sector and FDI in Singapore. Furthermore, the current study's overall results in employment in the mining sector and the regressors are not significant.

Table 6: Results of the Toda-Yamamoto Granger Non-Causality Test

Employment in Manufacturing (Tradable sector)		
Direction of causality	**P-value**	**Decision**
LTOPEN ⟶ LEMANU	**0.0107***	**Causal relationship exists**
LREXR ⟶ LEMANU	0.6751	Causal relationship does not exist
LNFDI ⟶ LEMANU	0.7108	Causal relationship does not exist
LEMANU ⟶ LTOPEN	**0.0002*****	**Causal relationship exists**
LEMANU ⟶ LREXR	0.5670	Causal relationship does not exist
LEMANU ⟶ LNFDI	0.8314	Causal relationship does not exist
Employment in Mining (Tradable Sector)		
Direction of causality	**P-value**	**Decision**
LTOPEN ⟶ LEMIN	0.8188	Causal relationship does not exist
LREXR ⟶ LEMIN	0.1582	Causal relationship does not exist
LNFDI ⟶ LEMIN	0.7106	Causal relationship does not exist
LEMIN ⟶ LTOPEN	0.2340	Causal relationship does not exist
LEMIN ⟶ LREXR	0.3761	Causal relationship does not exist
LEMIN ⟶ LNFDI	0.8057	Causal relationship does not exist

Note: ** and *** indicates significant at 5% and 1%, respectively.

As a prerequisite towards avoiding traditional problems to econometric testing which violate classical linear assumptions, the previously established models need to meet stochastic properties. Such properties include,

amongst other, autocorrelation, heteroscedasticity and parameter stability (Takaendesa, 2006). Table 7reports residual diagnostic test results. Findings suggest that the study's underlying models passed diagnostic tests for autocorrelation and heteroscedasticity as indicated by the respective p-values which are above 0.05 significance levels. However, normality tests in all models were not passed, represented by the Jarque-Bera 0.05 significance level.

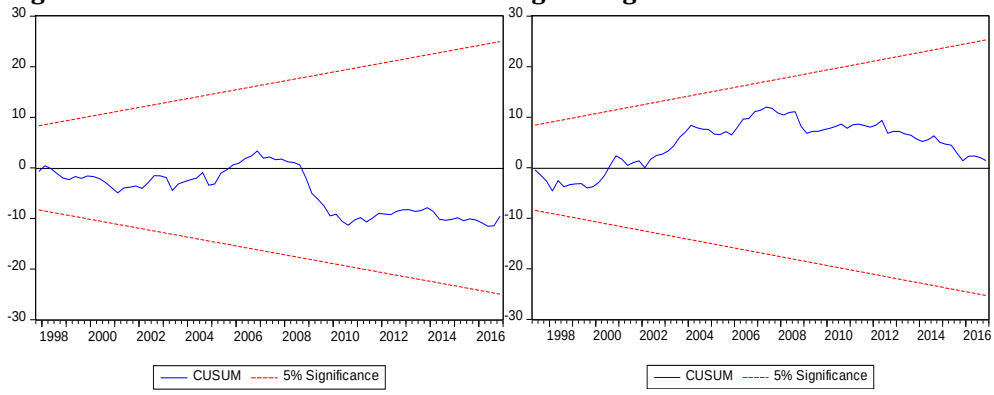
Table 7: Diagnostic Test Results

	LM Test	**White (CT)**	**Normality Test (Jarque-Bera)**
	H0= No serial correlation	H0= No heteroscedasticity	H0= Normally distributed
(Eq.1) LEMAN	(0.4444)	(0.0589)	(0.0137)*
(Eq.2) LEMIN	(0.4329)	(0.1889)	(0.0000)**
(Eq.3) LETRAD	(0.2379)	(0.1940)	(0.0000)**
(Eq.4) LEFIN	(0.5866)	(0.9688)	(0.0000)**
(Eq.5) LECONS	(0.2280)	(0.6648)	(0.0000)**

Note: ( ) indicates the P-value, * and **denotes significant at 5% and 1% respectively.

Frain (2007) contends that large data samples are not characteristic of an "α-stable" distribution and therefore it is natural for the null hypothesis of a normal distribution to be rejected within large samples. Suggesting that some regressions may be inconsistent over time. The test for normality is also said to be sensitive to large sample sizes (Kundu et al., 2011). As a result, the null hypothesis of normality testing may be rejected more frequently than it should (Chen & Kuan, 2003). A failed normality test accentuates the testing of further stability tests. Parameter stability testing is thus needed to avoid the misspecification encountered in time series volatility (Zanini et al., 2000). The Cumulative Sum of Recursive Residuals (CUSUM) was conducted as a means of model stability testing to confirm the study's parameter stability as encouraged by Lee and Strazicich (2004). Figure 1 of the CUSUM results reveals that the study's models do not give rise to model instabilities. The plots in these graphical representations remain within the 0.05 significance level, which is the uncritical region, and thus confirms the models' parameter stability. This suggests that these models' parameters are stable over time and therefore present robust findings of the short- and long-run estimations of the study's regressands and regressors. This follows suit with the classical theory's argument which asserts that changes in technology and structural changes in final output and consumption act as offsetting factors in the theory's long-run full employment assumption of the labour market equilibrium model. Keynes (1936) however associates the drop-in employment conditions with institutional or legal market constraints as well as the decrease in demand or consumption (Galí, 2013).

Figure 1: CUSUM Test ResultsManufacturing Mining



Discussion of Results: The negative long-run relationship between employment in the manufacturing sector and trade openness resonates with findings by various scholars (such as Ferreira et al., 2010; Menezes-Filho & Muendler 2011) who identified a decline in low-skilled manufacturing employment due to increased external competition. Based on Michael Porter's five forces model, price competition is increasingly high in

the face of low barriers to entry as is the case with increased trade openness or free trade. In such a case the least competitive tradable sectors may thus face intensified competition. Considering South Africa's relatively intense exposure to the global market, the observed long-run findings between trade openness and employment in the manufacturing sector also correspond with the observed employment decline within South Africa's exporting industries during the periods 1999 to 2001. According to Venter (2009), this was led by the export industry's pressure and focus on more capital-intensive inputs rather than formal-labour inputs in efforts to achieve a more competitive base in the foreign market. Alexandre et al. (2011) assert that fluctuations in the exchange rate largely affects sectors which are most exposed to foreign competition or trade openness, particularly the tradable sector. The associated long-run effects of the real effective exchange rate and employment in the manufacturing sector only accounted for a 0.26 percent decrease (increase) in employment following a real appreciation (depreciation) in the effective exchange rate.

The negative patterns of the real effective exchange rate versus manufacturing employment levels correspond with the general exchange rate and employment theory for the tradable sector. Most scholars (Bhorat et al., 2014; Huang & Tang, 2015) reveal that a real depreciation in the exchange rate is the most suitable mechanism for employment growth especially in the export-driven Economy's tradable sector. The analysis by Chipeta et al. (2017) ascertains that a real domestic currency appreciation makes the domestic economy's exports more expensive relative to exports from the foreign global market. Foreign demand for such export commodities thus decreases, whereas a real depreciation holds opposite effects. Kohler et al. (2014) extend that the domestic economy's export competitiveness in the global market tends to heighten amid a depreciation in the real exchange rate, while imports may be less competitive and thereby lead to an increase in demand and consumption of domestic goods and services. Notwithstanding, Hodge (2005) cautions that a significant Rand weakening can potentially cause inflationary pressures to the detriment of the long- run growth prospects. Furthermore, Alexandre et al. (2011) opine that a potential Rand appreciation implies the reduction in foreign prices relative to the domestic currency and may therefore lead to a decrease in the competitiveness of domestic exporters.

Competitiveness in the tradable sector can be lost either externally relative to the foreign market's tradable output, or internally relative to the non-tradable sector, or in terms of both circumstances. Internal competitiveness can therefore be lost when prices in the domestic tradable market declines relative to non-tradable prices, while external competitiveness can be lost when prices in the domestic tradable sector rises relative to the foreign market's tradable goods prices, and these may consequently lead to the appreciation in the real effective exchange rate (Bose, 2014). The loss of competitiveness and the drop in exports may hamper investment decisions concerning the firing and hiring of workers as well as impede profit margins (Alexandre et al, 2011). Although a real depreciation is assumed to be most favourable for the tradable sector's export competitiveness, Onselen (2016) however argues that the dangers of a weak currency may arise in the form of expensive imports.

Potential interest rate hikes, rising and faster domestic prices, business cost pressures, overall labour market insecurity, and retrenchments. Even so, South Africa's tradable sectors, such as the manufacturing industry, have however failed to capitalise on the country's prolonged weak Rand. Moreover, the limited reaction of South Africa's exporting tradable sectors to increased trade openness and the weak Rand can be explained by the country's structural constraints. Anand et al. (2016) contend that South Africa's critical production factors, such as market rigidities, labour supply and electricity, correspond with the slow response of the tradable sector's exports to the Rand depreciation. These factors may have likely prevented the exporting tradable sector from stimulating domestic exports and absorbing the comparative advantage presented by the weak Rand. General economic theory upholds that FDI has the potential to promote the formation of human capital, as well as the creation of employment opportunities and training (Sauvant, 2013). Nevertheless, the positive employment effects of FDI however rely on the manner in which FDI is utilised. This depends on whether the financing of investment decisions is accompanied by the utilisation of either capital inputs or labour inputs in production processes provided sufficient infrastructure (Kosteletou & Liargovas, 2000). In order to capture the comparative cost advantages, for most entities, the quest to reducing production costs and increasing efficiency and productivity implies the hiring of more capital equipment other than labour inputs within the production processes. In such a case, this evokes a negative implication on job creation patterns as indicated in the above findings of the manufacturing sector. Venter (2009)

discusses that the offset to employment benefits in South Africa's export sectors during a period such as 1999-2001 was driven by the pressure by export industries to become more competitive in the global market by means of employing capital intensive equipment rather human labour resources in order to cut costs.

The increase in South Africa's trade openness has witnessed high levels of unemployment since the onset of the post-apartheid regime. As opposed to alleviating South Africa's employment crisis, the country's manufacturing sector has heightened the problem. According to Jenkins & Edwards (2012), the latter sector has experienced a drop in employment opportunities of over 350 000 following the year 1990. Meanwhile, the year 2010 encountered a decline in manufacturing jobs from 1.5 million to less than 1.2 million. The manufacturing sector's declining share in employment and GDP and the sector's output composition partly resonates with increased import competition, such as the rise in China's highly competitive and increased import penetration (Jenkins & Edwards, 2012). Based on the suggested results of FDI and employment implications in the manufacturing sector, the suggested nexus effects are larger for the manufacturing employment sector relative to all other sectors. As indicated in the results of the current study, FDI affects employment in the manufacturing sector by 0.0274 percent. Henceforth this implies that FDI in South Africa largely affects employment in the manufacturing employment sector more than any other sector, thus a positive utilisation of FDI by means of employing more labour-intensive inputs relative to the non-tradable sector corresponds with higher employment benefits or increases. Similarly, an analysis by Demertzis and Pontuch (2013) suggests that FDI in the tradable sector likely presents more potential benefits to the trade balance and current account of the host economy. Demertzis and Pontuch (2013) further assert that countries, such as South Africa, which consider addressing current account balances to be an essential concern must therefore develop policies triggered to attract FDI to facilitate the current account rebalancing process. However, Kosteletou and Liargovas (2000) argue that the sustenance of current account deficits is only significant when future capital inflows are larger than initial inward capital flows.

5. Conclusion and Recommendations

Efforts in curbing South Africa's high unemployment rate, low economic growth and continued trade deficits potentially revolve around the enhancement of the tradable industry's competitiveness and its policies. This is significantly required in boosting South Africa's sectoral employment trajectories within domestic and international markets, particularly the tradable sector. The pursuit of the study objectives identified potent guidelines for providing a job enabling tradable environment based on the premise of established empirical and conceptual analyses of tradable employment. To secure the country's local and foreign demand for its export commodities, the study identifies the promotion of labour to capital ratio as an important factor along investment decisions. Specifically making sure that the financing of the tradable industry's investment decisions is not overseen by the deployment of extreme capital intensification relative to labour resources within productive ventures. The state may seek to provide cost-cutting incentives in the form of tax relief, to ensure enhanced labour absorption within economic sectors. This goes along with the significant establishment of an enabling and conducive FDI attracting environment.

The concentration of FDI within the tradable sector holds the potential to promote comparative advantage within the sector and improve the country's trade account driven by increased tradable goods production and productivity. Increased FDI within the tradable industry may fasten the absorption of economic benefits (Demertzis & Pontuch, 2013). Further local economic development (LED) solutions may be sought to oversee the support and strengthening of the manufacturing sector, making provision for suitable and sustainable linkages towards the mining and manufacturing tradable sectors towards stimulating job creation. This may also be accompanied by the monitoring of multinational enterprise (MNEs) for the bolstering of South Africa's small and medium-sized enterprises (SMMEs) towards sustaining the country's inexperienced and less-funded business ventures. Together with potential local entrants into the market while providing required training and support. Considering South Africa's failing tradable sectors such as the mining sector, the country's focus on globalisation has been unable to address the growing unemployment challenges. To absorb the poor and unemployed community, strategies to uplift localisation may be addressed to support the underprivileged society to participate in economic activities. This may be overseen by strengthening and supporting the unemployed and poor communities to engage in the production of goods or services most required by the local communities.

This may also be done by localising public works initiatives and social welfare as well as other government transfers. Based on Michael Porter's diamond model, productivity is crucial for establishing and sustaining competitiveness, amongst which, the government is a major determining participant which can affect the primary determinants of industry competitiveness, such as factor endowments. Given the rising labour costs in the country's production sector, as well as increasing cost of electricity, cost relief measures in the form of multifaceted state support (i.e. industrial subsidies, infrastructure support, affordable electricity, land and water) may be provided to tradable industries to encourage increased productivity and competitiveness particularly in tradable industries such as the manufacturing industry. This may prevent the tradable industry from exercising labour retrenchments by means of cost-cutting measures. In the long-run, increased exports resulting from higher productivity may also increase workers' living standards. Provision for infrastructural development may also be made to sustain the operations of both the tradable and non-tradable sectors.

References

Adamu, F. M. (2014). Trade openness and industrial performance in Nigeria: evidence from autoregressive distributed lag (ARDL) models. Çankaya University. (Doctoral dissertation - MA).

Adhikary, B. K. (2011). FDI, trade openness, capital formation, and economic growth in Bangladesh: a linkage analysis. *International Journal of Business and Management*, 6(1), 16-28.

Alexandre, F., Bação, P., Cerejeira, J. & Portela, M. (2011). Employment and exchange rates: the role of openness and technology. *Open Economies Review*, 22(5), 969-984.

Anand, R., Perrelli, R. & Zhang, B. (2016). South Africa's Exports Performance: Any Role for Structural Factors? https://www.imf.org/external/pubs/ft/wp/2016/wp1624.pdf. Date of access: 5 March 2018.

Arribas, I., Pérez, F. & Tortosa-Ausina, E. (2006). Measuring international economic integration: theory and evidence of globalization. Documentos de Trabajo – Fundación BBVA No. 24 (2006)

Asghar, M., Yousuf, M. U. & Ali, S. (2014). Impact of trade liberalization on employment: review of SAARC Countries. *Applied Sciences and Business Economics*, 1(01), 49-55.

Banerjee, A., Dolado, J. & Mestre, R. (1998). Error-correction mechanism tests for cointegration in a single-equation framework. *Journal of Time Series Analysis*, 19(3), 267-283.

Belke, A. & Kaas, L. (2004). Exchange rate movements and employment growth: An OCA assessment of the CEE economies. *Empirica*, 31(3), 247-280.

Bhorat, H., Tian, N. & Ellyne, M. (2014). The Real Exchange Rate and Sectoral Employment in South Africa. Cape Town: University of Cape Town. (DPRU working paper no. 201404).

Bose, D. (2014). Real Exchange Rates and International Competitiveness; Concepts, Measures and Trends in New Zealand. In *Paper for the NZAE Conference*. http://www.nzae.org.nz/wp-content/uploads.pdf. Date of access: 10 October 2017.

Brooks, C. (2014). Introductory Econometrics for Finance. 3rd Ed. Cambridge: Cambridge University Press.

Burgess, S. M. & Knetter, M. M. (1998). An international comparison of employment adjustment to exchange rate fluctuations. *Review of International Economics*, *6*(1), 151-163.

Campa, J. M. & Goldberg, L. S. (2001). Employment versus wage adjustment and the US dollar. *Review of Economics and Statistics*, 83(3), 477-489.

Casacuberta, C., Fachola, G. & Gandelman, (2004). The impact of trade liberalization on employment, capital, and productivity dynamics: evidence from the Uruguayan manufacturing sector. *The Journal of Policy Reform*, *7*(4), 225-248.

Catão, L. A. V. (2007). Why Real Exchange Rates? https://www.imf.org/external/pubs/ft/fandd/2007/09/pdf/basics.pdf. Date of access: 13 October 2017.

Cavallo, E. A. & Frankel, J. A. (2008). Does openness to trade make countries more vulnerable to sudden stops, or less? Using gravity to establish causality. *Journal of International Money and Finance*, 27(8), 1430-1452.

Cetkovic, J. & Zarkovic, M. (2012). Key Challenges of Future Path of Globalisation in Global Economy. *Intelektine Ekonomika*, 6(2), 163-173.

Chen, R. & Dao, M. (2011). The real exchange rate and employment in China. *IMF Working Papers*, 148(11), 1-50.

Chen, Y. T. & Kuan, C. M. (2003). A generalized Jarque-Bera test of conditional normality. Taipei: Institute of Economics, Academia Sinica. (Working paper no. 03-A003).

Chinembiri, E. K. (2010). An empirical assessment of the impact of trade liberalization on employment in South Africa. file:///C:/Users/Charmizy/Downloads.pdf. Date of access: 08 November 2017.

Chipeta, C., Meyer, D. F. & Muzindutsi, P. F. (2017). The Effect of Exchange Rate Movements and Economic Growth on Job Creation. *Studia Universitatis Babes-Bolyai Oeconomica*, 62(2), 20-41.

Demertzis, M. & Pontuch, P. (2013). The role of FDI in preventing imbalances in the euro area. *Quarterly Report on the Euro Area (QREA),* 12(2), 17-25.

Dritsakis, N. (2011). Demand for money in Hungary: an ARDL approach. *Review of Economics and Finance*, (5). http://users.uom.gr/~drits/publications/ARDL.pdf. Date of access: 03 October 2017.

Dube, S. & Zhou, Y. (2013). The Repo Rate Pass-Through to the Prime Rate in South Africa: Evidence from ARDL and FMLS Models. *Journal of Business Theory and Practice*, 1(2), 199-213.

Dutt, P., Mitra, D. & Ranjan, P. (2009). International trade and unemployment: Theory and cross-national evidence. *Journal of International Economics*, 78(1), 32-44.

Fernández, L. M. (2017). Challenges of economic globalization. *Revista de Relaciones Internacionales, Estrategia y Seguridad*, 12(1), 23-50.

Ferreira, F. H. G., Lite, P. G. & Wai-Poi, M. (2010). Trade Liberalization, Employment Flows and Wage Inequality in Brazil. Washington, DC: The World Bank. World Bank Policy Research. (Working Paper 4108).

Frain, J. C. 2007. Small sample power of tests of normality when the alternative is an α-stable distribution. Dublin: Trinity College Dublin, Department of Economics. (TEP working paper no. 0207).

Frocrain, P. & Giraud, P. N. (2017). The evolution of tradable and non-tradable employment: evidence from France. Centre for Industrial Economics. (Working Paper 17-CER-04).

Fujita, S. & Nakajima, M. (2016). Worker flows and job flows: A quantitative investigation. *Review of Economic Dynamics*, 22(1), 1-20.

Gaddis, I. & Pieters, J. (2014). The gendered labour market impacts of trade liberalization: evidence from Brazil. The World Bank. (Working paper No. 7095).

Galí, J. (2013). Notes for a new guide to Keynes (I): wages, aggregate demand, and employment. *Journal of the European Economic Association*, 11(5), 973-1003.

Gujarati, D. (2011). Econometrics by example. London: Palgrave Macmillan.

Haltiwanger, J., Kugler, A., Kugler, M., Micco, A. & Pages, C. (2004). Effects of tariffs and real exchange rates on job reallocation: evidence from Latin America. *The Journal of Policy Reform*, *7*(4), 191-208.

Haouas, I., Yagoubi, M. & Heshmati, A. (2005). The impacts of trade liberalization on employment and wages in Tunisian industries. *Journal of International Development*, 17(4), 527-551.

Hasan, R., Mitra, D., Ranjan, P. & Ahsan, R. N. (2012). Trade liberalization and unemployment: Theory and evidence from India. *Journal of Development Economics*, 97(2), 269-280.

Hodge, D. (2005). The effect of exchange rate volatility on trade and employment: A brief review of the literature. http://www.hsrc.ac.za/en/research-data/ktree-doc/1308. Date of access: 24 March 2018.

Huang, H. & Tang, Y. (2015). How did exchange rates affect employment in U.S. cities? *Contemporary Economic Policy*, 34(4), 678-697.

Huang, H., Pang, K. & Tang, Y. (2014). Effects of Exchange Rates on Employment in Canada.*Canadian Public Policy*, *40*(4), 339-352.

Inekwe, J. N. (2013). FDI, employment and economic growth in Nigeria. *African Development Review*, 25(4), 421-433.

Itskhoki, O. & Helpman, E. (2015). Trade Liberalization and Labor Market Dynamics with Heterogeneous Firms.https://www.princeton.edu/~itskhoki/papers/TradeLMDynamics.pdf. Date of access: 30 May 2018.

Janiak, A. (2006). Does trade liberalization lead to unemployment? Theory and some evidence. Mimeo. Universite Libre de Bruxelles.

Jenkins, R. & Edwards, L. (2012). Chinese competition and the restructuring of South African manufacturing. *DEV research briefing 4*. http://osf.org.za/wp-content/uploads/2015/08/Chin ese-competition-and-the-restructuring-of-South-African-manufacturing.pdf. Date of access: 26 October 2017.

Joshi, V. & Ghosal, S. (2009). Impact of foreign direct investment on employment in Oman. In *Conference of the International Journal of Arts and Sciences*, 1(18), 34-51.

Karunaratne, N. D. (2012). The globalization–deglobalization policy conundrum. *Modern Economy*, 3(4), 373–383.

Keynes, J. M. (1936). The General Theory of Employment, Interest and Money. Macmillan: New York.

Kohler, M., Manalo, J. & Perera, D. (2014). Exchange Rate Movements and Economic Activity. RBA Bulletin, March, 47-54.

Kosteletou, N. & Liargovas, P. (2000). Foreign direct investment and real exchange rate interlinkages. *Open Economies Review*, 11(2), 135-148.

Krugman, P., Wells, R. & Graddy, K. (2014). Study guide to accompany Essentials of economics, third edition, Krugman, Wells, Graddy. 3rd ed. New York, NY: Worth Publishers.

Kundu, M. G., Mishra, S. & Khare, D. (2011). Specificity and Sensitivity of Normality Tests. https://xa.yimg.com/kq/groups/16412409/1720123946.pdf. Date of access: 08 October 2017.

Kurtishi-Kastrati, S. (2013). The effects of foreign direct investments for host country's economy. *European Journal of Interdisciplinary Studies*, 5(1), 26-38.

Lee, J. & Strazicich, M. C. (2004). Minimum LM unit root test with one structural break. *Manuscript, Department of Economics, Appalachian State University*, 1-16.

Mano, R. & Castillo, M. (2015). The level of productivity in traded and non-traded sectors for a large panel of countries. International Monetary Fund. (Working paper No. 15-48).

Margalit, Y. (2012). Lost in globalization: International economic integration and the sources of popular discontent1. *International Studies Quarterly*, *56*(3), 484-500.

Mathekga, M. J. (2009). *The political economy of labour market flexibility in South Africa* (Doctoral dissertation, Stellenbosch: University of Stellenbosch).

McCarthy, D. M. (1996). International economic integration and business cultures: comparative historical perspectives. *Business and Economic History*, 72-80.

Menezes-Filho, N. A. & Muendler, M. A. (2011). Labor reallocation in response to trade reform. (National Bureau of Economic Research, No. w17372).

Mpofu, T. R. (2013). Real Exchange Rate Volatility and Employment Growth in South Africa: The Case of Manufacturing! In ECCE-USB conference.

Mukhtar, T. & Rasheed, S. (2010). Testing a long run relationship between exports and imports: Evidence from Pakistan. *Journal of Economic Cooperation and Development*, 31(1), 41-58.

Mushtaq, B., Batool, S. A. & Afzal, M. (2014). Globalization, technology transformation and economic growth (A case study of Pakistan). *African Journal of Marketing Management*, 6(5), 56-67.

Narayan, P. K. (2004). Reformulating critical values for the bounds F-statistics approach to cointegration: an application to the tourism demand model for Fiji (Vol. 2). Australia: Monash University.

Ngandu, S. N. (2009). The impact of exchange rate movements on employment: the economy-wide effect of a Rand appreciation. *Development Southern Africa*, 26(1), 111-129.

Nucci, F. & Pozzolo, A. F. (2010). The exchange rate, employment and hours: What firm-level data say. *Journal of International Economics*, 82(2), 112-123.

Nyen Wong, K. & Cheong Tang, T. (2011). Foreign direct investment and employment in manufacturing and services sectors: Fresh empirical evidence from Singapore. *Journal of Economic Studies*, 38(3), 313-330.

Onselen, V. G. (2016). The Rand after Nene? A report on the latest round of rand depreciation. https://solidariteit.co.za/wp-content/uploads/2016/03/March_2016_SRI_report_The_Rand_after_Nene.pdf. Date of access: 18 November 2017.

Pesaran, M. H., Shin, Y. & Smith, R. J. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621-634.

Pesaran, M. H., Shin, Y. & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(3), 289–326.

Pindyck, R. S. (1990). Irreversibility, uncertainty, and investment. Massachusetts: National Bureau of Economic Research. (Working Paper no. 3307).

Piton, S. (2017). Economic Integration and the Non-Tradable Sector: The European Experience. http://cepr.org/sites/default/files/1884_PITON%20%20Economic%20Integration%20and%20the%20Non-tradable%20Sector.pdf. Date of access: 12 October 2017.

Ribeiro, E. P., Corseuil, C. H., Santos, D., Furtado, P., Amorim, B., Servo, L. & Souza, A. (2004). Trade liberalization, the exchange rate and job flows in Brazil. *The Journal of Policy Reform*, 7(4), 209-223.

Rodrik, D. (2008). Understanding South Africa's economic puzzles. *Economics of Transition*, 16(4), 769-797.

Rogan, M., Diga, K. & Valodia, I. (2013). Labour Market Analysis and Business Process Services in South Africa: Poverty Reduction through Information and Digital Employment Initiative. University of KwaZulu-Natal.

Rose, A. K. (2011). Exchange rate regimes in the modern era: Fixed, floating, and flaky. *Journal of Economic Literature*, 49(3), 652-672.

Sauvant, K. P. (2013). Yearbook on International Investment Law & Policy 2011-2012. Oxford University Press. NY: USA.

Schumacher, R. (2012). Adam Smith's theory of absolute advantage and the use of doxography in the history of economics. *Erasmus Journal for Philosophy and Economics*, 5(2), 54-80.

Segerstrom, P. S. (2013). Trade and economic growth. (*In* Bernhofen, D. Falvey, R. Greenaway, D & Kreickemeier, U. Palgrave Handbook of International Trade. UK: Palgrave Macmillan.

Selimi, N. (2012). Integration and Economic Globalization: Analysis of Selected Western Balkans' Countries. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 2(4), 362-375.

Spence, M. & Hlatshwayo, S. (2014). Demand and Defective Growth Patterns: The Role of the Tradable and Non-Tradable Sectors in an Open Economy. *The American Economic Review*, 104(5):272-277.

Squalli, J. & Wilson, K. (2006). A new approach to measuring trade openness. Economic & Policy Research Unit. (Working Paper no 06-07).4

Strat, V. A., Davidescu, A. & Paul, A. M. (2015). FDI and Unemployment-A Causality Analysis for the Latest EU Members. *Procedia Economics and Finance*, 23, 635-643.

Takaendesa, P. (2006). The Behaviour and Fundamental Determinants of the Real Exchange Rate in South Africa (Master Dissertation, Rhodes University. Eastern Cape Province).

Taylor, J. E. (2001). Microeconomics of globalization: evidence from Mexico, China, El Salvador, and the Galapagos Islands. Report to the Latin America and Caribbean Regional Office. Washington, DC: World Bank.

Toda, H. Y. & Yamamoto, T. (1995). Statistical inference in vector auto regressions with possibly integrated processes. *Journal of Econometrics*, 66(1), 225-250.

Ulasan, B. (2012). Openness to international trade and economic growth: a cross-country empirical investigation. Central Bank of the Republic of Turkey. (Discussion Paper no. 25).

Venter, J. C. (2009). Business cycles in South Africa during the period 1999 to 2007. South African Reserve Bank: Quarterly Bulletin. https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/4050/Article%20%20Business%20cycles%20in%20South%20Africa%20during%20the%20period%201999%20to%202007.pdf. Date of access: 04 October 2017.

Wacziarg, R. & Wallack, J. S. (2004). Trade liberalization and intersectoral labor movements. *Journal of International Economics*, *64*(2), 411-439.

Wei, Y. (2013). The effect of FDI on employment in China. Iowa State University. Graduate Theses and Dissertations. (Working paper 13379).

Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. *Journal of Development Economics*, 72(1), 57-89.

Zanini, F. C., Irwin, S. H., Schnitkey, G. D. & Sherrick, B. J. (2000). Estimating farm-level yield distributions for corn and soybeans in Illinois. http://ageconsearch.umn.edu.pdf. Date of access: 02 October 2017.

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Integrated Supply Chain Management in the Fast-Moving Consumer Goods Manufacturing Industry: A Review

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Abstract: A move towards integrated supply chain management (ISCM) in the various manufacturing industries, with the integration of the different associated processes involved, is gaining prominence as a tool for achieving competitive advantage over rival companies. Various studies have been carried out on ISCM globally, with possible problems affecting competitiveness and effective customer service identified as non-integration, ranging from internal processes to suppliers. This paper reviewed literature on the application of ISCM in the Fast Moving Consumer Goods (FMCG) Manufacturing industry in Nigeria. This involved collecting, sorting, grouping and analysing of available papers to identify strengths and weaknesses and suggest the direction for future research. The review shows that, although some research has been conducted onISCM in the manufacturing industry, little has been done in the FMCG manufacturing industry globally, and in particular, ISCM is still in the initial stages of adoption in Nigeria. The aim of this review is to unearth the extent of application and implementation of ISCM in the FMCG industry in Nigeria, and advise on the status of ISCM and problems confronting its implementation and use. This paper posits that, based on the reviewed literature, there is a need for the FMCG manufacturing industry in Nigeria to implement ISCM, considering its importance as iterated by both academics and business managers. This review was carried out focusing on literature relating to ISCM in the FMCG Manufacturing industry and does not cover the entire manufacturing industry.

Keywords: *Fast-moving consumer goods, integrated supply chain management, Nigeria, manufacturing, customer service.*

1. Introduction

Global competition and the urge to provide effective service delivery to customers has been on the increase globally, thereby drawing much attention from various stakeholders on the need to integrate their supply chain processes, both upstream and downstream (Van Der Vaart& Van Donk, 2008). Therefore, the aim of Integrated Supply Chain Management (ISCM) is to ensure proper coordination of internal and external processes, through collaboration between stakeholders, in a way that encourages seamless operation, to foster the organisation's competitive advantage. In modern-day business, individual enterprises no longer compete in isolation, but rather as parts within a series of chains (Lambert, 2008; Fantazy, Kumar and Kumar, 2010). As such, Fast Moving Consumer Goods (FMCG) manufacturing companies are beginning to adopt ISCM as a result of global competition, greater demand for effective customer service, and with the intention of reducing cost and waste, and enhancing performance. In addition, companies are implementing ISCM in order to become more responsive to demands for the supply of raw materials arising from their production processes (Pamela and Pietro, 2011, Lambert, 2008; Fantazy et al., 2010). Frohlich and Westbrook, (2001) argued that integration that takes both upstream and downstream into consideration is perceived to be more adequate than when integration is only carried out between customers and suppliers.

Supply chain integration research has grown over the years, and many studies have been conducted globally (Chen, Daugherty and Landry, 2009; Bilgen and Günther, 2010; Flynn et al., 2010; Danese and Romano, 2011; Pamela and Pietro, 2011; Ellegaard and Kock, 2012; Hosseini, Aziz and Sheikhi,2012), which explore the implementation and effect of such practices on: cost reduction; marketplace agility; trust; waste reduction; and financial gain; along with operational effectiveness; collaboration amongst partners; and the effect such collaboration has on business performance(Ou et al., 2010; Wiengarten et al., 2010; Wong et al., 2011). This paper undertook an analysis of the application of ISCM by the FMCG manufacturing industry in Nigeria and how it can assist to enhance their competitiveness. Most FMCG industries in developing countries are facing problems in their Supply Chain Management (SCM) processes and seeking ways of overcoming these

challenges (Hosseini, Aziz and Sheikhi, 2012). This review was carried out to provide insight in the application of ISCM in the FMCG manufacturing industry while also suggesting ways on how SCM professionals can improve the application of ISCM to help their competitiveness, improve customer service and the bottom line of the organisation.

This paper contributes to the practice of supply chain theory, thereby identifying gaps in relation to the implementation and adoption of ISCM in the FMCG manufacturing industry in Nigeria. The remaining part of this paper is structured as follows; following this introduction, section two discusses the literature review in ISCM. Section three examines the FMCG industry in general and its characteristics. The fourth section deliberates the Nigerian FMCG industry and its contribution to the nation's economy. Section five explores the manufacturing supply chain. Section six looks at SCM in Nigeria. Section seven focuses on the analysis of ISCM and its relevance to the FMCG manufacturing industry. Section eight, the concluding part, discusses the adoption and application of ISCM globally and attempts to assess the level of ISCM adoption and implementation in Nigeria and analysis of gaps in the literature on ISCM in Nigeria.

2. Literature Review

ISCM: Adequate dissemination of demand and supply information in ISCM processes will enable organisations to improve customer service, logistics, cost reduction, inventory and competitiveness of the organisation. Integrated supply chain as defined by Zhu, Krikke & Caniela (2018) as the "Degree to which the focal firm strategically collaborates with its key supply chain partners and collaboratively manages inter-organisational processes to provide maximum value to the customer". Effective ISCM will assist organisations in achieving enhanced operational performance (Wong et al., 2011). According to Bagchi, Ha, Skjoett-Larsen, and Soerensen (2005), integration enhances competitiveness amongst organisations, whilst Power, (2005) states that integration must be characterised by: collaboration; cooperation; trust; information flow; and the use of technology, with a focus on managing chains rather than individual processes.Manzouri,Rahman, Ab, Arshad and Ghani, (2011) in their study on cutting down the difficulty of SCM implementation through comparison between Iranian and Malaysian companies identified the following problems associated with ISCM as; lack of or inadequate training, poor communication among the various stakeholders, lack of trust leading to insufficient information sharing, poor internal cost management of key processes, organisational culture, poor linkage between people and technology initiatives, poor people coordination when implementing technology change, government policies affecting international trade conflicting interest among channel partners.

Inadequate data sharing among stakeholders, poor collaboration among partners, inadequate control of third-party service providers inadequate funding of supply chain initiatives and poor technology infrastructure (Msimangira and Tesla, 2014). Two components make up ISCM, namely: internal and external integration factors. Internal integration factors involve interactions within organisations, whilst external integration factors concern interactions between different organisations (Banomyong and Supatn, 2011; Kotzab, Teller, Grant and Sparks, 2011; VanVactor, 2011). Amune & Ozuru (2014) conducted a study on integrated supply chain and its application in the Nigerian oil and gas industry to ascertain how this will impact on the performance of the organisations, using information technology as a mediator between information sharing, knowledge and process integration. Their findings indicate that integrated supply chain will improve organisation performance and competitiveness in the oil and gas industry. Similarly, Adebayo, (2012) main focus in his study conducted on supply chain practices in Nigeria to ascertain the effect of ISCM on their performance through a survey using structured questionnaire conducted on managers in 100 manufacturing industries, findings show that proper management of supply chain in those organisations has a positive impact on their performance. Furthermore, Wolf, (2011) investigated the sustainability of ISCM in German manufacturing industries, to ascertain the difference between traditional supply chain, integrated supply chain and sustainability, through the development of a model using case study.

Their findings show that part of the problems of ISCM could be due to lack of adequate knowledge and collaboration amongst stakeholders to achieve internal and external integration through the development of a viable framework. Research by Didia & Nwokah (2015), investigated ISCM and business performance in the

telecommunications industry in Nigeria through a survey, using a questionnaire method, with findings showing proper integration of the supply chain has positive effect on performance in the telecommunications company Chong et al. (2011), in a study carried out in the USA, highlight that some supply chain activities' associated costs, such as logistics, inventory and other supporting services, accounted for 10-13 percent of the gross domestic product (GDP). Globally, many organisations have been able to improve their processes through the integrated supply chain and this has led to improves customer service and profitability (Lee & Whang, 1999; Towil et al., 2000), and has enhanced organisations' performance and competitiveness (Simchi-Levi, Kaminsky and Simchi-Levi, 2003). Literature iterate that at the global level, only about 10 percent of the supply chain are properly integrated (Chtzoudes & Chatzoglou, 2011; Oliva & Watson, 2011; Vilasini, Neitzert, Rotimi and Windapo, 2012). Flynn et al. (2010) confirm that proper integration assists organisations in improving productivity. Integration is also highlighted by Danese and Romano (2011) in its effect of enhancing supply chain processes, which, when properly managed, assist organisations in achieving long-term competitiveness. Therefore, the importance of ISCM cannot be overemphasised, because of its ability to enhance organisational success and competitiveness.

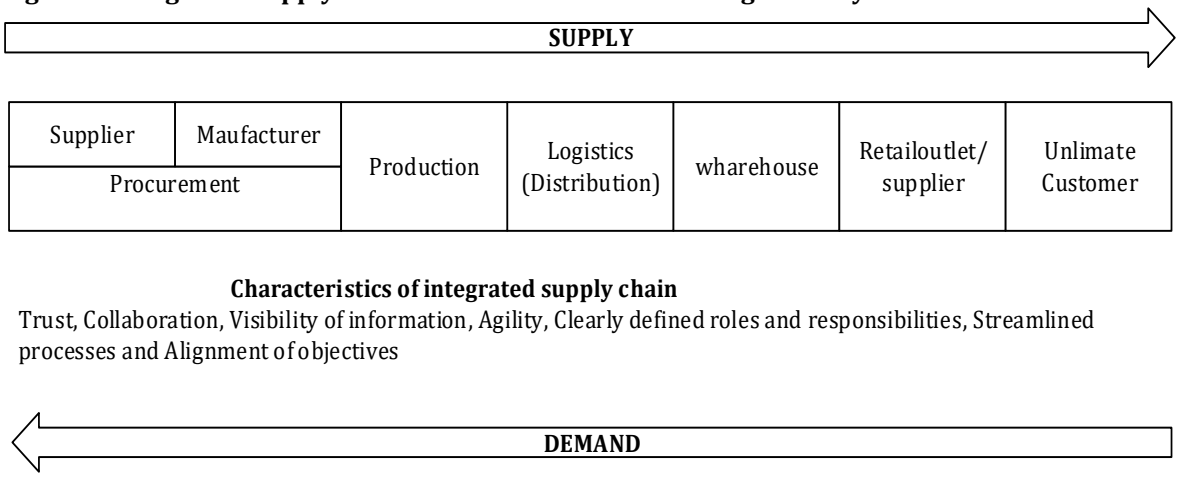
Fast-Moving Consumer Goods Industry: Leahy, (2011) describes the FMCG industry as producing products usually consumed within short periods of time, ranging from days to months, and which are quickly replaced. Billions of people buy and use FMCG on a daily basis, worldwide; these are usually bought at supermarkets, open markets, or from small shops or kiosks, and include products such as: detergent; drinks; pastes; and processed foods (Sattler, Volckner, Riediger and Ringle, 2010). The activities of FMCG companies are of significant benefit to the global economy, in that they: provide direct employment; produce goods for local consumption, and for export, at competitive prices; and encourage associated distribution. FMCG have been in existence prior to Nigerian independence, and form part of the modern-day culture of the country, with diverse brands having grown to be widely accepted and well-positioned within Nigeria's consumer market (Cowry Asset Limited, 2012). The Nigerian FMCG market is a thriving one, and can be said to possess an explosive growth potential; especially when considering key supporting economic indicators, such as: a growing GDP; a large and growing population; increasing annual disposable incomes; an expanding number of FMCG businesses; and a wide mix of competing brands within the market, from which consumers can make their choices. Most of the leading consumer goods brands are manufactured and marketed in Nigeria by local subsidiaries of well-known multinationals, such as Unilever, Nestlé, Procter & Gamble, and PZ Cussons, along with Reckitt Benckiser, Coca-Cola, Guinness, and Glaxo Smith Kline, and so on.

Typically, the largest and most familiar brands are currently international brands, also arguably the most successful, having a long-established presence in the country (i.e. having been incorporated before Nigeria's independence) (Lead Capital Nigeria, 2009). The Nigerian local economy has also significantly benefited from the FMCG industry through its provision of: employment opportunities; locally-consumed goods production; producing for export at reasonable prices; and enabling economic activities, such as distribution and retail opportunities; along with assisting the government in generating revenues through both company and value-added tax receipts. In view of this, the Nigerian government is also furthering the FMCG sector growth by creating incentives, and a favourable environment to encourage domestic manufacturing activities, in order to promote foreign capital flow (Cowry Asset Limited, 2012). Over the years, Nigeria's FMCG sector has grown in revenues from US$884 million in 2008, to an estimated $1 billion in 2011; with cumulative gains of 44 percent for 2010, and a projected gain of 48 percent for 2011 (CiuciConsulting, 2011).

Manufacturing Supply Chain: Most manufacturing industries face much pressure from global competitiveness, and the adoption of new business strategies. Hosseini et al. (2012) state that, in enabling them to compete, industries should adopt more efficient production systems and the implementation of integrated supply chains are increasing, becoming a key factor in enabling organisations to become more competitive. The authors add that little success has been achieved with ISCM by most companies surveyed, and that organisations have, hence, begun to question how they can integrate and improve their material and information flow activities and processes, both internally, and externally, with their supply chain partners. In order to fully benefit from and implement SCM concepts, it is important for companies to integrate efficiently with their suppliers, customers, warehouses, and other intermediate value-adding partners (Hosseini et al., 2012). Worth noting, therefore, are perceptible improvements in the way material sourcing

and collaboration are carried out by manufacturing industries when procuring the materials required for production. According to Manos (2006), traditional manufacturing SCM, which focuses on logistics in terms of moving physical materials from one location to another, the size and weight of objects shipped, and the distances from suppliers to manufacturing facilities, can play a major role in dictating the cost of products. In keeping with this, the manufacturing industry constantly attempts to negotiate better shipping rates, and fill containers with produce, in order to decrease unit cost; in the process also reducing labour costs necessary to generate finished products. Supply chain optimisation in manufacturing organisations is primarily accomplished through improvement in the speed of goods delivery, with subsequent cost reduction. Companies work to reduce physical inventory bottlenecks and negotiate better prices for raw materials.

Figure 1: Integrated Supply Chain Model in the Manufacturing Industry



Source: Adopted and modified from USAID Project deliver (2011). The model (Figure 1) clearly shows the various supply chain activities, with different characteristics within the manufacturing industry, which need to be in place for the integration of supply chains to occur.

Supply Chain Management in Nigeria: Studies of supply chains and ISCM in Nigeria are fairly new (Adebayo, 2012), with most organisations remaining unaware of the concept of integrated supply chains, and their importance for the manufacturing industry, especially that portion of the manufacturing industry involved in the production of FMCG. The primary way to speed up production is to find faster ways to move or manipulate product components, so that, by building partnerships with companies whose strengths complement their own, organisations can reduce costs, eliminate virtual bottlenecks or other intangible delays, and more quickly deliver lower-cost, finished products to the customer. Increasingly, integrated supply chains are becoming a key factor in enabling organisations to become more competitive. Hosseini, et al. (2012) take this notion further by indicating that, although little success has been achieved in ISCM by most companies, for organisations to fully implement and benefit from SCM concepts, it remains important that they integrate efficiently with their suppliers, customers, warehouses, and other intermediate value-adding partners (Hosseini et al., 2012).

3. Methodology

Most research on ISCM in the FMCG industry is relatively new, with sourcing for relevant materials conducted through searches in various databases, including; Google Scholar, Scopus, Elsevier, and the internet in general, using search strings such as FMCG, ISCM, Nigeria, SCM, sustainable integration and Competitive advantage and Integration. Articles relating to the manufacturing industry were found in the following journals: Supply chain management and international journal; Operations and supply chain management; Journal of business ethics; International journal of operations and production management; and International Journal of logistics management. Few papers were, however, found relating to the FMCG industry. The criteria used for choosing the papers were those focusing on ISCM, Manufacturing, FMCG, competitive

advantage and integrated supply chain, and those rejected focused on general SCM, and industries other than the FMCG industry.

4. Analysis and Gaps in the Literature

The FMCG manufacturing industry operates in a highly competitive environment (Li, Ragu-Nathan, Ragu-Nathan and Subba Rao, 2006). To be competitive and remain in business, it is thus imperative for this industry to introduce fresh innovations into their business processes; practice collaboration; reduce costs; and improve product quality; while reducing waste; establishing long-term supplier contracts; outsourcing processes and services where they do not have core competencies; and also making use of third- and fourth-party logistics operations and cross-docking. For organisations to successfully compete with rivals and remain in business in this era of global competitiveness will be reliant on the manner in which they harness these various improved initiatives. Arising from the fact that ISCM is a catalyst which can dictate the survival of individual organisations within the industry, as such, many of these organisations are beginning to adopt ISCM as a strategy, which is also seen to be in keeping with the practices of most global FMCG manufacturing industries.

ISCM provides organisations with the aptitude to modify the flow of resources and value over the course of entire supply chains, as well as being used as a procedure for integrating suppliers into one smoothly-operating and seamless competitive structure that can quickly and successfully provide products and services to customers. ISCM therefore acts as a replacement for SCM, serving as only one part of the operational strategy of organisations, as is the case in conventional supply chains. ISCM has been identified as a means of improving customer service delivery, value creation, performance, cost reduction and competitiveness in organisations globally (Hsu et al., 2009; Jabbour et al., 2011; Lummus and Vokurka, 1999; Stank, Keller, and Closs, 2001). Lambert et al. (1988) iterated the importance of ISCM and defined SCM as "Integration of business". However, the literature shows only about 10percent of supply chains are properly integrated (Chtzoudes & Chatzoglou, 2011, Oliva & Watson, 2011, Vilasini et al., 2012). Simchi-Levi et al. (2003) posit that some organisations have successfully implemented a supply chain, and apart from integration being possible, it will also enable organisations to perform better and be competitive.

Many theory and empirical research studies have explored implementation and adoption of ISCM in various industries, including the manufacturing industries (for example, Danese & Romano, 2011; Wolf, 2011; Adebayo, 2012; Amune & Ozuru, 2014). Surprisingly, none have been conducted in Nigeria to analyse how ISCM has been implemented and adopted in the FMCG manufacturing industry. The question pertinent to this, is to what extent the FMCG manufacturing industry has integrated their supply chain to enhance competitiveness? Arising from this, it is evident that a gap exists in the study of ISCM in Nigeria. Due to a lack of empirical studies and data on ISCM, it is somewhat difficult to provide justifiable evidence which shows its level of adoption and implementation in the country. However, several studies have been carried out in developed countries, such as the United States of America (USA), Canada, the United Kingdom (UK), Malaysia, and India, from which it becomes evident that an urgent need exists to conduct further empirical studies that will assist in providing insight into the implementation and adoption of ISCM in the FMCG manufacturing industry in Nigeria.

While studies have been conducted on SCM in other manufacturing industries, including Oil and Gas, Telecommunications and construction industries in Nigeria, few exist on ISCM in the FMCG industry. Globally, studies have been conducted that focus on the FMCG industry's SCM, but only a small number of studies have been performed on ISCM, with a particular focus on FMCG. There are many studies on ISCM in the manufacturing industry in general, but few of these focus on the FMCG manufacturing industry, specifically at the global level and Nigeria in particular. There is a lack of empirical studies on ISCM in the Nigerian FMCG manufacturing industry. Current empirical studies are limited to other manufacturing industries, which makes it difficult to compare findings with a global study. Further research may be conducted on the FMCG manufacturing industry. As such, articles dealing with ISCM and which fall within the acceptance criteria were reviewed and analysed accordingly.

5. Conclusion

Much research has been carried out on ISCM in many manufacturing industries globally. However, those carried out in relation to the FMCG manufacturing industry are limited globally with non especifically in Nigeria. Since there is no empirical evidence, a need exists for further research to ascertain whether and to what extent ISCM implementation can be found in the FMCG industry. This paper addresses the importance of ISCM, its impact on the FMCG manufacturing industry, and how it has boosted business performance and the overall economy in those countries where it has been implemented; for example, the USA, Canada, the UK, Malaysia, and India.Furthermore, it will help to provide insight into the application of ISCM in the FMCG industry and suggest ways on how SCM professionals can improve their competitiveness, customer service and bottom line. This paper contributes to the practice of supply chain theory through identification of gaps in relation to the implementation and adoption of ISCM in the FMCG manufacturing industry in Nigeria, to gain an adequate understanding of how this can assist organisations to improve their processes and enhance their service delivery, therefore leading to competitive advantage. In conclusion, this review will serve as a reference point for organisations who intend to implement ISCM in the FMCG manufacturing industry and other policymakers in any organisation who may want to earmark resources to do so.

References

Adebayo, I. T. (2012). Supply chain management practices in Nigeria today: impact of supply chain management, *European Journal of Business and Social Sciences*, 1(6), 107-115.

Ana Beatriz Lopes de Sousa Jabbour. (2011). Alceu Gomes AlvesFilho., Adriana Backx Noronha Viana., Charbel José Chiappetta, Measuring supply chain management practices. *Measuring Business Excellence,* 15(2), 18-31.

Amune, G. J. & Ozuro, H. (2014). Supply chain integration in organisations: An empirical investigation of the Nigerian Oil and Gas industry, *International Journal of Marketing Studies*, 6(6), 2014.

Bagchi, P. K., Ha, B. C., Skjoett-Larsen, T. & Soerensen, L. B. (2005). Supply chain integration: A European survey, *The International Journal of Logistics Management*, 16(2), 275-294.

Banomyong, R. & Supatn, N. (2011). Developing a supply chain performance tool for SMEs in Thailand, *Supply Chain Management: An International Journal*, 16(1), 20-31.

Bilgen, B. & Günther, H. O. (2010). Integrated production and distribution planning in the fast-moving consumer goods industry: a block planning application, *Or Spectrum*, (32), 927-955.

Chtzoudes, D. & Chatzoglou, P. (2011). The impact 360 supply chain integration on operational and business performance, *Operations and supply chain management*, 4(2/3), 145-156.

Chen, H., Daugherty, P. J. & Landry, T. D. (2009). Supply chain process integration: a theoretical framework, *Journal of Business Logistics*, 30(2), 27-46.

Ciuci Consulting. (2011). Winning in Africa: An Investor's Guide, [Online]. Available: <http://www.ciuci.us/wp-content/uploads/2011/11/Winning_In_Africa-An-investors-guide-to-FMCG-vF.pdf> [Accessed 10 July 2015].

Cowry Asset Limited. (2012). Industry Review, Nigerian FMCG Review, [Online] Retrieved Available:<http://www.cowryasset.com/uploads/reports/Cowry Report On Nigerian FMCG.pdf [Accessed 4 October 2014].

Danese, P. & Romano, P. (2011). Supply chain integration and efficiency performance: a study on the interactions between customer and supplier integration. *Supply Chain Management: An International Journal*, 16(4), 220–230.

Didia, J. U. D & Nwokah, G. (2015). Supply chain integration and Business performance in the Telecommunication Industry in Nigeria. *International Journal of Supply Chain Management*, 4(2), 81–89.

Ellegaard, C. & Kock, C. (2012). The effects of low internal integration between purchasing and operations on suppliers' resource mobilization, *Journal of Purchasing & Supply Management*, 18(3), 148-158.

Fantazy, K. A., Kumar, V. & Kumar, U. (2010). Supply management practices and performance in the Canadian hospitality industry, *International Journal of Hospitality Management*, 29(4), 685-693.

Flynn, B. B., Huo, B. & Zhao, X. 2010. The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management*, 28 (1), 58-71.

Frohlich, M. T. & Westbrook, R. (2001). Arcs of integration: an international study of supply chain strategies, *Journal of Operations Management*, 19,185-200.

Hosseini, S. M., Aziz, S. & Sheikhi, N. (2012). An investigation on the effect of supply chain integration on competitive capability: an empirical analysis of Iranian food industry, *International Journal of Business & Management*, 7(5), 73-90.

Hau Lee, Seungjin Whang. (1999). Decentralized Multi-Echelon Supply Chains: Incentives and Information. *Management Science,* 45(5), 633-640.

Hsu, C. C., Tan, K. C., Kannan, V. R. & Keong Leong, G. (2009). Supply chain management practices as a mediator of the relationship between operations capability and firm performance. *International Journal of Production Research,* 47(3), 835-855.

Kotzab, H., Teller, C., Grant, D. B. & Sparks, L. (2011). Antecedents for the adoption and execution of supply chain management, *Supply Chain Management: An International Journal*, 16(4), 231-245.

Lambert, D. M. (2008). An Executive Summary of Supply Chain Management: Processes, Partnerships, Performance, Supply Chain Management Institute, 3rd Ed.

Lambert, D. M. & Cooper, M. C. (1998). Supply chain implementation issues and research opportunities, The international journal of logistics, 9(2), 1-19.

Lead Capital Nigeria. (2009). Equity research report on Nestle Nigeria Plc, [Online]. Available: <http://www.leadcapitalng.com/resources/nestle.pdf> [Accessed 13 October 2013].

Leahy, R. (2011). Relationships in fast-moving consumer goods markets: The consumers' perspective, *European Journal of Marketing*, *4, 651-672.*

Li, S. Ragu-Nathan, B., Ragu-Nathan, T. S. & Subba Rao, S. (2006). The impact of supply chain management practice on competitive advantage and organizational performance, *The International Journal of Management Science*, 34, 107-124.

Majumdar, R. (2004). *Product Management in India*, 26–27. ISBN978-81-203-1252-4.

Manos, T. (2006). Value stream mapping – an introduction, *Quality Progress*, 39(6), 64–69.

Manzouri, M., Rahman, M. N. A. b., Arshad, H. & Ghani, J. A. (2011). Cutting down the difficulty of SCM implementation: a comparison between Iranian and Malaysian companies, *Applied Mechanics and Materials*, 44(47), 3652-3656.

Msimangira, K. A. B. & Tesla, C. (2014). Global supply chain management practices and risk facing developing countries: A case of Tanzania, Operations and supply chain management: An international journal (Forthcoming).

Oliva, R. & Watson, N. (2011). Cross-functional alignment in supply chain planning: A case study of sales & operations planning, *Journal of operations management*, 29(5), 434-448.

Ou, C. S., Liu, F. C., Hung, Y. C. & Yen, D. C. (2010). A structural model of supply chain management on firm performance. *International Journal of Operations & Production Management,* 30(5), 526-545.

Rhonda, R. Lummus. Robert Vokurka, J. (1999). Defining supply chain management: a historical perspective and practical guidelines", *Industrial Management & Data Systems,* 99(1),11-17.

Pamela, D. & Pietro, R. (2011). Supply chain integration and efficiency performance: a study on the interactions between customer and supplier integration, *Supply Chain Management: An International Journal*, 16,220-230.

Power, D. (2005). Supply chain management integration and implementation: a literature review, *Supply Chain Management: An International Journal,* 10(4), 252-263.

Sattler, H., Volckner, F., Riediger, C. & Ringle, C. M. (2010). The impact of brand extension success drivers on brand extension price premiums, *International Journal of Research in Marketing*, 27, 319-328.

Simchi-Levi, D., Kaminsky, P. & Simchi-Levi E. (2003). Designing and planning the supply chain concepts, strategies and case studies (2nd Ed) Boston: Irwin/ McGraw –Hill.

Stank, T. P., Keller, S. B. & Closs, D. J. (2001). Performance benefits of supply chain logistical integration, *Transportation Journal*, 41(2/3), 32-46.

Towill, D. R., Childer house, P. & Disney, S. M. (2000). Speeding up the progress curve towards effective supply chain management. *Supply Chain Management: An International Journal,* 5(3), 122-130.

USAID Project Deliver. (2011). Implementation of the Global Health Initiative.

Van der Vaart, T. & van Donk, D. P. (2008). A critical review of survey-based research in supply chain integration, *International Journal of Production Economics*, 111(1), 42-55.

VanVactor, J. D. (2011). A case study of collaborative communications within healthcare logistics. *Leadership in Health Services*, 24(1), 51-63.

Vilasini, N. Neitzert, T. R., Rotimi, J. O. B. & Windapo, A. O. (2012). A framework for sub-contractor integration in alliance contracts, *International journal of construction supply chain management*, 2(1), 17-33.

Wiengarten, F., Humphreys, P., Guangming, C., Fynes, B. & McKittrick, A. (2010). Collaborative supply chain practices and performance: exploring the key role of information quality. A Resource-based View of product development. *Academy of Management Review,* 2 (1), 132–142.

Wolf, J. (2011). Sustainable supply chain management integration: A qualitative analysis of the German manufacturing industry, *Journal of Business Ethics*, 102, 221-235.

Wong, C. W. Y., Lai, K. & Cheng, T. C. E. (2011). Value of information integration to supply chain management: roles of internal and external contingencies. *Journal of Management Information Systems*, 28 (3), 161-200.

Zhu, Q., Krikke, H. & Caniela, M. C. J. (2018). Supply chain integration: Value creation through managing inter-organizational learning, *International journal of operations & production management*, 38(1), 211-229.

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Technology, Financial Innovations and Bank Behaviour in a Low Income Country

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Abstract: Technology has enabled banks to introduce new products that integrate markets, simplify operations and enable expansion of business at low cost, expand to new markets, take new risks and deepen their markets. Zimbabwe registered significant growth in adoption and diffusion of financial innovations over the past two decades, which coincided with a shift in the structure of credit portfolios of banks, and growth in credit as well as risk appetite. This study empirically evaluates the impact of financial innovations in influencing bank behaviour, specifically, portfolio structure risk appetite and delivery channels of banks in Zimbabwe. The study applied co-relational analysis, Fully Modified OLS and the Dynamic OLS estimation models as well as Autoregressive Granger causality approaches. Empirical results show that technology has the capacity to influence activities of banks in risk management, credit and delivery of banking service in low-income countries. Precisely, financial innovation influences increase in credit towards previously high-risk areas, compositions of credit portfolios in banks and support growth in number of bank accounts. Causality was found to run from financial innovation to bank behaviour, and only in the long run.

Keywords: *Financial Innovation, Technology, Banks, Zimbabwe*

1. Introduction

The proliferation of information communication technology in banking enables financial innovations that influence dynamic changes in the behaviour of banks. Financial innovation involves crafting and popularizing new financial instruments, technologies, institutions, markets, procedures and business models including the new application of existing ideas in a different market context (Lerner & Tufano, 2011). Technology has enabled banks to introduce new products that integrate markets, simplifying operations and enable expansion of business at low cost. Through financial innovations, technology has created opportunities for banks to expand to new markets, take new risks, introduce new products and deepen their markets thereby redefining portfolio balance of banks. In developing markets, the last decade has seen a proliferation of innovative financial services targeted at the unbanked populations (Denyes & Lonie, 2016). Development of innovations supports increased credit by banks given improved credit scoring, monitoring, data processing and evaluation of borrowers. In respect of risk, financial innovation, on the one hand, reduces risk on some banks products and markets, allowing a reduction in risks and costs, resulting in enhancement in services (Arnaboldi & Rossignoli, 2013). On the other hand, it results in the emergence of new risks and increased the risk of some portfolios (Matthews & Thompson, 2008).

The influence of financial innovation on bank behaviour has also been evident in Zimbabwe. In Zimbabwe, there has been significant adoption and diffusion of financial innovations over the past two decades, with major innovation having been visible in the last nine years. Coincidentally, over the same period there has been a shift in the structure of credit portfolios of banks, with growth in credit in sectors that were previously regarded as high-risk areas. Clear examples have been growth in consumer/household lending from 1.3% of total credit in March 2009 to 22.2% in March 2017 (RBZ, 2017). In addition, banks began to expand into previously marginalised areas through microfinance activities and to adopt non-traditional delivery channels including digital channels. Banks are making a significant investment in technology, particularly to expand delivery models including mobile banking, agency banking, the point of sale (POS) and internet banking. Banks are also significantly driving adoption of plastic money and use of non-cash payment systems for transactions. The Reserve Bank of Zimbabwe statistics showed that transactions on the point of Sale, which uses debit cards, increased by 736.7% from USD$55.8 million in January 2011 to USD$466.9 million in May 2017. Mobile money transactions grew by 3372% from US$23.5 million in January 2011 to US$ 792 million in

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May. This growth was driven not only by the obtaining cash shortages of liquidity challenges, but as a strategy to enhance growth in business. Banks have also been changing their business models and the structure of their institutions. Banks are getting thinner on branch network, whilst increasing footprint through agencies and on mobile platforms. Literally, bank behaviour is gradually shifting, due to innovations. Preliminary assessment indicates that the new financial products in banking, the changes in risk appetite, expansion of delivery channels and business expansion in banking in Zimbabwe all came as a result of positive developments and reaction to challenges in the economy. Notwithstanding the effects of economic changes in the country, intuition suggests that technology and financial innovations have also enabled and supported this dynamic shift in the conduct of Zimbabwean banks. This study empirically evaluates the impact of financial innovations in influencing bank behaviour, specifically, portfolio structure, risk appetite and delivery channels of banks in Zimbabwe. The study contributes to the literature on financial innovations and risk-taking behavior of banking and structural transformation of banks. Literally, the study essentially evaluates the role of innovations and technology in influencing the future of banking.

Technology and Financial Innovations in Zimbabwe: Zimbabwe has been keeping pace with other developing countries in embracing technology and in the adoption and introduction of financial innovations in banking. For instance, the country was also among the first countries in Southern Africa to introduce computers in banking in the 1950s, to have ATMs in the early 1990s, and lately mobile banking among other fin tech products. Historically, the country's adoption and the introduction of financial innovations, in the 1970s and 1980s, was limited, presumably due to a closed financial system, with the "diffusion gap" (cross-country effects) being over 20 years (Bara, 2017). The international financial institutions played a big role in introducing and supporting innovation in the Zimbabwean banking sector. The financial liberalisation which occurred in the 1990s triggered the expansion of the financial sector, resulting in the emergence of local banks and financial institutions. This brought competition in the market and smaller banks, predominantly indigenous, had to look beyond ordinary banking practice for survival. These banks became more aggressive in financial innovation, embracing new technology and introducing new products in order to remain competitive.

Fundamentally, the openness of Zimbabwe's financial sector following financial liberalisation enabled increased penetration of innovations (Bara, 2017). Financial innovation slowed down during the period from 2000 to 2008 when the country underwent a phase of economic decline. During the period, the country's financial system was affected by hyperinflation that resulted in the loss of value of the country's currency. As such, the introduction and adoption of new products was minimal as banks concentrated on survival. For example, innovative products such as derivatives that had been introduced to the market in the late 90 s, were discontinued. A number of savings products in banks were discontinued as the value of savings were eroded by inflation. Zimbabwe officially abandoned its domestic currency in February 2009 following the period of economic decline from 2000-2008, following the collapse of the domestic currency (RBZ, 2010). The country replaced its currency with a basket of hard currencies under a system called 'multicurrency' and managed to contain the hyperinflation and stimulated economic activity. After the introduction of the multicurrency system, the banking sector recorded some positive developments, which included a rapid growth in financial innovation, adoption of modern technology in banking and rolling out of delivery channels such as mobile and agency banking, POS machines, Straight Through Process (STP) systems.

The country also joined the SADC Integrated Regional Electronic Settlement System (SIRESS) system, and began processes of implementing to Basel 2, among other developments. The sector also recorded growth in credit, deposit, and subsequently profitability and capitalisation of some banks. Due to competition, in the first 2 years of dollarization (multicurrency system), banks aggressively expanded lending in order to increase their market share. Also due to increased mechanisms of monitoring borrowers and reduced KYC requirements, banks began to expand into consumer lending, which previously was considered high risk. Banks also had to invest in technology, with some introducing microfinance in their portfolios, to target the consumer market, partly as a result of a decline in corporate business as capacity utilization in the manufacturing sector receded. To attract business, banks began issuing medium to long-term loans, but these were financed by short-term deposits and lines of credit. The disproportionate lending by banks resulted in the growth of non-performing loans on banks loans and the challenge was compounded as more medium to long-term loans were maturing.

The non-performing loans (NPLs) reach a peak of 20.1 per cent in September 2014 from a low rate of 1.8 per cent recorded in Feb 2009. These non-performing loans were mainly driven by the high cost of borrowing in the market, aggressive lending by banks on the back of weak credit risk management including inappropriate loan structuring, the absence of robust credit reference systems and governance issues particularly insider loans (RBZ, 2013). A number of banks also faced challenges emanating from the tight capital requirements, liquidity challenges and a general slowdown in the economic environment, which affected a number of banks. Resultantly, some banks collapsed, other banks resized, adjusting to shrinking macroeconomic environment, increasing NPLs and declining business. However, during the same time, a number of banks invested in delivery channels, including mobile banking and POS machines and began rolling out agency banking as measures to expand business at low cost. Banks were also expanding delivery channels, and started to offer credit to previously risky areas whilst de-risking in other traditional sectors. These and many other new innovations seemingly influenced bank behaviour, particularly on risk appetite, institutional structures and business focus. It is, therefore, not clear whether the change in strategy by banks was driven by technology, financial innovations or other factors and considerations. What is observable, though, is that there has been a gradual increase in the adoption of new innovations by the banking sector in Zimbabwe in recent years.

2. Literature Review

(Utterback & Afuah, 1998) views innovation as the use of technical knowledge to offer new products and service that the market wants. Financial innovations comprise technological advances that enable access to information, trading and support varying forms of payment (Solans, 2003). (Frame & White, 2004) and (Lewis & Mizen, 2000) relate the presence of financial innovation to the changing needs of customers, circumstances of providers, market conditions, policies and technology. (Laeven, et al., 2015) explain that financial innovation is not only restricted to the invention of new financial products and instruments, or financial institutions, but also includes financial improvements in data processing and credit scoring that enhances evaluation of borrowers by banks (Laeven, et al., 2015). Innovation permits reduction in costs and risk as well as an improvement in services (Arnaboldi & Rossignoli, 2013). Financial innovation is driven by the need to establish new and effective ways of increasing profitability by market participants (Bilyk, 2006). In respect of risk, on one hand financial innovation reduces risk on some banks products and markets, including credit risk. On the other hand, financial innovation has resulted in the emergence of new risks and increasing risk on some portfolios.

By allowing new products and activities on their portfolios, banks also expose themselves to new risks associated with the provision of this service (Matthews & Thompson, 2008). The ***Consultative Group to Assist the Poor (CGAP)*** pointed out that implementing digital financial services come with new risks that are beyond operational and technical risks. Financial innovation thus forces banks to redefine their risk management strategies, shifting risk preferences and in the process influencing the risk-behaviour of banks (Denyes & Lonie, 2016). Banks decisions in a regulated banking sector are heavily influenced by financial innovation (Kero, 2013). Banks achieve improvements in the costs and capacity of lending due to improvements in "back-office" technologies, whilst consumers benefit from improved "front-office" technologies (Berger, 2003). Effective financial innovations reduce costs and risks of service and also provide enhanced services to users. The advancing technology is permitting new financial products and effective risk management systems, while removing bias on varying approaches that enhance decisions by risk managers (Harle, et al., n.d). Technology, mainly mobile phones and networks of agents, is enabling previously excluded low-income individuals, microenterprises and marginalised people access financial services (Denyes & Lonie, 2016).

(Berger, 2003) Indicted that banks use financial technologies to create and value new securities, assess the distribution of returns, and in making decisions on portfolios. For examples, banks employ financial engineering to generate new financial products such as derivatives, risk models that are applied to the management of exposure, and design modern credit scoring and to assess credit requests (Berger, 2003). Financial innovations are also reshaping the banking processes, and the structure of financial institutions. (Llewellyn, 2009) noted that financial innovation driven instruments meant to alter credit risk produced new banking models that changes banking in an essential way. Customers' anticipations of banking services are changing with the emergence and evolvement of technology and new business models (Harle, et al., n.d).

Financial innovations, trusted by the growing ownership in mobile and smartphones, are reshaping the customer experience and transforming customer expectations, forcing banks to continuously invest in core systems and processes (Ernst&Young, 2015). In today's banking industry, varied and satisfying experience by the customer has become more important than the mere provision of financial services (Kamra, 2014). (Ernst&Young, 2015) Projected that the cost of banking services in emergent markets would decrease considerably, with mobile penetration rates increased significantly, if biometric security enabled mobile wallets to become the standard. The functions of retail banking, as well as relationship managers in banking, will be changed by technology as technology-based interfaces are increasingly used (Ernst&Young, 2015). Financial engineering could assist with decomposition, transferring and pooling of risks in line with the risk appetite of lenders and improve the existing options for managing risk (Jenkinson, et al., 2008). The desired risk appetite helps facilitate business portfolio decisions based on a comparison of risk-return profiles (Hyde, et al., 2009). Technical progression could support the growth of bank sizes through the creation of new services that enhances scale economies and by facilitating consolidation (Berger, 2003).

Technology would also drive the geographic expansion of banks beyond the scale effects of bank expansion (Berger, 2003). The institutional structural changes and change in banking processes are also triggered by disruptions that banks are now facing, mainly driven by innovation in information technology. New gadgets and devices are affording various customer touch points with banking, providing an information trail that banks should use to move their bottom line upwards (Kamra 2014). Banks face renewed competition in facilitating transactions, particularly transfers and payments driven by IT corporations, and are forced to react to the competition (Khayrallah, et al., 2015). In support of this argument, (Khayrallah, et al., 2015) noted that in the developing countries, nearly three billion people depend on mobile telecom operators, rather than banks, to manage their funds. A fin tech expert with KPMG Ireland pointed out that banks are prioritising investment in own technologies, mainly innovations in payments and lending, ahead of exterior start-ups (Cogley, 2016). Such investments are in line with the need to reduce operating cost, and subsequently reducing staffing levels (Cogley, 2016).

Regarding risk management, technology and financial innovations brings in two dimensions, where on one end banks are able to manage risk due to technology. On the other end, technology is bringing in new sophisticated risks, some of which banks are not able to anticipate and manage upfront, resulting in crises. Financial innovation in the banking sector increases the demand for risk management techniques in the primary and secondary markets (Kero, 2013). Growth in the degree of financial innovation enables banks to better hedge their idiosyncratic risk and exposing them to less total risk in their investment and therefore increase their inclination towards acquiring riskier assets (Kero, 2013). The increased appetite for risk would push banks to even venture into other portfolios which were considered un-bankable, thereby changing the portfolio balance. For example, financial innovation increases the demand for credit derivatives as they inevitably become better and efficient instruments for hedging of risk (Kero, 2013). Financial innovations, with the ability to pool and transfer risk, are capable of insulating the financial systems against negative shocks, thus can be used for effectively improving risk management (Jenkinson, et al., 2008).

Ordinarily, financial risks are generally categorized as credit, liquidity and interest rate risk as these relate to the management of a banks' balance sheet. (Beyani & Kasonde, 2005) opinioned that sophisticated structured products such as derivatives have resulted in banks being increasingly exposed to other risks, such as, market and operational risk. Banks may assume significant risks when they engage in a complex structured finance transaction (Bies, 2004). (Harle, et al., n.d) added that risk functions of banks would also have to cope with the evolution of newer types of risks brought by technology, including cyber risk, contagion risk and model risk, and, all of which demand new skills and tools to management. Innovations in credit risk management, including credit default swaps and synthetic collateralized debt obligations are some of the complex structured finance transactions introduced recently (Bies, 2004). Risk often increases exponentially with changes in technology, but generally bankers are sluggish in adjusting their perception of risk (Greuning & Bratanovic, 2003). Implicitly, the market's is thus capable of being innovative than understanding and accommodating the accompanying risk (Greuning & Bratanovic, 2003). The empirical literature also supports the effect of financial innovations and technology on bank behaviour, particularly risk-taking behaviour. (Norden, et al., 2014) finds out that banks with significant credit derivatives charge considerably low corporate loan margins, and the banks' net positions are not linked to loan pricing.

In addition, they also establish that such banks reduce their lending much less than other banks during the crisis and always have lower loan charges (Norden, et al., 2014). The innovation ignited a global financial crisis and this caused a shift in the risk functions. These included additional requirements in the capital, liquidity, and funding, as well as higher standards for reporting risk (Harle, et al., n.d). Innovation has also driven the development of complex structured finance transactions that may expose the financial institution to elevated levels of risk (Bies, 2004). The management of other risks outside the financial sector became more essential as the standards for compliance and conduct tightened (Harle, et al., n.d). (Kero, 2013) showed how financial innovation explains the strong growth in primary and secondary credit markets in the US, since the 1990s. In addition, (Kero, 2013) observed that financial innovation enables banks to reduce the risk through investing in credit derivatives in the secondary markets. Their study results show that financial innovation increases bank appetite for risky investment, credit derivatives acquisition and the portfolio variance (Kero, 2013). A study by (Irungu, 2014) revealed that financial innovations, that is, institution, product and process innovations- have a positive effect on management of credit risk of commercial banks in Kenya. Findings by (Santomero & Trester, 1998) insinuate that the risky asset portfolio held by banks explicitly increases due to innovations. (Iman, 2011) concluded that the market and other banks play an important role in influencing the adoption of e-banking services and, that, innovation and dynamism are mostly driven by smaller and newer banks than bigger and older banks.

3. Methodology and Data

Various studies use different approaches and methodologies to assess the impact of technology on banks. This study applies a quantitative approach to estimate the effect of technology and financial innovation on bank behaviour in line with (Norden, et al., 2014), (Irungu, 2014) and (Kero, 2013). (Norden, et al., 2014) used a standard loan pricing model, expressed as a general linear regression model to assess the effect of credit derivative on loan interest margins. (Kero, 2013) estimated a linear regression model, and add the Constant Absolute Risk Aversion (CARA) Normal specification of the model that permits generation of closed-form expressions for the demand of risky assets and for the demand of credit derivatives. (Brandon & Fernandez, 2005), (Beyani & Kasonde, 2005) and (Irungu, 2014) used qualitative approach using narratives to review how credit derivatives affect risk management. The study used dynamic and fully modified ordinary least squares approaches to estimate the link between financial innovations and bank behaviour. The paper also applied ordinary covariance analysis, testing the strength of the correlations between financial innovation index and variables that measure bank behaviour (bank credit- total and to individuals, branches and bank accounts). Correlation quantifies the extent to which two quantitative variables, move in sync. The Spearman's rank order test was used as it applies to non-linear relationships and disregards the distribution of the variables (Hauke & Kossowski, 2011).

Model Specification: The study model departs from the basic linear financial model that relates financial innovation to the financial outcome as below:

$$y = \alpha + \beta f + \gamma X + \varepsilon \quad (1)$$

where y is bank behaviour outcome, f is a vector of financial innovation and technology measures, $\boldsymbol{X_i}$ is a matrix of control variables. This study model framework as outlined in equation (2) below.

$$BB = \alpha + \beta FII + \gamma X + \varepsilon \quad (2)$$

Where BB is bank behaviour variables, which are be represented by adversely classified loans denoting credit risk; domestic credit to private sector and credit to individuals denoting credit portfolios; bank accounts representing business growth; and bank branching capturing delivery channel. X a set of control measures, F is a vector of financial innovation and technology measures proxied by a Financial Innovation Index (constructed from integration of values transacted through Automated Teller Machines, the Internet, Point of Sale machines, Mobile Banking, Electronic Transfers and Cheques), whilst, ε is the error term, and α, β and γ are parameters to be estimated.

$$\begin{bmatrix} ACL\_TL \\ CR \\ IND \\ BNKACC \\ BRNCH \end{bmatrix} = \alpha_i + \beta_i[FII] + \gamma_i \begin{bmatrix} LIQ \\ NIM \\ GGDP \\ DTA \\ LTD \end{bmatrix} + e_i \qquad (3)$$

where:

ACL_TL is Adversely Classified Loans to Total Loans
CR is Domestic credit to Private Sector
IND is credit to individual borrowers
BNAKACC is Bank Accounts
BRNCHis Bank branches

FII is Financial Innovation Index

LIQ is Liquidity
NIM Net interest margin
CAR is Capital adequacy ratio
GGDP is Gross Domestic Product growth
DTA is Deposit to Assets ratio
LTD is loan to deposit ratio

To estimate this model, the study runs three estimation models, the Ordinary Least Squares (OLS), the Fully Modified OLS (FMOLS) and the Dynamic OLS (DOLS). The rationale is that OLS estimators contain the 'second-order bias despite the estimators being consistent in the presence of a serial correlation in the error term and/or a correlation between the regressors and co-integration errors. To deal with this problem, the study runs Phillips and Hansen (1990)'s Fully modified least squares (FMOLS) estimator and (Stock & Watson, 1993)'s Dynamic Least Squares (DOLS). Besides, given that a few variables are stationary in difference when most variables are stationary in levels, co-integrating regressions (the FMOLS and DOLS) would be ideal to establish a long run relationship. FMOLS was designed by (Phillips & Hansen, 1990) to provide optimal estimates of co-integrating regressions. Based on Monte Carlo simulations, the FMOLS method is suitable for small samples as it produces reliable estimates and is able to test for robustness. The method also changes least squares to account for the endogeneity in the regressors and for serial correlation effects that result from the existence of a co-integrating relationship (Phillips & Hansen, 1990).In other words, DOLS can obtain efficient estimators for the co-integrating vectors involving deterministic components and accommodates varying orders of integration (Stock & Watson, 1993) and also account for possible simultaneity within regressors (Masih & Masih, 1996).

Granger Causality: Causality test was performed to establish the direction of causality between bank behaviour and financial innovation. The Granger causality means past values of the independent and the dependent variables help in explaining future values of the dependent variable. The set of equations for testing the Granger Causality test using an autoregressive approach can be represented as follows: -

$$BB_t = \sum_{i=1}^{n} \alpha_i FI_{t-i} + \sum_{j=1}^{n} \beta_j BB_{t-j} + u_{1t} \qquad (4)$$

$$FI_t = \sum_{i=1}^{n} \lambda_i FI_{t-i} + \sum_{j=1}^{n} \delta_j BB_{t-j} + u_{2t} \qquad (5)$$

Equation 4 represents an auto-regressive (AR) model that was converted to an auto-regressive model of order 2 (AR (2)) by setting n equal to two (Bara, et al., 2016). The lagged dependent variable under explanatory variables is meant to capture self-propelling causality effects. A test for Granger causality in a panel model tests the significance of$\alpha_1 = \alpha_2 = 0$ and $\lambda_1 = \lambda_2 = 0$ using a χ^2 with two degrees of freedom (Caporale, et al., 2009). This study runs the restriction of $\alpha_1 + \alpha_2 = 0$ and $\lambda_1 + \lambda_2 = 0$ to test for the long-run linkage between bank behaviour and financial innovation.

Data and Variables: The paper uses quarterly data for Zimbabwe, covering the period 2009 to 2016. The data were obtained from the Zimbabwe Statistical Agency and Reserve Bank of Zimbabwe. Measures used to capture bank behaviour were selected to represent credit risk behaviour (adversely classified loans as a proportion of total loans), portfolio preference of banks (domestic credit and credit to individuals as a proportion of total credit) as well as bank behaviour on delivery channel (branches) and business expansion (bank accounts). The definition of the variables used in this study are shown below, (Table 1).

Table 1: Variables and Description

Variable Category	Variable	Description
Dependent Variables- Bank Behaviour	ACL_TL	Adversely Classified Loans to Total Loans
	CR	Credit to the domestic private sector
	IND	Bank credit to individuals as a proportion of total credit
	BRNCH	Bank branches per 100000 adults
	BNKACC	Bank accounts per 1,000 adults
Financial Innovation Index (FII)	ATM	Values transacted through Automated Teller Machines
	Internet	Values transacted through the Internet
	POS	Values transacted through the Point of Sale machines
	Mobile	Values transacted through the Mobile Banking
	ZETSS	Values transacted through the Electronic Transfer
	Cheque	Values transacted through the Cheque
Control Variables	GGDP	Growth in Gross Domestic Product
	NIM	Net Interest Margin
	CAR	Capital Adequacy Ratio
	LIQ	Liquidity ratio
	DTA	Deposit to Total Assets
	LTD	Loan to Deposit

The Composite Financial Innovation Index (FII): Financial innovation was presented as an index of a number of variables that measure financial innovation products and processes combined together using the Principal Component Analysis (PCA) approach. Using the PCA, the FII was created using six variables namely values transacted through Automated Teller Machines, Internet, Point of Sale machines, Mobile Banking, Electronic Transfer and Cheques. The purpose of a composite index was to combine the effect of the various measures of financial innovation on bank behaviour. To establish this, a weighted linear combination of the original values was formulated with the weights being the set of uncorrelated principal components of the original variables. Thus the principal components for $\boldsymbol{n}$ set of variables from $\boldsymbol{X_1, X_2, \ldots X_n}$, would be as follows (Jolliffe, 2002):-

$$\boldsymbol{PC_i = \sum_{i=1}^{n} a_i X_i = a_1 X_1 + a_2 X_2 + \cdots + a_n X_n}$$

$\boldsymbol{PC_i}$ is the principal component, $\boldsymbol{a_i}$ represents the linear weights and $\boldsymbol{X_i}$ is the matrix of correlated variables of interest. In this case, three PC extracts will be generated from the original six variables and ordered in such a way that the first PC explains the largest amount of variation in the data (Jolliffe, 2002). The order in this study was determined by volume of transactions of the innovation. The composite index was then calculated from the six principal components from the first principal component contains the largest amount of information common to all of the variables of interest.

$$\boldsymbol{FII = a_1 ZETSS + a_2 Mobile + a_3 POS + a_4 ATM + a_5 Internet + a_6 Cheque}$$

Stationarity Tests: The stationarity or otherwise of a series can strongly influence its behaviour and properties - e.g. persistence of shocks will be infinite for non-stationary series. If two variables are trending over time, a regression of one on the other could have a high R2 even if the two are totally unrelated, leading to spurious regressions. If the variables in the regression model are not stationary, then the standard assumptions for asymptotic analysis would not be valid. The study carried out a stationarity test and results are presented in Table 2.

Table 2: Stationarity Tests

Variable	Augmented Dickey-Fuller test statistic	Level of Stationarity
ACL_TL	-4.7207***	I(0)
BNKACC	-2.9977**	I(0)
BRNCH	-5.7688 *** (intercept and trend)	I(0)
CAR	-2.7051*	I(0)
CR	-3.3715**	I(0)
DTA	-3.7473***	I(0)
FII	-2.8005** (intercept and trend)	I(0)
GGDP	-5.3917*** (intercept and trend)	I(0)
IND	-2.7002*	I(0)
LIQ	-3.6653***	I(0)
LTD	-3.8389***	I(0)
NIM	-2.7438*	I(0)

*, **, *** statistically significant at 10%, 5% and 1%, respectively

Variables are stationary in levels except for bank branches, GDP and Financial Innovation index which is level stationary in trend and intercept (Table 2). As such, the study employs co-integration regression approaches, FMOLS in line with (Phillips, 1995) and DOLS to estimate the long-run effects of financial innovation on bank behaviour.

4. Findings and Discussion

Correlation Analysis: Results in Table 3 indicates a positive correlation between financial innovation and bank credit; credit to individuals; bank branches; and bank accounts. Financial innovation is, however, negatively related to Adversely Classified Loans.

Table 3: Correlation Analysis between Financial Innovation and Bank Behaviour Variables
Covariance Analysis: Ordinary

Probability	ACL_TL	CR	IND	BNKACC	BRNCH	FII
ACL_TL	1					
CR	0.4914***	1				
IND	0.4841***	0.9615***	1.			
BNKACC	0.023831	-0.3804**	-0.3471*	1.		
BRNCH	0.261258	0.9423***	0.9085***	-0.4374**	1.	
FII	-0.190667	0.4939***	0.5489***	0.118311	0.5413***	1.

*, **, *** statistically significant at 10%, 5% and 1%, respectively

The correlation is, however, statistically significant for bank credit, credit to individuals, and bank branches. Indicatively, the results show that banks consideration of credit and branches are influenced by financial innovation. This result is in line with (Lerner & Tufano, 2011) that financial innovation popularizes new financial instruments, technologies, institutions, markets, procedures and business models including the new application of existing ideas in a different market context. Consistent with results, in Zimbabwe, financial innovation enabled introduction of banking delivery and payment systems such as ATMs, Mobile Banking, Electronic payment systems and Point of Sale and Internet Banking, all of which were included in the financial index. As to what causes the other, this would require the application of econometric models to test the causal relationship.

Econometric Estimation Results: The study carried out econometric estimations on three broad areas, one to estimate the linkage between credit risk and financial innovation, second the relationship between credit portfolio and financial innovation and lastly between delivery channels as well as business expansion (bank accounts) and financial innovation.

Credit Risk and Financial Innovation: Results in Table 4 shows that financial innovation generally impacts negatively on credit risk in banks. The negative impact of financial innovation on credit risk is statistically significant under Dynamic Ordinary Least Squares.

Table 4: Credit Risk and Financial Innovation

Dependent Variable: ACL_TL			
Exogenous variables	**Ordinary Least Squares (OLS)**	**Fully Modified Least Squares (FMOLS)**	**Dynamic Least Squares (DOLS)**
Financial Innovation	-0.00009	-0.000005	-0.0006**
Deposit to Total Assets	0.0268	-0.0122	-0.6439**
Domestic Credit	0.0011*	0.0010***	-0.0001
Liquidity	0.7450***	0.7452***	0.4825***
Capital adequacy ratio	-1.8168***	-1.8247***	-1.6242***
Growth in GDP	0.0001	0.0001**	-0.00007
Constant	0.1890**	0.2157***	0.7185***
R-sqd	0.988092	0.983264	0.999538
Adj R-sqd	0.985234	0.979081	0.996765

*, **, *** statistically sig at 10%, 5% and 1%, respectively

Indicatively, the results suggest that in the long run, financial innovation reduces banks' credit risk, as shown by the dynamic OLS, as one of the co-integrating regressions, shows long-term effects. The results are in support of (Arnaboldi & Rossignoli, 2013) that financial innovation reduces risk on some banks products and markets, including credit risk. The rationale could be that financial innovation is enhancing monitoring of borrowers, assist in credit management such that the number of adversely classified loans is reduced a financial innovation increase. The results could also be indicating that financial innovation is influencing banks towards introducing transactional and non-funded products than funded products, hence the gradual reduction in credit risk with improvement in technology. Financial innovation is bringing more of transactional income and banks become more reliant on non-funded income rather than funded income, particularly in the back of high NPLs in the sector.

Credit Portfolio and Financial Innovation: Results in Table 5 shows the outcome of estimations of the effects of financial innovation on banks' decision on credit portfolio. Econometric estimations indicate that financial innovation is statistically significantly linked to domestic credit under the DOLS model, where it results in a reduction in domestic credit (Table 5). The results, however, indicate that financial innovation has a relatively strong and positive effect on credit to individuals (0.0128 and 0.018 under OLS and FMOLS respectively). The result is consistent with (Berger, 2003) who noted that that banks use financial technologies to make portfolio decisions among other. And just as (Hyde, et al., 2009) noted that desired risk appetite helps facilitate business portfolio decisions based on a comparison of risk-return profiles, financial innovation by the bank in Zimbabwe pushed an increase in credit to individuals than total general credit, indicative of a shift in the portfolio and desired risks. The results are in line with (Kero, 2013) that growth in the degree of financial innovation enables banks to better hedge their idiosyncratic risk and acquire riskier assets. The fact that banks in Zimbabwe readjusted their credit portfolio and increased lending to individuals could have been influenced by the availability of technology and mechanism of managing risks associated with lending to individuals.

The use of financial innovation and technology to be able to monitor lending to previously high-risk areas of consumer lending have altered the banks' risk appetite for consumer lending. The availability of financial innovation to reach out to more individuals, coupled with high repayment rates by individuals, forces banks to increase consumer lending. The results thus are indicative of increased risk appetite for banks due to financial innovation. The results are indicative of the fact that financial innovation influences banks to redistribute credit from other sources towards individuals. In Zimbabwe, the growth in NPLs, before the introduction of ZAMCO, a special purpose vehicle created by the Reserve Bank of Zimbabwe to house bank NPLs, had driven most banks to reduce lending to productive sectors and increase lending to individual borrowers. Some of the borrowers classified as individuals would be entrepreneurs who are operating in the informal sector, as such financial innovation has enabled banks to be able to monitor them and hence tolerate

risks in these sectors. As such, bank risk taking behaviour has been responsive to financial innovation. Also, the prevailing cash shortage has pushed up demand for plastic money and subsequently need for bank accounts by the general public. Banks had to invest in ICT systems and fin tech products in order to accommodate the increasing volumes as well as provide alternative payment platforms to counter the cash shortages.

Table 5: Credit Portfolio and Financial Innovation

Endogenous variable	Exogenous variables	Ordinary Least Squares (OLS)	Fully Modified Least Squares (FMOLS)	Dynamic Least Squares (DOLS)
Domestic Credit	Financial Innovation	0.0738	0.0094	-0.3044**
	Liquidity	37.9120***	35.1475***	131.729
	Net interest income	-47.6104	-81.0290	881.659
	Capital adequacy ratio	-18.0180	-12.7742	309.082
	Bank accounts	-0.0026	1.06E-05	0.0082
	Growth in GDP	-0.0864***	-0.1030***	-0.1720***
	Constant	-10.327	-8.8466*	-128.6341
	R-sqrd	0.9165	0.9011	0.9980
	Adj-R-Sqrd	0.8965	0.8763	0.9865
Credit to Individuals as a proportion of total credit	Financial Innovation	0.0128**	0.0180***	0.0090
	Bank Accounts	-0.0003	-0.0004	-0.0001
	Liquidity	2.2980**	2.3083***	-50.372*
	Capital Adequacy ratio	-2.1328	-2.1952	71.320*
	Growth in GDP	-0.0042**	-0.0030*	-0.0035
	Net Interest Income	-6.9070	-9.4443*	-420.637**
	Constant	-0.3241	-0.2436	26.480**
	R-Sqrd	0.9165	0.9016	0.9960
	Adj-R Sqrd	0.8965	0.8770	0.9725

*, **, *** statistically significant at 10%,5% and 1%, respectively

In terms of control variables, only Liquidity significantly support credit, both domestic and to individuals. This is consistent with the theory that growth in money supply is normally followed by or results in an increase in credit. GDP is negatively related to credit consistent with findings and explanation by (Phakedi, 2014) (Le Roux & Moyo, 2015) and (Bara & Mudzingiri, 2016). Other control variables are not statistically significant.

Delivery Channel, Business Expansion and Financial Innovation: Results in Table 6indicate that financial innovation is positively related to bank accounts, implying that financial innovation influences the number of accounts a bank offers. The results are reflective of the developments in the banking sector where-in technology has enabled banks to expand the number of accounts issued. Banks have been making a significant investment in ICT systems to support growth in demand for bank accounts. On other variables, the only GDP positively supports growth in the number of bank accounts. The estimation results also show that financial innovation is not statistically significant in supporting the growth of bank branches. This result is consistent with the notion that financial innovation is actually threatening the existence of branches or expansion of banks through branches as it brings relatively cheaper ways of delivering banking services to outlying areas. In Zimbabwe, a number of the pan- African and international banks have few branches yet they are among the top performers. There has been growth in alternative delivery channels such as agency banking and digital platforms such as mobile banking, internet banking and POS machines.

Table 6: Bank Accounts, Branches and Financial Innovation

Endogenous variable	Exogenous variables	Ordinary Least Squares (OLS)	Fully Modified Least Squares (FMOLS)	Dynamic Least Squares (DOLS)
Bank Accounts	Financial Innovation	16.884***	15.4370***	22.1336
	Bank Branches	-1.5165	-1.1601	0.1600
	Growth in GDP	4.3705***	4.0574***	5.3836
	Credit to Individuals	31.569	28.1579	-42.2351
	Constant	66.9463***	66.4096**	49.5389
	R-sqrd Adj-R-Sqrd	0.5919 0.5315	0.5870 0.5235	0.7130 0.3304
Bank Branches	Financial Innovation	0.3151	0.3042	0.5960
	Bank Accounts	-0.0149	-0.0151	-0.0692
	Liquidity	116.471***	129.369**	72.100
	Growth in GDP	-0.4128***	-0.3931***	-0.2749**
	Deposit to Assets	-113.351	-40.5541	432.622
	Constant	34.7329	-17.9497	-292.403
	R-Sqrd Adj-R Sqrd	0.8569 0.8293	0.8424 0.8108	0.9920 0.9720

*, **, *** statistically significant at 10%,5% and 1%, respectively

Granger Causality Test: Granger causality (Table 7) between bank behaviour and financial innovation is only present in domestic credit and bank branches. In both cases, causality moves from financial innovation to bank behaviour and causality is present in the long run. With domestic credit, causality results imply that in the long run financial innovation causes a reduction in domestic credit (-0.02556). The rationale could be that financial innovation enables banks to increase revenue and earnings from non-funded sources through transactions based revenue and this could push banks to reduce lending, given the increase in NPLs. Indicatively, in the long run, financial innovation seems to support facilitation of banking transactions and not much on the enhancement of credit expansion and quality of credit. Consistent with the result, most fin tech products, including mobile banking that is supported by banks or introduced by banks are not inclined to credit. In respect of bank branches, results show that in the long run, financial innovation causes a reduction (-0.3237) in the bank branches, per 100 000 people, in Zimbabwe. The causality result is consistent with theoretical and practical expectations on the effect of technology and innovation on the bank's branch network. Financial innovation is expected to reduce the number of traditional bank branches as banks are using alternative methods to reach to markets. For example, financial innovation has enabled banks to use mobile banking, internet banking, agency banking and other alternative delivery channel to offer banking service. As such, bank behaviour in terms of expansion of branches would be negatively affected by financial innovation in the long run.

Table 7: Granger Causality Tests Bank Behaviour and Financial Innovation

	Granger causality test between Credit risk and Financial Innovation			
	Credit risk Dependent		Financial Innovation Dependent	
Short-run	FI(-1)=FI(-2)=0		ACL_TL(-1)=ACL_TL(-2)=0	
	Wald test Chi-square	0.3786	Wald test Chi-square	0.3037
Long-run	FI(-1)+FI(-2) = 0.00032		ACL_TL(-1)+ACL_TL(-2) = 0.593	
	Wald test Chi-square	0.2347	Wald test Chi-square	0.2386
	Granger causality test between Domestic Credit and Financial Innovation			
	Domestic Credit Dependent		Financial Innovation Dependent	
Short-run	FI(-1)=FI(-2)=0		CR(-1)=CR(-2)=0	
	Wald test Chi-square	3.1142	Wald test Chi-square	2.3433
Long-run	**FI(-1)+FI(-2) = -0.02556**		CR(-1)+ CR(-2) = 0.1228	
	Wald test Chi-square	**2.9176***	Wald test Chi-square	2.2473

	Granger causality test between Individual credit and Financial Innovation			
	Individuals Credit Dependent		Financial Innovation Dependent	
Short-run	FI(-1)=FI(-2)=0		IND(-1)=IND(-2)=0	
	Wald test Chi-square	0.9544	Wald test Chi-square	2.2423
Long-run	FI(-1)+FI(-2)= -0.0008		IND(-1)+ IND(-2) = 1.4582	
	Wald test Chi-square	0.2644	Wald test Chi-square	1.5112
	Granger causality test between Bank Account and Financial Innovation			
	Bank Account Dependent		Financial Innovation Dependent	
Short-run	FI(-1)=FI(-2)=0		BNKACC(-1)=BNKACC(-2)=0	
	Wald test Chi-square	0.8762	Wald test Chi-square	0.2682
Long-run	FI(-1)+FI(-2)= 1.0591		BNKACC(-1)+ BNKACC(-2)=0.0003	
	Wald test Chi-square	0.1691	Wald test Chi-square	0.0457
	Granger causality test between Bank Branches and Financial Innovation			
	Bank Branch Dependent		Financial Innovation Dependent	
Short-run	FI(-1)=FI(-2)=0		BRNCH(-1)=BRNCH(-2)=0	
	Wald test Chi-square	4.2858	Wald test Chi-square	2.2376
Long-run	**FI(-1)+FI(-2)= -0.3237**		BRNCH(-1)+ BRNCH(-2)=-0.0446	
	Wald test Chi-square	**4.2438****	Wald test Chi-square	2.1511

*, **, *** statistically significant at 10%, 5% and 1%, respectively

5. Conclusion and Recommendations

The paper put forward a discussion on the influence of financial innovation on bank behaviour, focusing on banks' decision regarding risk-taking; branch network and expansion of delivery channels for banking services. Empirical results show that financial innovation influences banks in Zimbabwe to increase credit towards previously high-risk areas. This is enabled by fin tech products that enhance credit monitoring, ensures high reach and access to financial service as well as improved models of credit management that are being introduced by banks. The ability of banks to monitor borrowers due to technology has increased risk appetite of banks. Technology has also enabled expansion of delivery channels by banks, including mobile and agency banking, and also influenced growth in a number of bank accounts. Also, technology enables the provision of low cost and banks accounts with minimal know-your-customer requirements, thus expanding to the unbanked markets. Causality was found to run from financial innovation to bank behaviour, and only in the long run. It, therefore, can be concluded that the behaviour of banks in a low-income country is responsive to technology and financial innovation.

Financial innovation has the capacity to influence activities of banks in a low-income country, particularly in risk management, credit and delivery of banking service. Technology also has the capacity to influence not only the core business of banking, including the products, but also on the structure of banking institutions and delivery channels used by banks, thereby impacting on costs and efficiency. Another deduction is that the impact of innovation in the short run is being limited, presumably by the fact that technology is mostly used to address current challenges faced by the banking sector than for a long-term expansion of the business. The influence and impact of technology in banking increases in the long run and has the potential to transform the banking sector in Zimbabwe. Financial innovation should be at the centre of the driving transformation of the banking sector. Technology and innovations should thus be part of the short, medium to long-term strategies of each banking institutions in Zimbabwe. Notwithstanding the benefits of traditional banking systems, fin tech products and technology should define delivery of banking service and be the basis for revolutionising banking in Zimbabwe.

References

Arnaboldi, F. & Rossignoli, B. (2013). Financial innovation in banking.

Bara, A. & Mudzingiri, C. (2016). Financial innovation and economic growth: evidence from Zimbabwe. *Investment Management and Financial Innovations*, 13(2), 65-75.

Bara, A. (2017). Diffusion and adoption of bank financial innovation in Zimbabwe: An external factor analysis. *African Journal of Science, Technology, Innovation and Development,* 8(4), 357-368.

Bara, A., Mugano, G. & Le Roux, P. (2016). Financial development and economic growth in the Southern African Development Community (SADC). *Studies in Economics and Econometrics,* 40(3), 65-93.

Bies, S. S. (2004). Financial Innovation and Effective Risk Management. Financial Services Institute 2004.

Berger, A. N. (2003). The economic effects of technological progress: Evidence from the banking industry. *Journal of Money, credit, and Banking*, 35 (2), 141-176.

Beyani, M. & Kasonde, R. (2005). Financial innovation and the importance of modern risk management systems-a case of Zambia. *Journal of Finance and Accounting,* 3(1), 124-135.

Bilyk, V. (2006). Financial Innovations and the Demand for Money in Ukraine. , s.l.: s.n.

Brandon, K. & Fernandez, F. (2005). Financial innovation and risk management: An introduction to credit derivatives., s.l.: s.n.

Caporale, G. M., Rault, C. & Sova, A. (2009). Financial development and economic growth: Evidence from ten new EU Members, s. l.

Cogley, M. (2016). Technology 'driving huge behavioural change' in bank behaviour, s.l.: Independent-Ireland.

Denyes, L. & Lonie, S. (2016). Digital Financial Services and Risk Management Handbook.

Ernst. & Young. (2015). Global banking outlook 2015: transforming banking for the next generation of technology reshaping banking, s.l.: EY Global Banking & Capital Markets.

Frame, W. & White, L. (2004). Empirical studies of financial innovation: lots of talk, little action?. *Journal of Economic Literature*, 42(1), 116-144.

Greuning, H. & Bratanovic, S. B. (2003). Analyzing and Managing Banking Risk: A framework for Assessing Corporate Governance and Financial Risk , Washington DC: World Bank.

Hauke, J. & Kossowski, T. (2011). Comparison of values of Pearson's and Spearman's correlation coefficients on the same sets of data. *Quaestiones Geographicae*, 30(2), 87-93.

Harle, P. et al., n.d. 8. Härle, P., Havas. A., Kremer. A., Rona. D. & Samandari., H. (n.d). The future of bank risk management. McKinsey Working Papers on Risk, s.l.: McKinsey Working Papers on Risk.

Hyde, P., Liebert, T. & Wackerbeck, P. (2009). A comprehensive risk appetite framework for banks, s.l.: Leading Research, Booz&Co.

Iman, N. (2011). Innovation in financial services: a tale from e-banking development in Indonesia. *International Journal of Business Innovation and Research,* 8(5), 498-522.

Irungu, M. (2014). The Effects of Financial Innovations on Credit Risk Management of Commercial Banks in Kenya, s.l.: Doctoral Dissertation, School Of Business,University of Nairobi.

Jenkinson, N., Penalver, A. & Vause, N. (2008). Financial innovation: what have we learnt?, s.l.: s.n.

Jolliffe, I. T. (2002). Graphical representation of data using principal components. *Principal Component Analysis*, 78-110.

Kamra, S. (2014). Digital Transformation in Banking – The Future of Banking, Happiest Minds Technologies, s.l.: s.n.

Kero, A. (2013). Banks' risk-taking, financial innovation and macroeconomic risk. *The Quarterly Review of Economics and Finance,* 53(2), 112-124.

Khayrallah, A. et al. (2015). Technology & Banking.. *Applied Innovation Review,* 23(1).

Laeven, L. R. L. & S, M. (2015). Financial innovation and endogenous growth. *Journal of Financial Intermediation,* 24(1), 1-24.

Le Roux, P. & Moyo, C. (2015). Financial liberalisation and economic growth in the SADC, s.l.: Economic Research Southern Africa (ERSA) .

Lerner, J. & Tufano, P. (2011). The consequences of financial innovation: a counterfactual research agenda. *Annual Review Financial Economics,* 3(1), 41-85.

Lewis, M. & Mizen, P. (2000). Monetary economics. , s.l.: OUP Catalogue..

Llewellyn, D. T.(2009). Challenges for Monetary Policymarkersin Emergency Markets, I.

Masih, R. & Masih, A. M. (1996). Stock-Watson dynamic OLS (DOLS) and error-correction modelling approaches to estimating long-and short-run elasticities in a demand function: new evidence and

methodological implications from an application to the demand for coal in mainland China.. *Energy Economics*, 18(4), 315-334.

Matthews, K. & Thompson, J. (2008). The Economics of Banking. second ed. s.l.:Chichester: Wiley,.

Norden, L., Buston, C. & Wagner, W. (2014). Financial innovation and bank behaviour: Evidence from credit markets. *Journal of Economic Dynamics and Control*, 43, 130-145.

Norden, L., Buston, C. & Wanger, W. (2014). Financial innovation and bank behavior: Evidence from credit markets. *Journal of Economic Dynamics and Control,* 43, 130-145.

Phakedi, M. (2014). Financial sector development and economic growth in SADC. A research paper to be submitted to the Committee of Central Bank Governors in SADC.

Phillips, P. & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with I (1) processes. *The Review of Economic Studies,* 57(1), 99-125.

Phillips, P. C. (1995). Fully modified least squares and vector auto-regression. Journal of the Econometric Society, 1023-1078.

Santomero, A. M. & Trester, J. J. (1998). Financial innovation and bank risk-taking. *Journal of Economic Behaviour & Organization*, 35(1), 25-37.

Solans, E. (2003). Financial innovation and monetary policy. In speech at the 38th SEACEN Governors Conference, Manila, February.. s.l., s.n.

Stock, J. H. & Watson, M. W. (1993). A simple estimator of cointegrating vectors in higher order integrated systems. Econometrica: Journal of the Econometric Society, 783-820.

RBZ (2017). Monetary Policy Statement, Harare: Reserve Bank of Zimbabwe.

RBZ (2010). Monetary Policy Statement, Harare: Reserve Bank of Zimbabwe.

RBZ (2013). Monetary Policy Statement, Harare: Reserve Bank of Zimbabwe.

Utterback, J. & Afuah, A. (1998). The dynamic 'diamond': a technological innovation perspective.. Economics of Innovation and New Technology.

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The Effect of Using Multi-Skilled Workforce on the Flexibility of Project Resource Scheduling and Project Costs

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Abstract: The introduction of multi-skilling within organisations is normally conducted with the aim of improving efficiency, quality, production and cost-effectiveness. The study addressed the effect of using multi-skilled workforce in the execution of project activities by studying the changes in project execution resource scheduling flexibility and project costs in response to workforce multi-skilling strategy. A quantitative research design was used, to test the concept of workforce multi-skilling to predict its influence on project resource scheduling, project cost saving, project duration, effect on optimal utilization of project technicians and members if adopted at Eskom PTM Central Group department. An electronic questionnaire was distributed to collect data and statistical analysis of data was conducted. The hypothesis testing performed concluded as follows; H1: The use of multi-skilling provides for flexible project resource scheduling; the research hypothesis was accepted. H2: Multi-skilling has a positive effect on the project cost savings; the research hypothesis was rejected. H3: The use of multi-skilling has no significant impact on project duration; the research hypothesis was rejected. H4 (i): The findings show that a positive relationship between multi-skilling and job redesign exists, and H4 (ii): Multi-skilling therefore has a positive impact on the adoption of multi skills; both research hypotheses were accepted.

Keywords: *Multi-skilling, flexible project scheduling, project costs, project duration, job redesign*

1. Introduction

X PTM is a division of X Group Technology; a mandated critical technical service provider to predominantly X Generation, as well as a project associated technical services to X Group Capital, Transmission and Distribution. This business unit also offers engineering support services, commissioning and maintenance of Power Electronics, Electrical Protection, Automatic Voltage Regulators, Supervisory Control and Security Systems, Specialised Electrical Tests on Power Transformers, Electrical Calibration Services, Metering and Measurements, Industrial Air-conditioning and Electronic Card Repairs. X PTM has offices in Johannesburg, Durban, Cape Town, Bloemfontein, Klerksdorp and Witbank. Nowadays, business peak level performance greatly relies on the continuous development of human resource policies. For this reason, most organizations consider human resource labour as the most important aspect of production, as well as the most indispensable form of capital, the main source of competitive advantage and vital to normal operations of the organization. Accordingly, the most effective advancements to attaining competitive superiority in the current business environment are in the improvement of employee proficiency (Saravani & Abbasi, 2013). It is only in developed countries that multi-skilling has been recorded as successful in carpentry and piping; crane operation and truck driving as a model to improve project labour cost, control project duration and reduce idle times between activities (Attia, Duquenne & Le-Lann, 2013).

The increasing need for production companies to rapidly respond to market volatility is however consequential because it creates a strong demand for flexibility in the operational processes of business (Attia, et al., 2013). The concept of multi-skilling promises to bring about flexibility in operational processes in a win-win approach where the company reduces its overall labour costs and on the other hand the multi-skilled employee income increases (Saravani & Abbasi, 2013). An effective well-targeted training aimed at multi-skilling of the workforce in production services can be a powerful force in addressing current skills shortages in manufacturing (Puttick, 2008). This research study aims to examine the effect of using multi-skilled workforce in the execution of project activities by studying the changes in project execution resource scheduling flexibility and project costs in response to workforce multi-skilling strategy and the use of job redesign to facilitate multi-skilling. The knowledge gaps identified in the literature review informs the purpose, research objectives, hypothesis and significance of the study. The major sources of information for this study range from published books', peer-reviewed published journals, conference publications, periodic articles as well as newspaper articles.

2. Literature Review

The database sources that were used were EBSCO host, Google Scholar, Science Direct and Emerald Insight. The selection of sources was based on the relevance of information to the topic under research, the credibility of the sources and year of publication. The introduction of workforce multi-skilling within organisations is typically carried out with the aim of improving efficiency, production, quality and costs reduction. Recent research reports that the majority of case study companies had used multi-skilling as part of their process of reorganisation (Horbury & Wright, 2010). In a like manner, the quest by businesses and leaders to find ways to improve productivity and cost effectiveness has led many companies to the adoption of labour multi-skilling practice, where workers can work across traditional occupational boundaries (Adamu, Nensok & Aka, 2012). The concept of multi-skilling arguably traces back in time to when mega structures like the Egyptian pyramid and the Great Wall of China were built (Nwaogazie, Augustine & Henshaw, 2016). Presently, the world's financial system has undergone tremendous changes in recent years and the immense competition created has given rise to the three buzzwords in the business world that are; targets, deadlines and performance (Sushil, 2014).

As a result, global trends suggest that skills shortage is a worldwide occurrence; hence countries, states and businesses all over the world continuously express unhappiness regarding the shortage of skilled professionals in various sectors of their economies (Mateus, Allen-Ile, & Iwu, 2014). The growing need for reaction to market volatility raises a strong demand for flexibility in organizational operations and call for businesses to develop strategies for short, medium and long-term in order to preserve and develop their workforce skills (Attia, et al., 2013). The most serious challenges confronting labour intense industries today is the limited access to the skilled workforce; seeing the increasing need for cost-effectiveness and productivity, some companies have already started using multi-skilling as a potential solution (Singh & Shah, 2014). Also, the rise in competition levels across industries has made competence to be regarded critical or business to maintain the long-term competitive advantage. Subsequently, firms are forced to realize the need to develop innovative technical competency measures that warrant the use of multi-skilling; narrowly defined as utilization strategy where an employee possess a range of skills appropriate for more than one work process (Akinola, Ogunsemi & Dada, 2015).

This means, organizations may introduce multi-skilling as support to business strategic changes aimed at improving efficiency, product quality, production rate and competitiveness, as well as cost effectiveness. The concept of multi-skilling allows firms the flexibility to reallocate labour resources in response to volatile industry demands (DeVaro & Farnham, 2010). Multi-skilling as defined by Engineering Employers Federation (EEF) is the attainment of additional skills, complementing those previously acquired in a given job. In addition, multi-skilling is also referred to as means of removing traditional divisions separating disciplines in work areas and giving responsibility to individuals well trained for a range of different types of activities and multi-skilling has three dimensions; vertical, horizontal and depth multi-skilling, however in most situations a combination of all three is ideal (Singh & Shah, 2014). Similarly, multi-skilled labour forces are workers who possess a range of skills that allow for participation in more than one work process (Gomar, et al., 2012). The database sources that were used were EBSCO host, Google Scholar, Science Direct and Emerald Insight. The selection of sources was based on the relevance of information to the topic under research, the credibility of the sources and year of publication.

Research Studies About the Concept of Multi-Skilling: The study by De Varo and Farnham (2010) to evaluate a product market volatility on a firm's choice between multi-skilling and skill specialization was conducted based on a theoretical model that captured trade-offs between multi-skilling (greater flexibility to schedule workforce in production) and specialization (which shapes workers to be experts in responding to product market signals in their area of specialty). The research by Irene (2009) to improve management strategies, decrease the mismatch between required and available skilled labour and to discuss the consequences of ignoring the interests of craftsmen. This quantitative study was conducted in the construction industry of Estonia, comparing multi-skilled to single skilled construction craftsman production outputs. The results analysis showed that no matter how volatile the construction project is, the composition of labour resources by trades is stable if an employer uses multi-skilling. Whereas for single-skilled labour resource overloads and idle time periods would be unavoidable. However, the study conducted in the construction industry and

it did not focus on the engineering project execution work part of buildings construction work. X programme management division assists the organisation to effectively, track, steer and manage projects from a strategic, enterprise orientated perspective.

Measuring Project Delivery: The factors to consider when measuring project delivery success is a topic greatly debated by scholars, but it is generally agreed that for a project to be deemed successful, the project must be suitable for purpose and achieve all deliverables, however, time, cost and quality remain as central project management delivery targets (Brown, Adams & Amjad, 2007). In contrary, traditional project management systems that entirely pursue success criteria of time, cost, quality and achieving technical requirements have been considered ineffective, with the shift focusing on multiple stakeholder expectations (Mir & Pinnington, 2014). Even though, the success of a project depends on completion of work before due date, within the project budget and achievement of technical deliverables, to some cases these limits are circumvented to lessen scheduling pressures through the use of a technique called project activity crushing to help finish activities quicker and ultimately the project (Kim, Kang & Hwang, 2012). Good to note is that, in business with flexible staff complement possessing multi-skills, planning of activities and project resource scheduling focuses on stakeholder needs than on staff capabilities (Rajendra, 2016). In line with the overall X business strategic objectives there is currently a need to improve on cost management in the form of cost containment, accurate projections and control over expenditure (Eskom, 2016). Objectively, programme management strives to enable the tracking of an aggregation of projects to oversee resource allocation, prioritize on-going investment decisions and track projects costs, schedule, risks and benefits as part of overall program management (Eskom, 2014).

Project Resource Scheduling and Cost: The use of labour workforce scheduling to correct overstaffing and or understaffing in the service industry across multiple projects is often challenged by lack of flexibility due to the exclusive use of specialist labour force (Henao, Munoz & Ferrer, 2015). An organization with multi-skilled personnel enjoys flexible labour-force benefits which provide the employer ability to schedule and arrange the workforce to best suit the needs of the business (Rajendra, 2016). This section examines the impact of assigning multi-skilled employees to different activities, study schedule efficiency and measure implications on cost savings. Labour resource scheduling is a process of putting together a work timetable and assigns staff to activities accordingly to help meet organizational service demands. This involves determining the number of workers with certain skills needed to complete a specific project task. Consequently, this makes it extremely difficult to determine optimal solutions that minimise costs, meet workforce preferences, allocate activities equitably among labour resources and fulfil all the workplace constraints.

As a result, companies provide project managers with the decision tools, such as spreadsheet and database tools to help schedule the right employees at the right time and at the minimal cost while ensuring a high level of employee job satisfaction (Ernst, Jiang, Krishnamoorthy & Sier, 2004). Meanwhile, the challenge with scheduling single skilled human resources is a well-known problem in project management, project scheduling with multi-skilled workforce is an extended problem due to the fact that this option requires a multi-skilled staff complement as it assumes that any resource can competently perform a project task that requires a range of skills (Zha & Zhang, 2014). Similarly, the advantage to multi-skilled resource strategy is that of which each worker possesses multiple skills which allows them to participate in any activity that fits one of their skills and this has been proposed to improve project workforce resource scheduling and utilization (Jaskowski, 2013). However, assigning project work to human resources taking into account resource specific skills and efficiencies is a general planning task that has to be performed in any organisation (Heimerl & Kolisch, 2010). For example, project resource scheduling in construction projects is mainly affected by unpredictable factors such as cash flow and design changes (Arunadhevi, 2016).

There are quite a number of different scheduling models established to reduce activity durations and hold-ups in projects, however most of these methods assume single skilled labour (Abotaleb, et al., 2014). For many years, the two approaches that have been proven to be useful in planning, scheduling and controlling construction projects have been the Critical Path Method (CPM) and the Project Evaluation and Review Technique (PERT) (Anon., 2015). However, research has shown that traditional scheduling techniques such as PERT and CPM are not suitable for handling linear projects (Liu & Wang, 2012). Given the rapid advancements in computer technology, more heuristic algorithms are now available to deal with complex

linear scheduling challenges involving work efficiency and resource task allocation (Liu & Wang, 2012). These methods allow project managers more control of the schedule and to better estimate the early and late times at which activities can start and finish, calculate activity slack, outline critical activities, and assess the impact of changes in duration, logical relations and cost on the overall project duration (Render, et al., 2015).

Research Studies on Multi-Skilling, Project Scheduling and Cost: A study conducted by (Zha & Zhang, 2014), to develop a model to address the project scheduling problem with multi-skilled worker, in which autonomous and induced learning are both considered, to help assist the project manager to determine the start time, the finish time, and resource scheduling for each activity, Moreover, combined with the total cost formulation, the project manager can balance the project make-span with the total cost. The results show that each level of induced learning corresponds to a combination of project make-span and total cost. By means of determining the level of induced learning, the project manager can balance them in project scheduling. However, the study was conducted in China as an experiment and was not focused to any industry. Lui and Yang (2011) created a model aiming at reducing total costs of the project through the use of multi-skilled labour. The model takes into consideration a number of variables not discussed in previous models such as the overtime cost and the number of skills per employee. Be that as it may, there was no strong validation provided by comparing the output with conventional techniques or rather actual projects as examples. Therefore, the success of multi-skilling strategy greatly relies on the project manager's ability to schedule workers to appropriate tasks and compose teams effectively.

Hence why, project managers still need to have important competencies in project scheduling and staffing of human resources, especially when facing the problem of labour resource skills constraints (Chan, 2014). Burleson, Haas, Tucker et al. (1998) made known to some multi-skilling strategies such as dual-skill strategy, four-skill strategy, four-skill-helpers strategy, and unlimited-skill strategy as means to prove the benefits of the multi-skilling concept. The four strategies were compared by comparing the economic benefit of each of them in a $70,000,000 construction project. The findings were that the proposed multi-skilling strategies resulted in a reduction in project labour cost by 3%-20%. However, the mechanism for selecting the best strategy for a given project was not developed. Henao, Muñoz and Ferrer (2015) conducted a study on the impact of multi-skilling on personnel scheduling in the service sector; a retail case. The study compared the impact of using multi-skilled resources to specialist resources on the efficiency of the schedule. The results showed that multi-skilled personnel may be a cheaper option compared to hiring part-time specialized staff, however depending on the cost of training required to upskill staff and therefore a balance between multi-skilling and the part-time specialist contract was found to be desirable in the retail sector.

Job Design: In the 21st-century competitive business world, considering new ways and means for creation of organizational efficiency is inevitable, given the rapid changes in the external business environment resulting to huge impacts to internal operations (Saravani & Abbasi, 2013). For example, the demand to satisfy customers, regulators, skilled workers, social activists and shareholders increase pressure on businesses to deliver excellent performance while maintaining diverse stakeholder needs at the same time (Tarus, 2014). Therefore, a new method of job design is necessary to motivate managers to adjust to changes presented by business environment, technological advancements, shareholder needs and workforce motivation. Job rotation is one of the most effective methods for empowering human resource (Saravani & Abbasi, 2013). Job rotation means a planned out reshuffling of human resource labour between jobs for a period of time with the aim of cross-skilling, ensuring job independence and increasing employee motivation (Saravani & Abbasi, 2013). Job rotation is particularly the product of Japanese companies' employment policies to ensure the attainment of knowledge and skills which help workers adapt to changes in technology and in the process improving the value of the employees in labour market (Kaymaza, 2010). Furthermore, when businesses provide the workforce with a large amount of firm-specific human capital, those workers become less subject to poaching by other companies, thus reinforcing returns on training investments made by the firm through job rotation (Morita, 2005). Job redesign and rotation enhances the productivity of human resource labour and increases level of performance for both the company and employees, because multi-skilling employees through on job training and classroom; creates a logical and effective interface between skills attainment and employee motivation (Saravani & Abbasi, 2013). Furthermore, with multi-skilling adoption, employees enjoy cross-functional training to increase skills competency and at the same time organizations enjoy increasing talent pool, thus labour force resource availability (Srinivasan, 2014). Additionally, some organizations brag

about bigger spending each quarter on training and development of new skill-sets to improve resource competence and availability to perform more job processes. Noteworthy, key to the concept of multi-skilling is formal acknowledgement and encouragement of knowledge sharing amongst employees (Srinivasan, 2014).

Research Studies on Job Rotation and Performance: Past similar studies by (Saravani & Abbasi, 2013) attempted to investigate the effects of job rotation patterns on the performance of employees considering the skill diversity and job satisfaction and providing effective guidelines to enable managers to lead the organization toward a better future by desired policies and the results showed that Job rotation positively influences job performance mediated by job satisfaction and skill variation. However, the study was conducted in the banking industry and it did not consider project resource scheduling. A study by Mossa, Boenzi, Digiesi, Mummolo and Romano (2016) proposed a model which aimed at finding optimal job rotation schedules in work environments characterized by low load manual tasks with a high frequency of repetition. The model is a mixed integer programming model allowing for the maximization of production rate jointly reducing and balancing human workloads and ergonomic risk within acceptable limits. Results show the models capacity to identify optimal job rotation schedules jointly achieving productivity and ergonomic risk goals. Performances of the solutions obtained improve as workforce flexibility increases. However, the study was focused on highly repetitive activities and did not consider electrical engineering non-repetitive complex tasks.

3. Research Methodology

Research methodology can be referred to as the universal technique the investigator utilizes to conduct a research project and the methodological strategy the researcher finds best suitable to resolve the research problem (Leedy & Ormrod, 2013). Also, research methodology involves more than just knowing applicable research techniques suitable to a study but rather the justification underlying the rationale for the choice of research technique (Kothari, 2008). As a result, this procedure usually presents the researcher with new knowledge and an in-depth understanding of the behaviour of variables under study and factors of influence relative to the research problem (Sekaran & Bougie, 2013).

Research Objectives: The objectives indicate the goals of a research study (Creswell, 2014). With that in mind, the objectives of this study are as follows:

- To measure the influence of multi-skilling on the flexibility of project scheduling
- To evaluate the relationship between multi-skilling and project labour costs
- To study the effect of multi-skilling on the duration of the project
- To evaluating multi-skilling and adoption of multi skills
- To evaluate the use of job redesign to facilitate workforce multi-skilling

Research Hypothesis: Hypothesis statements are predictions made by the researcher about expected results findings (Creswel, 2014). Therefore, the following are the research hypothesis statements:
H1: The use of multi-skilling provides for flexible project resource scheduling
H2: Multi-skilling has a positive effect on the project cost savings
H3: The use of multi-skilling has no significant impact on project duration
H4 (i): There is a positive relationship between multi-skilling and job redesign
H4 (ii): Multi-skilling has a positive impact on the adoption of multi-skills.

Population: Sekaran and Bougie (2013) define a study population as a group of individual elements or people or events of interest to the researcher to investigate and draw inferences accordingly. The population of this study is made up of eighty (80) X PTM Central Group project execution staff members. This means the total number of employees who meet the criteria for recruitment to this study, targeted recruits range from technical engineering employees to project support services and project management.

Sampling Method: Simple random sampling method was used as the sampling method, because each unit included in the target population has equal chance of inclusion in the sample. Moreover, this method is assumed to counter bias during sample element selection. Establishing an optimal sample size for a study

ensures adequate control to detect statistical significance. An exaggerated number of participants in a study is not only expensive but also unnecessarily increases the number of subjects to process. On the other hand, if a study experiences under-participation, it becomes statistically inconclusive and therefore incomplete (Suresh & Chandrashekara, 2012). A 95% confidence interval and 5% level of significance was used to calculate the required sample size for the research study, confidence level means the amount of tolerable uncertainty and level of significance means the acceptable margin of error.

The Research Instruments: A quantitative research investigation makes use of surveys, experiments and questionnaires, to collect data that is revised and numerically presented to allow for data to be categorized using of statistical analysis. In other words, a quantitative researcher measures variables on a sample of elements to show the relationship between variables with the use of effect statistics such as correlations, relative frequencies and or differences between means; this is done with a focus on testing of theory (Antwi & Hamza, 2015). A survey design provides a quantitative description of tendencies, attitudes or opinions of a population by examining a sample of the population in question and from the sample findings researchers generalize or induce inferences about the population. Similarly, in an experiment the researcher can also use a sample and generalize to the population, however; an experimental design is intended to test the impact of treatment on the results outcome thereby controlling all other possible influences to that outcome (Creswel, 2014). And, a questionnaire is a pre-formulated written set of questions to which research study respondents record their answers, usually within rather closely defined alternatives (Sekaran & Bougie, 2013).

The principles of questionnaire design focus on the wording of the questionnaire, on how variables are categorized, scaled and coded, and lastly the presentation of the questionnaire in terms of appearance (Sekaran & Bougie, 2013). Additionally, to encourage respondents to complete the questionnaire it must be kept as short as possible including questions themselves, it must be clearly worded and definition of concepts where necessary must be provided, it must begin with demographic questions to get respondents started and comfortable, follow appropriate use of measurement scales such dichotomous, Likert scales, etc., avoid open-ended questions if not intended for the study, avoid using leading questions as that influences respondents to respond towards a particular answer, take time to administer questionnaire pilot testing to uncover potential problems, and finally consider whether collection of data is for interval or nominal variable and a type of statistical technique intended for the study whether descriptive or inferential (Render, et al., 2015). A designed electronic questionnaire was constructed for the use of collecting data from research participants in a structured manner that allows for optimal addressing of the research purpose, hypothesis statements and overall research objectives in order to answer the research question.

Procedure for Data Collection: A designed electronic questionnaire was distributed to all participants of the study, collected and captured through the use of statistical software technologies; Question pro. Projected period of data collection was four weeks and during this phase a four-stage process was followed. Firstly, an email with an overview of the study, rights of participation and anonymity was sent out to all the respondent recruits. Secondly, the link to the administered electronic questionnaire was sent. Thirdly, during the collection period of data a follow-up email was sent to encourage participation. And lastly, a notification to thank respondents for their participation was sent. Notably, is the use of a higher confidence interval and or lower level of significant results in larger sample sizes ("Sample size calculator," 2016). Using a sample size calculator, a sample size of 67 was computed adequately representative of the total population of 80 elements.

Data Analysis and Interpretation: Accordingly, Creswell (2014) explains that descriptive data analysis studies the mean scores, standard deviations and range. Also, essential to keep in mind, is that in quantitative research studies where the process of data analysis ends with descriptive analysis, the study respondents' may have been too small for further inferential statistical analysis. The data collection software platform used was Question pro, an electronic questionnaire was designed, distributed to all research respondents, response data was collected by the tool automatically and a response report was created. Lastly, all statistical analysis was conducted using STATA, a statistical software tool.

Reliability and Validity: The research study instrument validity allows for the accurate and consistent collection of data (Saunders, et al., 2009). Furthermore, sources used in the study were all credible in terms of

peer review, published textbooks, online/internet sources were kept below five percent in references and sources were mostly limited to age in existence that is eighty percent of the sources kept to less than five years since publish. The use of the electronic data collection and analysis ensures the validity of data. Cronbach's alpha is a most used technique to test the reliability of a research instrument by testing internal consistency across various items in the research questionnaire. Cronbach's alpha (Cronbach 1951) assesses the reliability of a summative rating (Likert 1932) scale composed of specified items. Cronbach's alpha measures internal consistency, that is, how closely related a set of items are as a group (Tavakol & Dennick, 2011).

Ethical Considerations: Ethics in business research is defined as an expected standard social code of conduct that rules norms of behaviour while conducting research. Also, ethical conduct applies to systems of government, organizations and stakeholders that sponsor the research, the researcher conducting the research and the respondents (Sekaran & Bougie, 2013). The gatekeeper letter was obtained from X PTM Central Group manager for permission to conduct an academic research study prior to electronic questionnaire distribution. All recruits for participation were over the age of eighteen, no monetary incentive for participation, rights for participation was explained and emphasis was made that each respondent' can quit the study at any time without a consequence or penalty. The questionnaire was designed not to discriminate against research participants, sponsors and those interested to the research. In the informed consent form of the study the above ethical considerations were clearly explained and only after accepting the terms the electronic questionnaire allowed participants to engage with the study. Lastly, participation to the study is kept and will remain anonymous, and the electronic questionnaire data is safely stored and confidential for five years in line with the University of Kwa-Zulu Natal research policy.

4. Analysis and Interpretation

This Analysis and Interpretation focus on the analysis of data, presentation and interpretation of the response results and findings of the study. The respondents' response results are presented by means of figures and tables. The presentation of the results commences with the demographical information of the respondents followed by factors of project execution resource scheduling flexibility, project labour costs and duration of projects in response to workforce multi-skilling and the use of job redesign as a strategy to facilitate multi-skilling. This is then tailed by the presentation of the results according to the objectives and hypotheses of the study.

Table 1: Personal Demographic Information

Variable	**Label**	**Male**		**Female**		**Total**	
		Freq.	Perc	Freq.	Perc	Freq.	Perc
Race	African	26	76.5	14	87.5	40	80.0
	Indian	8	23.5	2	12.5	10	20.0
Total		34	100.0	16	100.0	50	100.0
Age group	21 to 30 years	10	29.4	7	43.8	17	34.0
	31 to 40 years	19	55.9	9	56.3	28	56.0
	41 to 50 years	5	14.7	0	-	5	10.0
Total		**34**	**100.0**	**16**	**100.0**	**50**	**100.0**
Job grade	**T11**	9	27.3	7	43.8	16	32.7
	T12	15	45.5	5	31.3	20	40.8
	T13	5	15.2	1	6.3	6	12.2
	S&M Band	4	12.1	3	18.8	7	14.3
Total		**33**	**100.0**	**16**	**100.0**	**49**	**100.0**
Experience	**< 5 Years**	11	33.3	5	31.3	16	32.7
	6 – 10 Years	11	33.3	8	50.0	19	38.8
	11 – 15 Years	7	21.2	3	18.8	10	20.4
	>15 years	4	12.1	0	-	4	8.2
Total		**33**	**100.0**	**16**	**100.0**	**49**	**100.0**
Education levels	Diploma/equivalent	18	54.5	11	68.8	29	59.2
	Degree/ equivalent	15	45.5	5	31.3	20	40.8

Total		**33**	**100.0**	**16**	**100.0**	**49**	**100.0**
Professional body	Yes	23	69.7	7	43.8	30	61.2
	No	10	30.3	9	56.3	19	38.8
Total		**33**	**100.0**	**16**	**100.0**	**49**	**100.0**

Table 1 indicates that eight out of ten respondents (80%) were African, while two out of ten (20%) were Indian. Comparably, there were more males than females thus 68% to 32% respectively. Twenty-eight respondents (56%) were aged 31-40 years, a third (34%) were aged 21-30 years with a few (10%) who were aged 41-50 years. Proportionally, females were more likely (43.8%) to be aged 21-30 years compared to males (29.4%). There were no significant differences in the percentage of male (55.9%) and female (56%) respondents aged 31-40 years. Notably, there were no female respondents aged 41-50 years. Four out of ten (40.8%) respondents were in the T12 (senior technician) job grade, a third (33%) were T11 (junior technician) while a few (19%) were in S&M (specialist and management) job band, and very few (12%) were in T13 (senior supervisor) job grade. Male respondents were more likely (45.5%) to be in T12 job grade than females (31.2%), while females were more likely to be in T11 job grade compared to males (43.85 vs. 27.3%). Almost four out of ten (39%) had between six to eight years work experience; a third with less than 5 years' experience, and a fifth (20%) with 11-15 years of experience. Very few respondents (8%) with over 15 years of work experience and were all males. Notably, females were more likely (50%) to have 6-10 years of work experience than males (33%) respectively. Regarding education levels, six out of ten (59%) respondents had a diploma or equivalent qualifications; while four out of ten (40%) had degrees. Females were more likely (69% vs. 55%) to have diplomas compared to males. Six in ten (61.2%) respondents belonged to a professional body; while 39% did not. Male respondents were much more likely (70%) to belong to a professional body compared to females (44%).

Descriptive Statistics: A Likert-type question (or 'item') asked respondents to select one of five responses that are ranked in order of strength. The following section provides descriptive statistics in the form of frequencies for the Likert scale responses for the different subscales. Each section on frequency tables is followed by descriptive statistics which provide mean scores and standard deviations. The scores were computed to produce mean scores that represent the strength along the 1-5 scale standard deviations indicate how far the values are away from the mean value, while skewness quantifies symmetricity of data distribution.

Table 2: Descriptive Statistics Summary - Project scheduling Flexibility Statistics

3 system missing values	N	Mean	Std. Dev	Min	Max
Workforce multi-skilling helps cushion against unforeseen project schedule changes.	47	1.68	0.783	1	4
Multi-skilled workforce helps improve project labour resource availability.	47	1.55	0.717	1	4
The use of multi-skilled workforce could smoothen rescheduling of labour resources from one project to another in multiple project environments such as X PTM.	47	1.55	0.686	1	4
Multi-skilled workforce improves project labour resource utilization	47	1.53	0.747	1	4

Table 2 shows that all aspects of schedule flexibility had mean scores greater than 1 but less than 2. This indicates respondents' tendency to generally agree on all four aspects pertaining to project schedule flexibility. The standard deviation (the spread of the distribution of the variable) for all factors is less than 1, this indicates that there were no outliers in responses. Multi-skilled workforce helps improve project labour resource utilization (Mean score = 1.5) was the highest rated in terms of the agreement, even though not significantly different from the other three factors.

Table 3: Descriptive Statistics Summary- Multi-Skilling and Project Costs Statistics

3 missing system values	N	Mean	Std. Dev	Min	Max
Multi-skilled workforce lack of skill specialization can drive up project costs by means of defects resulted due to lack of expert knowledge.	47	2.28	1.155	1	4
Multi-skilled workforce strategy will help X PTM Central Group reduce project transport costs	47	1.83	0.916	1	4
The use of multi-skilled workforce can help cut project labour costs for X PTM Central Group by reducing the number of labour workforce required per project.	47	1.57	0.715	1	4
Provided that a multi-skilled employee begins a project from start to finish, the experience gained from the whole project can help provide critical input feedback on lessons learnt and possible ways to reduce costs on future projects.	47	1.49	0.621	1	4

The highest rated factor (agreement) was that provided that a multi-skilled employee begins a project from start to finish, the experience gained from the whole project could help provide critical input feedback on lessons learnt and possible ways to reduce costs on future projects (Mean score=1.5). The lowest rated factor (mild agreement) was that Multi-skilled workforce lack of skill specialization could drive up project costs by means of defects resulted due to lack of expert knowledge (Mean score=2.3). A skill ranking system should be developed to trace skill gaps and areas of improvement to sustain adoption of multi-skilling as a strategy at X PTM Central Group and increase talent pool without having to increase headcounts.

Table 4: Descriptive Statistics Summary - Multi-skilling and project duration statistics

4 missing system values	N	Mean	Std. Dev	Min	Max
The use of multi-skilled workforce will not reduce job activity duration because the job is not performed by specialist personnel.	46	2.61	1.125	1	5
Multi-skilled workforce utilization allows project managers control over activity sequencing meaning rearrangement of tasks to suit project timelines or targets.	46	1.78	0.629	1	4
Multi-skilled workforce tends to take longer to finish an activity, but the time lost on activity duration compensates for idle time that a specialist would have spent waiting for the next specialist job (specialist idle time cost).	46	2.28	1.026	1	4

The use of multi-skilled workforce will not reduce job activity duration because the job is not performed by specialist personnel was the least rated factor in terms of the agreement (Mean score equals 2.6) towards uncertainty. Multi-skilled workforce utilization allows project managers control over activity sequencing meaning the rearrangement of tasks to suit project timelines and targets was the highly rated factor (Mean score equals 1.8) agreement.

Table 5: Descriptive Statistics Summary: The effect of adopting multi-skilling strategy statistics

	N	Mean	Std. Dev	Min	Max
X PTM Central Group project resources are adequately qualified (educated) in their respective field of specialisation.	46	1.74	0.648	1	3
X PTM Central Group project resources are competent in terms of skills, technical knowledge, experience and proficiency in the execution of projects.	45	1.76	0.743	1	4
Project management resources can negotiate project scope, time, cost and quality effectively with clients to meet in-house business objectives.	45	1.84	0.767	1	4
X PTM Central Group project resources demonstrate knowledge in the execution of activities.	46	1.85	0.842	1	4
Project management resources are effective at managing risks	45	1.87	0.625	1	4

from both financial and technical standpoints.					
Project Support Services show extensive experience in managing projects.	46	2.17	0.950	1	5
However, project resources cannot perform activities across disciplines because departments are divided into specialist skills e.g. Protection, Tele-control, and Metering.	45	2.18	1.173	1	5

X PTM Central Group project resources are adequately qualified (educated) in their respective field of specialisation together with X PTM Central Group project resources demonstrate knowledge in the execution of activities were the highest rated factors (Mean scores of 1.7) of the agreement. The two lowest rated (relative) were that (i) Project Support Services show extensive experience in managing projects, and that (ii) However, project resources cannot perform activities across disciplines because departments are divided into specialist skills e.g. Protection, Tele-control, and Metering (Mean score of 2.17 and 2.18).

Table 6: Descriptive Statistics Summary - Practical Means to Facilitate Multi-skilling

	N	Mean	Std. Dev	Min	Max
To support multi-skilling over and above on-job training and job rotation, managers can to set aside an adequate training budget for project resources to attend technical training on specific equipment	42	1.52	0.671	1	4
On-job training can be used to facilitate multi-skilling at X PTM Central Group	43	1.62	0.623	1	4
After on job training, job rotation can be used as one of the other means to help facilitate multi-skilling.	42	1.62	0.623	1	4

All the practical means to facilitate multi-skilling at X PTM Central Group mean scores indicate general agreement amongst respondents. To support multi-skilling over and above on-job training and job rotation, managers can to set aside an adequate training budget for project resources to attend technical training on specific equipment was the highest rated factor (Mean score of 1.5), while After on job training, job rotation can be used as one of other means to help facilitate multi-skilling was the least rated (Mean score=1.6).

Reliability of Data: When using Likert-type scales it is very important to measure Cronbach's alpha coefficient for internal consistency reliability of scales (Creswell, 2014). Cronbach's alpha (Cronbach 1951) assesses the reliability of a summative rating (Likert 1932) scale composed of specified items. Cronbach's alpha measures internal consistency, that is, how closely related a set of items are as a group (Tavakol & Dennick, 2011). Table 7 below indicates the results for all the Likert scale questions.

Table 7: Internal Consistency Reliability Test

			item-test	item-rest	Inter-item	
Objectives	Variable code	Obs.	corr.	corr.	cov.	**alpha**
Influence of multi-skilled workforce on project scheduling flexibility	SCHEDULE	47	0.756	0.609	0.133	**0.815**
Relationship between multi-skilling and project cost savings	COSTS	47	0.811	0.703	0.129	**0.800**
Effect of multi-skilling on project duration	DURATION	46	0.582	0.362	0.155	**0.868**
Effect of adopting multi-skilling strategy at X	MULTISKILL	45	0.649	0.494	0.152	**0.837**
Adoption of multi-skilling at X	ADOPTION	42	0.865	0.791	0.120	**0.780**
Job redesign	JOB	42	0.844	0.763	0.124	**0.787**
unstandardized items	Test scale				0.135	**0.842**

The reviewed literature shows that results with an alpha coefficient of greater than 0.6 are very reliable and provide enhanced interpretation (Sekaran & Bougie, 2013). The alpha coefficient for all the items was 0.84, this indicates that the questions in the designed electronic questionnaire instrument asked what they were intended to ask and provided reliable results for inferential statistics in the multivariate analysis.

Spearman's Correlation: The Spearman rank order correlation is a nonparametric association measure of the strength and direction observed between two variables of a study. Also, the correlation coefficient ranges from -1 to +1, the measurement of 0 indicates no correction, -1 shows a strongest negative correlation, whilst +1 shows a strongest positive correlation (Zaid, 2015). The following table provides results for the association between the dependent and the independent variables. At a statistical significance level of 5%.

Table 8: Spearman's' Rank Correlation

	MULTIS~L	SCHEDULE	COSTS	DURATION	ADOPTION	JOB
MULTISKILL	1					
SCHEDULE	0.2872	1				
Two-tailed sig	0.0558					
COSTS	0.3586	0.5776	1			
Two-tailed sig	0.0156	0				
DURATION	0.3483	0.2569	0.3255	1		
Two-tailed sig	0.019	0.0848	0.0273			
ADOPTION	0.5464	0.6755	0.6418	0.3132	1	
Two-tailed sig	0.0002	0	0	0.0434		
JOB	0.4445	0.6022	0.7553	0.2846	0.7909	1
Two-tailed sig	0.0032	0	0	0.0677	0	

Table 8 above indicates that there are statistically significant associations between the different factors of the multi-skilled workforce on the flexibility of project resource scheduling and project costs. Multi-skilling has weak positive association with flexibility of project resource scheduling ($rs=0.3$; $p<0.05$), moderate association with project costs (($rs=0.36$; $p<0.05$), duration ($rs=0.35$; $p<0.05$), strong associations with adoption ($rs=0.5$; $p<0.05$) and job redesign ($rs=0.44$; $p<0.05$). The results imply that an increase in multi-skilling is likely to improve project scheduling, costs, duration, and job redesign to facilitate multi-skilling. Stronger positive associations, with statistically significant results are seen among project cost and schedule flexibility ($rs=0.6$; $p<0.05$), schedule flexibility and adoption ($rs=0.7$; $p<0.05$) as well as schedule flexibility and job redesign ($rs=0.7$; $p<0.05$). Further strong positive associations occur between adoption and project costs ($rs=0.6$; $p<0.05$), job redesign and project costs ($rs=0.75$; $p<0.05$) and, job redesign and adoption ($rs=0.8$; $p<0.05$). An increase in schedule flexibility, adoption strategies and job redesign is likely to contribute positively to project costs.

Hypothesis Testing: This section examines the relationship between the factors of the multi-skilled workforce on project scheduling flexibility and project costs through paired t-tests for paired observations. This is done through four hypothesis tests. Specifically, the independent samples t-test compares the difference in the means from two groups to a given value, Stat a calculate the t-statistic and its p-value under the assumption that the sample comes from an approximately normal distribution. Hypothesis statements are predictions made by the researcher about expected results findings (Creswel, 2014). Therefore, the following are the research hypothesis statements:

Hypothesis 1: a relationship exists between multi-skilled workforce and project resource scheduling flexibility

Table 9: Paired t-test: multi-skilled workforce and project resource scheduling flexibility

Variable code	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
MULTISKILL	45	1.91	0.072	0.483	1.763	2.053
SCHEDULE	45	1.61	0.083	0.558	1.438	1.773
Diff	45	0.30	0.093	0.624	0.115	0.490

Mean (diff) = mean (MULTISKILL - SCHEDULE), t = 3.3 Pr (|T| > |t|) = 0.002, The results indicate that there is a positive (0.30) difference between the means of multi-skilled workforce and project resource scheduling flexibility, the p-value associated with the t-test is statistically significant at 5% level (p <0.05). Hence, the null hypothesis (Ho: mean (diff) = 0) is rejected. A conclusion can therefore be made that there is a direct relationship between the two variables. The t-statistics (t=3.3) suggests the use of multi-skilled workforce provides for flexible project resource scheduling as much as 3.3 times.

Hypothesis 2: Multi-skilling a has a positive effect on the project cost savings

Table 10: Paired t-test: multi-skilled workforce and project cost savings

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
MULTISKILLED	45	1.908	0.072	0.483	1.763	2.053
COSTS	45	1.773	0.077	0.515	1.619	1.928
Diff	45	0.135	0.084	0.565	- 0.035	0.304

Mean (diff) = mean (MULTISKILL - COSTS) t = 1.59 Pr (|T| > |t|) = 0.1174, The results indicate that there is negligible a positive (0.13) difference between the means of multi-skilled workforce and project costs, the p-value associated with the t-test is not statistically significant at 5% level (p >0.05). Hence, the null hypothesis (Ho: mean (diff) = 0) is not rejected. A conclusion can therefore be made that there is probably no positive relationship between multi-skilled workforce and project costs savings.

Hypothesis 3: The use of multi-skilling has no significant impact on project duration

Table 11: Paired T-Test: Multi-Skilled Workforce and Project Duration

Variable code	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
MULTIS~L	45	1.91	0.072	0.483	1.763	2.053
DURATION	45	2.22	0.091	0.607	2.040	2.405
Diff	45	- 0.31	0.094	0.630	- 0.504	- 0.125

Mean (diff) = mean (MULTISKILL - DURATION) t = -3.34 Pr (|T| > |t|) = 0.0017, The results indicate that there is a negative (0.31) difference between the means of multi-skilled workforce and project duration, the p-value associated with the t-test is statistically significant at 5% level (p <0.05). Hence, the null hypothesis (Ho: mean (diff) = 0) is rejected. A conclusion can therefore be made that there is no positive relationship between multi-skilled workforce and duration. In other words, the use of multi-skilling has 3.3 times the negative significant impact on project duration.

Hypothesis 4 (i): There is a positive relationship between multi-skilled workforce and adoption of multi-skilling

Table 12: Paired T-Test: Multi-Skilled Workforce and Adoption of Multi-Skills

Variable code	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
MULTIS~L	42	1.898	0.074	0.482	1.748	2.048
ADOPTION	42	1.635	0.082	0.530	1.470	1.800
diff	42	0.263	0.075	0.484	0.112	0.414

Mean (diff) = mean (MULTISKILL - ADOPTION) t = 3.52 Pr (|T| > |t|) = 0.0011, The results above indicate that there is a positive (0.26) difference between the means of multi-skilled workforce and adoption of the multi-skills, the p-value associated with the t-test is highly statistically significant at 5% level ($p < 0.05$). Hence, the null hypothesis (Ho: mean (diff) = 0) is rejected. A conclusion can therefore be made that there is a positive relationship between multi-skilled workforce and adoption of multi-skills. In other words, the use of multi-skilling could have 3.5 times the positive significant impact on multi skills adoption rate.

Hypothesis 4(ii): There is a positive relationship between multi-skilling job redesign

Lastly, the research provides scientific results findings and analysis procedure used to draw up conclusions about the effect of using multi-skilling on project resource scheduling, project cost savings, project duration, adoption of multi-skills and the influence of job redesign in facilitating multi-skilling.

Table 13: Paired T-Test: Multi-Skilled Workforce and Job Redesign

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
MULTIS~L	42	1.90	0.074	0.482	1.748	2.048
JOB	42	1.59	0.079	0.514	1.427	1.748
Diff	42	0.31	0.081	0.526	0.147	0.475

Mean (diff) = mean (MULTISKILL - JOB) t = 3.8 Pr (|T| > |t|) = 0.0004, The results above indicate that there is a positive (0.31) difference between the means of multi-skilled workforce and job redesign, the p-value associated with the t-test is highly statistically significant at 5% level ($p < 0.05$). Hence, the null hypothesis (Ho: mean (diff) = 0) is rejected. A conclusion can therefore be made that there is a positive relationship between multi-skilled workforce and job redesign. In other words, the use of multi-skilling could have 3.8 times the positive significant impact on job redesign.

5. Conclusion and Recommendations

This research contributes knowledge to project engineering management effective staffing of teams and operations management. The arrangement of the research objectives was a carefully thought out exercise to allow for research results to be quantified and generalized to the research site to enhance business decision making. Academic and or business researchers can use this research to further study the concept of multi-skilling and its impact in engineering projects, since the most literature on multi-skilling covers the retail sector, moderate on the construction industry and very few in project engineering management.

Objective 1: Influence of Multi-Skilled Workforce on Project Scheduling Flexibility: The conducted descriptive statistics showed that multi-skilled workforce could have an influence on project scheduling flexibility, but the results could not be used alone to draw conclusions. Accordingly, Spearman's correlation of associations was conducted, and the results showed that the use of multi-skilled workforce to have a weak positive association with project scheduling flexibility. However, correlations alone cannot be used to generalize results findings of a sample. Therefore, a conducted paired t-test hypothesis test concluded that the use of multi-skilled workforce provides for flexible project resource scheduling as much as 3.3 times. In other words, at X PTM Central Group the use of multi-skilled workforce can have up to 3.3 times more influence on project resource scheduling flexibility.

Objective 2: Evaluating the Relationship between Multi-Skilling and Project Costs: The descriptive statistics results in this regard showed that majority of respondents were in agreement with all the factors in this objective. Spearman's correlation results of association showed a moderate association between the two variables. Conclusively, paired t-test hypothesis results suggested a non-positive relationship between the two variables. This means the use of multi-skilling at X PTM Central Group will probably have no influence on project cost savings.

Objective 3: Evaluating the Effect of Multi-Skilling on Project Duration: A majority of respondents were in agreement that the use of multi-skilled workforce has an influence on project duration. The correlation results of association indicated a moderate positive association between the variables. A paired t-test hypothesis made the conclusion that there is no positive relationship between the use of multi-skilled workforce and project duration. The results conclude that the use of multi-skilled workforce at X PTM Central Group has no positive relationship with project duration.

Objective 4: Evaluating the Effect of Adopting Multi-Skilling Strategy: The majority of respondents in this regard were also in agreement that multi-skilling has an influence on the adoption of skills. The correlation results of association indicated a strong positive association between the two variables. Using hypothesis results, a conclusion was made that there is a positive relationship between multi-skilled workforce and adoption of multi-skills. This can be translated; the use of multi-skilling at X PTM Central Group has a positive effect on the adoption of multi-skills.

Objective 5: Evaluating the Use of Job Redesign to Facilitate Workforce Multi-Skilling: A large number of respondents were also in agreement with the factors of job redesign to facilitate workforce multi-skilling at X PTM Central Group. The results of associations showed a strong association between the variables. Hypothesis testing provided a conclusion that there is a positive relationship between multi-skilled workforce and job redesign. This concludes that at X PTM Central Group job redesigned can be used to facilitate multi-skilling.

Conclusion: There is evidence that the use of multi-skilled workforce provides for flexible project resource scheduling as much as 3.3 times. There is probably no positive relationship between multi-skilled workforce and project costs. Further results indicate that use of multi-skilling has 3.3 times the negative significant impact on project duration. The use of multi-skilling could have 3.8 times the positive significant impact on job redesign. Lastly, the use of multi-skilling could have 3.5 times the positive significant impact on the adoption of multi-skilling.

Limitations of the Study: There were no major problems encountered during this research, except for the usual research associated challenges such as ethical clearance application which took longer than anticipated by the research study timelines. The other challenge was the response rate at the beginning of the study, there was a low response rate but after a follow-up email respondents' participation increased greatly. However, a total number of non-responses was 17, in other words 25% of the recruits did not participate to the study. The size of the sample was limited by the research site population, that is X PTM Central Group project execution personnel, meaning the views were only limited to this group and no opinions from other X divisions were factored. The study assumed that all respondents have basic project execution and technical backgrounds, since employees at research site are technical personnel by profession.

Recommendations: The researched concluded that multi-skilled workforce has a positive influence on project scheduling flexibility at X PTM Central Group. However, it is recommended for this business unit to pay more attention to the factor "workforce multi-skilling helps cushion against unforeseen project schedule changes" as it showed to be in contrast with other contributing factors to the flexibility of project scheduling. X PTM Central Group should improve on the idea that, multi-skilled workforce lack of skill specialization can drive up project costs by means of defects resulted due to lack of expert knowledge, and that multi-skilled workforce strategy will help X PTM Central Group reduce project transport costs to yield positive results from multi-skilling and project cost savings objective. It imperative for X PTM Central Group to search for alternative ways to equip multi-skilled employees to reduce activity job duration to relatively close to a specialist output level and centralize multi-skilling to help afford project managers better control of projects, as this will improve multi-skilling influence to reduce project duration. Assessment to project labor resources showed that there is a need for project support services to show more experience and professionalism in managing projects, to improve proficiency in project management. It is recommended that technical project labor resources must be afforded a platform to practice cross skilling perhaps by doing away with specialist departments and rather form a multi-skilled talent pool.

References

Abomeh, O. & Peace, N. (2015). Effects of Training on Employees' Productivity in Nigeria Insurance Industry. British Journal of Economics, Management & Trade, 7(3), 227-235.

Abotaleb, I., Moussa, M. & Hussain, S. (2014). Optimization of Allocating Multi-Skilled Labor Resources Using Genetic Algorithms. Halifax, CSCE 2014 General Conference.

Acock, A. C. (2014). A Gentle Introduction to Stata. 4 ed. College Station: TX: Stata Press.

Adamu, N., Nensok, M. & Aka, A. (2012). Multi-skilling Barriers in The Construction Industry in North-Western Nigeria. Abuja, West Africa Built Environment Research (WABER) Conference.

Adeyoyin, S. et al. (2015). Effects of Job Specialization and Departmentalization on Job Satisfaction among the Staff of a Nigerian University Library, Lincoln: University of Nebraska.

Afifi, A. M. S. & Clark, V. (2012). Practical multivariate analysis. 5 ed. Boca Raton: CRC Press.

Ahmadian Fard Fini, A., Rashidi, T., Akbarnezhad, A. & Travis Waller, S. (2016). Incorporating Multiskilling and Learning in the Optimization of Crew Composition. Journal of Construction Engineering and Management, 142(5).

Akinola, J., Ogunsemi, D. & Dada, M. (2015). Impact of Multiskilling On Competency of Nigerian Quantity Surveyors. Abuja, The Nigerian Institute of Quantity Surveyors.

Aliyu, A. A., Bello, M. U., Kasim, R. & Martin, D. (2014). Positivist and Non-Positivist Paradigm in Social Science Research: Conflicting Paradigms or Perfect Partners? Journal of Management and Sustainability, 4(3), 79-95.

Anon. (2015). Project Planning and Scheduling Using PERT and CPM Techniques with Linear Programming: Case Study. International Journal of Scientific & Technology Research, 4(8), 222-227.

Antwi, S. K. & Hamza, K. (2015). Qualitative and Quantitative Research Paradigms in Research: A Philosophical Reflection. European Journal of Business and Management, 7(3), 217-225.

Arunadhevi, P. (2016). Optimization of Construction Project Scheduling by Using Linear Programming. International Journal of Advanced Research Trends in Engineering and Technology, 3(2), 1268-1273.

Attia, E., Duquenne, P. & Le-Lann, G. (2013). Considering skills evolutions in multi-skilled workforce allocation with flexible working hours. International Journal of Production Research, 52(15), 4548–4573.

Brown, A., Adams, J. & Amjad, A. (2007). The relationship between human capital and time performance in project management: A path analysis. International Journal of Project Management, 25(2007), 77–89.

Burleson, R., Haas, C., Tucker, R. & Stanley, A. (1998). Multi-skilled Labor Strategies in Construction. ASCE Journal of Construction Engineering and Management, 124(6), 480–489.

Chan, K. (2014). Multiple project team membership and performance: empirical evidence from engineering project teams. Sajems special issue, 17(2014), 76-90.

Creswel, J. (2014). Research design: qualitative, quantitative, and mixed methods approach. 4 ed. London: SAGE Publications Ltd.

Creswell, J. (2014). Research design: qualitative, quantitative, and mixed methods approach. 4 ed. London: SAGE Publications Ltd.

Das, K. R. & Imon, R. A. H. M. (2016). A Brief Review of Tests for Normality. American Journal of Theoretical and Applied Statistics, 5(1), 5-12.

DeVaro, J. & Farnham, M. (2010). Two Perspectives on Multiskilling and Product Market Volatility, East Bay: Economic and Social Research Council.

Dickson, O. (2003). A pilot investigation of the Potential Impact of the Practical Design and Implementation of Multi-Skilling to optimise Employees and achieve improved Productivity within the Automobile Manufacturing Industry., Durban: University of KwaZulu Natal.

Ernst A, T., Jiang, H., Krishnamoorthy, M. & Sier, D. (2004). Staff scheduling and rostering: A review of applications, methods and models. European Journal of Operational Research, 153, 3–27.

X. (2014). Deliver Projects - Programme Management Procedure, Johannesburg: s.n.

X. (2016). Engineering Cost Control on Capital Projects Works Instruction, Johannesburg: s.n.

Gomar, J., Haas, C. & Morton, D. (2012). Assignment and Allocation Optimization of Partially Multi skilled Workforce. Journal of Construction Engineering and Management, 128(2), 103-108.

Hegazy, T., Shabeeb, A., Elbeltagi, E. & Cheema, T. (2000). Algorithm for Scheduling with Multi skilled Constrained Resources. Journal of Construction Engineering and Management, 126 (6), 414-421.

Heimerl, C. & Kolisch, R. (2010). Work assignment to and qualification of multi-skilled human resources under knowledge depreciation and company skill level targets. International Journal of Production Research, 48(13), 3759–3781.

Horbury, C. & Wright, M. (2010). Development of a Multiskilling Life Cycle Model, Norwich: Health and Safety Executive.

Irene, L., 2009. Multiskilling in construction – a strategy for stable employment. Technological and Economic Development of Economy, 15(4), 540–560.

Jaskowski, P. (2013). Scheduling Construction Projects with Multi-Skilled Resources. International Journal of Arts & Sciences, 6(3), 347–353.

Kagona, J., Shukla, J. & Oduor, J. (2015). The effect of employee training on project performance A case of the Girl Child Catch up project of the International Education Exchange. Journal of Marketing and HR, 1(1), 33-40.

Kaymaza, K. (2010). The Effects of Job Rotation Practices on Motivation: A Research on Managers in the Automotive Organizations. Business and Economics Research Journal, 1(3), 69-85.

Keller, G. (2012). Managerial Statistics Abbreviated. 9th ed. UK/Europe/Middle East/Africa: South-Western - Cengage Learning.

Kepha, O., Assumptah, K. W. & Dismaso, O. (2014). The Influence of Training and Development on the Performance of Employees in Research Institutes in Kenya. International Journal of Science and Research, 3(5), 139-146.

Kim, J., Kang, C. & Hwang, I. (2012). A practical approach to project scheduling: considering the potential quality loss cost in the time–cost tradeoff problem. International Journal of Project Management, 30, 264–272.

Kothari, C. (2008). Research Methodology: Methods & Techniques. 2 ed. New Delhi: New Age International (P) Ltd.

Kuhn, T. S. (2012). The structure of scientific revolutions, Chicago: University of Chicago Press.

Lee, B. & Nam, J. (2013). What drives Korean firms to downsize under the global financial crisis? Asian Pacific Business Review, 19(2), 171-185.

Leedy, P. & Ormrod, J. (2013). Practical Research Planning and Design. 10 ed. New York: Pearson Education Inc.

Lill, I. (2009). Multiskilling in Construction a Strategy for Stable Employment. Technological and Economic Development of Economy, 15(4), 540-560.

Liu, S. & Wang, C. (2012). Optimizing linear project scheduling with multi-skilled crews. Automation in Construction, 24, 16–23.

Long, J. S. & Freese, J. (2014). Regression Models for Categorical Dependent Variables Using Stata. 3 ed. College Station: TX: Stata Press.

Mackey, A. & Gass, S. M. (2016). Second Language Research: Methodology and Design. 2nd ed. New York: Routledge Taylor and Francis Group.

Makholwa, A. (2010). Ageing Workforce a Worry. Finweek, 24 June.

Mateus, A. D., Allen-Ile, C. & Iwu, C. (2014). Skills Shortage in South Africa: Interrogating the Repertoire of Discussions. Mediterranean Journal of Social Sciences, 5(6), 63-68.

Maylor, H. (2010). Project management. 4 ed. Harlow: Pearson Education Limited.

Mir, F. A. & Pinnington, A. H. (2014). Exploring the value of project management: Linking Project Management Performance and Project Success. International Journal of Project Management, 32, 202–217.

Morita, H. (2005). Multi-skilling, Delegation and Continuous Process Improvement: A Comparative Analysis of US–Japanese Work Organizations. Economica, 72, 69–93.

Mossa, G. et al. (2016). Productivity and ergonomic risk in human-based production systems: A job-rotation scheduling model. International Journal of Production Economics, 171(4), 471–477.

Motsoeneng, L., Schultz, C. & Bezuidenhout, A. (2013). Skills Needed by Engineers in the Platinum Mining Industry in South Africa, Pretoria: Mining Qualifications Authority, South Africa.

Nwaogazie, I., Augustine, O. & Henshaw, T. (2016). Multi-skilling in construction industry and dual skill labour strategy: a case of construction companies in port harcourt. International Journal of Civil Engineering and Technology, 7(4), 208–222.

Puttick, G. (2008). Multi-skilling overcomes labour shortages. Analysis management, 14 March, p. 1.

Qin, S., Liu, S. & Kuang, H. (2016). Piecewise Linear Model for Multiskilled Workforce Scheduling Problems considering Learning Effect and Project Quality. Mathematical Problems in Engineering, 11.

Rajendra, J. (2016). Accountability of Multi-Skilling in Enrichment of Career Planning of Organization and Employee in the Global Scenario, India: MIT- SOM PGRC KJIMRP National Research Conference.

Render, B., Stair, R., Hanna, M. & Hale, S. (2015). Quantitative Analysis for Management. 12 ed. Harlow: Pearson Education Limited.

Saravani, S. R. & Abbasi, R. (2013). Investigating the influence of job rotation on performance by considering skill variation and job satisfaction of bank employees. Tehnički vjesnik, 20(3), 473-478.

Saunders, M., Lewis, P. & Thornhill, A. (2009). Research methods for business students. 5 ed. Harlow: Pearson Education Ltd.

Sekaran, U. & Bougie, R. (2013). Research methods for business. 6 ed. West Sussex: Wiley and Sons Ltd.

Singh, V. & Shah, S. (2014). Implementing Kaizen in A Job Shop Industry Through Multi-Skilling of Labour. International Journal of Emerging Technology and Advanced Engineering, 4(3), 289-291.

Srinivasan, I. A. (2014). The impact of multi-skilling on an outsourced environment. International Journal of Advance Research, 2(1), 1-18.

Stratton, S. J. (2015). Assessing the Accuracy of Survey Research. Prehospital and Disaster Medicine; Cambridge, 30(3), 225-226.

Suresh, K. & Chandrashekara, S. (2012). Sample size estimation and power analysis for clinical. Journal of Human Reproductive Sciences, 5 (1), 7-12.

Sushil, S. (2014). Role of Job Enrichment and Job Enlargement in Work-Life Balance. Global Journal of Finance and Management, 6(3), 239-244.

Tancott, G. (2014). Addressing the skills shortage. Infrastructure News and Service Delivery, 14 May.

Tarus, B. K. (2014). Effects of Job Rotation Strategy on High-Performance Workplace, in Lake Victoria North Water Services Board, Kenya. International Journal of Business and Management, 9(11), 139-146.

Tavakol, M. & Dennick, R. (2011). Making sense of Cronbach's alpha. International Journal of Medical Education, 2(2011), 53–55.

Testa, B. (2010). Multi-skilled Employees Sought as Versatility Becomes a Workplace Virtue. workforce, 20 September, 1-3.

Zaid, M. A. (2015). Correlation and Regression Analysis. 1 ed. Ankara: The Statistical, Economic and Social Research and Training Centre for Islamic Countries.

Zar, J. (2014). Spearman Rank Correlation, Illinois: Research Gate.

Zha, H. & Zhang, L. (2014). Scheduling Projects with Multi-skill Learning Effect. The Scientific World Journal, 2014(731081), 7.

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An Inter-Generational Effect of Socio-Economic Status on Education Attainment in South Africa

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Abstract: Higher socio-economic status (SES) empowers an individual to have more access to a variety of materials relevant to achievements in life than would otherwise be possible. In theory, a child's educational attainment can be influenced by hereditary and ecological variables; parents' achievements are prompting children to achieve, or a deliberate investment that parents undertake in their children's welfare, all suggestive of inter-generational effect in the process. A parent's SES may therefore play a significant role in the child's achievements. This paper attempts to determine the relationship between a parent's SES and a child's educational attainment and uses South African data collected at the national level. Employing descriptive statistics and OLS regressions, an inter-generational effect of parental SES positively influencing a child's educational attainment is established. The finding supports policies promoting education as a fundamental poverty and inequality fighting mechanism in South Africa.

Keywords: *Academic attainment; inter-generational effect; socio-economic status; South Africa; well-being*

1. Introduction

There is increasing interest in understanding the relationship between a parent's socio-economic status (SES) and a child's education attainment (Alhaidari et al., 2016; Stahl, Schober & Spiess, 2018). A parent's SES affects the parent's education involvement in a child's life. The parent's education involvement is a multifaceted construct encompassing a parent's education involvement at home and at school, as well as a parent's academic socialisation (Benner, Boyle, & Sadler, 2016; Hill et al., 2004; Hill & Tyson, 2009). A parent's education involvement represents the required 'concerted cultivation' i.e. "deliberate and sustained effort to stimulate children's development and to cultivate their cognitive and social skills" (Cheadle & Amato, 2011:681). A child's educational attainment directly affects his/her future economic participation and well-being. It is in this view that promoting education attainment is one priority when targeting the socio-economic ills in developing countries. In South Africa, promoting education attainment is one avenue to address the historical and perpetual economic imbalances. Socio-economic status (SES) includes a person's positioning in the hierarchy of needs indicated by access to or control over some blend of esteemed wares; for example, riches, influence, and economic well-being (Caro, 2009; Considine & Zappalà, 2002; Sirin, 2005). A comprehensive measure of family SES accounts for a parent's education, occupation prestige, family income and multi-dimensional operationalisation of a parent's education involvement (Benner et al., 2016; Eilertsen et al., 2016; Long & Pang, 2016). The current study focuses specifically on a parent's education and employment status as constituent components of SES in assessing the child's educational attainment.

These SES indicators shape the home environment that is helpful for a child's learning. Benner et al. (2016) refer to the parent's education as a socio-demographic marker that may constrain the levels or amounts of educational involvement that the parents are able to provide and the effects of such involvement. For instance, less educated parents are more likely to express lower educational expectations for their children compared to educated parents (Carolan & Wasserman, 2015), and hence limited academic socialization in the form of less (in) direct messages to children about school that communicate expectations of parents on their children's schooling and views around the importance of education (Cheadle & Amato, 2011; Roksa & Potter, 2011). Limited academic socialization also manifests in the form of lack of concrete discussions between parents and children in which parents promote and influence the development of their children's future educational and occupational plans. Hill and Tyson (2009) applauded academic socialization as a process that allows parents to provide their children with the tools necessary for independence and educational success. A parent's education is therefore one essential family context that influences children's consequent accomplishments as grown-ups (Ermisch & Pronzato, 2010). In the South African context and as of 2017, only 4.5% of South Africans between the ages of 18 and 29 years were enrolled in a university institution - up from 4% in 2002 (Statistics South Africa, 2017).

This is a mere increase of 0.5% over a period of fifteen years. Of the 766 812 pupils who were enrolled at tertiary institutions in 2016, approximately 66.4% were African; 18.7% were White; 7.8% were Indian/Asian, and 7.1% were Coloured (Statistics South Africa, 2017); a distribution in line with South African demographics. Although this distribution shows that most of the students in the South African universities were of African descent, within the African youth group of ages 18 to 29 years, merely 3.3% were in school during the year 2016. This within-race percentage is the lowest compared to other races, which have 3.5% for Coloureds, 18.8% for Indians/Asians and 17.5% for White South Africans (Statistics South Africa, 2017). Against this background, an important issue to consider - and hence the main focus of the current paper - is to seek to establish whether there is any discernible relationship between a parent's SES and the academic achievement of a child. Specifically, the paper attempts to establish if the parent's education and employment status explain the child's educational attainment within the South African context. The remainder of the paper is structured as follows. Section 2 provides a literature review. Data and methods are presented in section 3. Section 4 presents the results. Section 5 gives a discussion and, finally, section 6 concludes the exposition.

2. Literature Review

Theory: The positive relationship between a parent's SES and a child's educational attainment has various conceivable explanations. The pure selection theory holds that a parent with more education has a child who will do as such (Black, Devereux, & Salvanes, 2005). In terms of this theory, qualities that lead parents to choose elevated levels of education may be identified with other hereditary and ecological variables imparted to their children that will lead the children, likewise, to accomplish elevated levels of education (Dickson, Gregg, & Robinson, 2016). In addition, children of educated parents may also aim to emulate their parents. In this manner, a positive correlation between the parent's SES and the child's educational attainment is a norm rather than a chance event. The causal theory, another plausible explanation, suggests that acquiring more education makes one a different kind of a parent that may also prompt their children to attain higher educational outcomes (Black et al., 2005). Large amounts of schooling enable parents to give superior experience and home conditions to their children - such that the children improve on their schooling (Black et al., 2005; Chevalier, 2004; Dickson et al., 2016). Chevalier (2004) further states that highly educated parents provide an environment that enhances their children's opportunities and choice procedures. This parent SES measure is stable, established at an early age by the parents and has a tendency to remain the same (Sirin, 2005). Family environment may advance procurement of numeric skills that relate to parents' educational achievements and their abilities (Ermisch & Pronzato, 2010). These intellectual incitements relate to better academic achievements by children.

Investment theory, however, posits that children's success in school depends on the investments that parents, among other stakeholders, make in the child's education (Stevens & Schaller, 2011). In terms of this theory a child's education enters into the parent's spending function, both in terms of time and monetary values. This means that the availability of resources as influenced by the parent's SES plays a crucial role in the child's educational attainment. Willingham (2012), for instance, argues that low-salary families cannot as promptly manage the costs of books, computers, access to tutors and different sources of academic support. Advanced education expands the ability to earn income in the market and, in turn, entails spending more income on everything that parents esteem - including their children's education (Black et al., 2005; Ermisch & Pronzato, 2010; Sirin, 2005). Parents' education accomplishments may also change their attitude towards investment in their children, for example, by reading to the child, an engagement that may influence children's goals (Ermisch & Pronzato, 2010). Investment theory, likewise, suggests that a parent's SES assumes a noteworthy role in providing educational resources and imposes a stronger influence on the child's educational success.

Empirical literature: A probit model to explain the effects of the number of years of a parent's education and income on their children's education level by (Chevalier, 2004) and using UK data, establishes that increasing a parent's education by one year builds the likelihood of a child remaining at school by 4 percentage points. The model results also show that the combined effects of the mother and father's education on child's education are similar in magnitudes and that children living in higher income homes are more likely to obtain a higher level of education. Chesters (2010) estimates a logistic model to test the effects of a parent's education on child education, using three different eras to compare the outcomes between 1987

and 2005 in Australia and finds that both the father and the mother's education have a positive influence on the child's education, with the mother's carrying more weight.

Black et al. (2005) find a minimal causal relationship between a parent's education and a child's education in spite of strong ordinary least squares relationships, using Norwegian data. A Norwegian data based twin-analysis testing whether child's education is dependent entirely on either genes or their common childhood environment (by gathering the impact of the parent's education on the child's education net of any hereditary impacts) suggests other aspects than just growing up in a similar environment with the same parents (Ermisch & Pronzato, 2010). In terms of a parent's employment status, Usaini and Abubakar (2015) use an OLS regression model on Malaysian data to investigate the effect of a parent's employment status on a child's academic performance. Usaini and Abubakar (2015) find that parents' employment status influences academic performance in secondary school, such that students whose parents had better jobs in the formal sector had better marks and performed better in school than the students whose parents worked in the informal sector or were unemployed. "When parents have a better occupation, they provide economic, social, psychological and emotional support to their children, and this would make it possible for the children to perform well in their educational attainment" (Usaini & Abubakar, 2015:114).

In a study by Ngare et al. (2017), it is reported that parents with less-esteemed occupations or who were unemployed neglected to make these sufficient arrangements to support their children in their educational accomplishment, which could result in poor academic performance or even dropouts. Employing ANOVA in determining the significance of parents' employment status and family income on a child's education attainment and using Pakistan data, Shah and Anwar (2014) showed that both a mother and a father's employment status have a positive and significant effect on a child's education, with a father's being greater. While the positive impact of these parents' SES indicators is mostly reported, other studies report the possibility of parents who are not employed being advocates of education and therefore inspiring their children to do better at school. Considine & Zappalà (2002) argue that parents may have a low salary and a low-status occupation but transmitting high education desires to their kids. Schildberg-Hörisch (2016) suggests a negative relationship between parents with high-status occupation and child education attainment, as high-status employment diminishes time spent at home with the children. Parents in such circumstances were detached from their children's schoolwork. The current paper employs South African data, collected at the national level, to assess the impact of a parent's education and employment status on a child's educational attainment.

3. Data and Methods

In this paper, we make use of National Income Dynamics Study (NIDS) data, a national survey carried out in South Africa. The paper initially assesses the relationship between a parent's education and employment status and a child's educational attainment descriptively, and then precedes to using regression models in determining the extent to which a child's educational attainment is explained by the parent's education and employment status. Sub-group analyses that take cognisance of race and gender factors are carried out to get more nuanced results. Specifically, wave 4 data (collected in 2014) of the NIDS project are used. The adult questionnaire of the survey collects information from respondents about their families, education and employment status, among other things. Extensive information on the respondent's education history and the education and occupation history of the parents of the respondents are available. A sample of 26534 adults was successfully interviewed for this wave and this paper restricts the sample to adults of age range 15 to 64 years, remaining with a sample of 24427 adults. The dependent variable in the analysis is the child's education with values ranging from 0 (when a respondent has no formal education at all or 0 years of education) to 18 years (highest possible academic qualification - which is a Master's or Doctoral degree).

The main covariate is the parent's SES represented by its indicators; that is the parent's education and the parent's employment status. A parent's education similarly ranges from 0 to 18 years, whereas unemployment status is a binary variable assuming the value 0 (=unemployed) or 1 (= employed). Based on the available literature, we expected both parents' education and employment status to influence the child's educational attainment positively. In addition, and as controls, age, race and gender of the child are included in the analysis. The gender variable is a binary variable taking the value 1 if female and 0 if male. The race

variable has four categories: 0 (= African), 1 (= Coloured), 2 (= Indian/Asian), and 3 (= white). Given the South African historical background, previously disadvantaged groups in South Africa are less likely to obtain a formal education because of the lack of opportunities and/or money. A priori, female individuals are less likely to attain higher levels of formal education than their male counterparts are.

The paper also makes use of sub-group analysis to report the effects of a parent's SES on a child's educational attainment, based on race and gender. The variables in the analyses, therefore, are the child's education attainment (childeduc), the mother's highest education level (HE_M), the father's highest education level (HE_F), the mother's employment status ($OccM$), the father's employment status ($OccF$), and age, race and gender of the respondent/child. Turning to the econometric models, Ordinary Least Squares (OLS) regression models are used. Model 1 and Model 2 assess the influence of a parent's education and a parent's employment status respectively and are expressed as follows:

$$childeduc = \beta_0 + \beta_1 HE_M + \beta_2 HE_F + \beta_3 Age + \beta_4 Race + \beta_5 Gender + \varepsilon_i \quad (1)$$

$$childeduc = \beta_0 + \beta_1 OccM + \beta_2 OccF + \beta_3 Age + \beta_4 Race + \beta_5 Gender + \varepsilon_i \quad (2)$$

In addition, goodness of fit tests are conducted comparing the variance explained statistics of *Model 1* and *Model 2*, and also conducting the F-tests for the two models. Further, a complete model (*Model 3*) with two SES indicators is given as:

$$childeduc = \beta_0 + \beta_1 HE_M + \beta_2 HE_F + \beta_3 OccM + \beta_4 OccF + \beta_5 Age + \beta_6 Race + \beta_7 Gender + \varepsilon_i \quad (3)$$

Sub-group regression models are represented by *Model 4* and *Model 5* as:

$$childeduc = \beta_0 + \beta_1 HE_M + \beta_2 HE_F + \beta_3 OccM + \beta_4 OccF + \beta_5 Age + \beta_7 Gender + \varepsilon_i \quad (4)$$

$$childeduc = \beta_0 + \beta_1 HE_M + \beta_2 HE_F + \beta_3 OccM + \beta_4 OccF + \beta_5 Age + \beta_6 Race + \varepsilon_i \quad (5)$$

So, *Model 4*separates the respondents by race while *Model 5* separates the respondents by gender.

4. Results

Descriptive statistical results are presented in Tables 1 and 2, followed by regression results in Tables 3 to 5. The respondent's education is about 9 years on average, with a median value of around 10 years. However, mean education level is higher for male respondents compared to female respondents, though with no statistical significance on this difference. The mother's highest education has mean and median values of approximately 4 years, while the father's highest education level is approximately 4 years on average and the median value 0 years. It is interesting to note that children/respondents, on average, have achieved more than double their father and mother's educational attainment. Most of the parents of the respondents in this study do not have a formal education - as percentages of reported zeros in terms of mother's and father's education are 54.91% and 55.33% respectively, while the percentage of zeros for formal education for respondents is a mere 9.4%. Approximately 95% of the educational attainment for both respondents and parents fall within two standard deviations of the mean. In terms of the parent's employment status, about 46% of the mothers were employed whereas 69% of the fathers were employed, clearly showing that the respondents' mothers are more likely than the fathers to be unemployed. This sample is in line with the South African population demographics consisting mostly of Africans (83.4%), followed by Coloureds (13.8%), then Whites (1.8%), and lastly Indians/Asians (0.9%). The average age of the respondents was 34 years, of which the males' average age was 32 years and that of females 35 years. White respondents were on average more educated than their African, Coloured and Indian/Asian counterparts. The average years of education for Whites is 12 years while for the other races, the average values lie between 9 – 10 years. Similarly, White parents on average were more educated than the African, Coloured and Indian/Asian parents, having double the education of the Africans and Coloureds.

This trend is also evident concerning employment status. Evidence of the influence of SES in its different forms on the child's educational attainment is presented next. Table 3 shows, as expected, a positive relationship between the parent's education and the child's educational attainment. The estimates for model 1 suggests that increasing the mother's education and the father's education by a year respectively raises, and statistically significantly so, the child's education attainment by 0.17 years and 0.12 years. Black et al. (2005); Dickson et al. (2016) and Ermisch and Pronzato, (2010) also reported statistically significant results in similar studies. Model 2 shows that employed parents are more likely to have children who attain higher

levels of education, reporting statistically significant coefficients of 0.70 and 0.63 for mother and father respectively. When the two SES indicators are included in the same model (Model 3), positive results are consistent for both parent's education and parent's employment status. Model 3 also shows that coefficients for parent's education are closer to those of Model 1 but the coefficients for parent's employment status drop in magnitude, compared to those in Model 2. The consistency of results across the models is also reported for the control variables - which are age, race and gender of the child/respondent. While the age of the respondent has a negative relationship with his/her education attainment, possibly because the dawn of democracy in South Africa opened doors for the young generation to attain higher levels of education, the race factor shows that Whites and Indians fare.

Table 1: Descriptive Statistics

	Total sample					Male child				Female child			
	Mean	Median	Std. Dev	% of zeros	Sample (n)	Mean	Median	Std. Dev	Sample (n)	Mean	Median	Std. Dev	Sample (n)
childeduc	9.34	10	3.48	9.4%	22, 133	9.36	10	3.23	8, 832	9.21	10	3.6	11, 917
HE_M	4.46	4	4.54	54.91%	11, 014	4.91	5	4.65	4, 372	4.16	3	4.45	6, 642
HE_F	4.02	0	4.7	55.33%	10, 910	4.44	3	4.8	4, 531	3.73	0	4.61	6, 379
OccM	0.46	0	0.46	51.35%	11, 839	0.46	0	0.5	4, 810	0.47	0	0.5	7, 029
OccF	0.69	1	0.46	67.48%	10, 944	0.71	1	0.46	4, 759	0.67	1	0.47	6, 185
Age	34	31	13.78	0%	24, 427	32	28	13.52	8, 850	35	32	14.09	11, 931
Gender	0.57	1	0.49	14.93%	20.781	-	-	-	-	-	-	-	-

Notes: Childeduc= respondent's education; HE_M = Mother's highest education; HE_F = Father's highest education; OCCM = Mother's employment status; OCCF = Father's employment status; Std. Dev = standard deviation.

Table 2: Descriptive Statistics, by Race

Variables	African			Coloured			Indian/Asian			White		
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	Mean	Median	Std. Dev	Mean	Median	Std. Dev
Childeduc	9.23	10	3.48	9	9	3.2	10.86	11.5	3.08	12.33	12	2.41
HE_M	4.26	3	4.52	4.69	5	4.18	5.28	7	4.48	10.37	12	2.54
HE_F	3.68	0	4.6	4.99	5	4.59	7.49	8	4.77	10.55	12	2.18
OccM	0.43	0	0.5	0.66	1	0.48	0.24	0	0.43	0.57	1	0.5
OccF	0.65	1	0.48	0.86	1	0.35	0.75	1	0.46	0.88	1	0.32
Age	33	29	13.76	35	34	13.94	38	37	14.53	43	45	14.85
Gender	0.58	1	0.49	0.56	1	0.5	0.54	1	0.5	0.55	1	0.5

Notes: Childeduc= respondent's education; HE_M = Mother's highest education; HE_F = Father's highest education; OCCM = Mother's employment status; OCCF = Father's employment status; Std. Dev = standard deviation.

Table 3: Determinants of a child's Education Attainment

Variables	Model 1	Model 2	Model 3
Mother's highest education	0.175^{***}	-	0.1659^{***}
	(0.0116)		(0.0135)
Father's highest education	0.1279^{***}	-	0.1341^{***}
	(0.0111)		(0.0129)
Mother's employment status	-	0.7026^{***}	0.3879^{***}
		(0.0786)	(0.0966)
Father's employment status	-	0.6357^{***}	0.474^{***}
		(0.0876)	(0.1075)
Age	-0.0802^{***}	-0.1064^{***}	-0.0783^{***}
	(0.0034)	(0.003)	(0.0039)
Base outcome: African = 0			

Coloured=1	-0.1092	-0.2365**	-0.4658***
	(0.1132)	(0.1089)	(0.1289)
Indian/Asian= 2	2.688***	2.8079***	2.2714***
	(0.3889)	(0.3567)	(0.3953)
White= 3	2.7233***	4.535***	2.3627***
	(0.2015)	(0.1887)	(0.218)
Gender	-0.0484	-0.079	-0.0982
	(0.0798)	(0.0754)	(0.0908)
Const.	10.8709***	12.4397***	10.4887***
	(0.1569)	(0.1235)	(0.1905)
Obs.	7341	7755	5429
R^2	0.2898	0.2079	0.3079

Notes: *, **, *** denote significance at 10%, 5% and 1% levels. Robust standard errors are in parentheses.

Sub-group analyses on race are reported in Table 4. The results show that, except for the Indian child, the mother's education boosts the child's education attainment for all races significantly. The highest coefficient for the mother's education is for Whites (0.3293), followed by that for Coloureds (0.2319) and lastly that of Africans (0.1489). In the case of father's education, the highest coefficient is reported for Indians (0.3209), followed by Whites (0.249), then Coloureds (0.2217), and lastly Africans (0.1145). This seems to suggest that giving an extra year of education to a White mother is more economically significant than giving a same year to an African mother, for instance. However, the trend of results may also not be surprising as culturally we expect African mothers to have a wide array of responsibilities within the household, other than assisting the children with schoolwork or education socialisation in general. The generally low level of education for African parents could also be playing a role in dampening the coefficients of parent's education as a covariate. With sub-group analyses, it is clear that the employment factor plays a statistically significant role only among Africans.

When the African mother or father is employed, the child's educational attainment is raised statistically significantly. This is crucial as employment is a source of income and generally helps to reduce poverty that is predominant among African families. Here, the age of the respondent/child for the African and Coloured continued to bear a negative sign, and significantly so. However, that of the White child is positive and significant. Such results are a clear indication of the advantages that a White child enjoyed even before the dawn of democracy, but also the advantages of the dawn of democracy in South Africa that opened doors for other races, and hence by age now shows negative correlations. The gender of the child/respondent does not influence educational attainment in this South African sample. This is possible because South Africa has embraced the Millennium Development Goals, and has reported success in educating a girl child in the same way as a boy child. The r-squared values for the three models are relatively high, indicating acceptable goodness of fit. The race results are a clear testimony of the perpetuating disparities in South Africa, the aftermath of the Apartheid era, with White parents showing positive and significant influence on children education attainment. Lastly, being African shows a better outcome on child's education than being Coloured while being Indian and White show a better outcome than being African, irrespective of child's gender. Largely, this confirms the success in giving equal education opportunities to both a girl and a boy child.

Table 4: Determinants of a Child's Education Attainment, By Race

Variables	Regression models for race clusters			
	Black	**Coloured**	**Indian/Asian**	**White**
Mother's highest education	0.1489***	0.2319***	0.0608	0.3293***
	(0.0148)	(0.0378)	(0.1063)	(0.0792)
Father's highest education	0.1145***	0.2217***	0.3209***	0.249***
	(0.0142)	(0.0361)	(0.1041)	(0.0812)
Mother's employment status	0.4768***	-0.0009	-0.8044	0.3855
	(0.107)	(0.2688)	(0.9617)	(0.3828)
Father's employment status	0.5513***	-0.1359	-1.3773*	-0.2058
	(0.1142)	(0.3626)	(0.0349)	(0.4449)
Age	-0.0878***	-0.0485***	0.01759	0.0341**
	(0.0044)	(0.01)	(0.0349)	(0.0159)
Gender	-0.0946	-0.0947	-0.8519	0.188
	(0.1017)	(0.2319)	(0.6504)	(0.3312)
Const.	10.8988***	8.9259***	10.3932***	5.0182***
	(0.2114)	(0.5586)	(1.4874)	(1.4251)
Obs.	4519	687	46	177
R^2	0.2827	0.3459	0.3395	0.1990

Notes: *, **, *** denote significance at 10%, 5% and 1% levels. Standard errors are in parentheses.

Table 5: Determinants of a Child's Education Attainment, by Gender

As a confirmation of no gender differences in terms of the effects of the SES indicators and other control variables, Table 5 shows exactly the same results with respect to statistical significance. A parent's education is highly significant irrespective of the gender of the child. A parent's employment status is a significant factor, and highly so for the girl child. The age of the child carries a negative sign and significantly so irrespective of the gender.

	Regression models for gender clusters	
Variables	**Male**	**Female**
Mother's highest education	0.1138***	0.2124***
	(0.0198)	(0.0183)
Father's highest education	0.131***	0.1325***
	(0.0188)	(0.0176)
Mother's employment status	0.3824**	0.3989***
	(0.1489)	(0.1261)
Father's employment status	0.3174*	0.5321***
	(0.1656)	(0.14)
Age	-0.0622***	-0.0901***
	(0.0061)	(0.0051)
Baseline outcome: African = 0		
Coloured=1	-0.4032**	-0.5172***
	(0.2017)	(0.1661)

Indian/Asian= 2	3.3174***	1.6418***
	(0.4346)	(0.5359)
White= 3	2.379***	2.306***
	(0.3326)	(0.2843)
Const.	10.2083***	10.6751***
	(0.2862)	(0.2393)
Obs.	2194	3235
R^2	0.2501	0.3471

Notes: *, **, *** denote significance at 10%, 5% and 1% levels. Standard errors are in parentheses.

Discussion: Education attainment in its own right is an important opportunity, particularly for children from economically poor households as it helps them overcome the inconvenience of their frayed background. It sets the previously disadvantaged on an equivalent balance with the previously advantaged when entering the work environment and even at the workplace. The SES of the families where children come from is thus crucial as it affects their education accomplishment (Taylor & Yu, 2009). The parent's SES can therefore block the child from catching up in terms of well-being, simply because they are inheriting poverty and its ugly dimensions. In this paper, the claim of parent's education positively influencing the child's educational attainment is confirmed, concurring with notions of educated parents having higher expectations for their children, but also the existence of academic socialisation in such families (Hill & Tyson, 2009). A causal theory is playing out to some extent as high education for parents begets higher education for their children. The parent's employment status, a proxy for the provision of economic, social, psychological and emotional support, is also an important determinant of a child's educational attainment. Here, the investment theory is confirmed as employment status is a sign of (UN) availability of resources. Such resources enable parents to fulfil their esteemed goals, including their children's educational achievements. The extent of the analysis carried out in this paper cannot categorically support or refute the pure selection theory, calling for in-depth data collection that enables such rigorous analysis.

5. Conclusion

This study focused on the influence of a parent's education and employment status, described as SES components, on a child's educational attainment. These SES components directly inform a parent's education involvement that happens at home, at school, as academic socialisation and as concerted cultivation. An additional outcome of this paper focused on the impact of race, the impact of gender in the form of the influence of the mother's SES compared to the father's SES as well as the gender of a child. The positive and statistically significant effects of parents' SES components on children's education attainment augurs well with policies promoting education in South Africa as a fundamental inequality fighting mechanism. This result supports the efforts of the South African government to provide education to children and employment opportunities for parents. However, the result also calls for intervention measures - especially to children from households with parents who have no or little education.

Lack of proper academic socialisation at home may result in efforts of free education to children from previously disadvantaged families being in vain. The paper has shown that SES components inform parents and therefore families' capacities to confront the economic and social ills that characterise many South African households. An indication that follows from the analysis of this paper is that for households whose SES is low there is a need for appropriate and direct intervention to break the negative inter-generational effect that would imply poverty inheritance. The paper takes note of the limited number of measures of SES employed here, namely education and binary employment status. Further studies may benefit literature by adding more measures of SES such as income level, wealth level and interaction of both parents' SES measures. In addition, a specific look at the quality of education and not just the level of education as well as specific occupations of the parents as opposed to the status of being employed or not may add to this line of literature.

References

Alhaidari, S. I., Al Houssien, A. O., Alteraiqi, M. A., Al Arafah, A. M., Al Houssien, R. O., Alhaidari, O. I. & Omair, A. I. (2016). Children's growth pattern and mothers' education and socioeconomic status in Riyadh, Saudi Arabia. *Journal of Health Specialties*, 4(4), 276-281.

Benner, A. D., Boyle, A. E. & Sadler, S. (2016). Parental involvement and adolescents' educational success: The roles of prior achievement and socioeconomic status. *Journal of Youth and Adolescence*, 45(6), 1053–1064.

Black, S. E., Devereux, P. J. & Salvanes, K. G. (2005). Why the apple doesn't fall far: Understanding intergenerational transmission of human capital. *American Economic Review*, 95(1), 437–449.

Caro, D. H. (2009). Socio-Economic Status and Academic Achievement Trajectories from Childhood to Adolescence. *Canadian Journal of Education*, 32(3), 558–590.

Carolan, B. V. & Wasserman, S. J. (2015). Does parenting style matter? Concerted cultivation, educational expectations, and the transmission of educational advantage. *Sociological Perspectives*, 58(2), 168–186.

Cheadle, J. E. & Amato, P. R. (2011). A quantitative assessment of Lareau's qualitative conclusions about class, race, and parenting. *Journal of Family Issues*, 32(5), 679–706.

Chesters, J. (2010). Has the effect of parents' education on child's education changed over time? Australian National University, Centre for Economic Policy Research.

Chevalier, A. (2004). Parental education and child's education: a natural experiment, 1153.

Considine, G. & Zappalà, G. (2002). Factors influencing the educational performance of students from disadvantaged backgrounds. In Competing visions: Refereed proceedings of the national social policy conference, 91–107.

Dickson, M., Gregg, P. & Robinson, H. (2016). Early, late or never? When does parental education impact child outcomes? *The Economic Journal*, 126(596), 184–231.

Eilertsen, T., Thorsen, A. L., Holm, S. E. H., Bøe, T., Sørensen, L. & Lundervold, A. J. (2016). Parental socioeconomic status and child intellectual functioning in a Norwegian sample. *Scandinavian Journal of Psychology*, 57(5), 399–405.

Ermisch, J. & Pronzato, C. (2010). Causal effects of parents' education on children's education. ISER Working Paper Series.

Hill, N. E., Castellino, D. R., Lansford, J. E., Nowlin, P., Dodge, K. A., Bates, J. E. & Pettit, G. S. (2004). Parent academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development*, 75(5), 1491–1509.

Hill, N. E. & Tyson, D. F. (2009). Parental involvement in middle school: a meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*, 45(3), 740.

Long, H. & Pang, W. (2016). Family socioeconomic status, parental expectations, and adolescents' academic achievements: a case of China. *Educational Research and Evaluation*, 22(5–6), 283–304.

Ngare, N. N., Maronga, E., Tikoko, B. & Sigei, J. (2017). Parental occupation as a predictor of student's academic performance, in Kenya certificate of secondary education in public mixed day secondary schools in nyamira north sub-county, Kenya. *Kabarak Journal of Research & Innovation*, 4(2), 70–83.

Roksa, J. & Potter, D. (2011). Parenting and academic achievement: Intergenerational transmission of educational advantage. *Sociology of Education*, 84(4), 299–321.

Schildberg-Hörisch, H. (2016). Parental employment and children's academic achievement. IZA World of Labor.

Shah, M. A. A. & Anwar, M. (2014). Impact of Parent's Occupation and Family Income on Children's Performance. *International Journal of Research*, 1(9), 606–612.

Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417–453.

Stahl, J. F., Schober, P. S. & Spiess, C. K. (2018). Parental socio-economic status and childcare quality: Early inequalities in educational opportunity? *Early Childhood Research Quarterly,* 44 (3rd Quarter), 304-317.

Statistics South Africa. (2017). General Household Survey 2016. Statistical Release P0318.

Stevens, A. H. & Schaller, J. (2011). Short-run effects of parental job loss on children's academic achievement. *Economics of Education Review*, 30(2), 289–299.

Taylor, S. & Yu, D. (2009). The importance of socio-economic status in determining educational achievement in South Africa. Unpublished Working Paper (Economics). Stellenbosch: Stellenbosch University.

Usaini, M. I. & Abubakar, N. B. (2015). The impact of parents' occupation on academic performance of secondary school students in Kuala Terengganu. *Multilingual Academic Journal of Education and Social Sciences*, 3(1), 115.

Willingham, D. T. (2012). Ask the Cognitive Scientist: Why Does Family Wealth Affect Learning. *American Educator*, 36(1), 33–39.

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Labour Dynamics in Climate and Techno Reliant Small Scale Maize Production

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Abstract: Adoption of improved technology tends to recalibrate labour use in agricultural production. The study examined how the adoption of various maize varieties impacted labour use in smallholder production. The study utilised a structured pre-coded questionnaire-based survey of 487 smallholder maize farmers in South Africa. The purposive sample was obtained from Ingquza Hill and Port St John's Local Municipalities in the Eastern Cape Province. A multinomial regression model and Monte Carlo Simulation were utilised to analyse the data. Statistical Package for Social Scientist (SPSS) version 23 as well as Excel were the statistical tools utilised. Through multinomial regression analysis, the study found that weeding labour was the most significantly affected by a change in maize variety. It was observed that as maize variety transcends in use from Landrace to GMO, improved OPV and conventional hybrid, ploughing and weeding hours tend to decrease. The harvesting, storage and shelling hours tend to increase. Utilising the Monte Carlo Simulation, the study also found an increased impact of maize variety utilisation on harvesting as well as on shelling and storage labour hours. The study recommends that varieties be promoted taking cognizance of the labour dynamics to tier maximize suitability and labour-based productivity, reducing tedious labour use in ploughing and weeding, whilst promoting employment in harvesting, shelling and storage.

Keywords: *Improved Maize Varieties, Labour, Monte Carlo Simulation, South Africa*

1. Introduction

Low input subsistence agriculture has been a major contributing factor to food security and improved rural livelihoods in developing countries. The World Bank (2008) indicates that it is significant in sustainable development, poverty reduction and enhanced food security. However, despite this significant recognition, agricultural productivity has continued to decline, with poverty levels increasing (Ouma and De Groote, 2011). Various factors have been attributed to this decline; chief amongst them being climate change and variability. In that scenario, various technologies have been developed to boost agricultural production, taking aim at the two-tier impacts of increased productivity in a dynamic climatic environment. More so, this technological advancement has been more evident in the production of maize, a staple crop in most third world countries (Regier and Dalton, 2013). South Africa has been one of the leading countries in the aspect of maize technology advancement and utilization, realizing an increase in maize output in tonnage from 6.9 million in 2006 to 14.9 million in 2014. However, production has gradually been decreasing from thereon to 7.7 million in 2016 (Quantec easy data, 2017a). This is despite the year on year area planted change decreasing by 36.5%, 4.39 % and 25.85% in 2006, 2014 and 2016 respectively (Quantec easy data, 2017b). The country has been at the forefront in innovating Genetically Modified (GM) maize, as well as increasing use of hybrid maize in Sub-Saharan Africa.

James, (2014) identifies South Africa occupying 9th position in the world in terms of biotech crop production, with 2.7 million hectares under enhanced crop production. According to the Global Harvest Initiative, (2017) South Africa is the only country where small-scale farmers have been growing GMOs in the past 10 years. Among the various maize varieties grown in the country include B_t maize, which was introduced in 1988, and H_t maize, introduced in 2003, with "stacked" maize combining both traits introduced in 2009. Out of the total maize producing areas in South Africa in 2012, 43% was stacked, 29% B_t and 13% H_t (Global Harvest Initiative, 2017). Mbofung (2010) highlights that the use of this improved maize varieties and technologies has enabled an increase in crop yields, improved storage potential, protein content, bio-fortification and improved food functionality. This has made South Africa the 10th largest producer of maize in the world, and since 1971 the country has topped 14.9 million tonnes in 2014 and bottoming 3.3 million tonnes in 1992 due to the climate change-induced drought (Quantec easy data, 2017a). However, with technological advancement comes the downside. Besides the most documented concerns relative to food safety, enhanced advancement in technology has recalibrated labour use in agricultural production, rendering it redundant in some instances. Being one of the most significant and abundant factors of production in developing countries,

underutilisation and/or contraction of the labour based opportunities has also been a contributing factor to depleted poverty reduction.

Gouse, Piesse, Thirtle and Poulton (2009) indicated that introducing a labour saving technology in a labour abundant economy, labour incomes fall and poverty increases. This presents a quagmire to planners and policymakers. The major question rose to be the trade-off between poverty-reduction-based technology advancement or labour enhancement (Gouse et al., 2009). In addition, previous studies have blanketed findings, disregarding area specific dynamics in terms of climatic variability. Be it as it may, such fundamental decisions cannot be made in a vacuum, there requires in-depth valuations. This necessitates the current study, which identifies how the adoption of various crop technologies has influenced labour dynamics. Specifically, the paper examines how the adoption of various crop varieties in differing climatic regions will likely impact labour use in small-scale maize production.

2. Labour Use in Maize Production

Labour is a significant factor of production in maize husbandry, which has attracted a share amount of academic attention (Regier and Dalton, 2013; Gouse, Sengupta, Zambrano and Zepeda, 2016; Gouse, 2014). This was corroborated by Leonardo et al. (2015) who found labour having more significance in addressing maize productivity in Mozambique relative to land. Smallholder farmers are efficient users of their production resources, especially labour. Family labour use for example, has been found to enhance smallholder production activities (Gouse et al., 2016), a phenomenon now regarded as the inverse farm size relationship. Furthermore, subdividing this labour, weeding was the main category determining maize yields (Leonardo et al., 2015). This was supported by Gouse et al. (2016) and Global Harvest Initiative, (2017) identifying a 10 to 12-day reduced weeding time in utilising improved maize varieties in South Africa. In addition, this played to the household dynamics, where females were more involved in agricultural production, freeing them to pursue other household chores. Alhassan, Salifu and Adebanji, (2016) corroborated labour being a significant determinant of improved maize variety adoption in Ghana. In Bangladesh, Karim, Moniruzzman and Alam (2010) discovered labour cost accounting for 33% of variable costs in the use of maize varieties, with much of this labour being hired. Human labour coefficient was identified having a significant impact on gross return in maize enterprises (Karim et al., 2010).

In terms of scale, larger scale farmers tend to achieve better yield because of their ability to hire labour, especially during weeding, relative to the small-scale maize farmers, who actually hired out their labour. Leonardo et al. (2015) highlighted intensive maize production being labour saving relative to extensive. In South Africa, Gouse, Piesse and Thirtle (2006) found the use of GM maize displacing labour, negatively affecting the poverty status of the households. For instance, they found the use of non-tillage maize varieties reducing labour input by 63%, especially in weeding and land preparation. However, Regier and Dalton, (2013) found total labour cost increases for GM maize, suggesting a recalibration of labour from other aspects of husbandry, but ultimately increasing the cost of labour. They highlighted that non-tillage maize varieties tend to reduce weeding labour as it is replaced through herbicide use. Bamire et al. (2010) corroborate, indicating that adoption of new technologies implies need in additional labour, making adoption less attractive to farmers with limited labour. Subdividing labour use between children, gender and hired labour amongst various maize varieties, Regier and Dalton, (2013) found higher labour use in non-GMO maize varieties with females providing a greater share of this labour. The labour used reduced slightly as maize variety changed from Bt, Round Ready and a combination of both. Interestingly, hired labour was lower for Bt and Round Ready maize varieties, but however higher for the combinational variety (Regier and Dalton, 2013).

Gouse (2014) corroborates with findings of small-scale farmer search of best land preparation and planting method. Furthermore, improved maize varieties increased the cost of production with cost savings in land preparation, planting and weeding. There was lower labour demand in land preparation and weeding in no-tillage varieties which were however not modified or hybrid. In addition, as the maize variety usage transcended from saved seed with manual weeding through old hybrid, also with manual weeding, up to B_t and H_t maize utilisation, the yield per labour day also tends to increase. This was through the tier effect of an increase in maize output and reduction in labour days (Gouse, 2014). Literature related to labour used in

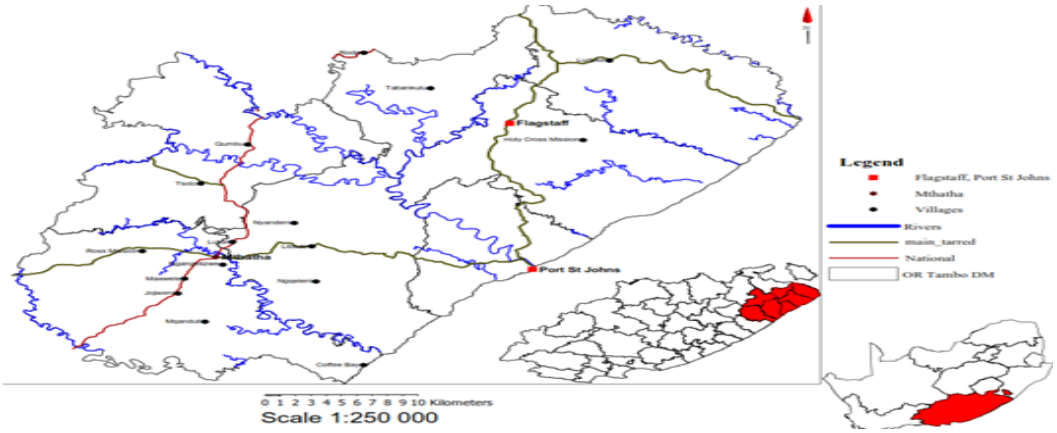
maize enterprises has had mishaps especially relating to disaggregating in on how it is utilised (Karim et al, 2010; Regier and Dalton, 2013). Factoring in the maize variety use (Sibiya, Tongoona, Derera and Makanda, 2013; Grouse, 2014) as well as furthering with climatic variability (Alhassan et al., 2016), studies relating to such have been few and far in between. This is particularly significant in the instance where labour has been identified as significant in improving maize enterprise returns.

Karim et al. (2010) proved this by identifying a 1% increase in labour leading to a 43.1% increase in gross returns in Bangladesh. Alhassan et al. (2016) identified that socio-economic circumstances tend to shape maize technology adoption, "cautiously" determined by the climatic variability. In Ghana, contrary to literature, they discovered labour use in farmers that adopt improved maize varieties being higher. The labour dynamics were a significant factor in adoption decision, but the study also fell short in disaggregating this labour use (Alhassan et al., 2016). Gouse (2014) highlighted labour demand bottleneck in land preparation, planting and weeding negatively and significantly impacting maize yield and expansion. Putting the rural to urban migration in rural South Africa into perspective, this has made agricultural land productively inert. According to Regier and Dalton (2013), the impact of improved maize varieties depends on input availability. For instance, if labour is abundant, labour incomes fall and poverty increases. Conversely, if there is plentiful land planting area and output increase and thus higher labour use and higher wages. South Africa is endowed with abundant marginal land (Regier and Dalton, 2013), with a constrained farm labour supply. Furthermore, a rise in labour has a differing effect on input demand for improved maize variety use. Improved maize variety users are more likely to substitute this labour with fertilisers, less seed and herbicide (Regier and Dalton, 2013). However, such assertions are put into question when the labour use has been aggregated in these studies. Furthermore, the climate variability will also likely recalibrate labour use in the various arrays of maize husbandry. This forms the core objective of the current study, to add knowledge on how labour use is recalibrated in the two-tier wake of maize variety and climate variability.

3. Methods and Material

The study covered two local municipalities in the O. R Tambo district municipality (ORTDM) namely Port St John's and Ingquza Hill as shown in Figure 1 below. In each local municipality one area was selected based on the prevalence of potential maize production and these are Port St John's-rural and Flagstaff respectively. The district has a land area of 12 096 square kilometres, with 92 percent constituting of rural (90.22% on tribal land) and 8 percent urban (Department of Local Government, 2012; McCann, n. d.). The population in the ORTDM increased from an estimated 1 771 176 people in 2003 to 1 961 815 in 2013 (ECSECC, 2014). With six of its seven local municipalities classified as category B4-Municipalities (except for King Sabata Dalindyebo Local Municipality), this signifies that they are rural or mainly a subsistence economy where settlements are small and the incomes of their inhabitants low. In the district, agriculture is the major private sector activity though its potential remains largely untapped, contributing about 8% to the formal employment, and a mere 1.8% to the districts GDP (IDP, 2016; Department of Local Government, 2012) on an unemployment base and dependency ratio of 70.76% and 4.06, respectively (McCann, n.d.). The ORTDM has good fertile soils, with favourable climatic conditions, abundant land with suitable terrain on river valleys providing irrigations from abundant water sources and huge market (ORTDM, 2007). Furthermore, maize is the dominant crop being cultivated in the district.

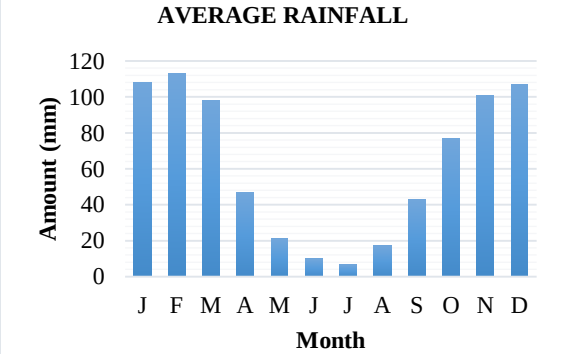
Figure 1: Map Showing the Location of the Two Study Sites in the Eastern Cape Province

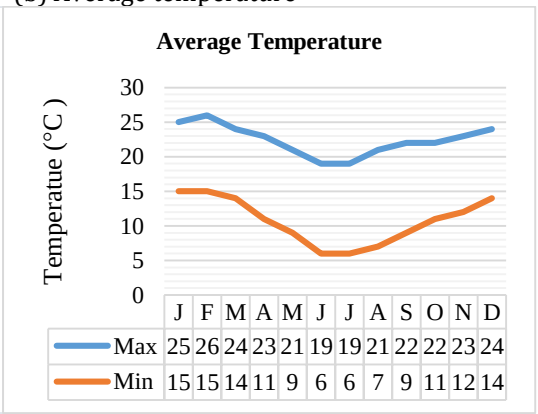


Source: Constructed from www.geoinfo.statssa/gov.za/censusdigitalatlas/ by GIS Department, University of Fort Hare. Ingquza Hill Local Municipality (IHLM) was selected because of its great agricultural potential availed by large tracts of fertile rural land (IDP, 2009) and subtropical climate with relatively high rainfall. Flagg staff in Ingquza Hill receives 749 mm rainfall annually, with a temperature range of 19.3-25.2^{o}C (Figure 2).

Figure 2: Average Rainfall and Temperature in Flagstaff, Ingquza Hill Local Municipality

(a) Average rainfall (b) Average temperature



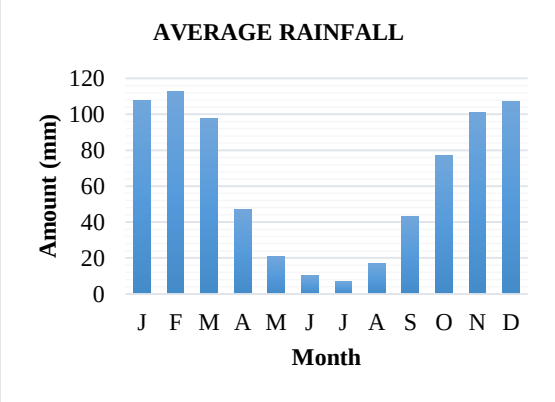


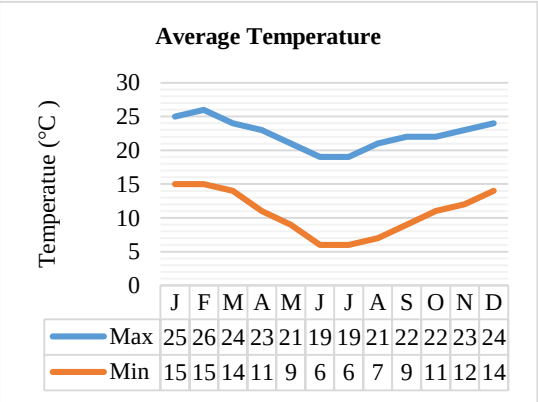
Source: SA Explorer (2014)

Agriculture is the predominant form of land use in IHLM, growing mainly maize, with small-scale farming supplementing nutritional needs and generating income for the highly unemployed (KPA3, n. d.). The area is mostly hilly, with alluvial soils lacking in phosphorous and potassium (Mandikiana, 2011), with most farms between one and two hectares close to homesteads. Family labour as well as seasonal workers (paid in kind) are the forms of labour, with people working the land by hand and small-scale mechanization. Port St John was selected because of its high maize production by smallholder farmers with some in irrigation. The area receives 990mm annually, with however a more even distribution as compared to Flagg staff, with a temperature range of 21-25.8^{o}C (Figure 3).

Figure 3: Average Rainfall and Temperature in Port St John, Port St Local Municipality

(a) Average rainfall (b) Average temperature





Source: SA Explorer (2014)

Agriculture is also a predominant land use in Port St John, with however a mere 5.6% contribution to the Local Municipality's Gross Geographical Product (GGP) (PSJM, n. d.), where over 80% of the local people are unemployed, with 40% people in the rural areas neither able to read nor write (SALN, n. d.). Agriculture is mainly subsistence, with the production of poultry, vegetables and maize predominating. Informal trading and social grants largely drive Port St John economy, with a largely illiterate and limited skilled labour force (PSJM, n. d.). The study used a cross-sectional, descriptive and quantitative survey of smallholder dry and irrigated maize producers. A structured pre-coded questionnaire was used as the research instrument for data collection to interview smallholder farmers in the study area. The data collected included socio-economic, demographics, labour use in various stages of maize production and the maize variety is grown. For the purpose of capturing a well-represented sample of the smallholder farmers in the study area, multiple sampling was used as the sampling technique. Amongst the district municipalities in Eastern Cape Province, O. R Tambo District Municipality was purposively selected because of the prevalence of the crop. With five local municipalities in O. R Tambo District Municipality, two were also purposively selected, Ingquza Hill (Moderate rainfall) and Port St John's (High rainfall), due to differences in agro-ecological zones and climatic conditions.

Based on information from extension officers working in the study sites, Flag staff has 10 wards that are into maize production whilst Port St John's has 13 wards. Therefore, random sampling of the required number of wards was done from the above-mentioned wards. From the given number of wards, villages to interview were purposively selected. Convenience sampling was used in these villages to select households to interview. A sample size of 487 smallholder farmers was randomly drawn with sample sizes varying from one ward to the other and from local district municipality to the other. Descriptive statistics, multinomial regression and Monte Carlo Simulation (MCS) were used to analyze the results. Multinomial regression is utilised in predicting the probability of category membership of a dependent variable based on independent variables (Schwab, 2002). It is a reliable model because of the reduced assumptions concerning normality, linearity or homoscedasticity. In the multinomial regression model, considering individual choosing maize variety amongst n alternatives in a choice set, with $X_{1\ldots n}$ independent variables (labour use), the log it for each non-reference category $j = 1, \ldots, C-1$ against the landrace maize variety category (0) depends on the values of the independent variables (labour use), with probability parameters $\pi_i^{(0)}, \pi_i^{(1)}, \ldots, \pi_i^{(C-1)}$ through:

$$\log\left(\frac{\pi_i^{(j)}}{\pi_i^{(0)}}\right) = \beta_0^{(j)} + \beta_1^{(j)} X_{1i} + \cdots + \beta_k^{(j)} X_{ki}$$

for each $j = 1, \ldots, C-1$ where $\beta_0^{(j)}, \ldots, \beta_k^{(j)}$ are unknown population parameters. This expands to:

$$\log\left(\frac{\pi_i^{(j)}}{\pi_i^{(0)}}\right) = \beta_0^{(j)} + \beta_1^{(j)} PLO_{hrs/ha} + \beta_2^{(j)} PLA_{hrs/ha} + \beta_3^{(j)} WEE_{hrs/ha} + \beta_4^{(j)} HAR_{hrs/ha} + \beta_5^{(j)} SHE\ \&\ STO_{hrs/ha} \ldots + \mu$$

Where the independent variables include the hours per hectare of: $PLOU$-the ploughing, PLA-planting, WEE-weeding, HAR-harvesting and $SHE\ \&\ STO$-shelling and storage as well asμ-error term.

Monte Carlo Simulation (MSC) is a probability simulation utilised to measure variability, through estimating a range of values rather than relying on single discrete values (Mary, Phi mister and Roberts, 2013). This creates a more realistic picture of what occurs in reality. It generates random variables for modelling uncertainty (The Economic Times, 2018). A simulation model was determined to include uncertainty in the deterministic labour use identified for the most significant maize variety in transiting from the landrace maize base category. Consider

$$\varphi = E_\pi\{U(X)\} = \int U(x)\pi(x)dx$$

Where $E_\pi\{\ \}$ is the expectation with respect to the probability density π and $X = \{\tau, \omega\}$ is a vector of decision parameters i.e. total labour, τ, and a combination, ω, of system parameters i.e. labour (ploughing, planting, weeding, harvesting and shelling and storage) and state variables calculated by the models. The symbol $U(\ )$ denotes a response function in this case the total labour. The MCS evaluates the integral by generating random draws $X = x^m$ from the target distribution π and then estimating φ as the average of $U(x^1), \ldots, U(x^k)$ where k is the number of replications.

As alluded to earlier, ω is a combination of system parameters (i.e. the state of nature), ω_0, and state variables $\omega_s = \{\omega_{1s}, \ldots, \omega_{Ts}\}$ calculated by the model. This splitting produces the following reformulation:

$$\varphi = E_{\pi_0}\left\{E_{\pi_{s|0}}\{U(X)\}\right\} = \int\left\{\int U(x)\frac{\pi(x)}{\pi_0(\omega_0)}d\{\tau, \omega_s\}\right\}\pi_0(\omega_0)d\omega_0$$

Where $E_{\pi_0}\{\ \}$ is the expectation with respect to the probability density π_0 of the state of nature and $E_{\pi_{s|0}}\{\ \}$ is the expectation with respect to the conditional probability density given a state of nature. The double integral may be numerically evaluated through drawing n states of nature, $\omega_0^1, \ldots, \omega_n^n$, at random from the distribution π_0. Random sampling for each $q$observation from the distribution $\pi_{s|0}$ is created by the simulations q times. Thus the total number of simulations run equals $p = n \times q$ (Kristensen and Pedersen, 2003).

4. Results and Discussion

Descriptive Results: Table 1 shows that the average age of the total respondents was 58 years, lower in Ingquza Hill (56) and higher in Port St John's (59). There was a lower age range for the respondents in Port St John's (62 years) relative to Ingquza Hill (72 years). In both areas, most of the maize producers were predominantly female, with primary education, with those in Ingquza Hill being single relative to married in Port St John's. On average, collectively, the dependency ratio of the respondents was 1.9, with Ingquza Hill and Port St John's individually having dependency ratios of 1.57 and 2.44. Most of the respondents were formally employed, who were also however dependent on social grants. In terms of labour use, respondents in Port St John's on average utilise 46.5 hrs/ha relative to 79.9 hrs/ha in Ingquza Hill in terms of ploughing. Planting labour hours for maize producers in Port St John's average 39.5 hrs/ha relative 54.7 hrs/ha in Ingquza Hill. Port St John's maize producers tend to utilise 173.1 hrs/ha for weeding relative to 202.0 hrs/ha in Ingquza Hill. In terms of harvesting and shelling and storage, Port St John's maize producers utilise 100.1 hrs/ha and 204.2 hrs/ha respectively, relative to 121.8hrs/ha and 222.5hrs/ha respectively for Ingquza Hill.

Empirical Results: For referral purposes, the landrace variety was chosen as the reference category because it is the most common and environmentally adapted amongst the maize varieties used in the study area. Table 2 shows that the ploughing labour hours of a maize producer transiting from producing landrace to producing GMO is significant ($P_{value} < 0.01$). This is observed for maize producers in Port St John's where the negative coefficient indicates that as the maize variety is changed from landrace to GMO, the labour hours devoted to ploughing tend to decrease. There are two prong explanations to this finding: either (1) because of improved mechanization by farmers in the study area, labour hours devoted to ploughing has substantially reduced or (2) because of extension advice concerning GMO utilization being weed or pest resistant, the ploughing labour hours to reduce weeds and pests therefore become redundant. These findings are supported by Gouse et al. (2006) and Gouse, (2014) identifying cost savings in land preparation. The log odds ratio indicates a 0.9% likely chance of the labour hours decreasing. This is however not the case in Ingquza Hill, where the labour hour differences are not significant, mostly because the farmers utilise less mechanisation. From observation in the field, Ingquza Hill farmers exhibited free rider tendencies, lacking motivation in producing maize and thus inert to ploughing recommendations, especially when utilizing improved maize varieties.

In terms of planting labour hours, there exist no significant differences whether a maize farmer transits from using landrace to utilising GMO, Sahara, Hybrid or all inclusive. This is because planting labour required to plant equal hectarage of any maize variety is unlikely to change dependent upon the maize variety used. This is in stark contrast to Gouse, (2014) who identified a cost saving in planting labour induced by improved maize varieties. Weeding labour hours tend to be significantly different for Ingquza Hill maize farmers when they change from landrace variety to GMO ($P_{value} < 0.01$), Sahara ($P_{value} < 0.1$) as well as combining landrace with GMO ($P_{value} < 0.05$) respectively. The negative coefficients suggest that as this transition takes effect, the amount of weeding labour tends to decrease. The log odd ratios indicate a 0.5%, 0.2% and 0.3% likely chance of weeding labour hours decreasing when transiting from landrace to GMO, Sahara and combination of landrace with GMO respectively. This is also true for maize farmers in Port St John's transiting from landrace to GMO, combining landrace and GMO ($P_{value} < 0.01$) as well as combining GMO and Sahara ($P_{value} < 0.1$) respectively. The log odd ratios in this instance indicate a 0.7%, 1.2% and 1.5% likely chance of weeding labour reduction respectively. This is because utilisation of improved maize varieties which are weed and pest tolerant tend to decrease labour devoted to weeding. This speaks directly to Leornardo et al. (2015).

Table 1: Descriptive Results

Variable		Overall (n=487)				Ingquza Hill (n=247)				Port St. John's (n=240)			
		Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.
Age		19	91	57.78	13.635	19	91	56.47	14.460	25	87	59.13	12.618
Gender				Female				Female				Female	
Educational level		Non	Tertiary	Primary		Non	Tertiary	Primary		Non	Tertiary	Primary	
Marital status				Married				Single				Married	
Age and household composition	**0-15 years**	0	15	3.06	2.305	0	14	3.09	2.243	0	15	3.03	2.372
	16-40 years	0	14	2.50	2.034	0	10	2.85	2.007	0	14	2.13	2.001
	41-65 years	0	8	1.28	1.086	0	8	1.11	0.961	0	6	1.47	1.175
	Above 65 years	0	4	0.49	0.788	0	3	0.30	0.648	0	4	0.70	0.864
Employment status		Unemployed	Full time farmer	Formally employed		Unemployed	Full time farmer	Formally employed		Unemployed	Full time farmer	Formally employed	
Source of income				Social grants				Social grants				Trading/ business	
Ploughing hrs/ha		0.20	1800.00	63.4215	158.94864	0.34	1800.00	79.8636	180.46767	0.20	1306.67	46.5000	131.47479

Planting hrs/ha	0.20	1250.00	47.1790	106.17710	0.34	1250.00	54.6721	121.83473	0.20	653.33	39.4675	86.76586
Weeding hrs/ha	0.00	2800.00	187.7364	307.98638	0.00	2800.00	201.9540	319.71399	0.00	1960.00	173.1040	295.38375
Harvesting hrs/ha	0.00	960.00	111.0897	118.55697	0.00	960.00	121.7736	127.47780	0.00	672.00	100.0941	107.77787
Shelling and storage hrs/ha	0.00	2415.00	213.5014	288.43077	0.00	2415.00	222.5456	314.79018	0.00	1960.00	204.1934	258.84862

Table 2: Multinomial Regression Results

Area	Maize variety	Ploughing hrs/ha			Planting hrs/ha			Weeding hrs/ha			Harvesting hrs/ha			Shelling and storage hrs/ha		
		β	Sig.	Log odds	**β**	Sig.	Log odds	**β**	Sig.	Log odds	**β**	Sig.	Log odds	**β**	Sig.	Log odds
Overall Effect	GMO	**-0.009***	0.002	0.991	0.002	0.570	1.002	**-0.006***	0.000	0.994	**0.004***	0.005	1.004	**0.002***	0.004	1.002
	Sahara	0.004	0.110	1.004	-0.010	0.105	0.990	**-0.003*****	0.063	0.997	0.004	0.152	1.004	0.001	0.216	1.001
	Hybrid	-0.001	0.770	0.999	-0.001	0.898	0.999	-0.001	0.455	0.999	**0.005****	0.049	1.005	0.001	0.666	1.001
	Landrace & GMO	-0.001	0.551	0.999	-0.001	0.749	0.999	**-0.005***	0.000	0.995	**0.004*****	0.058	1.004	**0.002***	0.003	1.002
	GMO & Sahara	-0.003	0.803	0.997	0.003	0.778	1.003	-0.013	0.106	0.987	**0.009****	0.020	1.009	0.001	0.725	1.001
	GMO & Hybrid	-613.226	0.908	4.592E-267	0.798	0.930	2.221	0.279	0.909	1.321	0.038	0.982	1.038	0.334	0.940	1.397
	Landrace & Hybrid	-0.001	0.985	0.999	-0.007	0.890	0.993	-0.006	0.691	0.994	-0.003	0.896	0.997	-0.005	0.758	0.995
	All 3 varieties	-0.322	0.999	0.725	0.426	0.998	1.531	0.032	0.998	1.032	-0.406	0.999	0.999	-0.083	1.000	1.000
Ingquza Hill	GMO	-0.004	0.114	0.996	0.002	0.547	1.002	**-0.005***	0.000	0.995	**0.004*****	0.019	1.004	**0.002****	0.025	1.002
	Sahara	0.003	0.270	1.003	-0.009	0.172	0.991	**-0.002*****	0.100	0.998	0.002	0.593	1.002	0.002	0.114	1.002
	Hybrid															
	Landrace & GMO	-0.001	0.739	0.999	-0.002	0.701	0.998	**-0.003****	0.033	0.997	0.003	0.257	1.003	0.001	0.298	1.001
	GMO & Sahara	-0.214	0.838	0.808	-0.163	0.863	0.849	-0.041	0.692	0.960	0.008	0.141	1.008	0.000	0.985	1.000
	GMO & Hybrid															
	Landrace & Hybrid															
	All 3 varieties	-0.335	0.999	0.715	0.387	0.999	1.472	0.017	0.999	1.017	-0.436	0.999	0.647	-0.004	1.000	0.996
Port St John's	GMO	**-0.034***	0.000	0.966	0.000	0.946	1.000	**-0.007****	0.000	0.993	**0.007****	0.034	1.007	0.002	0.129	1.002
	Sahara	0.009	0.385	1.009	-0.010	0.604	0.990	-0.004	0.392	0.996	0.012	0.130	1.012	-0.006	0.499	0.994
	Hybrid	0.001	0.884	1.001	-0.003	0.618	0.997	-0.001	0.444	0.999	**0.007*****	0.055	1.007	0.000	0.869	1.000
	Landrace & GMO	-0.009	0.187	0.991	0.006	0.321	1.006	**-0.012****	0.000	0.988	**0.007*****	0.068	1.007	**0.004****	0.013	1.004
	GMO & Sahara	-0.005	0.747	0.995	0.012	0.437	1.012	**-0.015*****	0.094	0.985	0.012	0.121	1.012	0.002	0.638	1.012
	GMO & Hybrid	-96.690		1.019E-42	-1.124	0.998	0.325	0.338	0.995	1.402	0.340	0.999	1.405	-0.212	0.999	0.809
	Landrace & Hybrid	0.005	0.877	1.005	-0.006	0.912	0.994	-0.008	0.615	0.992	0.002	0.930	1.002	-0.005	0.760	0.995

	All 3 varieties					
Model Summary						
Overall effect	χ^2 (df= 8)	29.153	9.355	70.644	12.920	12.691
	(-2) Log Likelihood	**1088.035***	1068.236	**1129.525***	1071.802	1071.573
	Nagekerke R^2	0.338				
Ingquza Hill	χ^2 (df= 8)	5.419	8.091	26.190	6.914	6.337
	(-2) Log Likelihood	540.136	542.808	**560.907***	541.630	541.053
	Nagekerke R^2	0.292				
Port St John's	χ^2 (df= 8)	32.608	1.983	34.665	8.903	8.660
	(-2) Log Likelihood	**481.454***	450.829	**483.511***	457.748	457.506
	Nagekerke R^2	0.473				

Reference category: Landrace
Sig at * P<0.01, ** P<0.05, *** P<0.1

Table 3 below summarises the major maize crop husbandry practices that transiting from utilising landraces will influence. It is shown that weeding labour hours are most influenced, followed by harvesting, shelling and storage and then ploughing. The labour requirements in terms of planting are not affected.

Table 3: Changes in Labour Induced by Transiting from Landrace Variety

	Maize variety	Ploughing	Planting	Weeding	Harvesting	Shelling and storage
Ingquza Hill	GMO			✓	✓	✓
	Sahara			✓		
	Hybrid					
	Landrace and GMO			✓		
	GMO and Hybrid					
	Landrace and Hybrid					
	All 3 varieties					
Port St John's	GMO	✓		✓	✓	
	Sahara					
	Hybrid				✓	
	Landrace and GMO			✓	✓	✓
	GMO and Hybrid			✓		
	Landrace and Hybrid					
	All 3 varieties					

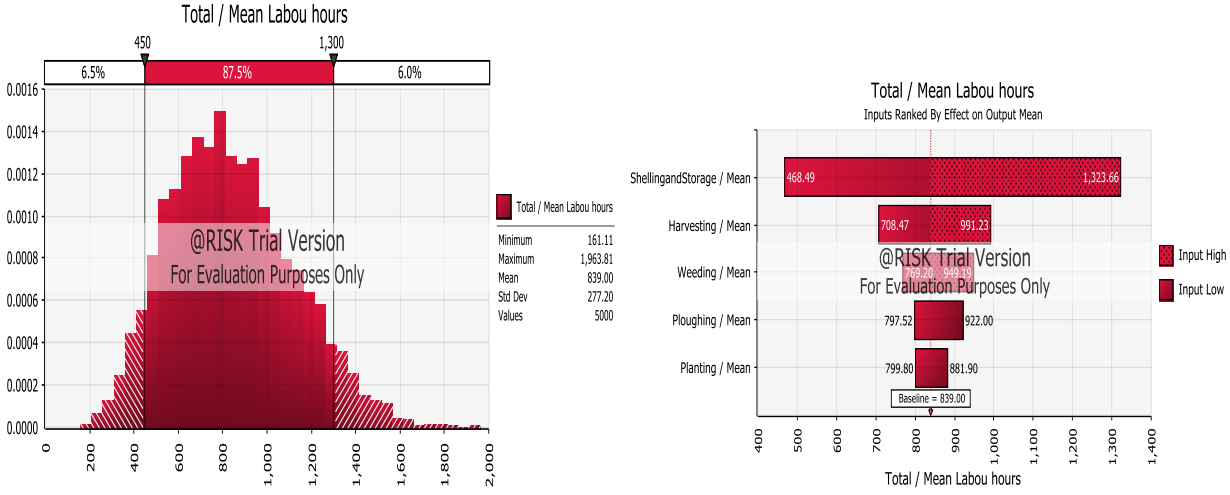
Simulative results*:* Referring to table 3 transiting from landrace to GMO in Ingquza Hill and Port St John's as well as combining landrace and GMO in Port St John's had significant labour changes and thus were used in the simulation models. Figure 4 (a) shows that there is an 87.5% chance of the total labour hours to be

between 450-1300 hours per hectare for maize farmers combining Landrace and GMO maize varieties in Port St John. The tonado Figure 4 (b) shows that shelling and storage is the activity with the highest labour hours followed by harvesting and weeding. The scatter plots with 5000 iterations (Figures 4(c), 4(d) and 4(e)) show that there is a higher correlation of the total labour hours per hectare with shelling and storage hours per hectare (accounting for 47.7%) followed with harvesting (33.2%) and weeding (31.9%). In Figure 5 (a) there is a 90% possibility of total labour hours per hectare falling in the range 892 to 2692, with Figure 5 (b) showing that shelling and storage, weeding and ploughing were the most distinguishing from Ingquza Hill maize farmers using GMO maize varieties. The iteration shows a higher correlation between total labour per hectare with shelling and storage (accounting for 41.9%), weeding (40.5%) and harvesting (32.4%) (Figures 5(c), 5 (d) and 5 (e)).

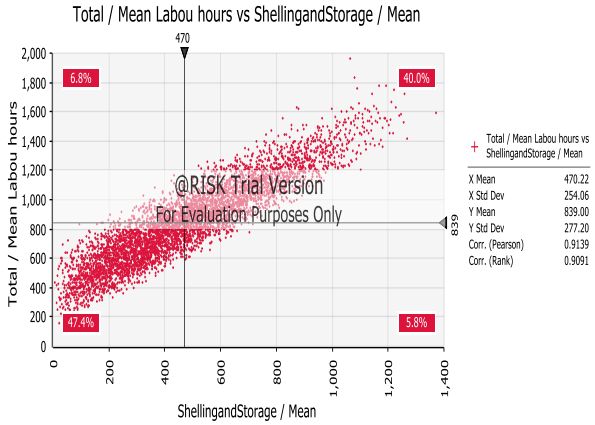
Harvesting labour hours are significantly different when the maize producers transit from landrace to GMO ($P_{value} < 0.05$) in Ingquza Hill. The positive coefficient shows that the labour hours tend to increase in this instance. There is a 0.4% likely chance that harvesting hours will increase in this transition. This is also true for maize producers transiting from landrace to GMO ($P_{value} < 0.05$), Hybrid and combining GMO and landrace ($P_{value} < 0.1$) in Port St. John's. The likely chance of this occurring is 0.7% in each instance. Shelling and storage labour hours are significantly different when the maize producers change from landrace to GMO in Ingquza Hill and to combining with GMO ($P_{value} < 0.05$) in Port St John's. In both cases the positive coefficient suggests that labour hours tend to increase in such transitions. The likely chance of the shelling and storage labour hours increasing is 0.2% and 0.4% in Ingquza Hill and Port St. Johns respectively. The positive increase in labour hours in this instance can be explained by the improved yields that are obtained when the maize variety improves from landrace to the other varieties. Gouse (2014) explained this through an increase in yield per labour day, identifying an increase in maize output. The Nagekerke R^2 values show that transitioning from landrace maize variety explains more labour dynamics in Port St. Johns than in Ingquza Hill, however, both values were low, requiring further variables to fully account for changes in maize varieties. The log likelihood values show that weeding hours are the major labour hours influenced by a change in the maize variety used, whilst in Port St John it is both ploughing and weeding hours.

Figure 4: Monte Carlo Simulation Results

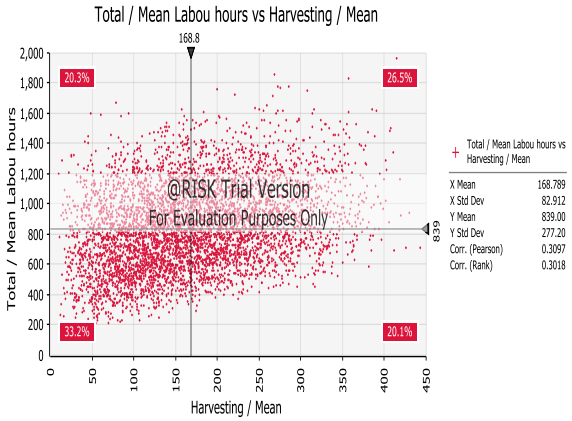
(a) (b)



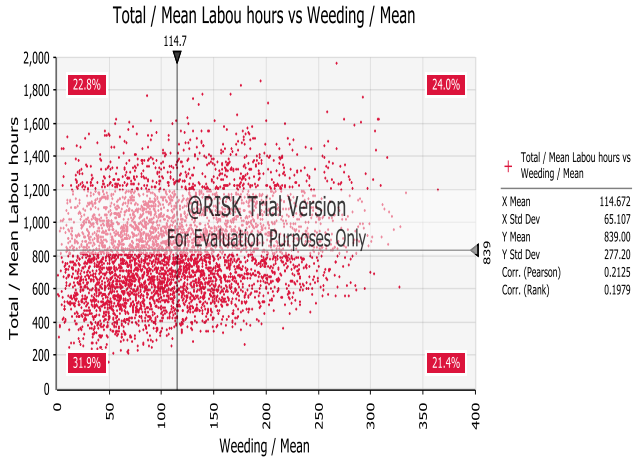
(c)



(d)



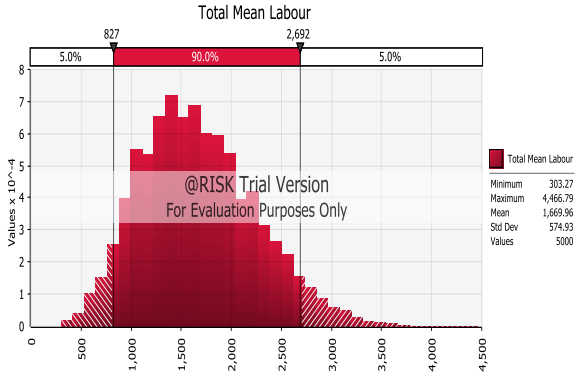
(e)



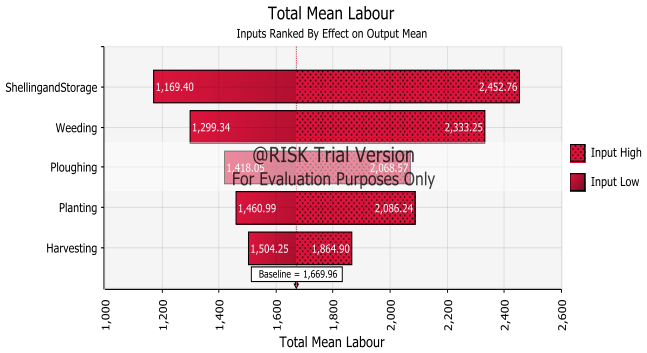
Iterations for Port St John's maize farmers combining Landrace and GMO varieties pertaining to (a) Mean Total Labour hours/ha, (b) Tonado of most significant Labour contributions (c) scatter plot of Mean Total Labour/ha vs Shelling and Storage Labour/ha (d) scatter plot of Mean Total Labour/ha vs Harvesting Labour/ha and (e) Mean Total Labour/ha vs Weeding Labour/ha

Figure 5: Monte Carlo Simulation Results

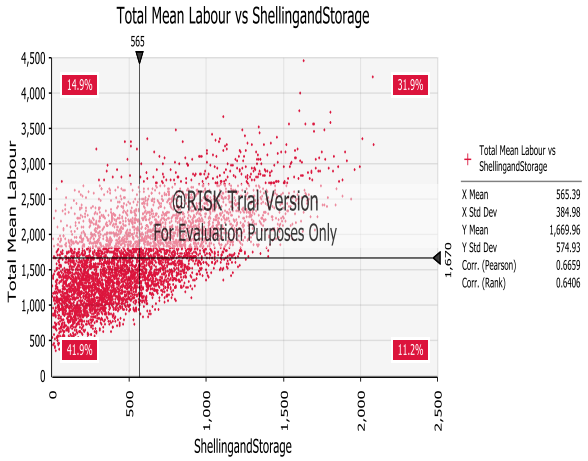
(a)



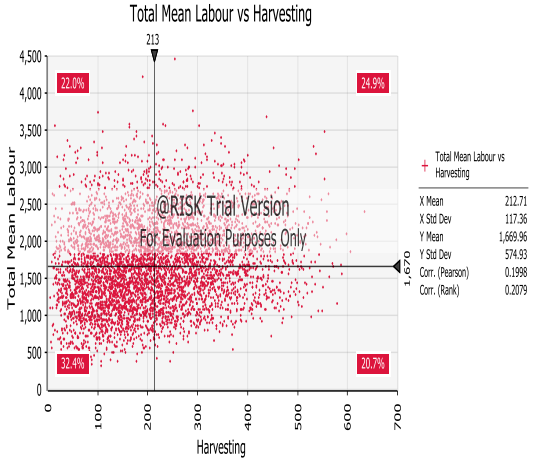
(b)



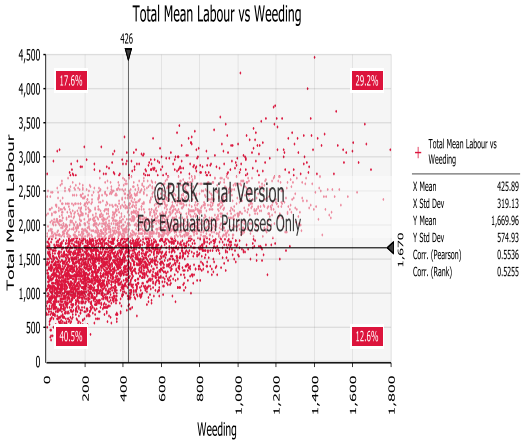
(c)



(d)



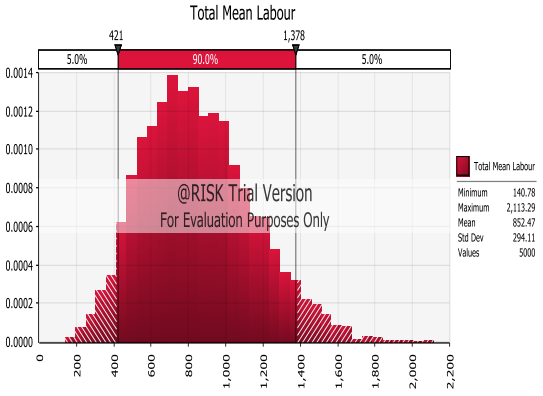
(e)



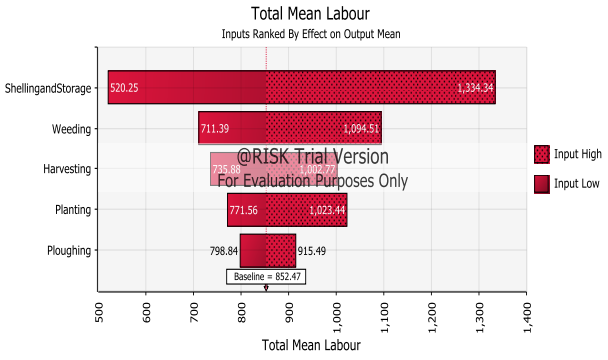
Iterations for Ingquza Hill's maize farmers with GMO varieties pertaining to (a) Mean Total Labour hours/ha, (b) Tonado of most significant Labour contributions (c) scatter plot of Mean Total Labour/ha vs Shelling and Storage Labour/ha (d) scatter plot of Mean Total Labour/ha vs Harvesting Labour/ha and (e) Mean Total Labour/ha vs Weeding Labour/ha

Figure 6: Monte Carlo Simulation Results

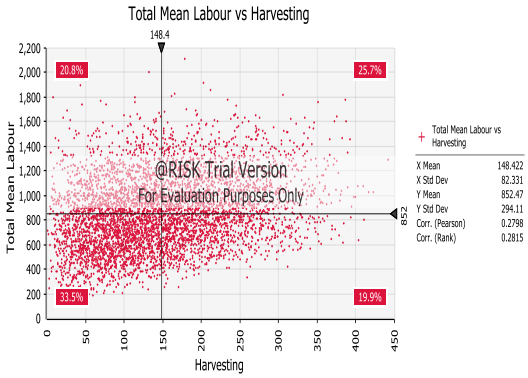
(a)



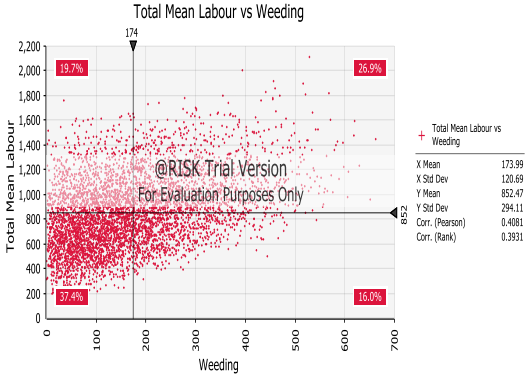
(b)



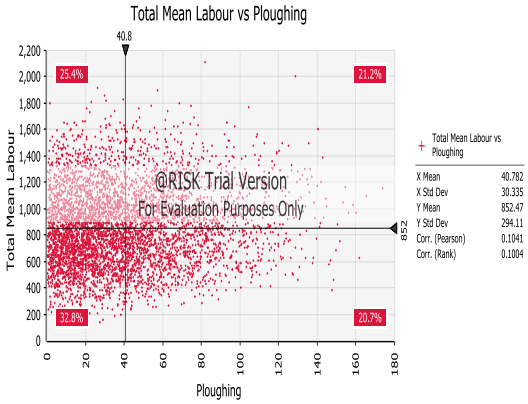
(c)



(d)



(e)



Iteration Port St John's maize farmers with GMO varieties pertaining to (a) Mean Total Labour hours/ha, (b) Tonado of most significant Labour contributions (c) scatter plot of Mean Total Labour/ha vs Shelling and Storage Labour/ha (d) scatter plot of Mean Total Labour/ha vs Harvesting Labour/ha and (e) Mean Total Labour/ha vs Weeding Labour/ha

Figure 6 (a) shows a 90% chance of mean total labour hours per hectare to fall between 421 and 1378 hours for GMO only variety users in Port St John's, being accounted for shelling and storage, weeding and harvesting hours per hectare (Figure 6 (b)). The iterations however reveal a somewhat scattered plot, with weeding having the highest account for 37.4% of the mean total labour followed by harvesting (33.5%) and then ploughing (32.8%). Alhassan et al. (2016), Gouse (2014) and Gouse et al. (2006) findings of weeding laying bedrock in determining maize yields, through improved maize variety adoption. Regier and Dalton, (2013) explain this through the weeding labour being replaced by herbicide use when the maize variety improves.

5. Conclusion and Recommendations

In conclusion, utilising GMO varieties appear to have more impact in terms of labour use in the two study sites. It has a bearing on the weeding, harvesting, shelling and storage labour in Ingquza Hill. In Port St John's, GMO utilization tends to have a bearing on ploughing, weeding as well as harvesting hours. Overall, weeding labour hours were seen to be mostly affected by the use of improved maize varieties. Utilising improved maize varieties tends to reduce the weeding labour requirements. However, as the output increases from the use of the improved varieties, harvesting, shelling and storage labour hours tend to increase, also having a bearing on labour requirements. The simulations do however show an increased impact of maize variety utilisation on harvesting as well as on shelling and storage labour hours. This is accounted for by the increased yields envisaged in improved maize varieties. The study recommends the promotion and uptake of improved maize varieties especially GMO mainly based on two fronts: (1) there is reduced labour hours in the tedious husbandry practices of ploughing and weeding, freeing labour for other household chores as well as (2) the possibilities of creating employment opportunities especially when high yields are realised requiring

more labour in terms of harvesting, shelling and storage. Labour should thus be recalibrated to focus on harvesting, shelling and storage if the increased output envisaged from improved maize varieties is not to overshadow the shift in labour use.

References

Alhassan, A., Salifu H. & Adebanji A. O. (2016). Discriminant Analysis of Farmers Adoption of Improved Maize Varieties in Wa Municipality, Upper West Region of Ghana, *Springer Plus*, 5, 1514.

Bamire, S. A., Abdoulaye T., Amaza P., Tegbaru A., Alene A. D. & Kamara A. Y. (2010). Impact of Promoting Sustainable Agriculture in Borno (PROSAB) Program on Adoption of Improved Crop Varieties in Borno State of Nigeria, *Journal of Food, Agriculture and Environment*, 8(3&4), 391-398.

Department of Local Government. (2012). The Local Government Handbook. A complete guide to municipalities in South Africa: OR Tambo District Municipality (DC15). Available on the World Wide Web: http://www.localgovernment.co.za/districts/view/6/OR-Tambo-District-Municipality. [Accessed on 30 November 2015].

ECSECC. (2014). Eastern Cape Socio-Economic Consultative Council; O.R. Tambo, Eastern Cape: 2014 Socio-Economic profile. Available on the World Wide Web:http://www.ecsecc.org/files/library/documents/ECSECC_OR_Tambo_SP_2014.pdf [Accessed 01 October 2015].

Gouse, M. (2014). Seed Technology and Production System Comparisons-South African Subsistence/Smallholder Farmers, Creating a Community of Practice in KwaZulu Natal-a Templeton Foundation Supported Project Report

Gouse, M., Piesse, J. & Thirtle, C. (2006). Output and labour effects of GM maize and minimum tillage in a communal area of KwaZulu Natal. *Journal of Development Perspectives,* 2(2).

Gouse, M., Piesse, J., Thirtle, C. & Poulton, C. (2009). Assessing the performance of GM maize amongst smallholders in KwaZulu-Natal, South Africa. *Ag Bio Forum*, 12(1), 78-89.

Gouse, M., Sengupta, D., Zambrano, P. & Zepeda, J. F. (2016). Genetically Modified Maize: Less Drudgery for Her, More Maize for Him? Evidence from Smallholder Maize Farmers in South Africa, *World Development,* 83, 27-38.

Global Harvest Initiative. (2017). #Science Matters: Biotech Maize Reduces Labor for Women Farmers, http://www.globalharvestinitiative.org/index.php/2017/04/sciencematters-biotech-maize-reduces-labor-for-women-farmers/

IDP. (2016). OR TAMBO District Municipality Integrated Development Plan Review 2016/17, http://ortambodm.gov.za/download/IDP-2016-17-27-May-2016.pdf [accessed 30 May, 2017]

IDP. (2009). Ingquza Hill Local Municipality Integrated Development Plan Review 2009/2010

James C. (2014). Global Status of Commercialized Biotech/Gm Crops: 2014, International Service for The Acquisition of Agri-Biotech Application (ISAAA), Brief 49, Ithaca, NY

Karim M. R., Moniruzzaman. & Alam, Q. M. (2010). Economics of Hybrid Mazie Production in Some Selected Areas of Bangladesh, *Bangladesh, J. Agri Res*, 35(1), 83-93.

KPA, 3. (n. d.). Support Programme to "Decentralisation and Local Development Policies in South Africa: A Network of Tuskan and South African Local Government": Eastern Cape Report

Kristensen, A. R. & Pedersen, C. V. (2003). Representation of Uncertainty in a Monte Carlo Simulation Model of a Scavenging Chicken Production System. In *EFITA Conference* (451–459). Debrecen, Hungary, 5-9 July.

Leonardo, W. J., van de Ven, G. W. J., Udo H., Kanellopoulos, A., Sitoe, A. & Giller, K. E. (2015). Labour not Land Constraints Agricultural Production and Food Self-Sufficiency in Maize-Based Smallholder Farming Systems in Mozambique, *Food Security*, 7, 857-874.

Mandikiana, B. W. (2011). Economics of Bt maize yield guard production case of small holder farmers in the Eastern Cape Province (Masters dissertation, University of Fort Hare).

Mary, S., Phimister, E. & Roberts, D. (2013). Testing the sensitivity of CGE models: A Monte Carlo filtering approach to rural development policies in Aberdeenshire. Luxembourg

Mbofung, C. M. F. (2010). The Role of GMOs in Africa: Food and Nutrition Security, GMOs for African Agriculture: Challenges and Opportunities Workshop Report, Academy of Science of South Africa (ASSAf), Pretoria, ISBN: 978-0-9814159-7-0

McCann, M. (n. d.). Annexure 5: District Profile Eastern Cape O. R. Tambo District Municipality (DC 15): Programme of Support to Local Economic Development in the Eastern Cape: Eastern Cape Competitive Advantage Assessment and Training Support Project, European Consultants Organization, AMS/451-LOT N^0 9, Mission N^{0}2005/109496http://www.ecsecc.org/documentrepository/informationcentre/030407135344.pdf

Ouma, J. O. & De Groote, H. (2011). Determinants of Improved Maize Seed and Fertilizer Adoption in Kenya, *Journal of Development and Agricultural Economics,* 3(11), 529-536.

ORTDM. (2007). O. R. TAMBO District Municipality, District Growth and Development Strategy, Position Paper on Agriculture Sector, February

PSJM. (n. d.). Port St John Municipality, https://www.psjmunicipality.gov.za/index.php/local-economic-development-managers-responsibilities/ [accessed 30 May, 2017]

Quantec easy data. (2017a). Maize: Area Planted [database], Available on the World Wide Web: www.easydata.co.za/data/timeseries/AGR-T007S002/ [accessed 30 May, 2017]

Quantec easy data. (2017b). Maize: Area Planted [database], Available on the World Wide Web: www.easydata.co.za/data/timeseries/AGR-T007S001/# [accessed 30 May, 2017]

Regier, G. K. & Dalton, T. J. (2013). Labour-Savings of Roundup Ready Maize: Impact on Cost and Input Substitution for South African Smallholders, 4th International Conference of the African Association of Agricultural Economists, 22-25 September

South Africa Explorer. (2014). Flagstaff and Port St Johns climate.

SALN. (n. d.). Port St John Development Agency: About this Community of Practice, http://led.co.za/leda/port-st-johns-development-agency

Sibiya J., Tongoona P., Derera J. & Makanda I. (2013). Farmers' Desired Traits and Selection Criteria for Maize Varieties and Their Implications for Maize Breeding: A Case Study from KwaZulu-Natal Province, South Africa, *Journal of Agriculture and Rural Development in the Tropics and Subtropics,*114(1), 39–49.

Schwab, J. A. (2002). Multinomial logistic regression: Basic relationships and complete problems. http://www.utexas.edu/courses/schwab/sw388r7/solvingproblems.

The Economic Times. (2018). Definition of "Monte Carlo Simulation", https://economictimes.indiatimes.com/definition/monte-carlo-simulation [accessed 12 March, 2018]

World Bank. (2008). World Development Report 2008: Agriculture for Development, Washington DC: World Bank.

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Owners' Characteristics and the Financial Bootstrapping Strategies Used by Rural Small Businesses in South Africa

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Abstract: The purpose of this study was to examine if there are significant differences in the financial bootstrapping strategies of rural small businesses on the basis of owners' demographic characteristics (level of education and gender). The research followed a quantitative research method with descriptive research design. A sample of 104 rural small businesses participated in the survey. Data was collected through the use of self-administered questionnaires in a survey. The participants in the study were rural small business owners in Fetakgomo Municipality located in the Limpopo Province of South Africa. The study utilised the convenience and snowball sampling techniques to select the study participants. Data analysis included descriptive statistics, factor analysis and the T-test. The Cronbach's alpha was used to measure reliability. The results of the T-test showed significant differences between gender and level of education and the financial bootstrapping methods used by rural small businesses. Recommendations are made to improve the awareness of bootstrapping by small business owners.

Keywords: *Owners' characteristics, financial bootstrapping, small business, rural, South Africa*

1. Introduction and Background

There is no uniform definition of a rural area in South Africa (Gaede & Versteeg, 2011; Jacobs & Hart, 2012). According to the Department of Land Affairs (1997, p1), rural areas can be defined as "sparsely populated areas in which people farm or depend on natural resources, including the villages and small towns that are dispersed through these areas. In addition, rural areas include large settlements in former homelands, created by the apartheid removals, which depend for their survival on migratory labour and remittances". The rural population can be calculated as the difference between total population and urban population (Trading Economics, 2016). The rural areas of South Africa face many development challenges. Armstrong et al. (2007) indicate that the incidence of poverty is much higher in the rural areas of South Africa. The poverty rates of individuals and households in the rural areas more than double the corresponding rates for urban areas. In addition, the level of unemployment in the rural areas is much higher than in urban areas (de Witte et al., 2011; Tshabalala, 2014). Rural income inequality is much higher than urban inequality (Mahadea & Simson, 2010). Crime is higher in rural areas compared to urban areas (The South African Presidency, 2008). The creation and growth of small and medium enterprises (SMEs) can help to alleviate the challenges faced by rural areas in South Africa (Mugobo & Ukpere, 2012; Lekhanya, 2016). According to Amra et al. (2013), growing and successful SMEs offer a critical contribution to the policy goals of poverty alleviation, employment creation and promotion of economic growth in South Africa. However, the failure rate of SMEs is the rural area is very high in South Africa (Chimucheka & Mandipaka, 2015).

In general, 70% of SMEs in South Africa fail in their first year. The failure rate of rural SMEs is higher than that of urban SMEs (Business Environment Specialist, 2014). This negatively impacts on the ability of SMEs to reduce the high rates of unemployment, poverty and crime in the rural areas of South Africa. The major causes of the failure of rural SMEs include small markets, lack of *business* and technical skills and limited access to external finance (Mugobo & Ukpere, 2012; Arko-Achemfuor, 2012; Agbenyegah, 2013). Lam, (2010) points out that financial bootstrapping is a method for meeting the need for resources by firms without reliance on long-term external finance from equity or debt holders. Financial bootstrapping is used in managing and accessing resources necessary for business development. Financial bootstrapping helps to reduce the need for financial capital or to provide alternative sources of capital. This suggests that financial bootstrapping can be of significance to rural small businesses in two ways. (1) It can reduce the need for external finance and (2) it can provide alternative sources of resources (Padachi et al., 2012). Owners' demographic characteristics such as the level of education and gender can influence the financial decisions and performance of firms (Rauch & Frese, 2007; Neeley & Van Auken, 2010; Isaga, 2015). A review of the empirical literature on rural entrepreneurship in South Africa (Pooe & Mafini, 2012; Mugobo & Ukpere, 2012;

Arko-Achemfuor, 2012) and financial bootstrapping strategies of SMEs (Pretorius, 2007) revealed that no study has investigated the effect of owners' demographic characteristics on the financial bootstrapping methods employed by rural small businesses.

Objectives of the Study

The objectives of the study are: To investigate the financial bootstrapping strategies used by rural SMEs
To examine if there is are significant differences in the financial bootstrapping methods used by rural SMEs on the basis of owners' demographic characteristics (level of education and gender).

2. Literature Review

Definition and Contribution of Small businesses in South Africa: This study will make an empirical contribution to the literature on financial bootstrapping from the context of SMEs that are located in the rural areas. The National Small Business Act of South Africa 1996 as amended in 2003 defines a small business as "a separate and distinct entity including cooperative enterprises and non-governmental organizations managed by one owner or more, including its branches or subsidiaries if any is predominantly carried out in any sector or sub-sector of the economy mentioned in the schedule of size standards, and can be classified as an SME by satisfying the criteria mentioned in the schedule of size standards" (Government Gazette of the Republic of South Africa, 2003). The Act also provides for a schedule of size standards to quantitatively define a small business as depicted in table 1.

Table1: Schedule of Size Standards for the Definition of Small businesses in South Africa

Size class	Employees (less)	Turnover less than or equal to (Rand)	Balance sheet less than or equal to (Rand)
Micro	5	0.20m	0.10m
Very small	20	4.00m	0.60m
Small	50	19.00m	3.00m
Medium	200	39.00m	6.00m

Source: Adapted from Government Gazette of the Republic of South Africa (2003).

SMEs are one of the drivers of inclusive economic growth in South Africa. SMEs makeup to 91% of formalized enterprises, provide employment to about 60% of the labor force and contribute about 34% of the gross domestic product of South Africa. One of the major challenges facing SMEs in South Africa is lack of access to resources especially external finance (Agbenyegah, 2013; Banking Association of South Africa, 2017).

Resource Dependency and Capital Structure Theories: According to Pfeffer & Salancik, (1978), the Resource Dependency Theory (RDT) argues that resources are a critical or important part of an organisation's operation. RDT focuses on how the external resources of organisations affect the behaviour of the organisation. Resources include all physical and financial assets, capabilities, and organisational. Resources can help a small business to survive, grow and gain competitive advantage (Kraaijenbrink et al., 2010). The traditional view of bootstrapping coincides with the RDT. Firms do not possess all of the resources they need and must therefore obtain resources from external parties (Ebben & Johnson, 2006).

Capital structure is described as the mix of debt and equity that a firm uses to finance its operations. Capital structure theories (Modigliani & Miller, 1958, 1963; Jensen & Meckling, 1976; Myers, 1984) focus on how firm access and use debt and equity finance. Small businesses in South Africa face difficulties in accessing debt capital. The rejection rate of credit applications by commercial banks is very high (Mahembe, 2011; Andreea & Aiga, 2012; Fin Mark Trust, 2015). In addition, small businesses have difficulty accessing funds from equity providers such as business angels and venture capitalists ((Baldock & North, 2012). Thus, there is both a debt and an equity gap in small business financing (Balogun et al., 2016). The debt and equity gap is most prevalent in rural small businesses because of their low credit rating and weak growth (Coleman & Okyere, 2016). Financial bootstrapping is one of the methods that firms can use to meet the need for resources without reliance on external equity or debt finance (Lam, 2010).

Definition of Financial Bootstrapping: Freear et al. (1995) describe bootstrap financing as highly creative ways of acquiring the use of resources without borrowing money or raising equity financing from traditional sources. Bhide, (1992) refers to bootstrap financing as the financing of ventures with modest personal funds. Bootstrap financing includes all sources of capital used after personal savings and loans from financial institutions are either exhausted or are not available, such as loans from friends and relatives, credit cards, home equity loans, life insurance, supplier credit, leases, and customer financing (Padachi et al., 2012). Bootstrapping finance allows a business to operate with minimum resources. Bootstrapping can be used as a creative financing strategy. In addition, bootstrapping can be used for the acquisition and control of resources (both tangible and intangible), and the efficient uses of those resources to finance the enterprise for growth (Vanacker et al., 2011). Ebben (2009) points out that the bootstrapping method includes a combination of techniques that reduce overall capital requirements, improve cash flow, and take advantage of personal sources of financing. Andreea & Aiga, (2012) identify thirty-two financial bootstrapping method (refer to table). The thirty-two bootstrapping methods can be grouped into the following: (1) owner financing, (2) minimising accounts receivable, (3) joint utilisation of resources, (4) delaying payments of accounts payable, (5) minimising stock, and (6) subsidy financing (Schofield, 2015).

Owners' Demographic Characteristics and Financial Bootstrapping: Hart & Wainwright, (2013) and Isaga, (2015) remark that demographic factors such as education and experience contribute to the success of entrepreneurs. Owners' characteristics affect the financial decisions and performance of small businesses. Owners' characteristics influence business decisions and may shape the bootstrap choices that entrepreneurs make (Neeley et al., 2015).

Level of Education of the Owner and Financial Bootstrapping: According to Neeley & Van Auken (2009), high level of education improves network diversity. This can enhance access to resources apart from debt or equity. The literature about the effect of the education of the owner on firm financial bootstrapping strategies is inconclusive. Schinck & Sarkar, (2012) report that low educated SME owners tend to use bootstrapping finance than their highly educated counterparts. Pretorius, (2007) finds that education does not impact on financial bootstrapping of small businesses. A high level of education can improve the knowledge of bootstrapping methods and networking by small businesses (Neeley & Van Auken, 2009; Irwin & Scott; 2010; Grichnik et al., 2014). It is hypothesised that there is a significant difference in the financial bootstrapping strategies used by rural entrepreneurs on the basis of the level of education of the owner.

Gender and Financial Bootstrapping: Kwong et al. (2012) point out those women entrepreneurs find it more difficult to access finance from commercial banks than male entrepreneurs. This can be attributed to many factors such as supply-side discrimination and debt and risk aversion. Neeley & Van Auken (2010) indicate that women tend to use their own finance and borrow from close relatives and family than men. Consequently, women are likely to use less external financing options than men. Women entrepreneurs suffer from a higher level of discouragement in applying for credit from commercial banks and higher rejection rates. Thus women entrepreneurs will have to source for unconventional sources of finance (Schinck & Sarkar, 2012). This suggests that female entrepreneurs will use bootstrap financing more than male entrepreneurs. It is hypothesised that there is a significant difference in the financial bootstrapping strategies used by rural entrepreneurs on the basis of the gender of the owner.

3. Research Methodology

The survey was conducted in the Fetakgomo Local Municipality in the Limpopo Province of South Africa. The study following the quantitative research method with a descriptive research design data was collected through the use of the self-administered questionnaire in a survey. The population for this study was all SMEs in Fetakgomo municipality. Due to the difficulty in getting a population frame of SMEs in the study area, a sample size of 230 SMEs in Fetakgomo municipality was conveniently taken. This was considered a sufficient sample size for the study to cater for the documented low response rate among SMEs. The questionnaires were given to the owners of SMEs to complete. The questionnaire had three sections (1) biographical information (2) need and access to external finance (3) financial bootstrapping methods employed. Question items included dichotomous questions and Likert scale questions. The part of the questionnaire on financial bootstrapping was adapted from Schinck and Sarkar, (2012) and Fatoki (2014).

The questionnaire contained thirty-one question items. Likert scale questions where the respondents could answer 1-5 representing "1 never use", "2 rarely use", "3occassionally", "4 moderate amount" "5 a great deal". The Cronbach's alpha was used to measure reliability. Data analysis included descriptive statistics, factor analysis and the T-test

Response Rate and Biographical Details: Two hundred and thirty questionnaires were distributed to rural small business owners and one hundred and four questionnaires were returned. The response rate was 45.2%.

4. Results and Discussion

Table 2: Biographical Details of the Participants

Biographical factors	Frequency
Gender	
Male	59
Female	45
Age	
Below 20	5
21- 30 years	22
31- 40 years	41
41- 50 years	16
Above 50 years	20
Level of education	
Below Matric	7
Matric	43
Diploma	25
Degree	15
Post graduate	14
Legal status	
Sole proprietorship	63
Partnership	22
Close corporation	12
Company	7
Sector	
Retail	48
Service	56
Number of employees	
No employees	15
1-4 employees	47
5-10	26
11-20	16
21-50	0
Above 50	0
Length of business operation	
Less than one year	9
1-5 years	63
6-10 years	24
11-15 years	5
Above 15 years	3

The biographical details are depicted in table 2. The results show that the majority of the respondents are males, in the 31-40 age group with matric qualification. The legal status of the majority of the respondents is sole proprietorship. In addition, the majority of the respondents are in the service sector, with one to five employees and operating for between 1 and 5 years. Thus it can be concluded that the majority of the respondents' business are micro-enterprises. The National Small Business Act of 2003 as amended defines a

microenterprise as a business with less than five employees. In addition, the majority of the respondents' businesses can be classified as young enterprises with the business life of between one and five years.

Need for External Finance

Table 3: Need and Access to External Finance by the Participants

Statement	Yes	No
Is your contribution to your business adequate to finance your business	8%	92%
Do you require finance from commercial banks?	76%	24%
Have you applied for finance from commercial banks	68%	32%
Was your application for commercial bank finance successful?	21%	79%

92% of the respondents agree that internal finance is adequate to run their businesses. The results indicate that internal finance is often inadequate for small businesses to survive and grow. It is increasingly difficult to keep the costs within the constraints of self-financing (Mateev & Anastasov, 2011). The results also indicate that the majority of application for funding by small businesses from commercial banks is unsuccessful. Wehinger, (2014) finds that the acceptance rate of small business credit applications is very low. Thus rural small businesses need to find innovative and creative ways of obtaining resources.

Bootstrapping Methods Used by Rural Small Businesses

Table 4: Bootstrapping Methods Used by Rural Small Business Owners

Bootstrapping technique	Mean	Standard deviation
1. In my business I buy used equipment instead of new	2.50	1.307
2. I borrow equipment from other businesses for shorter periods	2.60	1.178
3. I hire personnel for shorter periods instead of permanently employing personnel	2.37	1.133
4. I coordinate purchases with other businesses	3.00	1.223
5. I lease equipment instead of buying	2.41	1.228
6. I practice barter instead of buying/selling goods	2.42	1.040
7. I offer customer discounts if paying in cash	2.62	1.185
8. I buy on consignment from supplier/s	2.89	1.105
9. I seek out best conditions possible with supplier/s	3.18	1.221
10. I deliberately delay payment to supplier/s	2.24	1.219
11. I withhold manager's salary for some period	4.05	1.109
12. I make use of my own private credit card for business expenses	4.57	1.180
13. I obtain capital via assignments in other businesses	2.39	.999
14. I obtain payment in advance from customers	2.34	1.085
15. I raise capital from a factoring company	2.47	1.004
16. I obtain loans from relatives/friends	4.29	1.121
17. I deliberately delay payment of value-added tax	1.99	.970
18. I obtain a subsidy from the County Administrative Board	2.13	1.103
19. I use routines in order to speed up invoicing	2.75	1.113
20. I use interest on overdue payment from customers	2.51	1.052
21. I cease business relations with customers frequently paying late	2.54	1.051
22. I offer the same conditions to all customers	3.20	1.257
23. I deliberately choose customers who pay quickly	2.85	1.077
24. I use routines in order to minimize capital invested in the stock	3.05	1.046

25. I employ relatives and/or friends at a non-market salary	2.45	1.190
26. I run the business completely at home	4.03	1.242
27. I share premises with others to cut costs	2.61	1.169
28. I share employees with other businesses	2.27	1.159
29. I share equipment with other businesses	2.23	1.168
30.Late payment of wages and salaries for my employees	2.13	1.094
31. I receive free consulting	1.49	.975

Table 4 depicts the results of the bootstrapping methods used by rural small business owners. The findings show that the most frequently used bootstrapping methods by rural small businesses are obtaining loans from family and friends, withholding salaries and running the business from home The limited use of bootstrapping methods can be due to the fact that rural SMEs are not aware of bootstrapping finance. Schinck and Sarkar, (2012) report that many small business owners are not aware of bootstrapping finance.

Factor Analysis

Table 5: Rotated Component Analysis

Bootstrapping technique	1	2	3	4	5
I withhold manager's salary for some period	0.834				
I make use of my own private credit card for business expenses	0.762				
I obtain loans from relatives/friends	0.654				
I employ relatives and/or friends at a non-market salary	0.776				
In my business I buy used equipment instead of new		0.651			
I share premises with others to cut costs		0.755			
I borrow equipment from other businesses for shorter periods		0.565			
I coordinate purchases with other businesses		0.666			
I practice barter instead of buying/selling goods		0.763			
I lease equipment instead of buying			0.562		
Late payment of wages and salaries for my employees			0.634		
I deliberately delay payment to supplier/s			0.721		
17. I deliberately delay payment of value-added tax			0.543		
I hire personnel for shorter periods instead of permanently employing personnel				0.761	
I buy on consignment from supplier/s				0.631	
I use routines in order to minimize capital invested in the stock				0.853	
I seek out best conditions possible with supplier/s				0.640	
I obtain capital via assignments in other businesses				0.533	
I offer customer discounts if paying in cash					0.774
I obtain payment in advance from customers					0.636
I use routines in order to speed up invoicing					0.863
I use interest on overdue payment from customers					0.622
I cease business relations with customers frequently paying late					0.773
I offer the same conditions to all customers					0.674

I deliberately choose customers who pay quickly					0.776
Eigen value	45.643	9.301	6.211	4. 563	2.771
% of variance explained	47.533	20.654	12.774	8.665	4.551
Cronbach's alpha	0.751	0.832	0.744	0.765	0.775

Items with factor loading less than 0.300 removed

Table 5 shows the results of the component analysis. Five factors were identified by the factor analysis. Factor 1 is labelled as owner's finance. Existing literature identify financial resources as one of the most pressing challenges for small businesses. Factor 2 is labelled as joint utilisation and consists of five items. These are innovative measures used by the business to cut costs by sharing the burden of costs. This involves items such as buying used equipment, sharing premises, borrowing equipment, coordinating purchases with others as well as embarking on barter trade. Factor 3 is labelled as identified as delaying payments. This factor consisted of 4 items such as: leasing equipment instead of buying, late payment of wages and salaries for my employees, deliberately delaying payment to supplier/s and delaying payment of value-added tax. Factor 4 is labelled as minimising investment and consists of five items. Cutting down unnecessary costs increases the firm's profitability. Factor five is identified as minimising accounts receivables. Accounts receivables form a crucial part of the working capital of any business. The findings are inconsistent with the results of the study by Schinck & Sarkar, (2012) which reported that low educated SME owners tend to use bootstrapping finance than their educated counterparts. However, a high level of education can improve the knowledge of bootstrapping methods and networking by small businesses (Neeley & Van Auken, 2009; Irwin & Scott; 2010; Grichnik et al., 2014).

Gender Difference

Table 6: Gender Difference in Financial Bootstrapping Strategies

Factor	Female	Male	t- statistic	Sig level
Owner financing	3.453	3.835	1.65	0.01
Joint utilisation	1.665	1.775	1.43	0.03
Delaying payments	1.475	1.133	1.02	0.76
Minimisation of investment	1.236	1.156	0.45	0.01
Minimisation of receivables	0.472	0.761	0.87	0.26

Sig 0.05

Table 6 shows a gender difference in the financial bootstrapping strategies used by rural small businesses. There are significant gender differences for three factors. These are owner financing, joint utilisation and minimisation of investment. Considering each factor, males tend to use more of owner financing than females. In addition, the results indicated gender differences for joint utilisation. However, considering minimisation of investments, females have a higher mean than males. The results are consistent with the findings of Jayawarna et al. (2012). The study found gender differences in some of the measures of financial bootstrapping. Males engage in more payment-related bootstrapping activities than females. Gender differences are significant in the working capital such as obtain payment in advance from customers, delay payments to suppliers and speed up invoicing.

Level of Education Difference

Table 7: Level of Education Difference in Financial Bootstrapping Strategies

Factor	Matric and below	Tertiary qualification	t- statistic	Sig level
Owner financing	2.561	3.754	1.61	0.03
Joint utilisation	1.632	1.754	0.76	0.26
Delaying payments	1.264	1.264	1.43	0.33
Minimisation of investment	0.268	0.257	0.66	0.54
Minimisation of receivables	1.733	1. 863	1.63	0.02

Sig 0.05

Table 7 depicts the results of the t-test for the level of education educational difference. The results show that educational level is significant on two factors: owner's financing and minimisation of account receivables. Considering the owner's financing it can be deduced that people with tertiary qualifications tend to use their own funds more than those with Matric and below. Delayed payments and minimisation of investments do not show a significant difference. This is consistent with Pretorius, (2007) finds that the level of education does not impact on financial bootstrapping of small businesses.

5. Conclusion and Recommendations

The rural areas of South Africa face many development challenges. These include high rates of unemployment, poverty and crime. The growth of the small businesses is one of the solutions to the challenges faced by rural areas in South Africa. Rural small businesses have a high failure rate. One of the principal causes of failure is inaccessibility to external finance. Financial bootstrapping is a method for meeting the need for resources by firms without reliance on long-term external finance from equity or debt holders. The study investigated the financial bootstrapping strategies used by rural small businesses. In addition, the study examined if there is a significant difference in the financial bootstrapping methods used by rural small businesses on the basis of owners' demographic characteristics (level of education and gender). The findings show that the most frequently used bootstrapping methods by rural small businesses are obtaining loans from family and friends, withholding salaries and running the business from home. The results indicated a significant gender difference in some of the bootstrapping techniques. Furthermore, the results showed that educational level is significant for two bootstrapping techniques. These are owner's financing and minimisation of account receivables. The findings of the study indicated significant gender differences for some of the bootstrapping techniques. The government has a huge role to play to in providing finance and information to rural small businesses. It is recommended that the government embark on a heavy awareness campaign specifically targeted at rural male and female small business owners. In addition, government agencies such as Small Enterprise Development Agency (SEDA) and Small Enterprise Finance Agency (SEFA) among others should conduct a series of workshops to enlighten both male and female small business owners about financial bootstrapping. The findings of the study indicated that the level of education affects financial bootstrapping. Rural small business owners should improve their knowledge of financial management. Rural small business owners should be proactive and attend training on small business finance organised by universities, government agencies and non-governmental organisations that support entrepreneurship.

References

Agbenyegah, A. T. (2013). Challenges facing rural entrepreneurship in selected areas in South Africa. (Unpublished Doctoral dissertation, North-West University).

Amra, R., Hlatshwayo, H. & McMillan, L. (2013). SMME employment in South Africa. In: Biennial conference of Economics Society of South Africa. Bloemfontein, 25-27.

Andreea, F. & Aiga, D. (2012). Financial bootstrapping: Motivation and usage of bootstrapping methods among SMEs in the tourism sector. [Online]. Available:http://www.diva-portal.se/smash/get/diva2:532991/FULLTEXT01.pdf. [Accessed on 01 October 2017].

Arko-Achemfuor, A. (2012). Financing Small, Medium and Micro Enterprises (SMMEs) in rural South Africa: An exploratory study of stokvels in the nailed local municipality, North West Province. *Journal of Social Anthropology*, 3(2), 127-133.

Armstrong, P., Lekezwa, B. & Siebrits, K. (2007). Poverty in South Africa: A profile based on recent household surveys. *Stellenbosch Economic Working Paper,* 4(8), 1-26.

Baldock, R. & North, D. (2012). The Role of UK Government Equity Funds in Addressing the Finance Gap facing SMEs with Growth Potential" [Online]. Available: www.isbe.org.uk/content/assets/10.RobertBaldockBP. [Accessed on 23 September 2017].

Balogun, O., Nazeem, A. & Agumba, J. (2016). Determinants Predicting Credit Accessibility within Small and Medium-sized Enterprises in the South African Construction Industry. *Procedia Engineering*, 164, 473-480.

Banking Association of South Africa. (2017). SME Financial Literacy in South Africa. [Online]. Available:http://www.banking.org.za/what-we-do/sme/sme-financial-literacy-in-south-africa. [Accessed on 01 March 2017].

Bhide, A. (1992). Bootstrap finance: The art of start-ups. Harvard Business Review, 109–117.

Blackburn, R., Hart, M. & Wainwright, T. (2013). Small business performance: business, strategy and owner-manager characteristics. *Journal of Small Business and Enterprise Development*, 20, 8-27.

Business Environment Specialist. (2014). Examining the challenges facing small businesses in South Africa. [Online]. Available:http://www.sbp.org.za/uploads/media/SBP_Alert_-_Examining_the_challenges_facing_small_businesses_in_SA_01.pdf. [Accessed on 01 March 2017].

Chimucheka, T. & Mandipaka, F. (2015). Challenges Faced by Small, Medium and Micro Enterprises in the Nkonkobe Municipality. *International Business & Economics Research Journal*, 14(2), 309-316.

Coleman, M. & Okyere, D. (2016). Financing Small Scale Oil Palm Producers in the Western Region of Ghana-Ahanta West District. *Business and Economic Research*, 6(1), 272-289.

Coleman, S. (2007). The role of human and financial capital in the profitability and growth of women-owned small firms. *Journal of Small Business Management*, 45(3), 303-319.

Department of Land Affairs. (1997). Rural Development Framework. Pretoria: CTP Books

De Witte, H., Rothmann, S. & Jackson, L. (2011). The psychological consequences of unemployment in South Africa. *South African Journal of Economic and Management Sciences,* 15(3), 235-252.

Ebben, J. & Johnson, A. (2006). Bootstrapping in Small Firms: An Empirical Analysis of Change over Time. *Journal of Business Ventures*, 21(1), 851-865.

Ebben, J. (2009). Bootstrapping and the financial condition of small firms. *International Journal of Entrepreneurial Behaviour& Research*, 15(4), 346-363.

Fatoki, O. (2014). The Financing Options for New Small and Medium Enterprises in South Africa. *Mediterranean Journal of Social Sciences,* 5(20), 748-755.

FinMark Trust. (2015). Financial Access and SME Size in South Africa. [Online]. Available:http://www.finmark.org.za/wp-content/uploads/2016/01/Rep_Financial-Access-and-SME-Size-in-SA_Dec2015.pdf. [Accessed on 30 January 2016].

Freear, J., Sohl, J. & Wetzel, W. E. (1995). Angels: personal investors in the venture capital market. *Entrepreneurship & Regional Development,* 7(1), 85-94.

Gaede, B. & Versteeg, M. (2011). The state of the right to health in rural South Africa. [Online]. Available: http://www.rhap.org.za/wp-content/uploads/2014/02/Chap-9-State-of-right-Rural-Health-pgs-99-106.pdf. [Accessed on 20 August 2017].

Government Gazette of the Republic of South Africa. (2003). National Small Business Amendment Act. [Online]. Available. http:/ /www.info.gov.za/gazette/acts/2003/a26-03.pdf. [Accessed on 10 August 2017].

Grichnik, D., Brinckmann, J., Singh, L. & Manigart, S. (2014). Beyond environmental Scarcity: Human and social capital as driving forces of bootstrapping activities. *Journal of Business Venturing,* 29, 310-326.

Irwin, D. & Scott, J. (2010). Barriers faced by SMEs in raising bank finance. *International Journal of Entrepreneurial Behaviour and Research,* 16, 245-259.

Isaga, N. (2015). Owner-Managers' Demographic Characteristics and the Growth of Tanzanian Small and Medium Enterprises. *International Journal of Business and Management*, 10(5), 168-181.

Jacobs, P. & Hart, T. (2012). Rural Innovation Assessment Tool (Riat) Concept Paper Series: Skills Development in Rural Areas- a Brief Review of Evidence". [Online]. Available:http://www.hsrc.ac.za/uploads/pageContent/5091/Skills%20Development%20in%.pdf. [Accessed on 29 August 2017].

Jayawarna, D., Woodhams, C. & Jones, C. (2012). Gender and alternative start-up business funding. *Competition and Change*, 16(4), 303-322.

Jensen, M. & Meckling, W. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Capital Structure. *Journal of Financial Economics*, 3(4), 305-360.

Kraaijenbrink, J., Spender, J. & Groen, A. (2010). The resource-based view: a review and assessment of its critiques. *Journal of Management, 36*(1), 349-372.

Kwong, C., Jones-Evans, D. & Thompson, P. (2012). Differences in perceptions of access to finance between potential male and female entrepreneurs: Evidence from the UK. *International Journal of Entrepreneurial Behavior & Research,* 18(1), 75-97.

Lam, W. (2010). Funding gap, what funding gap? Financial bootstrapping: supply, demand and creation of entrepreneurial finance. *International Journal of Entrepreneurial Behaviour& Research,* 16(4), 268-295.

Lekhanya, L. M. (2016). E-Commerce as an instrument of governing SMEs' marketing strategy in an emerging economy. Risk Governance & Control: *Financial Markets & Institutions*, 6(4), 298-305.

Mahadea, D. & Simson, R. (2010). The challenge of low employment economic growth in South Africa: 1994 - 2008. *South African Journal of Economic and Management Sciences,* 13(4), 391-406.

Mahembe, E. (2011). Literature Review on Small and Medium Enterprises' Access to Credit and Support in South Africa. [Online]. Available:www.ncr.org.za/. [Accessed on 29 July 2017].

Mateev, M. & Anastasov, Y. (2011). On the growth of micro, small and medium-sized firms in central and Eastern Europe: a dynamic panel analysis. *Banking and Finance Review*, 3(2), 81-104.

Modigliani, F. & Miller, M. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review,* 48(3), 261-295.

Modigliani, F. & Miller, M. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*, 53(3), 433-444.

Mugobo, V. & Ukpere, W. (2012). Rural entrepreneurship in the Western Cape: Challenges and opportunities. *African Journal of Business Management,* 6(3), 827-836.

Myers, S. (1984). Capital structure puzzle. *Journal of Finance,* 39(3), 575-592.

National Small Business Act. (1996). Definition of Small Businesses. [Online]. Available. www.smesurvey.co.za/research-current.htm. [Accessed on 1 May 2015].

Neeley, L. & Auken, H. (2009). The relationship between owner characteristics and use of bootstrap financing methods. *Journal of Small Business & Entrepreneurship,* 22(4), 399-412.

Neeley. L. & Auken, H. (2010). Women and men entrepreneurs: different relationships to bootstrap finance. In United States Association for Small Business and Entrepreneurship. Conference Proceedings. United States Association for Small Business and Entrepreneurship.

Padachi, K., Howorth, C. & Narasimhan, M. (2012). Working capital financing preferences: The case of Mauritian manufacturing small and medium-sized enterprises (SMEs). *Asian Academy of Management Journal of Accounting and Finance,* 8(1), 125-157.

Pfeffer, J. & Salancik, G. (1978). The external control of organizations: A resource dependence perspective. New York: Harper & Row

Pooe, R. & Mafini, C. (2012). Business development challenges in a rural District Municipality in South Africa: A case of FezileDabi District Municipality". *The Southern African Journal of Entrepreneurship and Small Business Management,* 5(1), 89-109.

Pretorius, W. (2007). Bootstrap Financing Applied by South African Entrepreneurs. Unpublished Doctoral dissertation, University of Pretoria.

Rauch, A. & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology*, 16(4), 353-385.

Schinck, A. & Sarkar, S. (2012). Financial Bootstrapping: a critical entrepreneurship skill. *Centro de Estudos e Formação AvançadaemGestão e Economia da Universidade de Aveiro,* 20, 1-24.

Schofield, R. (2015). Relationship between Bootstrap Financing, Number of Employees, and Small Business Success. DBA. Thesis, Walden University.

The South African Presidency. (2008). The impact of crime on small business in South Africa. [Online]. Available: http://www.info. gov.za/view/downloadfileaction? id85242 [Accessed on 01 March 2017].

Trading Economics. (2016). Rural Population in South Africa". [Online]. Available: http://www.tradingeconomics.com/south-africa/rural-population-wb-data.html. [Accessed on 29 August 2017].

Tshabalala, N. (2014). Crime and Unemployment in South Africa; Revisiting an Established Causality. Evidence from the Kwazulu Natal Province. *Mediterranean Journal of Social Sciences,* 5(15), 519-528.

Vanacker, T., Manigart, S., Meuleman, M. & Sels, L. (2011). The Impact of Financial Bootstrap Strategies on Value Added in New Ventures: A Longitudinal Study". [Online]Available:http://www.gsom.spbu.ru/files/upload/niim/seminar/sophie_manigart_bootstrap_strategies.pdf. [Accessed on 21 September 2017].

Wehinger, G. (2014). SMEs and the credit crunch. *OECD Journal Financial Market Trends,* 3(2), 115-148.

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The Importance of Entrepreneurship as a Contributing Factor to Economic Growth and Development: The Case of Selected European Countries

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Abstract: Entrepreneurship has been pointed out as a key contributor to sustained economic growth and development as it not only creates employment, but increased spending in markets, knowledge transfers, employment and innovation. However, very few studies exist that empirically measures the relationship between the three variables; economic growth, economic development and entrepreneurship. Therefore, the purpose of this study is to determine and highlight the importance of entrepreneurship as a contributing factor to economic growth and development. Traditionally, economic growth is measured by the gross domestic product (GDP) of a country. As no formal measurement of economic development exists, an index was created taking into consideration the Human Development Index (HDI), percentage population above the poverty line and employment rate. The entrepreneurship development variable is measured by the Total Early-Stage Entrepreneurial Activity (TEA). The study followed a quantitative research design and made use of secondary time series data with the sample period ranging from 2005 to 2016. The study area comprised five selected member states of the European Union (EU) which included Germany, the Netherlands, Hungary, Belgium and Poland. Findings suggest that economic growth, development and entrepreneurship seem to be inexplicably connected. As several other factors may also contribute to the fluctuations of economic growth and development results differed from one country to another. However, the analyses from the Dutch, Hungarian and Polish economies for the period under consideration reveal correspondingly healthy economic and social environments where entrepreneurial climates are flourishing. The analysis from Germany and Belgium, however reveal subdued entrepreneurial development. Based on these findings, it is recommended that the development of SME sectors especially in transition economies be centralised as important focus areas towards improving economic and social growth outlooks. In turn, policy stakeholders should ensure the creation of enabling environments structured around responsive micro and macro decision-making.

Keywords: *Entrepreneurship, economic growth, economic development, European countries*

1. Introduction

For centuries, entrepreneurship has been identified as a key contributor of employment, innovation and sustained economic growth and development (Acs & Audretch, 2005; Langevang & Gough, 2012; Aparicio et al., 2016, Meyer & Meyer, 2017). However, a renewed emphasis was placed on the role of entrepreneurship and small businesses after the 1980s period of global stagflation and high unemployment levels (Toma et al., 2014). A realisation has emerged that the main contributors to economic growth was no longer predominantly large companies but the small and medium enterprises (SMEs) were making a considerable contribution to the Gross Domestic Product (GDP)of certain economies (Brock & Evans, 1989; EIM, 1997; Toma et al., 2014). Globally, large industries have been transforming to smaller more robust business models and since the 1970s a considerable amount of literature has emerged making reference to the role and contribution of smaller entrepreneurial businesses in economies (Toma et al., 2014).

The EIM (1997) identified a shift in the composition of the European business environment's contribution to GDP showing that small business growth exceeded that of large businesses for the period of 1988 – 1997. Similarly, Brock and Evans, (1989) identified comparable trends in the United States of America. As explained by Wennekers and Thurik (1999), shifts like these could be due to changes in the global economic environment, technological evolutions, supply of labour, increased and improved education levels, consumer preference changes and ease of entry regarding business regulation. The realisation of these global trends has placed much-needed emphasis on the advancement of the small business entrepreneurial sector and its contribution, to not only economic growth, but economic development as well. Therefore, the purpose of this study is to determine and highlight the importance of entrepreneurship as a contributing factor to economic

growth and development. The study makes use of a selection of European countries including Hungary, Germany, Netherlands, Poland and Belgium to test this relationship and contribution between the three variables; economic growth, economic development and entrepreneurship.

2. Literature Review

Several studies have proven that a link between economic growth, development and entrepreneurship exists (Herrington & Kew, 2013; Naudé, 2013; Meyer & Meyer, 2017). Herrington and Kew (2013) mention that a consistent correlation between per capita GDP and TEA rates exists and Naudé (2013) found a link between entrepreneurship and economic development. Entrepreneurship is undeniably a large contributor to a country's economic success in terms of its GDP (Tamilmani, 2009; Toma et al., 2014). However, in the modern era, economic growth is not the only aspect to consider when measuring a country's prosperity (Toma et al., 2014). Masoud, (2014) refers to economic growth, from a neo-classical perspective, as a cumulative increase of output, or the accumulation of production factors reflecting a quantitative measurement of a country's progress or growth. To a large extent, the concept of economic growth is based on models mainly developed by traditional economists such as Solow, (1956) Myrdal, (1957) and Rostow, (1959). Economic growth is primarily measured by tracking the progress with regards to a country's GDP and per capita GDP. However, in recent decades, controversies regarding the traditional measurement of GDP to quantity growth were pointed out and one of the main concerns was listed as the exclusion of aspects such as human development, equality and social cohesion (OECD, 2005).

In light of this, Todaro and Smith (2011), refers to the notion of economic development, somewhat in contrast to economic growth (GDP), which encapsulates a multi-dimensional measuring concept specifically including social development aspects and in-turn providing an inclusive impression of a country's progress (Iyer et al., 2005). Notwithstanding this, the traditional measure of growth using the rise and decline in GDP still remains an important economic indicator. The concept of economic development was rarely used in economic literature before the 1930s (Toma et al., 2014). Wennekers and Thurik (1999), refer to this concept as the 'new' endogenous growth theory. As mentioned, the neoclassical growth models such as those of for example Solow, omitted key aspects linked to development and in reaction to this, the endogenous growth theories emerged (Martin & Sunley, 1998). This theory takes into consideration the impact of endogenous factors as opposed to exogenous factors leading to long-run economic growth. These endogenous factors linking to economic development involves an all-inclusive enhancement of a society's standard of living through the growth of all sectors of the economy, including for example education, health, technology and infrastructure and the overall reduction of poverty and unemployment (Carlson, 1999).

In essence, economic development is the balance between the economic and social dimensions of a country's economy (Huq et al., 2009; Toma et al., 2014). It is important to understand these differences and comprehend that economic growth on its own is not a true reflection of a country's growth and development. As with pure economic growth and development theories, many historical and modern theories, to some degree, touch on the concept of entrepreneurship. However, a few stand out as they encapsulate the essence of entrepreneurship. These include, but are not limited to, Cantillon's theory of entrepreneurship (1755), Von Thünen's location theory (1783 – 1850), Menger's subjective theory of value (1840 – 1921), Marshall's theory of substitution (1842 – 1924), the Schumpeterian theory of innovation (1883 – 1950), Knight's theory of profit (1885 – 1972), Schultz's theory on entrepreneurship (1902 – 1988) and Kirzner's 'alert' entrepreneur (1930 – current) (Bula, 2012). Cantillon (1680-1734), one of the first economists to write about the notion of entrepreneurship, identified an entrepreneur as a risk-taking agent who takes supply and demand into account in order to create balance. He did not view the entrepreneur as a production factor (Bula, 2012).

As part of the original Austrian school, Cantillon (1755), who works was only published two decades after his death, studied entrepreneurship extensively and, at that time, held similar views on entrepreneurship as are currently advanced by the said school of thought. He stated that creating entrepreneurs leads to the development of an economy through the creation of an exchange, price fluctuations, money transfer and increased competition; and added that entrepreneurs are responsible for bringing prices and production in line with demand. Taking the aforementioned into consideration, the Schumpeterian entrepreneurs were perceived as flexible and being creators of variability and creative destruction, thereby referring to the

potential creation of new possibilities (Wennekers & Thurik, 1999; Naudé, 2013). Schumpeter followed a different approach to that of Cantillon, mainly by classifying an entrepreneur as an innovator and an agent of change (Toma et al., 2014). His theory assumed that an entrepreneur is an economic and social front-runner and profit is not the main goal of the entrepreneurial activity, but rather that of fulfilling a need in society through new innovations (Bula, 2012).

He proposed that five conditions occur during the entrepreneurial process: new production processes, new products, new markets, new production factors or materials and new ventures (Toma et al., 2014). Conventionally, as theoretical neo-classical models assumed perfect competition and accorded no to little consideration to dynamic innovation in the equilibrium process, there was little room for the concept of entrepreneurship (Wennekers & Thurik, 1999). Nevertheless, with the founding of the new endogenous growth theory, which had a profound impact on industrial and evolutionary economics and managerial literature, new prospects evolved, opening a door for the development of the concept referred to as entrepreneurship. Wennekers & Thurik (1999), state that a good example of the insertion of this concept into theory was evident in Romer's model. His model presumed that an instrument of growth can be found in new varieties of capital goods. In addition, Romer's model proposes that growth can be driven by the development of new products; thus economic change could be sparked by the various activities executed by profit-pursuing entrepreneurs.

When considering the link between entrepreneurial activity and economic growth, two key roles of an entrepreneur are identified. The first refers to new entry, which denotes the role of creating a new business, regardless of the level of innovation. The second refers to innovation or novelty as a key economic role which ultimately entails transforming ideas and discoveries into economically feasible actions (Baumol, 1993; Toma et al., 2014). This 'newness' achieved by means of ground-breaking innovation may be considered one of the most relevant factors linking entrepreneurship to economic growth and development (Toma et al., 2014). The very existence of entrepreneurship is key to economic functioning as it addresses inadequacies within economies and directly contributes to market supply and demand. As stated, entrepreneurship is directly and indirectly linked to economic growth and development (Wennekers & Thurik, 1999; Herrington & Kew, 2013; Meyer & Meyer, 2017). Several studies have empirically proven this link. For example, Toma et al. (2014) identified entrepreneurship as a booster of economic growth, occurring for a number of reasons, including improved competition as the number of businesses increases, knowledge 'spill-over' and diversity and innovation created amongst economic agents. The first of these, improved competition as the number of businesses increases, directly contributes to growth since an increase in the number of businesses eventually leads to an increase in employment. Moreover, competition creates a conducive environment for the growth of knowledge which leads to the second economic booster.

Knowledge 'spill-over' are created as new knowledge is created the effects thereof are transferred to other individuals or businesses. Knowledge 'spill-over' is an important causal instrument for endogenous growth. The third reason refers to the diversity and innovation that is created by economic agents which creates uniqueness and in turn influences economic growth. Audretsch and Thurik, (2000) found further empirical evidence in a longitudinal study conducted amongst 23 OECD countries over a period of 20 years (1974-1994). The study specifically focussed on the effect the number of entrepreneurs had on unemployment levels. Results indicated that the number of small businesses had a positive correlation to employment levels, thus more small businesses resulted in lower levels of unemployment. Meyer and Meyer (2017), conducted a pooled panel time-series analysis annual secondary data from2001 to 2015 for the BRICS countries. Results indicated that-long run relationship existed between the dependent variables of GDP and employment and the independent variables which included TEA, entrepreneurial intention (EI) and established business ownership rates (EBO). In addition, further results indicated that TEA and EI are significant predictors of economic growth (GDP), and that established business ownership is a significant predictor of employment.

The traditional measures of growth and development were explained earlier, however entrepreneurship is not such an easy concept to measure (Wennekers & Thurik, 1999). Nonetheless, over the past 19 years, the GEM Consortium has developed a method to measure and compare cross-national entrepreneurial activity as well as perform intra-country time series analysis. In order to provide data that can be used for reliable

comparisons the GEM makes use of a standardised research design for all countries. The most well-known and used indicator to measure entrepreneurship is the Early-stage entrepreneurial activity (TEA) which consists of two stages: nascent and new entrepreneurs. TEA can be defined as the percentage of the adult population between the ages of 18 and 64 years who have very recently started a business or who are in the process of doing so (Herrington & Kew, 2013). Nascent entrepreneurs are defined as people who have started a new business but who have either not paid salaries to employees or if salaries have been paid, they were for less than three months (Herrington et al., 2015). Entrepreneurial activity is represented by the total early-stage entrepreneurial activity (TEA) index.

New business ownership rates include those who have paid salaries to employees for more than three consecutive months, but whose businesses are not older than 42 months, as semi-established businesses (Herrington et al., 2015). The GEM considers TEA to be the most important entrepreneurial indicator as this is potentially the group of businesses that might successfully grow into established ones. TEA levels could fluctuate with levels of unemployment and, in some cases, be higher when unemployment is high due to job demands not being met by the private and public sector (Herrington & Kew, 2013). In conclusion, entrepreneurship does impact economic growth and development positively for a number of reasons as listed in the aforementioned discussion and as entrepreneurship development is equally important for economic growth and economic development, a deeper understanding of this topic is fundamental to the existing body of knowledge.

3. Methodology

This section elaborates on the methodology that was used during the research process. The research purpose study areas as well as the data and sample period that was used are discussed. Furthermore, a clear and concise discussion of the techniques that were used during the analysis is provided.

Data, Variables and Sample Period: The study made use of time series data with the sample period ranging from 2005 to 2016. This time period was chosen based on the availability of data. A total of three variables were selected for the analysis. These included the annual percentage growth in *the* gross domestic product (GDP) per capita and a self-constructed composite economic development index ranging from 0 to 100. The index was constructed by Meyer et al. (2016) and was simplified for this study using three indicators including the HDI, the percentage of the population at risk of poverty and social exclusion and finally, the unemployment rate (all equally weighted). The index was constructed by using three indicators including the HDI as a measure of human development, the percentage of the population at risk of poverty and social exclusion and finally, the unemployment rate (all equally weighted). All three indicators were converted to ensure the analytical soundness of the index. This indicator represents the percentage of population between 18 to 64 years old who are either nascent entrepreneurs or owners of a business which is less than 42 months old (Herington et al., 2017). However, for the purpose of the study this variable was converted to indicate the number of people of the population not involved in *the* early-stage entrepreneurial activity. All selected variables together with the conversions and interpretations are shown in Table 1.

Table 1: Variable Identification and Interpretation

Indicator	Variables	Conversion	Interpretation
Gross domestic product (GDP) growth	GDP per capita growth (annual % change)	Measured with a base score of 90.	GDP growth rate with a base of 90. Score higher than 90 indicates positive growth, where scores lower than 90 indicates negative growth.
Economic development index	HDI, the percentage of the population at risk of poverty and social exclusion, unemployment	HDI expressed as percentage (HDI x 100); % of the population not at risk of poverty and social exclusion (100 - % of the population at risk of poverty and social exclusion;	The index score is ranging from 0 to 100. Higher scores indicate higher levels of economic development.

	rate.	Employment rate (100 – unemployment rate). Three variables used to construct index equally weighted.	
NTEA	Total Early Stage entrepreneurial activity (TEA)	Negative TEA (NTEA), (100 – TEA rate). Includes the number of people not involved in the early-stage entrepreneurial activity (TEA).	Indicates the % of the population not involved in any early-stage entrepreneurial activities. The score ranges from 0 – 100 with lower scores indicating higher involvement.

Source: Authors' own compilation

Research Purpose and Design: The study comprised both a qualitative and quantitative research approach. The qualitative part included an extensive literature review that was based on key concepts of economic growth, entrepreneurship and economic development. More specifically, the inquiry focused on the link between entrepreneurial activity and its respective contribution towards stimulating economic activity and alleviating poverty and unemployment. The quantitative aspects involved the use of secondary data that was acquired through the use of various sources. These included the World Bank and Euro stat while all entrepreneurial data were obtained from the Global Entrepreneurship Monitor Consortium.

The Study Area: The chosen study area comprised of five selected member states of the European Union (EU) which included Germany, the Netherlands, Hungary, Belgium and Poland. Entrepreneurial activity within these countries and in the EU region in general is seen as an important driver for employment growth together with strong linkages to economic dynamism and innovation (Rusu & Roman, 2017). These attributes together with the unique intricacies of being governed by common standards, yet faced by ever increasing global and diversified markets prompted the choice of the study area. Furthermore, the inherent differences between more advanced European economies (Germany, Netherlands, Belgium) and their transitional (Hungary and Poland) counterparts serve as an interesting framework towards the analysis of the impact of entrepreneurship on the socio-economic environment in Europe.

Data Analysis: Data for selected variables were analysed through the use of a descriptive analysis technique. This involved the examination of the underlining economic, social and entrepreneurial climates for each of the selected countries between 2005 and 2016. Time trends for each of the countries are shown *in* Figures 1 to 5 with the purpose of ascertaining the relationship between entrepreneurship, economic growth and development.

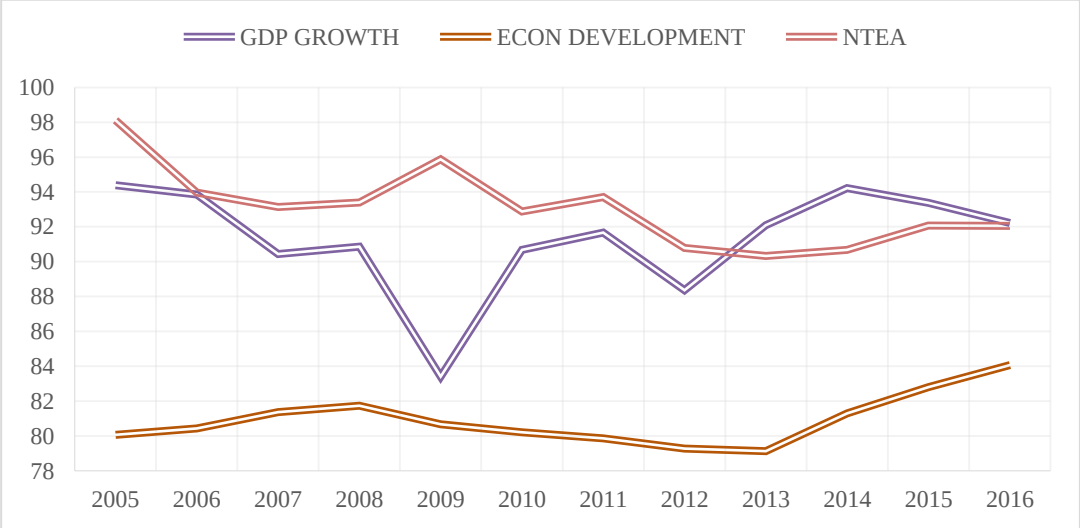
4. Results and Discussion

This section reports the results of the study. More specifically, the trends of the selected European countries pertaining their entrepreneurial climate, economic development and subsequent growth performances are evaluated and discussed for the period ranging from 2005 to 2016.

Hungary: Classified as a transition economy in the central European region, the Hungarian economy has experienced significant changes over the last few decades (WEF, 2017). The country has been earmarked by large-scale transitions from a central*ly* planned system to *a* pure market system which has had a profound impact on the economy's performance (Bozóki, 2008). This transition together with its subsequent reduction of public sector involvement, the emergence of private ownership and large-scale Foreign Direct Investment (FDI) in the modern economy saw the countries acceptance to the European Union in 2004 bringing with it large-scale development. Results from Figure 1 indicate some of these changes where the Hungarian economy, in the past 12 years, has shown significant improvements especially in their entrepreneurial climate. Results show that NTEA rates since 2005 have dropped from 98.12 percent to 92.06 in 2016, indicating an increase in *a* number of people involved in starting a business. This has been accompanied by significant increases in other related entrepreneurial indicators, where Entrepreneurial Intention (EI) has improved by 13.56 percent to an estimated 15.11 percent in 2016 whilst, Established Business Ownership (EBO) rates have increased from 2.05 percent in 2005 to 5.50 percent in 2016 (GEM Consortium, 2018a).

The increase in entrepreneurial activity as shown in Figure 1 can primarily be asserted to the vast expansion of the small business sector and enterprises in the Hungarian economy (Szira, 2014). According to the OECD (2016a), this expansion has brought with it the creation of privatised local markets, subcontracting of large-scale state-owned enterprises and additional job creation opportunities that have spurred labour market growth. Furthermore, the increase in entrepreneurial activity contributed to improved competitiveness especially for export sectors as well as resource mobility and increased risk-taking abilities which has in-turn had positive consequences for underlining economic development and growth (Dudin et al., 2016). As seen from Figure 1, economic development index scores improved from 80.06 to 84.06 for the period under review. However, noticeable fluctuations in economic growth and reductions in economic development levels between 2008 and 2013 (Figure 1) show the strong impact the global financial crisis had on economic activity. This is particularly evident in GDP growth rates between 2008 and 2009 where the Hungarian economy contracted by an estimated 6.6 percent.

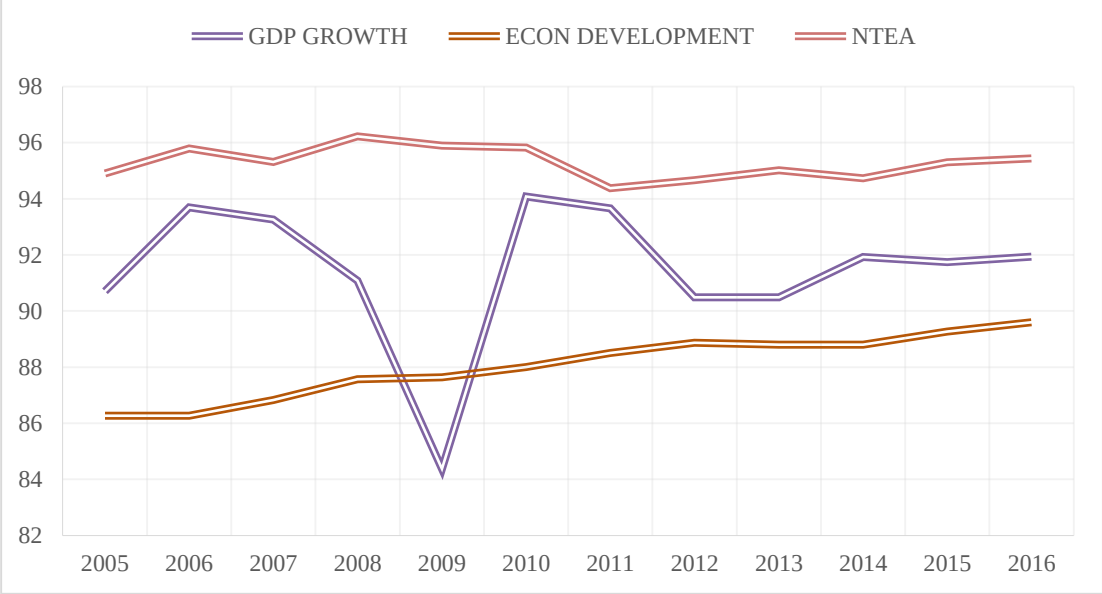
Figure 1: Hungarian NTEA Rates, Economic Development Scores and GDP Per Capita Growth Rates



Source: GEM Consortium, 2018b; Euro stat, 2018; World Bank, 2018

Germany: Figure 2 shows Germany's performance for the selected indicators from 2005 to 2016. From this figure it can be observed that amongst the selected countries included in this study, Germany has shown little improvement in their entrepreneurial climate. In fact, the country boasts the highest NTEA rate (lowest involvement in entrepreneurial activity), estimated at 95.44 percent. Additionally, lower intention rates (6.23% in 2016) are also recorded when compared to the global average (22.32%) (GEM Consortium, 2018c). Holicza and Tokody, (2016) note that the crisis had a detrimental impact on the country's SME sector to which it increased fear of failure rates from 17 percent before 2008 to more than 42 percent in 2014. Together with growing small business bankruptcies, lack of investment, as well as significant job losses, the lower rates shown are indicative of the lack of a strong entrepreneurial climate in the country. However, despite this low entrepreneurial involvement in economic processes the country has maintained stable economic growth levels over the past decade which has far surpassed other countries (Folkerts-Landau, 2016). Similar to the experiences of Hungary, economic activity did show significant sensitivity to the onset of the global financial crisis (Funk, 2012) where growth rates contracted by 5.62 percent between 2008 and 2009. Nevertheless, the country showed strong and rapid economic recovery which since has carried over to recent strong performances. Bastasin (2016) notes that these continued performances have been the main result of stable fiscal and monetary positions, low household and consumer debt levels as well as advanced infrastructural developments rather than entrepreneurial prosperity in the economy.

Figure 2: German NTEA Rates, Economic Development Scores and GDP per Capita Growth Rates

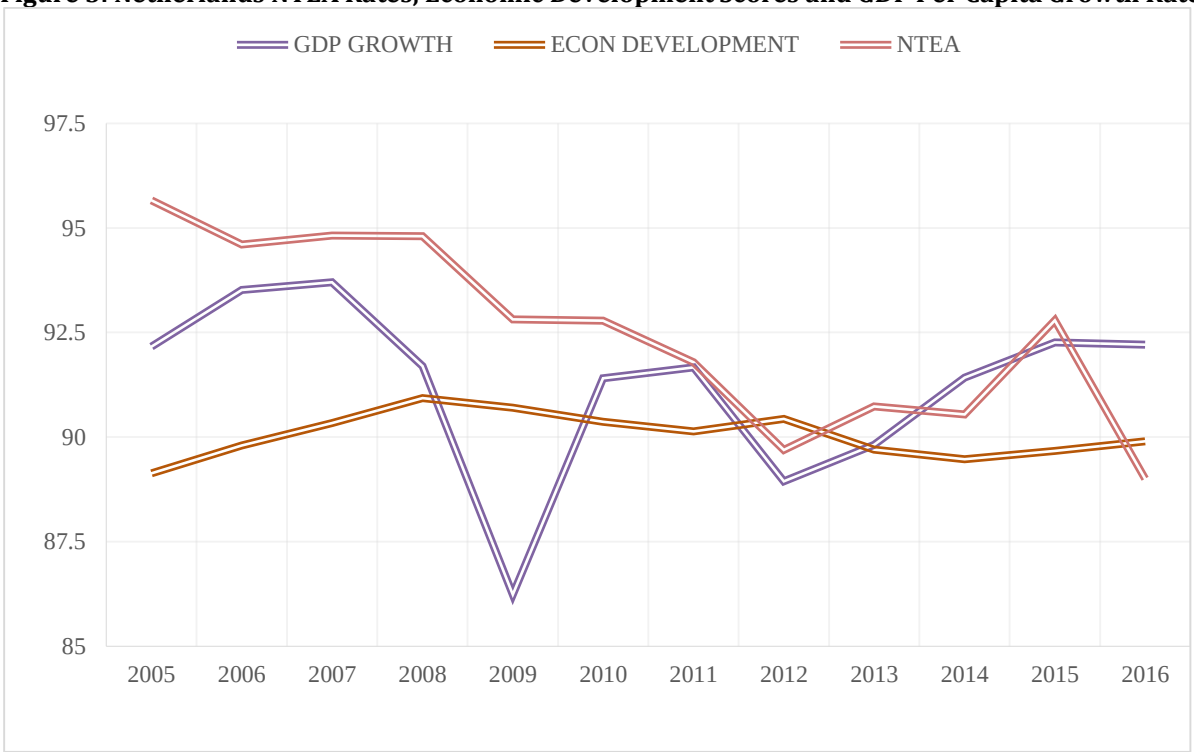


Source: GEM Consortium, 2018b; Euro stat, 2018; World Bank, 2018

In relation to the stable growth prospects attained by Germany, it can be observed from Figure 2 that economic development levels have similarly shown consistent improvement over the 12-year period. Development index scores show continuous increments ranging from 86.26 (2005) to 89.60 (2016) even despite recorded growth fluctuations in 2009. These findings suggest a minimal contribution of the inherent German entrepreneurial climate towards economic growth and development. Low entrepreneurial involvement in this regard can be ascribed to efficient labour markets attributing significantly low unemployment levels (GEM Consortium, 2018c). This is further compounded by cognisance of a lack of entrepreneurial culture and lower perceptions of entrepreneurship as a viable career choice in the country (Raible, 2016). Economic growth and development in this regard are rather driven by stable long-term technological based manufacturing and political stability which have significantly contributed to high employment levels, inclusivity and a virtuous quality of life (Folkerts-Landau, 2016).

Netherlands: The third country under consideration included the Netherlands. Economic development index scores, growth rates and NTEA rates for the country are shown in Figure 3. As observed, the Netherlands boasts the highest recent economic development scores (89.9) amongst the selected countries. Additionally, the lowest NTEA rates (89.0%) for 2016 are recorded. For the period under review, the Netherlands have reduced NTEA rates from the high 95.44 percent to below 90 percent. This suggests a significant increase in the number of people involved in entrepreneurial activities since 2005. Empirical finding in similar studies (Stam, 2015) show that entrepreneurship has played a pivotal role in the country's economic performance. In this regard the OECD (2016b) note that entrepreneurship has significantly contributed to improved trade and the development of one of the leading global export bases. Furthermore, these processes have assisted in increased industry diversification, local and national competitiveness as well as sustained job creation over the 12-year period (OECD, 2016b). These effects are particularly evident in Figure 3. Economic growth rates in the Dutch economy shows various fluctuations, taking into account the financial crisis of 2008. However, recovery since these timeframes show positive upward trends especially from 2012 onwards (ranging from -1.06% to 2.2% in 2016). Goldhausen (2017) indicates that one of the underlining drivers of the recovery has been the SME sector performance and its contribution towards fostering innovation and reducing unemployment levels.

Figure 3: Netherlands NTEA Rates, Economic Development Scores and GDP Per Capita Growth Rates



Source: GEM Consortium, 2018b; Euro stat, 2018; World Bank, 2018

Whilst these trends show a suggestable strong relationship between Dutch economic growth and entrepreneurship, the importance of the improving entrepreneurial climate towards economic development cannot be ignored. As observed from Figure 3, pre-crisis (2005 - 2008) and post-crisis (2010 – 2016) trends for the NTEA and economic development index show simultaneous reductions and increments, illustrating the positive relationship between venture creation and its subsequent impact on economic development. However, as observed during the crisis, lower employment rates and higher poverty risks tend to induce a movement towards increased entrepreneurial involvement (lower NTEA rates). Wennekers et al. (2010) likewise suggest a bidirectional relationship between economic development and entrepreneurship. In this regard innovation-driven venture creation can contribute to improved standards of living and knowledge transfers, while lower economic development (higher unemployment and poverty) induces a greater

involvement in entrepreneurial activities primarily due to the lack of employment opportunities and lower income levels (Mojica-Howell et al., 2012).

Poland: As part of the countries that are included in the efficiency classification, results from Figure 4 shows that Poland attributed amongst the most stable conditions in the past 12-years. NTEA rates for the period ranging from 2005 to 2016 maintained a consistent level close to 91 percent with slight reductions from 2015 to 2016. These rates together with a high intention to start a business rate (20.66) as well as comparatively (other efficiency-driven economies) high established business ownership rates (7.1%) attribute a sound and healthy entrepreneurial climate in the economy (GEM Consortium, 2018d). This has likely contributed to similar stable trends shown in GDP per capita growth rates as shown in Figure 4. Although having noticeable declines in 2008 and 2009, the Polish economy has maintained positive growth rates. During the global crisis the economy was the sole EU state member wh*o* avoided *the* economic recession (Orłowski, 2011). Paulina (2017) points the continued strong and stable performance to among others, are pensive macroeconomic policy, a large domestic economy and finally the sustained confidence of local entrepreneurs which brought with it diversified export structures and significant fund inflows.

Figure 4: Polish NTEA Rates, Economic Development Scores and GDP Per Capita Growth Rates

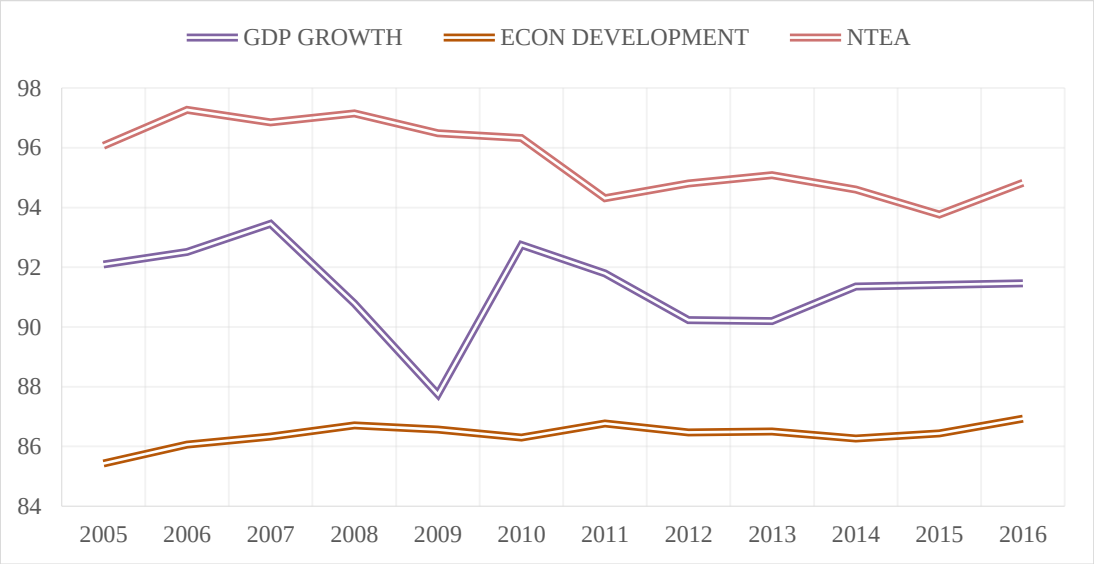
Source: GEM Consortium, 2018b; Euro stat, 2018; World Bank, 2018

In light of the stable entrepreneurial and economic conditions shown over the last two decades, Poland's economic development levels have shown significant improvement. Trends shown in Figure 4 indicate an increase of 13.6 index points in the last 12 years moving from 72.2 in 2005 to 85.8 in 2016. Sienkiewicz (2014) showed that business formation and the fostering of an effective and enabling entrepreneurial climate had contributed significantly towards Polish employment levels as well as the development of infrastructural capacities. These have concomitantly been supplemented by a growing diversified product line, innovation creation processes, job security, improved productivity, enhanced regional competitiveness and the creation of better intellectual capital (Paulina, 2017). The significance of these findings suggests that stable economic as well entrepreneurial conditions prove pivotal for enhanced economic development levels. In this regard, the provision of economic conditions which is centralised around localised strategies and policy responsiveness assures business confidence and venture creation (Sienkiewicz, 2014). These in turn, provide a labour market supplemented by small and medium enterprise led growth contributing to the reduction of unemployment levels, fostering an improved standard of living and establishing a diversified economic structure (Mularska-Kucharek & Wiktorowicz, 2015).

Belgium: Belgium constituted the final country pertaining, the analysis of the three selected variables for the study. Results for the country concerning entrepreneurship, economic growth and development are shown in Figure 5. As observed from the figure, NTEA rates for the period under consideration show reductions from 96.07 percent (2005) to 94.82 percent (2016). However, amongst the selected countries, NTEA rates are the second highest only trailing Germany. Other indicators, such as the EBO rate (3.75%), EI rate (10.85%) and Motivational Index rate (1.61%) are also well below regional and developmental level averages all suggesting

a low entrepreneurial climate in the country (GEM Consortium, 2018e). Interestingly, economic development index scores only show subdued improvement over the 12-year period. Recent index scores (86.93 in 2016) are the lowest amongst the included developed and innovation-driven economies in the study (shown in Figure 5). In this regard, lower entrepreneurial involvement possibly can contribute to the lower development levels in the Belgium economy. Dumont and Kegels, (2016) in their findings illustrate the country's lack of young firm creation, highlighting its subsequent effect in lowering productivity, technical efficiency and innovative activities that prove crucial towards fostering higher development.

Figure 5: Belgian NTEA Rates, Economic Development Scores and GDP Per Capita Growth Rates



Source: GEM Consortium, 2018b; Euro stat, 2018; World Bank, 2018

Based on the results from Figure 5, the relationship between entrepreneurship and growth in GDP per capita tend to correspond with the findings of the recent GEM report (Holvoet et al., 2015) for the country. According to the report, entrepreneurs in the Belgium economy were more inclined to be necessity-driven rather than opportunity-driven (Holvoet et al., 2015). This is illustrated in lower growth rates between 2007 and 2009 and 2010 and 2013 with concomitant lower NTEA rates for these periods (shown in Figure 5). Whilst these trends are unique, especially for the innovation-driven economies, it signals possible barriers restricting the potential contribution of entrepreneurship to current mediocre growth and development levels. In this regard, and in providing an enabling environment for the entrepreneurial activities, recent GEM rankings for the country illustrate strong performances in the provision of physical as well as commercial and legal infrastructure (GEM Consortium, 2018e). However, the country ranks poorly with regards to education at school, government support and illustrates weak perceptions of entrepreneurship as a viable career choice. From this point of view, it is clear that both social and public sector support proves pivotal in spurring on entrepreneurial involvement and increasing its impact on the economic and social performance of not only transitional economies but more developed nations as well.

5. Implications and Recommendations

The results from the study disclose various implications. Upon reflection, economic growth, development and entrepreneurship seem to be inexplicably connected. Whilst the causality of these relationships are unclear from this specific study, the analyses from the Dutch, Hungarian and Polish economies for the period under consideration reveal correspondingly healthy economic and social environments where entrepreneurial climates are flourishing. As shown in the empirical evidence this tends to resonate around the ability of entrepreneurs to instil additional added innovation, knowledge transfers and diversification processes in economic structures. The analysis from Germany and Belgium however, reveal subdued entrepreneurial development. Results suggest that the provision of sound infrastructural capacity and regulatory frameworks are not sufficient in cultivating and taking advantage of the intrinsic potential that entrepreneurship

provides. Rather support should include strong policy backing, localised strategies and cultivating societal and educational views on the viability and significance of self-employment and venture creation. This furthermore highlighted the bidirectional significance between entrepreneurship and stable economic conditions amongst the selected countries. Based on these findings, it is recommended that the development of SME sectors especially in transition economies be centralised as important focus areas towards improving economic and social growth outlooks. In turn, policy stakeholders should ensure the creation of enabling environments structured around responsive micro and macro decision making. This should include the removal of business stumbling blocks whilst additionally providing the adequate training initiatives that instil business confidence. Lastly, governments should prioritise the emphasis on entrepreneurship development as early as primary school levels with the focus on improving social and cultural norms regarding self-employment and venture creation.

Conclusion: The results of the study highlighted several important aspects. Amongst these, findings showed noticeable linkages between entrepreneurial activity and the selected countries' economic performances. Entrepreneurship seems to play a key role in establishing diversified economic structures, innovation creation processes, whilst serving as crucial buffers to economic shocks within the EU. Results pertaining to growth and development suggest these indicators be significantly intertwined with the provision of enabling environments together with the strong public sector and social support proving pivotal for entrepreneurship development. Nevertheless, the unique intricacies of each country seem to affect and alter these relationships. Limitations of the study were primarily based on the descriptive nature of the analysis. The lack of long time series data in this regard prevented the use of any causal, predictive or confirmatory statistical methods in the study. This does however provide room for future research endeavours. Studies directed towards the particular area of interest may look to the use of panel data methodologies or other intercontinental comparisons in order to ascertain a more definitive conceptualisation on the relationship between entrepreneurship, development and economic growth amongst these countries.

References

Acs, Z. J. & Audretsch, D. B. (2005). Entrepreneurship and innovation (No. 2105). Papers on Entrepreneurship, Growth and Public Policy.

Aparicio, S., Urbano, D. & Audretsch, D. (2016). Institutional factors, opportunity entrepreneurship and economic growth: Panel data evidence. *Technological Forecasting and Social Change*, 102(1), 45-61.

Audretsch, D. B. A. & Thurik, A. R. (2000). Capitalism and democracy in the 21st century: From the managed to the entrepreneurial economy. *Journal of Evolutionary Economics,* 10(2000), 17-34.

Bastasin, C. (2016). Germany: a global miracle and a European challenge. Global Economy & Development Working Paper No. 62, Brookings, Washington, D.C.

Baumol, W. J. (1993). Formal entrepreneurship theory in economics: Existence and bounds. Journal of Business Venturing, 8, 197-210.

Bozóki, A. (2008). Consolidation or second revolution? The emergence of the new right in Hungary. *Journal of Communist Studies and Transition Politics,* 24(2), 191-231.

Brock, W. A. & Evans, D. S. (1989). Small business economics. Small Business Economics, 1, 7-20.

Bula, H. O. (2012). Evolution and theories of entrepreneurship: A critical review of the Kenyan perspective. *International Journal of Business and Commerce*, 1(11), 81-96.

Cantillon, R. (1755). Essai Sur La Nature Du Commerce in Général (Essay on the Nature of Trade in General) London: Frank Cass and Co., Ltd. Translated and republished in 1959.

Carlson, B. A. (1999). Social dimensions of economic development and productivity: Inequality and social performance. An overview. (In B.A. Carlson, eds. Social dimensions of economic development and Productivity: Inequality and social performance. Santiago: United Nations. p. 7-19).

Dudin, M. N., Voykova, N. A., Galkina, M. V. & Vernikov, V. A. (2016). Development of Hungary's Manufacturing Industry in the Conditions of European Integration. *International Journal of Economics and Financial Issues*, 6(5), 48-52.

Dumont, M. & Kegels, C. (2016). Young Firms and Industry Dynamics in Belgium. Federal Planning Bureau Working Paper No. 6-16. Federal Planning Bureau, Brussels.

EIM. (1997). The European Observatory for SMEs. 5th Annual report, Zoetermeer.

Euro stat. (2018). People at risk of poverty and social exclusion. [Online], Euro stat.

Folkerts-Landau, D. (2016). Beacon of stability: The foundations of Germany's success. Deutsche Bank Research, Frankfurt.

Funk, L. (2012). The German Economy During the Financial and Economic Crisis Since 2008/2009: An Unexpected Success Story Revisited. Konrad Adenauer Stiftung, Berlin.

GEM Consortium. (2018a). Entrepreneurial behaviour and attitudes: Hungary [Online]. Global Entrepreneurship Research Association.

GEM Consortium. (2018b). Entrepreneurial behaviour and attitudes. [Online], Global Entrepreneurship Research Association.

GEM Consortium. (2018c). Entrepreneurial behaviour and attitudes: Germany. [Online], Global Entrepreneurship Research Association.

GEM Consortium. (2018d). Entrepreneurial behaviour and attitudes: Poland. [Online], Global Entrepreneurship Research Association.

GEM Consortium. (2018e). Entrepreneurial behaviour and attitudes: Belgium. [Online], Global Entrepreneurship Research Association.

Goldhausen, J. (2017). Access to finance and growth: Evidence from Dutch SMEs. [Online]. University of Twente.

Herrington, M. & Kew, J. (2013). GEM 2013 South African Report: Twenty Years of Democracy. University of Cape Town Centre for Innovation and Entrepreneurship. Cape Town, South Africa.

Herrington, M., Kew, J. & Kew, P. (2015). 2014 GEM South Africa report: South Africa: The crossroads – a goldmine or a time bomb? University of Cape Town Centre for Innovation and Entrepreneurship. Cape Town, South Africa.

Herrington, M., Kew. P. & Mwanga, A. (2017). South Africa Report: Can Small Businesses Survive in South Africa, University of Cape Town Centre for Innovation and Entrepreneurship, Cape Town: South Africa.

Holicza, P. & Tokody, D. (2016). Field of challenges: A critical analysis of the Hungarian SME sector within the European economy. *Hadmérnök*, 9(3), 110-120.

Holvoet, T., Bosma, N. & Crinjs, H. (2015). Global Entrepreneurship Monitor Report for Belgium and Flanders, Global Entrepreneurship Research Association, London.

Huq, M. M., Clunies-Ross, A. & Forsyth, D. (2009). Development Economics. London: McGraw Hill Education.

Iyer, S., Kitson, M. & Toh, B. (2005). Social capital, economic growth and regional development. *Regional Studies,* 39(8), 1015-1040.

Langevang, T. & Gough, K. V. (2012). Diverging pathways: Young female employment and entrepreneurship in Sub-Saharan Africa. *The Geographical Journal*, 178(3), 242-252.

Martin, R. & Sunley, P. (1998). Slow convergence? The new endogenous growth theory and regional development. *Economic Geography,* 74(3), 201-227.

Masoud, N. (2014). A contribution to the theory of economic growth: Old and new. *Journal of Economics and International Finance,* 6(3), 47-61.

Meyer, D. F., De Jongh, J. J. & Meyer, N. (2016). The formulation of a composite regional development index. *International Journal of Business and Management Studies,* 8(1), 100 – 116.

Meyer, N. & Meyer, D. F. (2017). An econometric analysis of entrepreneurial activity, economic growth and employment: The case of the BRICS Countries. *International Journal of Economic Perspectives*, 11(2), 429-441.

Mojica-Howell, M. N., Whittaker, W. L., Gebremedhin, T. G. & Schaeffer, P. V. (2012). Examining The Bidirectional Relationship Between Entrepreneurship and Economic Growth: Is Entrepreneurship Endogenous. Entrepreneurship-Born, Made and Educated, Burger-Helmchen, T. (ed), In Tech, London.

Mularska-Kucharek, M. & Wiktorowicz, J. (2015). Entrepreneurship of rural residents in Poland. *Acta Scientiarum Polonorum. Oeconomia,* 14 (3), 83-93.

Myrdal, G. (1957). Rich Lands and Poor. New York: Harper and Row.

Naudé, W. A. (2013). Entrepreneurship and Economic Development: Theory, Evidence and Policy. Discussion Paper, IZA DP No. 7507. Maastricht: University of Maastricht.

OECD (Organisation for Economic Cooperation and Development). (2005). Is GDP a satisfactory measure of growth.

OECD (Organisation for Economic Co-operation and Development). (2016a). OECD Economic Surveys: Hungary May 2016, OECD Publishing, Paris.

OECD (Organisation for Economic Co-operation and Development). (2016b). Peer Learning Country Report: Netherlands, OECD Publishing, Paris.

Orłowski, W. (2011). Post-Accession economic development of Poland. *Eastern Journal of European Studies*, 2(2), 7-20.

Paulina, F. (2017). Development of individual entrepreneurship in Poland under crisis conditions. Ovidius University Annals, *Economic Sciences Series*, 17(1), 484-490.

Raible, S. E. (2016). Entrepreneurship ecosystems: A comparison of the United States and Germany. Bosch Working Paper, No. XXXII. Robert Bosch Stiftung, Gerlingen.

Rostow, W. W. (1959). The stages of economic growth. *The Economic History Review*, 12(1), 1-16.

Rusu, V. D. & Roman, A. (2017). Entrepreneurial activity in the EU: An empirical evaluation of its determinants. *Sustainability*, 9(10), 1679-1695.

Sienkiewicz, M. W. (2014). Local economic development policy in Poland: Determinants and outcomes. Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu, 32(2), 405-427.

Solow, R. M. (1956). A contribution to the theory of economic growth. The Quarterly Journal of Economics, 70(1), 65-94.

Stam, E. (2015). Entrepreneurial ecosystems and regional policy: A sympathetic critique. *European Planning Studies*, 23(9), 1759-1769.

Szira, Z. (2014). The situation of the SME Sector in Hungary. Management, Enterprise and Benchmarking - in the 21st century, 2014(1), 107-118.

Tamilmani, B. (2009). Rural women micro entrepreneurs: An empirical study on their social profile, business aspects and economic impact. *Journal of Entrepreneurship Development*, 6(2), 7-20.

Todaro, M. P. & Smith, S. C. (2011). Economic Development. 11th ed. Essex: Pearson Education Limited.

Toma, S. G., Grigore, A. M. & Marinescu, P. (2014). Economic development and entrepreneurship. *Procedia, Economics and Finance*, 8(2014), 436-443.

WEF (World Economic Forum). (2017). The inclusive growth and development report. World Economic Forum, Geneva.

Wennekers, S. & Thurik, R. (1999). Linking entrepreneurship and economic growth. *Small Business Economics*, 13(1), 27-55.

Wennekers, S., Van Stel, A., Carree, M. & Thurik, R. (2010). The relationship between entrepreneurship and economic development: Is it U-Shaped? *Foundations and Trends in Entrepreneurship*, 6(3), 167-237.

World Bank. (2018). World development indicators. [Online], World Bank Group.

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Conflicts Intervention and Peace-Building Mechanisms in the West Africa Sub-Region

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Abstract: Conflict prevail when there is the absence of peace. African countries probably get the worst representation globally with the exception of Syria when it comes to conflicts and violence in the continent. Seemingly, every story emanating from the continent project one atrocity or another. Despite the shouldering of the larger share of the world's conflict, Africa has relatively become more peaceful as well, however in Nigeria, the Boko Haram insurgence in the north is another epicentre. This paper centres on the intervention besides collaborative determination of ECOWAS – AU in mediating peace, and the peacebuilding mechanisms in resolving states conflicts, and to strengthen democracy in West Africa, with the case of Côte d'Ivoire. The organizations' efforts in the Ivorian case reflect discourses and the dynamics of the operations of an effective regional organization, and the international community in addressing conflicts. The collaborative theory was embraced to put things inappropriate perception. Findings show that the implementation of the Contrivance and the Protocol on Democracy and Good Governance by ECOWAS were better prepared to meet challenges related to peace and security in the region. This paper concludes and recommends that organisations who mediate peace in any conflict zone must first understand the cause of the conflict, thereafter timely intervene, and take common positions in applying different mechanisms to prevent, manage and resolve conflicts. It is recommended that to prevent violence and human rights abuses in crisis situations, the organisations of ECOWAS and AU, and particularly SADC should improve interventions procedure.

Keywords: *Democratic regional organizations; conflict prevention; peace-making; peace-building, and security*

1. Introduction

Conflict prevail when there is the absence of peace, it is a staid deviation and argument that arise between two or more people on something of interest, and may lead to violence. Conflict is regarded as threats to peace and security. Apparently, every story emanating from the continent of Africa seems to project one violence or another. Debatably, African has experienced about half of the world's conflicts, despite being 16% of the world population. Amazingly this is a slightly larger share of the world's conflicts than in the 1990s chaotic years of post-cold wars. Nevertheless, there are two main important caveats, the absolute number of conflicts in the world has experienced has considerably decreased in the last two decades. Despite the shouldering of the larger share of the world's conflict encumbrance, Africa has relatively become more peaceful as well (Dorrie, 2016). A continent of 55 nation-states, conflicts only cluster in a few specific regions. According to the Uppsala Conflicts Data program in 2014, only about 12 African nations experienced what is categorized as armed conflicts, but in 2015 countries like Burundi, Niger and Chad made it to the list. Geographically, Africa's conflicts are tightly clustered along an arc stretching from northern Mali through southern Algeria, Libya into Egypt, extending into the Sinai Peninsula (Dorrie, 2016).

In Nigeria, the Boko Haram insurgency ravaging in the northern part of the country is another epicentre - interestingly it is considered the deadliest conflicts on the continent of Africa which cannot be categorized as terrorist conflict, though it is gradually spreading into other African neighbouring states (Dorrie, 2016). It is positioned in relative proximity to an area of a hot spot in the centre African Republic, the eastern DRC, South Sudan, Darfur and Burundi, regions. On the eastern coast of Africa, we have Somali civil war which is currently ongoing strong after three decades. Basically all African modern conflicts are thus exceedingly confined and interestingly they flout unsophisticated elucidations based on stereotypes (Curtis, 2012). Therefore, there is the need for the institution of the Economic Community of West Africa States(ECOWAS) to collaborate with African Union (AU) to devise a strategy to intervene and resolve the various conflicts within its region. In 2002 the then Organisation of African Unity (OAU) transition to African Union(AU), adopted several mechanisms and protocols defined AU's position and role in peacekeeping and peace-making, as well as its commitments to strengthen democracy and good governance in Africa. This marked shift policies and practices of the then OAU. It is principally because the OAU Charter highlighted commitments by members to maintain peace and security on the continent, the principle to respect sovereignty and territorial integrity of

member states and its non-interventionist stance during periods of conflict in several African countries elicited concerns over the relevance of the OAU in upholding and stimulating peace and security within the region.

The failure of the OAU to intervene decisively in the Rwandan genocide and conflicts in Liberia, Sierra Leone, Somalia and the Democratic Republic of the Congo (DRC), revealed its inability or unwillingness to take action to resolve conflicts even if gross violations of human rights and atrocities were committed. The Constitutive Act of the AU in 2002 rejects unconstitutional changes of government and the new organisation of AU developed mechanisms and protocols to promote democracy and good governance. The African Union established the Peace and Security Council (PSC) in 2004, with its provision to recommend that the Assembly of heads of state for the Union to intervene in states experiencing crimes against humanity, this highlights a major change in way conflict resolution is viewed under the African Union (Kode, 2016). The principle of rejecting unconstitutional changes of government has been significantly strengthened and given legal backing by the AU organisation, and in practice the AU organisation has intervened in countries where changes in government have been unconstitutional, and where peace and security have been threatened. In the case of ECOWAS, its intervention in Liberia and Sierra Leone conflicts, and the need to strengthen its peace and security mechanisms necessitated the advance of the Protocol involving the Instrument or Mechanism for the Prevention of Conflict, Management, Resolution, Peace and Security (1999), the Protocol on Democracy and Good Governance (2001) (Kibasomba, 2002). These protocols were aimed at enabling a better-coordinated retort to conflict and crises in the region.

The AU organisation alongside the ECOWAS intervention role played in the Ivorian crisis is a good example that increasingly came under analysis. Then again, the peace-production and peacekeeping endeavors of these associations were applauded for averting further barbarities. Their efforts to restore peace were not often respected by various parties involved in the conflict, being criticised in some quarters. Côte d'Ivoire became a test case for rapid interventions by regional actors at a time when the Organisation for African Unity (OAU) and ECOWAS experienced what is called transitional changes in order to upgrade so as to meet what it requires to ensure peace and security in Africa in the 21st century (David, 2016). The specific obligations, structure, economic capability and the degree of sustainability of regional determinations to ensure that conflicts are resolved, principally with regards to peace-making, peace-keeping, and peace-building came under questioning. Discussions additionally centred around the near preferred standpoint of provincial and UN-authorized mediations, the inability to react to violations against humankind and destruction in Rwanda, the manageability of African-led peacekeeping activities and the criticalness in the operationalization of some UN-led tasks. The mediations of AU in Burundi in 2003 and Somalia in 2007, the ECOWAS drove activity in Liberia in 1990, and Sierra Leone in 1997, expanded desires concerning the crucial part of African-drove peacekeeping missions (Shillinger, 2009). This study basically presents the peace-keeping role of the ECOWAS, the AU and the international community in the resolution of conflicts through collaborative efforts, and highlights the dynamics involved in the takeover of regional peacekeeping missions by UN operations.

2. Literature Review

A Cursory Review on African States' Conflicts and Insurgencies: In Nigeria, the frequent reports on Boko Haram throughout 2015 came with hopes. Though the uprising is said to be one of the deadliest conflicts that Africa has now firmly spread into other neighbouring states as well, it has recorded the lowest levels of deaths according to report as predicted in 2015 forecast (Dorrie, 2016). The president of Nigeria Mohammad Buhari finalized some specific modification son how conflicts are managed, these seem to be paying off on the long run as the Nigerian military continue to record victory over the sets group (Boko Haram which literally means 'western education is evil'). The current military successes in combatting the set groups labelled as the Boko Haram are depended on spending billions on modern military gear that none of the neighbouring countries involved can actually afford, riding all of them into serious debt. France and the United States provide Nigeria with critical assistance, both in terms of intelligence and combatting other terrorist groups farther north, so that Nigeria's army can therefore focus on the Boko Haram threat. This goes without saying that it is not terribly sustainable. Nevertheless, it is argued that the Boko Haram insurgency has continued to

be a substantial source of violence in both in Chad, Niger, Cameroon, and Nigeria, though not on the extremist level as experienced in 2014 and early 2015 which marked the peak of the violence (Dorrie, 2016).

In African today, the Mali-Algeria-Libya triangular conflicts are regarded as the international terrorist hot spot. There are several conflicting groups which include the Al-Qaeda in the Islamic Maghreb is the most active group across some of the most arbitrary borders in the world, these conflicts are interrelated. Their firmness will still require primarily national approaches (Peter, 2016). According to Dorrie (2016), Mali is only currently held unruffled by the existence of the international troops and donors it receives, while still becoming more insecure even in the country's south. It is quite unfortunate that the corrupt and inept political elite obviously has learned nothing from the near collapse experienced in the year 2012, and there is only little hope that it will do so miraculously in the near future years ahead. As the global community is too capitalised to let Mali crash, however the people will nevertheless witness what is called widespread insecurity and belligerent in the northern part of the state, while on the other hand the south will experience more terrorist spasms targeted to the government, with it establishments linked with West. In Algeria however, there is indeed a fascinating circumstance, the political administrations are so elite-driven, securely entwined with the security institution, that they are fundamentally impassable from the external.

President Abdelaziz Bouteflika amalgamated supremacy over the last few years, but unfortunately he is an old man with a dyed-in-the-wool history of serious illness. Algeria's internal power balance is heavily grounded or built on using funds spawned by the state's rich benefaction with hydrocarbons to buy modern and innovative kits for its bloated military apparatus, thus charge officers and recruited men happy, in order to suppress public disgruntlement. The oil prices in a slump and internal conflicts over Bouteflika's succession, the worst-case scenario would see anger over low living standards and lack of opportunity boil over, mix with elite factionalism. In the Central Africa Republic up to 2013, the conflicts in the Central Africa Republic (CAR), and South Sudan linger to flame off over the period of 2016 till present. These states have gotten to delicate post-conflict concessions in the form of a political election in the CAR and the administration of the national unity in South Sudan. It is imperative to note that in both nations, the central government had a very limited power or authority even before the civil wars besmirched their capabilities to basically nothing to write home about. It is therefore predicted that there will continue to exist low-level violence as well, with flare-ups likely in case the UN peacekeeping operation with MONUSCO decides to bring the hammer down on some of these groups.

According to Dorrie (2016), there were some scandals involving UN peace-keepers sexually abusing children in 2015 (Dorrie, 2016). In Somali, the catastrophes of Somalia continue to be in Darfur in Sudan, Darfur is proficient in an uptick in belligerent lately and there is no motive, certainly not the non-exiting international attention. And of course in Burundi, much was set to be contingent on the pronouncements of the African Union, with nearly every probable form of interference apprehensive with hesitations. A very noteworthy development would be the distribution of military dynamism against the will of the organisation under section 4(h) of the union's constitutive act (Curtis, 2012). According to a World Bank report, it warns that South Africa is another country to watch out for with her current attacks on foreign nationals by its citizens. South Africa remains the second largest economy after Nigeria in the south of the Sahara, and will absolutely not decentralize into large-scale core clash, there are few perturbing signs of progress however, the country's economy had recently fallen into junk status, and it keeps going dejected the ditch, former President Jacob Zuma of South Africa appeared to be more incompetent or rather inept by the day while racial tension continues to run high in the country over a decade after end of apartheid. It is on record that South Africa remains the highest level of inequality in the world according to World Bank (2016) report, more than two decades after apartheid.

There continue to be communal turmoil with considerable loss of life in 2015 and 2016, along with the line of the Marikana killings in 2016, the systematic prevalent of xenophobia and intolerance in the country, which may likely see the South African people turning contrary to each other as an alternative of the current state. However, the conflict that surrounded Côte d'Ivoire in 2002 divided the whole country for eight years, with its south part run by the Government and the north part controlled by the rebel forces. The violence and divisions in the country caused the reversal of major economic returns that had been gained since independence, and the political uncertainties threatened regional stability. While Côte d'Ivoire's economy

blossomed after independence, acknowledgements in part to readily available labour from nationals who had migrated from neighbouring countries in West Africa, signs of political tensions became apparent in the 1990s and culminated with a coup d'état in 1999, a disputed election in 2000 and an attempted coup in 2002 (Dorrie, 2016). Between 2002 and 2010, Côte d'Ivoire experienced ethnic-related tensions, with the rebels running a parallel government. Elections were postponed repeatedly despite diplomatic interventions by the Economic Community of West African States (ECOWAS). The African Union (AU) and France, and military intervention by the United Nations. Even after elections were finally held in 2010, disputes around the electoral results led to violence and human rights violations and brought the country to the brink of another brutal civil war. The difficulties faced by the belligerents in agreeing on a way forward at the different stages of the conflict meant regional actors and the international community had to step in on a regular basis to prevent further escalations of violence during periods of relative peace (Dorrie, 2016).

3. Material and Method

A documentary analysis or method was adopted in this study as it helps to enlighten researchers and thereby make sense of written documents, which exist either in the unrestricted or private purview (Mogalakwe, 2006). This suggests that researchers can select the relevance of the documents they access on the basis of their applicability to the study. In that same vein another researcher argued that "in the documentary analysis, the criteria for selecting documents, or for focusing on particular extracts, should reflect the issues on which evidence is pursued" (Dey, 2005: 105). This study adopts the collaborative theory or approaches to resolving conflict in order to put things inappropriate perception.

Theory: Collaborative Theory to Conflict Intervention: The collaborative theory to resolving conflict basically provides an introduction to a variety of conflict management techniques, incorporating a combination of theory and practice, and geared towards a broad audience (Isenhart and Spangle, 2000). In collaborating method, it strives to ensure that two aggrieved sides are satisfied. It requires an open discourse of the considerable number of issues and concerns, investigation of elective arrangements, genuineness and responsibility from every one of the group. To be fruitful, the collaborating method of intervention members should have the capacity to surface worries in a non-undermining way and think inventively. It is imperative to first comprehend the distinction between a bargaining method and a teaming up style: bargaining is 'horse-exchanging', surrendering things you need in the expectations that the opposite side will do likewise and that you can live with the result. In a coordinated effort, the two sides are endeavouring to find an answer which genuinely fulfils the necessities of each (Isenhart and Spangle, 2000). The teaming up style is a fantastic method to combine bits of knowledge from individuals with alternate points of view on an issue, and the outcome can be a solid responsibility for the arrangement from each side. The drawback of the teaming up style is that it is difficult to do! It requires close consideration regarding the current issues (concerns, not simply positions) and to the enthusiastic condition of the opposite side.

4. The Interventions Mechanism in Conflict Situations in Africa

In the 1990s the implementation of majority rule system reforms or changes and organized multiparty system election was implemented by most African nations, which flagged a move far from one-party governmental issues and the multiplication of military administrations that had described Africa's nation in the prompt post-autonomy period. There was a chance for common society and autonomous media to beware of government abundances and consider public authorities to be responsible and accountable for their stewardship as they exercise the people's mandate. In this light elections turned into a normal component in African governmental issues and a few nations corrected their constitutions by including arrangements to regard the control of law and advance great administration (Dorrie, 2016). This implied a new beginning for most African nations, particularly when contrasted with the quick post-freedom period, when administering parties caught control and forced serious limitations on the political restriction and common society. Nonetheless, this period likewise saw frightful and crushing clashes in nations like Burundi, the DRC, Liberia, Rwanda, Sierra Leone, Somalia and Sudan. While each one of these contentions was intra-express, all had genuine ramifications for their separate locales, and some really spread past national outskirts. While belligerents battled and conferred net infringement of human rights—murdering, lynching and snatching

civilians —there was a call to mediate and put an end to these abominations by the international community (Swart and Solomon, 2004).

According to Klingebiel (2005), there were instances, where several questions were raised about the inability or the reluctance of the international community to put an end to the atrocities with the abuse of human rights in some of these conflict states particularly the African organisations. At the end of the Cold War, there have been banters about the parts and duties, the planning and the yearnings of the international community -especially, the UN, previous pioneer powers and regional actors, in interceding in strife influenced territories. In putting forth a defense for outsider mediations in conflicts circumstances, Zartman (2005:1) contends that foreign performers can't 'take cover behind the dread of their own losses or of long-haul association as a reason for inaction'. The test for an international organisation in interceding in clashes lies in quickly assembling suitable powers to uphold peace and consolidating such military activities with discretionary arrangements between warring groups.

In situations where clashes eject and there is a gross infringement of human rights and barbarities conferred by those associated with the contention, there have been worries about the timeframe it takes to approve and set up together peacekeeping powers and send them to the warring states to keep up the peace and secure existences of the general population. Regardless of the solid case for why international community ought to mediate in specific clashes, Mays (2002) advises us that 'the authorizing of peacekeeping activities and intercessions in clashes or the growing of continuous tasks relies upon the endorsement of all UN Security Council individuals'. Furthermore, there are worries that the perpetual individuals from the Security Council have settled on choices about where and when to intercede depending, not on the need to ensure people or authorize a peace understanding, however on the vital connections they have with nations influenced by struggle (Adebajo, 2011). It can likewise be contended that the absence of firm activity by the Council in specific clashes radiates from the absence of specific financial, political or vital interests individual members from the Council have with nations in strife or their pre-occupation with different emergencies. The annihilation in Rwanda, for instance, and the withdrawal of the United Nations Assistance Mission in Rwanda (UNAMIR) exhibits the connection among countries and individuals from the Security Council and the desires of the last in mediating in specific clashes over others (May 2002). The way that most individuals from the Council did not have major vital interests in Rwanda at the time, especially in the post-Cold Wartime, the intersection of contentions that required the consideration of the global network amid that period and the encounters of the United States in Somalia prevented individuals from the Council from completely submitting.

The Organisational Transformation from the OAU to AU (African Union): It has been noted on several occasions the United Nations Security Council has infrequently responded adequately to conflicts, and on time in Africa, even though most of the deliberations on peace and security matters concern African countries (Adebajo, 2011). There comes a noteworthy thought, if the international organisation as the United Nations (UN) neglected to intercede in specific clashes, what could territorial organisations like the AU do to avert mass monstrosities when clashes emitted in Africa? In the result of the Rwandan decimation and different clashes around Africa, the then OAU (the Organization of African Unity) was frequently reprimanded for neglecting to assume the liability to mediate in clashes, authorize peace and stop human rights infringement. While the OAU had an instrument to review strife and savagery, as the Commission on Mediation, Conciliation and Arbitration, its endeavors to determine African clashes rather adopted a political strategy, underscoring the utilization of peacefulness and regard or respect for the sway and regional respectability of its member states (Foltz, 1991; Ajulu, 2004; Yound, 1991). In this respects, specially appointed boards of trustees were set up by the Commission additionally to address savagery and struggle, however as Deng contends, most African pioneers and leaders had framed agreeable partnerships with each other, and this implied, during strife, individuals from these councils were more keen on ensuring the security and assurance of their associates than settling the main problem of contentions. In spite of the foundation of the Commission on Mediation, Conciliation and Arbitration, the then OAU amid its reality favored non-obstruction in the inward undertakings of its states amid the contention, and was viewed as 'a quiet spectator to monstrosities submitted in various member states' (Gomes, 2008: 113– 30).

Apparently, the leaders of African states met in Sirte, Libya in September 1999, to survey and review the OAU Charter in order increase the productivity level, boost efficiency and adequacy of the mainland alliance to address the difficulties witnessed by the continent. One of these difficulties was the scourge of contention and the consequences for the general population of Africa. The Sirte Declaration consequently required the end of contention and conflicts, keeping in mind the end goal to accomplish this and different targets, they chose to shape the new association known as the African Union (AU). This was trailed by the foundation of the AU in 2002, the point of which was to advance peace, security and dependability, popularity based standards and organizations, standard cooperation and great administration, and to strengthen democracy in Africa particularly. Aware of the exercises from the then OAU in the territory of peace and security, strife avoidance and goals, the new organisation is known as the AU therefore received a more interventionist approach through its systems, structures and foundations (Besada, Goetz and Werner, 2010; Khadiagala, 2012). Be that as it may, in 2004, the AU thought of another technique and built up its Peace Security Council (PSC) through the Protocol identifying with the Peace and Security Council (2002). The board made out of 15 individuals, the PSC was made to oversee and resolve strife and conflicts, which has a command to lead peace-production and peace-keeping on the mainland of Africa. Article 7 (e) on the Protocol connecting to the foundation of the PSC engages the PSC to prescribe to the Assembly mediation for the benefit of the AU in nations experiencing atrocities, massacre and wrongdoings against mankind (AU, 2002).

The way and manner that the OAU's instrument for strife and conflicts aversion, administration and goals (1993) was supplanted by the AU's PSC feature the adjustment in mentality and arrangements from non-obstruction to non-impassion. Mwanasali (2008:41) states that this change from non-obstruction to non-lack of concern 'flags a noteworthy move in African political reasoning and foreshadows or shows the beginning of an interventionist stage in the African continent administration of peace and security'. This move in mentality was clear in the mediation of African-driven peacekeeping powers with a command from the AU in Burundi (2003– 04), Sudan (2004– 06), (Somalia 2007) and Central African Republic (2013). The mediations in these nations have created blended outcomes yet demonstrate a noteworthy move in the approach of the AU, despite the fact that the AU states unmistakably that it regards the privilege to power and regional trustworthiness of its individuals. In the instances of the Central African Republic and Sudan, the AU understood the material and money related expenses of peacekeeping missions and this exhibited the requirement for help from the universal network.

Regardless of its adjustment in the state of mind to endeavors went for mediating in struggle circumstances to bring peace, and the blended victories following its intercessions in Burundi, Côte d'Ivoire and Sudan, the AU has wound up in a circumstance much the same as that of its forerunner. This is especially valid on account of Burundi, which was dove into the struggle in April 2015 after a choice by President Pierre Nkurunziza to remain for a third term in office, which brought about resistance from political gatherings, common society and local nationals (David, 2016). The AU organisation voted not to send troops to Burundi regardless of the way that about 1,000 Burundians had been killed following a very long time of brutal dissents, an endeavored rebellion in May 2015, an undeniably critical compassionate circumstance and worries that Burundi could totally implode at the time the AU settled on its choice (Kode, 2016). In West Africa, the force and complexities of contentions in the 1990s—especially in Liberia (1989– 97 and 1999–2003), Sierra Leone (1991– 2002) and Guinea-Bissau (1998– 99)— called for earnest intercessions to stop mass outrages, killings, demolition of property and state organizations, and the aggregate fall of society. The idea of the brutality had local ramifications with monstrous streams of displaced people crosswise over fringes which undermined the dependability of the district. The mediation of ECOWAS in Liberia and Sierra Leone helped stop the killings and the wanton demolition of the property. Military mediation, especially in Liberia, Sierra Leone and later in Côte d'Ivoire, was gone before by, went with or took after conciliatory endeavors that prompted the consenting to of peace arrangements like the Cotonou, Abuja and Accra Peace Agreements on account of Liberia and the Lomé Agreement on account of Sierra Leone (Kode, 2016).

The accomplishments made after intercessions in Liberia (1990) and Sierra Leone (1997) constrained West African pioneers to take a gander at more organized and compelling approaches to drive local peacekeeping and peace-production endeavours. In such a manner, the various leaders of the local body consented to build up structures and instruments to encourage a more powerful and effective intends to intercede in future clashes and conflicts. ECOWAS set up an instrument for strife aversion and prevention, administration and

goals, peacekeeping and security, in 1999 to control the association in counteracting, overseeing, settling interstate and intrastate clash and keep up peace and steadiness. The component had structures including the Council of Elders (Council of the Wise), the Mediation and Security Council and the Defence and Security Commission to address security issues (Kode, 2016). This component was additionally formed into the Supplementary Protocol on Democracy and Good Governance in 2001. The Protocol was intended to fortify majority rules system of democracy in the locale with the thought that the nonappearance of genuine vote based systems and energetic organizations were at the focal point of contentions in the district. The formalization of a reserve drive called for under the 1999 Protocol would have suggestions for the continent and for the AU's peacekeeping mission's endeavours. The choice by the AU's Peace and Security Council to build up an African Standby Force implies ECOWAS is the most developed in the formation of its provincial power.

Peace Mediation and Collaborative Role of the ECOWAS and AU in Côte D'ivoire Conflict: The mechanism on Peace Mediation and the Collaborative effort of ECOWAS and AU adopted for the creation of an early-warning system, the Council of the Wise and the special mediators on conflict and peace to pre-empt watersheds, was set up to react fittingly in nations influenced by strife and conflicts. It speaks to the most comprehensive structure for tending to dangers to peace and security in the locale, as it bolsters endeavours to pre-emptively address potential clash circumstances before they raise and gives ECOWAS duty to add to post-struggle improvement and reproduction (Zounmenou and Loua, 2011). This made exceptional delegates in struggle zones to liaise with local actors and the AU association. In 2001 ECOWAS grasped the Democracy and Good Governance Protocol (DGGP) keeping in mind the end goal to address a portion of the political clashes and administration disappointments that provoked clash in the locale. This convention built up the rules for the association for solid decisions, and along these lines approaches individuals to regard vote based standards and constitutions, and rejects illegal changes of government. Notwithstanding, in 1993 the ECOWAS Treaty was amended, giving supranational status on the organisation, to organize human security trying to reposition it to address the difficulties experienced by West African states toward the end of the Cold War. With the advantage of insight into the past and with encounters accumulated from its intercessions in Liberia and Sierra Leone clashes, ECOWAS member states understood the criticalness of; maintaining a strategic distance from postponements to activate troops from different parts of the world, having a decent comprehension of the geopolitics of the district: and, in this manner; received local way to deal with settle clashes (David, 2016). The local alliance embraced the Protocol Encompassing Mechanism for Conflict Prevention, Management, Resolution, Peacekeeping and Security in 1999 (Ekiyor, 2017). The Protocol on Non-animosity was embraced to deliver dangers identified with the interstate clash and approached ECOWAS individuals to cease from debilitating to utilize the power and abstain from overlooking threats against each other. The Protocol on Mutual Assistance on Defense was clear about the aggregate reaction of all individuals on security issues, as it noticed that dangers to one member influenced security in the whole locale. These conventions were likewise received in the quick post-autonomy period, strife and unlawful changes in government were being supported by neighboring nations.

The intercession endeavors of the ECOWAS association in clashes within the area is in this manner upheld by the Mechanism and Protocol on Good Governance in accordance with arrangements on peace, security, the advancement of human rights and the insurance of nationals set up in the systems of the UN, the AU and the New Partnership for Africa's Development. ECOWAS perceives the centrality of teaming up with the AU and UN in fortifying peace and security in the entire region and in interceding in struggle circumstances. This joint effort is viewed as basic by ECOWAS pioneers and leaders and is commenced on lawful and moral commitments. As far as lawful commitments, it perceives the part of the UN in keeping up peace and security. It is one of eight authoritatively perceived local organisations in Africa and it teams up with the UN and AU in accordance with Chapter VIII of the UN Charter. The systems that guide ECOWAS's mediations in clashes and its commitments in post-struggle remaking which reflects enter standards in the Constitutive Act of the AU and the UN Charter and their rules on peace and security.

The ethical commitments are driven by the obligation to secure (R2P - Responsibility to Protect), especially in acknowledgement of the repercussions of contention inside, viciousness and misuse executed against civilians and the inclination for interior clashes to rise above national limits. Besides, on 31 October 2010, without precedent for around 10 years and after a few delays, Ivorians finally went to the polls to vote. The

elections were seen by delegates from the AU and ECOWAS notwithstanding others from universal associations and the European Union (EU). The Independent Electoral Commission (IEC), On 4 November 2010, reported that Gbagbo had gotten 38.04% of the votes, against 32.07% for Ouattara and 25.24% for Henri Konan Bédié (HRW, 2011). This required a run-off by the initial two hopefuls, in accordance with sacred arrangements.

As per Afolabi (2012), the board and its intercession endeavors were eclipsed in a path by the 'varying interests and wanted political results of the individuals in accordance with their different advantages, the presence of an association with President Gbagbo, ideological introduction and the impact of France, Côte d'Ivoire's previous frontier ace. In the wake of debilitating all political and serene endeavours to determine the emergency, French and UN powers helped the FN, which had promised dependability to Ouattara and was renamed the Republican Forces. A few exercises can be drawn from the mediation by the AU and ECOWAS in the Ivorian strife. The position taken by a few pioneers of the AU and ECOWAS to advance down and hand over power following the production of the aftereffects of the run-off decisions 2010 exhibited that African pioneers would now be able to reprimand the undemocratic inclinations of their associates, particularly when these companions lose elections and choose to hold tight to control. It was a positive message that the Democracy and Good Governance Protocol received by ECOWAS was by and large effectively connected in Côte d'Ivoire.

Findings and Discussion: Just like in 2002, after the attempted coup, there was a quick response from regional actors. The argument is that the interventions mechanisms adopted did not demonstrate a satisfactory leadership in ECOWAS and the AU collaborative efforts in mediating peace and peace-building in the conflicting states, with the diplomatic engagements with the parties on the conflict. However, this mechanism did not create the right measures to ensure that actions made amid transactions and negotiations were completely authorized or actualized. Despite the fact that few ECOWAS pioneers had demanded that military move was to be made on the off chance that strategy flopped, however at last there were divisions among the leaders, they were not joined to the extent that this position becomes worried because of some close to home interests. Gbagbo had demanded amid the contention that the difficulties experienced by Côte d'Ivoire were caused by 'settler powers' endeavouring to destabilize the nation. This view resounded with his supporters, especially the Young Patriots, who related to his approaches and convictions, regularly bolstered his activities, and had done assaults against French business interests. This view additionally charmed Mbeki to Gbagbo and he selected rather for an arranged arrangement between the warring groups. Moreover, there was an inclination among ECOWAS leaders that Mbeki was pushing for an arranged arrangement between President Gbagbo and Alassane Ouattara as opposed to embracing the position held by a few ECOWAS leaders that Gbagbo must surrender control. Indeed, even strategic endeavours were not extremely fruitful. Mbeki and Odinga, Peace envoys did not prevail with regards to convincing Gbagbo to surrender control as the brutality held on. This along these lines demonstrates the shortcomings in recognizing the correct people to lead strategic commitment by the association. The mediations by ECOWAS and the AU additionally featured divisions in approach positions at both local and mainland levels. Such divisions additionally helped Gbagbo in buying additional time and holding tight to control for longer, consequently delaying the viciousness and the monstrosities conferred. At the territorial level, Nigeria, Burkina Faso, Senegal and Sierra Leone were supportive of firm activities for driving Gbagbo to leave control and, if every strategic exertion flopped, likewise military activity. Others including Guinea, Liberia and to a specific degree Ghana, Togo and Benin did not take clear positions on the issue. The disappointment of the AU and ECOWAS to enough determination the emergency implied that obligation was given over to the UN and France. Without sufficiently tending to the subject of citizenship, it turned out to be progressively troublesome for recognizable proof procedures to be dealt with, which was the principle reason the elections were put off something like six times.

5. Conclusion and Recommendations

Conclusively, it was discussed in this paper that the conflict which engulfed Côte d'Ivoire in 2002 apparently divided the country for eight years. Due to violence and divisions in the country the major economic gains that had been made since independence were reversed, and the regional stability was threatened by political uncertainties. While Côte d'Ivoire's economy blossomed after independence, acknowledgements in part to readily available labour from nationals who had migrated from neighbouring countries in West Africa, signs

of political tensions became apparent in the 1990s and culminated with a coup d'état in 1999, a disputed election in 2000 and an attempted coup in 2002.

It was also argued that the lack of action by the Council in certain conflicts emanates from the lack of particular economic, political or strategic interests of members of the Council with countries in conflict or their pre-occupation with other crises. The genocide in Rwanda, for example, and the withdrawal of the United Nations Assistance Mission in Rwanda (UNAMIR) was cited as a good example, which demonstrates the relationship between nations and members of the Security Council and the aspirations of the latter in intervening in certain conflicts over others. This paper has argued that the ECOWAS adoption of the Mechanism and the Protocol on Democracy and Good Governance, implied that its individuals were aware of what should be better arranged to address difficulties identified with peace and security in the sub-area. It likewise showed that ECOWAS individuals trusted that peace and security were important for a majority rule government system to flourish. The instrument on Peace Mediation and the Collaborative exertion of ECOWAS and AU embraced for the making of an early-cautioning framework, the Council of the Wise and unique go-between to pre-empt watersheds, that was set up to react suitably in nations influenced by strife and conflicts was an appreciated improvement.

It was viewed as the most comprehensive structure for tending to threats to peace and security in the district, as it underpins endeavours to pre-emptively address potential clash circumstances before they raise and gives ECOWAS obligation to add to post-struggle improvement and reproduction. At long last, the position taken by the pioneers of the AU and ECOWAS to venture down and hand over power following the production of the aftereffects of the run-off races 2010 showed that African pioneers would now be able to revile the undemocratic propensities of their grandees, particularly when they lose elections and choose to hold tight to control. It was also a positive message that the Democracy and Good Governance Protocol received by ECOWAS was by and large effectively connected in Côte d'Ivoire. In 2002, after the endeavoured upset, there was a brisk reaction from territorial actors. It was characterized that 'Contention win when there is the nonappearance of peace, since it is a staid deviation and contention resulted between at least two individuals that regularly prompt viciousness'. The struggle is viewed as dangers to peace and security.

Recommendations

Reject Unconstitutional Changes of Government: In the first phase of the civil war, the conflict and peace intervention strategy of ECOWAS and the AU is commendable. The matter of the fact that several leading African states including Nigeria and Ghana denounced the coup attempt against Gbagbo. It demonstrated that leaders of these African States adhered to key principles backed by protocols which rejected unconstitutional changes of government. This perhaps set a precedent as similar coups in Togo, Mali and Guinea Bissau were denounced by ECOWAS and the AU, with ECOWAS in particular imposing sanctions on these countries and suspending their membership.

Peace Negotiation: Peace Talks should be encouraged at all times and a call to roundtable discussion should be carried out or emphasis that can be credited with addressing the key issues at the centre of the conflict.

Implement Peace Agreements: As a matter of fact ECOWAS confronted many challenges and was unable to fully warrant the implementation of peace agreements. It has successfully averted a full escalation of the conflict on several occasions and made progress in the implementation of certain sensitive aspects of the peace agreements.

Legalize intervention in conflict zones: ECOWAS and the AU successfully resolve conflicts through the legalization of the various protocols, even in the case of Côte d'Ivoire. Under the supervision of ECOWAS and the AU, different parties to the conflict in Côte d'Ivoire signed several peace agreements but most of the agreements could not be implemented as there were no enforcement mechanisms to make the belligerents respect the provisions.

Timely Interventions: The organisations of ECOWAS and the AU leaders played their role in consultations with Gbagbo and the president-elect, Alassane Ouattara to prevent an outright civil war which would have

had ethnic connotations. The AU's position in resolving the conflict was closely aligned with that of ECOWAS and the UN, particularly in their public endorsement of Ouattara as president in the aftermath of the run-off and amid the violence that engulfed the country after the 2010 polls.

Reject the Use of Force: Uganda and South Africa were vocal about its rejection of the use of force, is one of the leading nations involved in the mediation efforts, maintained that the option of creating a power-sharing government should be pursued. In the face of Gbagbo's regional and global isolation, the divergent views of individual members of ECOWAS and the AU member states showed that he had support on the continent, which was one of the factors that enabled him to hang on to power for a long time.

Common positions: In applying the different mechanisms in place to prevent, manage and resolve conflict, members of both ECOWAS and the AU need to ensure that they take common positions in relation to leaders who cling to power through unconstitutional means. This study further concludes with a series of recommendations for the Southern Africa peace-building procedure, aimed at supporting and informing the advancement of South Africa's civilian capacity mechanisms. The key recommendations as lessons for the Southern Africa organisation and South Africa are outlined as below: It is recommended that a wider discussions should be held among policymakers on the roles and functions of South Africa's new development agency, the South African Development Partnership Agency (SADPA); It recommends that South Africa's engagements should be preceded by the development of a longer-term strategy, which should take into consideration current debates and discussions around civilian capacities in mediating peace internationally.

South Africa should use its expertise and experience to complement and enhance the various engagements of multilateral institutions to promote safety and stability. The government, particularly in its diplomatic relations, defence, trade and coordination of actors and institutions – should further refine the country's comprehensive approach to post-conflict peacebuilding and reconstruction.The value of this recommendation is in what it can add to existing knowledge on the impact of civilian capacities in conflict resolution and prevention in South Africa (drawing on the background of the xenophobic attack on fellow but foreign Africans in the Republic), and around the world. Its purpose is to add to the development of SADPA and support South Africa to improve its civilian capacity mechanisms in conflict prevention, peace-building, peace-making and sustain socio-economic development, and peaceful coexistence among people, because South is Africa's window to the world in terms of foreign direct investment.

References

Adebajo, A. (2011). UN Peacekeeping in Africa: From the Suez Crisis to the Sudan Conflicts (Boulder, CO: Lynne Rienner, 2011).

Afolabi, B. T. (2012). ECOWAS and Conflict Mediation in West Africa', in U. Engel (ed.), New Mediation Practices in African Conflicts (Leipzig: Leipziger Universitätsverlag GmbH, 2012), 169–93.

African Union. (2002). Protocol relating to the establishment of the Peace and Security Council of the African Union. Addis Ababa, African Union.

Ajulu, R. (2004). African Security: Can Regional Organisations Play a Role? in S. Field (ed.), Peace in Africa: Towards a Collaborative Security Regime (Johannesburg: Institute for Global Dialogue, 2004).

Besada, H., Goetz, A. & Werner, K. (2010). African Solutions to African Problems and Shared R2P', in H. Besada (ed.), Crafting an African Security Architecture: Addressing Regional Peace and Conflict in the 21st Century (Surrey: Ashgate 2010), 1–14.

Curtis, D. (2012). The International Peacebuilding Paradox: Power sharing and Post-Conflict Governance in Burundi", *African Affairs*, 112, 72-91.

David, K. (2016). The Complexities of Democracy building in the Conflict-Affected States: The Role of ECOWAS and The African Union in Côte D'ivoire.

Dey, I. (2005). Qualitative data analysis. London: Rout ledge, Taylor and Francis Group.

Dorrie, P. (2016). The wars are ravaging Africa in 2016. The National Interest. The Buzz. www.nationalinterest.org

Economic Community of West African States (ECOWAS). (2008). The ECOWAS Conflict Prevention Framework, Regulation MSC/REG.1/01/08, 16 January 2008,

<http://www.lawschool.cornell.edu/womenandjustice/upload/ECOWAS-Conflict- Prevention-Framework.pdf>, accessed 4 November 2017

Ekiyor, T. (2017). ECOWAS Conflict Prevention Framework (ECPF): a new approach to an old challenge', West Africa Civil Society Institute Op-Ed, 1 June 2008, <http:// responsibilitytoprotect.org/ECOWAS%20ECPF%20Ekiyor.pdf>, accessed 25 October, 2017.

Foltz, W. J. (1991). The Organisation of African Unity and the Resolution of Africa's Conflicts', in F. M. Deng and I. W. Zartman (eds), Conflict Resolution in Africa (Washington, DC: The Brookings Institute, 1991).

Gomes, S. (2008). The Peace-making Role of the OAU and AU: A Comparative Analysis', in J. Akokpari, A. Ndinga Muvumba and T. Murithi (eds), The African Union and its Institutions (Auckland Park: Fanele, 2008).

Human Rights Watch (HRW). (2011). They Killed Them Like It Was Nothing: the need for justice for Côte d'Ivoire's post-election crimes', 6 October 2011, <https://www.hrw.org/ report/2011/10/05/they-killed-them-it-was

Isenhart, M. W. & Spangle, M. (2000). Collaborative Approaches to Resolving Conflict, Thousand Oaks, CA: *Sage Publication*, 2000, 242.

Khadiagala, G. (2012). The Role of the African Union, New Partnership for Africa's Development, and African Development Bank in Post-Conflict Reconstruction and Peacebuilding', in D. Curtis and G. A. Dzinesa (eds), Peacebuilding, Power and Politics in Africa (Athens, OH: Ohio University Press, 2012).

Kibasomba, R. (2002). Conflict Prevention and Resolution". Paper presented at the Ten Year Presidential Review Conference, 12- 13 November. (Available at: http://www.thepresidency.gov.za/docs/pcsa/irps/kibasomba.pdf.

Klingebiel, S. (2005). 'Africa's new peace and security architecture: converging the roles of external actors and African interests', African Security Review, 14/2 (2005), 35–44.

Kode D. (2016). The Complexities of Democracy building in the Conflict-Affected States: The Role of Ecowas and The African Union in Côte D'ivoire.

Mays, T. M. (2002). Africa's First Peacekeeping Operation: The OAU in Chad 1981–1982 (West Port: Praeger, 2002).

Mogalakwe, M. (2006). Research Report. The Use of Documentary Research Methods in Social Research. *African Sociological Review*, 10(1), 221-230.

Mwanasali, M. (2008). From Non-interference to Non-indifference: The Emerging Doctrine of Conflict Prevention in Africa', in J. Akokpari, A. Ndinga-Muvumba and R. Murithi (eds), The African Union and its Institutions (Auckland Park: Fanele, 2008).

Peter D. (2016). The wars are ravaging Africa in 2016. The National Interest. The Buzz. www.nationalinterest.org

Shillinger, K. (2009). Africa's Peacemaker: Lessons from South African Conflict Mediation, SAIIA.

Swart, G. & Solomon, H. (2004). Conflict in the DRC: A Critical Reflection of the Lusaka Ceasefire Agreement. SAIIA Report, 40.

World Bank. (2016). Data for Zimbabwe, Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Congo, Dem. Rep. The World Bank. Available at (http://data.worldbank.org/?locations=ZW-AO-BW-LS-MW-MU-MZ-NA-SC-ZA-SZ-TZ-ZMCD). Accessed 17 August, 2016.

Yound, C. (1991). Self-determination, Territorial Integrity and the African State', in F. M. Deng and I. W. Zartman (eds), Conflict Resolution in Africa (Washington, DC: The Brookings Institute, 1991).

Zartman, W. (2005). Cowardly Lions: Missed Opportunities to Prevent Deadly Conflict and State Collapse (Boulder, CO: Lynne Rienner, 2005).

Zounmenou, D. D. & Loua, R. S. (2018). Confronting Complex Political Crises in West Africa: An Analysis of ECOWAS Responses to Niger and Côte d'Ivoire', Institute for Security Studies Paper no. 230, December 2011, <https://www.issafrica.org/uploads/Paper230.pdf>, accessed 4 March 2018.