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Editorial

Journal of Econmics 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 conceptualisation of economics and behavioral devlopments but comprise interdisciplinary and multi-facet approaches to economics and behavioral theories and practices as well as general transformations in the fileds. 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, Nigeria and Zimbabwe. The effect of sample size on the efficiency of count data models, analysis of crime data, customer service expectations, effectiveness of monetary policy, effectiveness of the expanded public works program, significance of mining infrastructural development, brand consciousness of consumers, dynamics of foreign direct investment, liquidity management practices, affective commitment of human resource management practitioners, quality of life among rural populace, framework for advancement of women working, savings mobilization and financial development, threshold cointegration & nonlinear causality test between inflation rate & repo rate, evaluating entrepreneurial features, supply chain strategies, role of e-banking on the switching behaviour, macroeconomic policy frameworks adopted by the BRICS countries, current Zimbabwean liquidity crisis, asymmetric information and volatility of stock returns and learning orientation & the performance of small and medium enterprises 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

The Effect of Sample Size on the Efficiency of Count Data Models: Application to Marriage Data

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Abstract: Sample size requirements are common in many multivariate analysis techniques as one of the measures taken to ensure the robustness of such techniques, such requirements have not been of interest in the area of count data models. As such, this study investigated the effect of sample size on the efficiency of six commonly used count data models namely: Poisson regression model (PRM), Negative binomial regression model (NBRM), Zero-inflated Poisson (ZIP), Zero-inflated negative binomial (ZINB), Poisson Hurdle model (PHM) and Negative binomial hurdle model (NBHM). The data used in this study were sourced from Data First and were collected by Statistics South Africa through the Marriage and Divorce database. PRM, NBRM, ZIP, ZINB, PHM and NBHM were applied to ten randomly selected samples ranging from 4392 to 43916 and differing by 10% in size. The six models were compared using the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Vuong's test for over-dispersion, McFadden RSQ, Mean Square Error (MSE) and Mean Absolute Deviation (MAD).The results revealed that generally, the Negative Binomial-based models outperformed Poisson-based models. However, the results did not reveal the effect of sample size variations on the efficiency of the models since there was no consistency in the change in AIC, BIC, Vuong's test for over-dispersion, McFadden RSQ, MSE and MAD as the sample size increased.

Keywords: *Poisson regression, Negative binomial regression, Zero-inflated Poisson, Zero-inflated negative binomial, Poisson Hurdle and Negative binomial hurdle*

1. Introduction

Count data is defined by Hilbe (2014)as observations that only take non-negative integers theoretically ranging from zero to the maximum value of the variable being modelled. Poisson regression model (PRM) is used as the basis for modelling count responses under the assumption that the conditional mean of the outcome variable is equal to the conditional variance (equi-dispersion) (Vach, 2012). However, as much as this is a naturally occurring basic property of the Poisson distribution, it is not always true in real life datasets and count response data may exhibit under-/over-dispersion (SAS-Institute, 2012; Tang et al., 2012; Vach, 2012).These authors cautioned that violation of the equi-dispersion assumption results in inefficient, potentially biased parameter estimates and small standard errors of the PRM. As such, SAS-Institute (2012) recommends the negative binomial regression model (NBRM) as an extension of PRM in situations where the variance is significantly bigger than the conditional mean (over-dispersion).

A limitation of both the PRM and NBRM occurs when there are too many zeroes (excess-/ extra-zeroes) in the count outcome variable. This may be due to either non-response (structural or unobserved zeros) or many respondents having a count of zero for the outcome variable being measured (observed zeros) (Little, 2013; Wang, Xie, Fisher & Press, 2011). Excess-zeroes in the count outcome variable may distort the expectation and variance values of some covariates when PRM and/or NBRM are used for modelling such count data (Little, 2013). As such, the zero-inflated Poisson (ZIP) model was designed to model count response data with excess zeros when the assumption of equi-dispersion holds (SAS-Institute, 2012). On other hand, zero-inflated negative binomial (ZINB) was formed to model over-dispersed count response data with excess zeros (SAS-Institute, 2012). Other challenges that may arise in count response modelling are under-dispersion and zero-deflation but they seldom occur in practice (Morel & Neerchal, 2012; Ozmen & Famoye, 2007). Despite their seldom occurrence in practice, under-dispersion and zero-deflation have led to the birth of hurdle models namely: the Poisson Hurdle model (PHM) and Negative Binomial Hurdle model (NBHM) which are described in detail by Rose, Martin, Wannemuehler & Plikaytis (2006).The models considered in this study based on their popularity are: PRM, NBRM, ZIP, ZINB, PHM and NBHM.

2. Literature Review

Literature shows that several studies compared numerous count data models using different datasets. There is evidence that count data models are evolutional in that previous research worked towards developing models that can remedy the shortcomings of the existing ones. However, there is no count data model that has been found to be generally ideal. Several authors including Ver Hoef and Boveng (2007) and Rose et al. (2006) caution that the choice of the model is dependent on the theoretical and/or scientific knowledge of the data being modelled. Most authors such as Burger, Van Oort and Linders (2009), Famoye and Singh (2006), Mei-Chen, Pavlicova and Nunes (2011), Rose et al. (2006) and, Yip and Yau (2005) compared PRM, NBRM, ZIP, ZINB, PHM and NBHM to other count data models including the quasi-Poisson regression model (QPRM), zero-inflated generalized Poisson (ZIGP) and zero inflated double- Poisson (ZIDP). It is therefore evident that PRM, NBRM, ZIP, ZINB, PHM and NBRM are the most commonly used count data models in literature hence the scope of this study is limited to these six models. The most common criteria for comparing count data models in literature are AIC, Vuong test, goodness of fit tests and generalised Pearson's Chi-square (Burger et al., 2009; Ver Hoef & Boveng 2007; Mei-Chen et al., 2011; Rose et al., 2006; Yip & Yau, 2005). These criteria are adopted in the current study and are discussed in detail in the methodology section. The current study acknowledges that the efficiency of count data models is mainly affected by poor data quality (excess zeroes) and violations of distributional assumptions (under-/ over-dispersion for instance) hence effort should be made to improve on data quality rather than just re-parameterisation of count data models.

Despite the common practice of sample size considerations in multivariate analysis, many previous studies around the application of count data models have not focused on sample size considerations. More specifically, literature shows that most studies have only compared various count data models under one sample size (Fuzi, Jemain & Ismail, 2016; Ver Hoef & Boveng, 2007; Mei-Chen et al., 2011; Park, Lord & Hart, 2010; Rose et al., 2006). As such, this study largely seeks to understand whether or not sample size variations can improve the efficiency of count data models relative to under/ over-dispersion and excess zeroes without further iterative re-parameterisation of the known models with the intent to bridge a gap in literature around the application of count data models. Another motivation for conducting this study is that marriage and divorces datasets usually have both metric and categorical variables but previous studies did not apply count data models to such data despite their ability to model both metric and categorical variables. As such, this study contributes a new idea to the research around marriage and divorces by applying count data models to such data. In essence, the study compares the efficiency of the most commonly used count data models under different sample sizes.

3. Methodology

Description of data: The data used in this study were sourced from Data First, available at https://www.datafirst.uct.ac.za. The proposed datasets are for the periods of 2010 (N=22936) and 2011 (N=20980). These data sets are used because they are readily available and also share the methodology of collection as opposed to other datasets collected prior to 2010. The data were collected by Statistics South Africa (StasSA) using a standard structured form (Divorce Form 07-04) prepared by StatsSA in collaboration with the Department of Justice. The categorical variables used in this study are: Male Race, Female Race, Male Occupation, Female Occupation, Male Status (Marital status of husband), Female Status (Marital status of wife), Male No Times Married, Female No Times Married, Solemnisation, and Marriage Type. The continuous variables are Male Age, Female Age, No of Children and Duration of Marriage (dependent variable). The choice of these variables is embedded on literature which has identified these selected socio-demographic variables of the couples as significant predictors of marriage life (Cox & Demmitt, 2013; Holman, 2006; Reis & Sprecher, 2009).

It is worth noting that the main focus of this paper is on the application of models and not on the prediction of the Duration of Marriage. Data are analysed using the Statistical Analysis Software (SAS®) version 9.3, registered to the SAS Institute Inc. Cary, NC, USA. The datasets for 2010 and 2011 were merged using the MERGE statement of SAS® as recommended by Tilanus (2008) to form a total of N=43916. Since the interest of the current study is to explore the performance of count data models under different sample sizes, the merged dataset for 2010 and 2011 (N=43916) were further divided into ten random samples in multiples of

10% until 100% (N). The random sampling was performed using the SQL procedure of SAS® as recommended by Matignon (2007). There is no specific theoretical reason for choosing these sample sizes (at 10% increments) but the general intention is to simulate scenarios in which count data models are applied to different sample sizes. The samples are randomly selected from the merged dataset with the intention of preserving the distributional characteristics of the merged data (mean and variance, See Table 1). By keeping the means and variances similar across the samples, one may ensure that the severity of under-/ over-dispersion does not differ much across the samples hence the effect of sample size on the proposed models can be assessed more accurately. The general intent here is to minimise the hallo effects and ensure that the aspect that significantly differentiate between the samples is sample size, which is the main interest of this study. An advantage for drawing samples from a real life dataset is that the samples depict the real life scenarios better than the completely simulated datasets.

Generalised Linear Models (GLMs): Zeileis, Kleiber and Jackman (2008) emphasise that all count data models belong to the Generalised Linear Models (GLM) family. The authors also explained that all GLMs use the same log-linear mean function which is defined in (1) but make different assumptions about the remaining likelihood. The general GLM is defined by:

$$\log \mu = x^T \beta, \tag{1}$$

where μ, x^T and β denote the mean, the transpose of a vector of regressors and the parameter vector respectively. For all count data models under study, the ML algorithm is used in maximising the $\mathcal{L}$ function to enable the estimation of parameter estimates. This ML algorithmic known as the Newton Raphson (SAS Institute, 2010). The algorithm updates the parameter vector $\boldsymbol{\beta_r}$at each iteration with (2):

$$\boldsymbol{\beta_{r+1}} = \boldsymbol{\beta_r} - \boldsymbol{H^{-1}s}, \tag{2}$$

where $\boldsymbol{s}$ is the gradient or score matrix generated from the first derivative of $\mathcal{L}$ and $\boldsymbol{H}$is the Hessian Matrix generated from the second derivative of $\mathcal{L}$ at the current value of the parameter. More specifically, $\boldsymbol{s}$and $\boldsymbol{H}$are computed using (3) and (4) respectively:

$$\boldsymbol{s} = [s_j] = \left[\frac{\partial \mathcal{L}}{\partial \beta_j}\right] = 0 \tag{3}$$

$$\boldsymbol{H} = [h_{ij}] = \left[\frac{\partial^2 \mathcal{L}}{\partial \beta_i \partial \beta_j}\right] = 0 \tag{4}$$

Poison and negative binomial models: For PRM, the current study adopts the methods explained by Karlaftis, Mannering and Washington (2010) unless otherwise specified. The probability of the count outcome variable$\boldsymbol{y_i}$ is given by (5):

$$P(y_i|x_i) = \frac{e^{(-\lambda_i)}\lambda_i^{y_i}}{y_i!}, \tag{5}$$

where x_i denote the i^{th} set of predictors per couple. The parameter λ_i is defined by the expected value of y_i.The parameters for PRM are estimated by maximising the Poisson log- likelihood ($\mathcal{L}$) function expressed in (6) (Hilbe, 2014):

$$\mathcal{L}(\beta: y_i) = \sum_{i=1}^{n} \left\{ y_i \ln(x_i'\beta) - e^{(x_i'\beta)} - \ln y_i \right\} \tag{6}$$

NBRM is designed to be used when there is significant over-dispersion in the data and accounts for over-dispersion by including an extra parameter in the PRM model (the dispersion parameter). The general probability function for NBRM is defined by (7) and is adopted from Whitehead, Haab and Huang (2012) as:

$$P(y_i|x_i) = \frac{\Gamma\left(y_i+\alpha^{-1}\mu_i^{2-p_i}\right)\alpha^{y_i}\mu_i^{(p_i y_i-2y_i)}\left(1+\alpha\mu_i^{p_i-1}\right)^{-\left(y_i+\alpha^{-1}\mu_i^{2-p_i}\right)}}{\Gamma(y_i+1)\Gamma\left(\alpha^{-1}\mu_i^{2-p_i}\right)}, \quad (7)$$

where Γ is the Gamma function,

$$\mu_i = E(y_i|\boldsymbol{\beta}), \quad (8)$$

which follows a binomial probability distribution, p_i and α are additional parameters that allow for flexibility in over-dispersion. The parameter estimates for NBRM are obtained by maximising the $\mathcal{L}$ function in (9) (adopted from (Hilbe, 2014) :

$$\mathcal{L}(\mu; y, \alpha) = \sum_{i=1}^{1} y_i \ln\left(\frac{\alpha\mu_i}{1+\alpha\mu_i}\right) - \frac{1}{\alpha}\ln(1+\alpha\mu_i) + \ln\Gamma\left(y_i+\frac{1}{\alpha}\right) - \ln\Gamma(y_i+1) - \ln\Gamma\left(\frac{1}{\alpha}\right). \quad (9)$$

Zero inflated models: ZIP is a special form of PRM which is used when the equi-dispersion assumption holds but the count outcome variable exhibits zero-inflation. The equations discussed in this section are adopted from the SAS Institute (2010) unless otherwise specified. The probability density function of $y$for ZIP is given by (10):

$$f(y) = \begin{cases} \omega + (1-\omega)e^{-\lambda}, for\ y = 0 \\ (1-\omega)\frac{\lambda^y e^{-\lambda}}{y!}, for\ y = 1,2,3\ \ldots' \end{cases} \quad (10)$$

where ω denotes the zero-inflation probability and λ is the Poisson mean parameter. The parameter estimates for ZIP are obtained by maximising the $\mathcal{L}$ function in (11) using the ML algorithm.

$$\mathcal{L} = \begin{cases} w_i \log\left[\omega_i + (1-\omega_i)e^{-\lambda}\right], for\ y_i = 0 \\ w_i \log[(1-\omega_i) + y_i \log(\lambda_i) - \lambda_i - \log(y_i!)], for\ y_i > 0 \end{cases}' \quad (11)$$

where w_i denotes the weight of the observation.

The probability density functions of $y$underZINB are given by (12):

$$f(y) = \begin{cases} \omega + (1-\omega)(1+k\lambda), for\ y = 0 \\ (1-\omega)\frac{\Gamma(y+1/k)}{\Gamma(y+1)\Gamma(1/k)}\frac{(k\mu)^y}{(1+k\lambda)^{y+1/k}},\ for\ y = 1,2,3\ \ldots' \end{cases} \quad (12)$$

where k is the negative binomial dispersion parameter and ω denotes the zero-inflation probability. Parameter estimates for ZINB are obtained by maximising the $\mathcal{L}$ function in (13) which is defined by:

$$\mathcal{L} = \begin{cases} \log\left[\omega_i + (1-\omega_i)\left(1+\lambda\frac{k}{\omega_i}\right)\right], for y_i = 0 \\ \log(1-\omega_i) + y_i \log\left(\frac{k\lambda}{\omega_i}\right) \\ -\left(y_i+\frac{\omega_i}{k}\right)\log\left(1+\frac{k\lambda}{\omega_i}\right) \\ +\log\left(\frac{\Gamma\left(y_i+\frac{\omega_i}{k}\right)}{\Gamma(y_i+1)\Gamma\left(\frac{\omega_i}{k}\right)}\right), for y_i > 0 \end{cases}. \quad (13)$$

SAS Institute (2010) elaborate that there are two link functions and linear predictors associated with zero-inflated distributions of which one is for the zero inflation probability (ω) and another is for the mean parameter (λ).

Hurdle models: Hurdle models are designed to address both under/ over-dispersion. In order to obtain the zero-truncated forms of the probability density functions (PDF's), this study adopts the methods explained by Stroup (2012). The general form of the zero-truncated Poisson PDF corresponding to PHM is given by (14):

$$P(Y) = \frac{e^{(-\lambda_i)}\lambda_i^y}{y_i!(1-e^{-\lambda_i})}. \quad (14)$$

The parameter estimates for PHM are obtained by maximising the $\mathcal{L}$ function in (15) using the ML algorithm.

$$\mathcal{L} = \begin{cases} \log p_i & for\ y=0 \\ \log(1-p_i) y \log \lambda_i - \lambda_i - \log(y!) - \log\left[1-e^{-\lambda_i}\right] & for\ y = 1,2,\ldots \end{cases} \quad (15)$$

The PDF for the zero-truncated negative binomial model corresponding to NBHM is defined by (16):

$$P(Y) = \frac{\binom{y+\left(\frac{1}{\alpha}\right)-1}{y}\left(\frac{\lambda_i}{1+\alpha\lambda_i}\right)^y\left(\frac{1}{1+\alpha\lambda_i}\right)^{1/\alpha}}{1-\left(\frac{1}{1+\alpha\lambda_i}\right)^{1/\alpha}}. \quad (16)$$

In order to obtain the parameter estimates, the $\mathcal{L}$ function of NBHM in (17) is maximised using the ML algorithm.

$$\mathcal{L} = \begin{cases} \log \mathrm{p_i} & \text{for y=0} \\ \log(1-p_i) + y\log\frac{\alpha\lambda_i}{1+\alpha\lambda_i} - \frac{1}{\alpha}\log(1+\alpha\lambda_i) + \log\left\{\binom{y+\left(\frac{1}{\alpha}\right)-1}{y}\right\} & for\ y = 1,2,\ldots \end{cases} \quad (17)$$

Model Comparison Criteria: The comparison of the six proposed count data models considered in this study was done at two phases namely: the within-sample comparison and the between-sample comparison stage. The within-sample comparison phase entails comparing the proposed models within a specific sample size and selecting the most efficient model based on the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), both recommended by Hilbe (2014). The Vuong's test for over-dispersion (Rose et al., 2006; Little, 2013) and the McFadden's RSQ (Karlaftis et al., 2010) are also used as other criteria to avoid biasness. The model that minimises the values of AIC and BIC but maximises the McFadden's RSQ is preferred (Hilbe, 2014; Karlaftis et al., 2010). The Vuong's test and LRT generally test the hypothesis that the dispersion parameter is zero. The values of the Vuong statistic less than -1.96 favours the null model while values greater than 1.96 favours the proposed alternative (Alt) model whereas the $|V| < 1.96$ yields inconclusive results (Peng, Shi, Nagaraja & Xiang, 2014).

The six models that were selected from each sample were then compared to each other in the between-sample comparison phase with the aim of selecting the most effective model from the proposed six. The McFadden'sRSQ (Karlaftis et al., 2010), the mean absolute deviation (MAD) suggested by Bajpai (2009) and the mean squared error (MSE) adopted from Park et al. (2010). The model which maximises the McFadden's RSQ is preferred (Karlaftis et al., 2010) whereas the model which minimises the MAD and MSE is preferred (Bajpai, 2009 & Park et al., 2010). The equations of model comparison criteria used in both the within- and between-sample comparisons are given in Appendix 1. Following the selection of the most effective model is the test for overall significance of the model using the likelihood ratio chi-square test (Berk & Carey, 2009) and the significance of each parameter estimate in the selected model using the Wald's test (Cameron & Trivedi, 2013).

4. Data Analysis and Results

Dispersion and zero-inflation: Since the under-/ over-dispersion and excess zeros are of interest when using count data models, this study analysed the percentage of zeros and the measures of dispersion (mean and variance) as presented in Table 1.

Table 1: Sample sizes, percentage of zeros and dispersion of Duration of Marriage

Sample	N	Mean	Variance	% 0's
10%	4392	11.09	74.523	4.94
20%	8783	11.164	74.89	4.94
30%	13175	11.139	74.541	4.93
40%	17566	11.135	74.781	5.04
50%	21958	11.108	74.422	5.16
60%	25107	11.612	71.421	5.17
70%	29311	11.604	71.367	5.09
80%	33478	11.592	71.339	5.09
90%	37667	11.591	71.228	5.14
100%	41881	11.589	71.153	5.08

Table 1 shows that the mean and variance of Duration of Marriage are approximately equal across all samples. The variance is about seven times more than the mean implying that the dependent variable (Duration of Marriage) may be over-dispersed. The study therefore implemented Vuong's test for over-dispersion in order to confirm whether significant over-dispersion exists in the data or not (See Table 2). The percentage of zeroes in each sample is approximately five implying that the Duration of Marriage is not zero-inflated for all sample sizes. The results in Table 1 suggest that NBRM which is theoretically designed to analyse over-dispersed data that are not zero-inflated (SAS-Institute, 2012) is appropriate for the data sets under study. However, for experimental purposes, this study fitted all the six proposed models, compared them and selects the most effective model under different sample sizes.

Within-sample comparison phase: Table 2 shows that at Stage 1, PRM is compared to ZIP and it is evident that all criteria are in favour of ZIP except for the 50% sample size where McFadden's RSQ favoured PRM. Generally, Stage 1 favoured ZIP over PRM. The Vuong's test favours ZIP over PRM indicating the need to model zero-inflation in the data under the assumption of equi-dispersion. Based on the collective results in Stage 1, PRM is eliminated from the comparison and ZIP is compared to NBRM at Stage 2. Highlighted in Stage 2 is that ZIP has a bigger McFadden's RSQ but the majority of criteria are in favour of NBRM. The dispersion parameter (alpha) was significantly greater than zero confirming that the data are over-dispersed (Liu and Cela, 2008). Since NBRM was found to be more appropriate for modelling the Duration of Marriage at Stage 2, this model was compared to ZINB in Stage 3 which is proved to be by all selection criteria. As such, ZINB is compared to PHM in Stage 4 where all but one comparison statistics is favouring ZINB. Stage 5 compares ZINB to NBHM and the AIC and BIC are in favour of NBHM but ZINB slightly outperforms NBHM in terms of the variation explained in the Duration of Marriage by the predictor (Mc Fadden's RSQ). Due to its inconclusive results ($|V| < 1.96$) in comparing NBHM and other models using the Vuong's test, the results of this test were not stated in Table 2 and Table 3 but AIC, BIC and McFadden's RSQ are reported. NBHM is chosen as the best model for fitting the Duration of Marriage for the 10%, 20%, 30%, 40% and 50% sample sizes and is compared to other models in the within-sample comparison phase. The results for the 10% to the 50% sample sizes are collated into Table 1 because they lead to the same conclusion about the preferred model. Similarly, the results for sample sizes of 60% to 100% are collated into Table 2 for the same reasons.

Table 2: Within-sample comparison and selection (10% to 50% sample sizes)

STAGE	NULL	ALT	CRITERION	10% COMPARISON STATISTICS	20% COMPARISON STATISTICS	30% COMPARISON STATISTICS
1	PRM	ZIP	VUONG	V(4.766752)>1.96	V(7.408155)>1.96	V(9.3474)>1.96
			AIC	PRM(13444)>ZIP(13178)	PRM(27508)>ZIP(26825)	PRM(41193)>ZIP(39956)
			BIC	PRM(13518)>ZIP(13325)	PRM(27590)>ZIP(26990)	PRM(41280)>ZIP(40131)
			McFadden RSQ	PRM(0.70869)<ZIP(0.932)	PRM(0.70200)>ZIP(0.688)	PRM(0.701474)<ZIP(0.711)
2	ZIP	NBRM	VUONG	V(3.54722)>1.96	V(6.34488)>1.96	V(7.61848)>1.96
			AIC	ZIP(13178)>NBRM(12349)	ZIP(26825)>NBRM(25057)	ZIP(39956)>NBRM(3734)
			BIC	ZIP(13325)>NBRM (12429)	ZIP(26990)>NBRM (25146)	ZIP(40131)>NBRM (37434)

			McFadden RSQ	ZIP(0.6937)>NBRM(0.587)	ZIP(0.702)>NBRM(0.582)	ZIP((0.711)>NBRM(0.584)
			VUONG	V (114.775)>1.96	V (83.64964)>1.96	V (100.218)>1.96
3	NBRM	ZINB	AIC	NBRM(12349)>ZINB(12290)	NBRM(25057)>ZINB(24872)	NBRM(373397)>ZINB(36994)
			BIC	NBRM(12429)>ZINB(12442)	NBRM(25146)>ZINB(25044)	NBRM(25146)>ZINB(37176)
			McFadden RSQ	NBRM(0.58744) <ZINB(0.59029)	NBRM(0.58162) <ZINB(0.58514)	NBRM(0.58382) <ZINB(0.58796)
			VUONG	V(-4.39533)<-1.96	V(-7.54295)<-1.96	V(-9.194521)<-1.96
4	ZINB	PHM	AIC	ZINB(12290)<PHM(13179)	ZINB(24872)<PHM(26826)	ZINB(36994)<PHM(39954)
			BIC	ZINB(12442)<PHM(13326)	ZINB(25044)<PHM(26991)	ZINB(37176)<PHM(40129)
			McFadden RSQ	ZINB(0.59029) <PHM(0.69367)	ZINB(0.58514) <PHM(0.68773)	ZINB(0.58514) <PHM(0.688825)
			AIC	ZINB(12290)>NBHM(12288)	ZINB(24872)>NBHM(24868)	ZINB(36994)>NBHM(36990)
5	ZINB	NBHM	BIC	ZINB(12442)>NBHM(12441)	ZINB(25044)>NBHM(25039)	ZINB(37176)>NBHM(37172)
			McFadden RSQ	ZINB(0.59029)>NBHM(0.5895)	ZINB(0.58514)<NBHM(0.58426)	ZINB(0.58796)>NBHM(0.58704)

Table 2: Within-sample comparison and selection (10% to 50% sample sizes) continued

STAGE	NULL	ALT	CRITERION	40% COMPARISON STATISTICS	50% COMPARISON STATISTICS	PREFERRED MODEL
			VUONG	V(11.274)>1.96	V(13.504)>1.96	ZIP
			AIC	PRM(59710)>ZIP(57632)	PRM(83309)>ZIP(80785)	ZIP
1	PRM	ZIP	BIC	PRM(59803)>ZIP(57817)	PRM(83403)>ZIP(80974)	ZIP
			McFadden RSQ	PRM(0.67619)>ZIP(0.663)	PRM(0.639)>ZIP(0.622)	ZIP
			VUONG	V(9.374)>1.96	V(39.780)>1.96	NBRM
			AIC	ZIP(57632))>NBRM(53831)	ZIP(80785)>NBRM(67384)	NBRM
2	ZIP	NBRM	BIC	ZIP(57817)>NBRM (53931)	ZIP(80974)>NBRM (67486)	NBRM
			McFadden RSQ	ZIP(0.663)>NBRM(0.550)	ZIP(0.6219)>NBRM(0.549)	ZIP
			VUONG	V (113.220)>1.96	V (114.775)>1.96	ZINB
			AIC	NBRM(53831)>ZINB(53241)	NBRM(67384)>ZINB(67240)	ZINB
3	NBRM	ZINB	BIC	NBRM(53931)>ZINB(53433)	NBRM(67486)>ZINB(67436)	ZINB
			McFadden RSQ	NBRM(0.550) <ZINB(0.555)	NBRM(0.549) <ZINB(0.550)	ZINB
			VUONG	V(-11.210)<-1.96	V(-42.294)<-1.96	ZINB
			AIC	ZINB(53241)<PHM(57630)	ZINB(67240)<PHM(80768)	ZINB
4	ZINB	PHM	BIC	ZINB(53433)<PHM(57814)	ZINB(67436)<PHM(80956)	ZINB
			McFadden RSQ	ZINB(0.555) <PHM(0.664)	ZINB(0.550) <PHM(0.622)	PHM
			AIC	ZINB(53241)>NBHM(51492)	ZINB(67240)>NBHM(67207)	NBHM
5	ZINB	NBHM	BIC	ZINB(53433)>NBHM(51591)	ZINB(67436)>NBHM(67402)	NBHM
			McFadden RSQ	ZINB(0.555)>NBHM(0.554)	ZINB(0.550) >NBHM(0.549)	ZINB

Table 3: Within-sample comparison and selection (60% to 100% sample sizes)

STAGE	NULL	ALT	CRITERION	60% COMPARE STATISTICS	70% COMPARE STATISTICS	80% COMPARE STATISTICS
1	PRM	ZIP	VUONG	V(2.924)>1.96	V(2.958)>1.96	V(2.942)>1.96
			AIC	PRM(77709)>ZIP(77500)	PRM(91181)>ZIP(90958)	PRM(104421)>ZIP(104181)
			BIC	PRM(77805)>ZIP(77693)	PRM(91280)>ZIP(91155)	PRM(104521)>ZIP(104382)
			McFadden RSQ	PRM(0.687)>ZIP(0.686)	PRM(0.685)>ZIP(0.684)	PRM(0.684)>ZIP(0.684)
2	ZIP	NBRM	VUONG	V(4.92629)>1.96	V(4.92629)>1.96	V(6.36931)>1.96
			AIC	ZIP(77500)>NBRM(71850)	ZIP(90958)>NBRM(84248)	ZIP((104181)>NBRM(96325)
			BIC	ZIP(77693)>NBRM (71953)	ZIP(91155)>NBRM(84355)	ZIP(104382)>NBRM(96433)
			McFadden RSQ	ZIP(0.686)>NBRM(0.577)	ZIP(0.684)>NBRM(0.575)	ZIP(.68356)<NBRM(0.575)
3	NBRM	ZINB	AIC	NBRM(71850)	NBRM(84248)	NBRM(96325)
			BIC	NBRM(719536)	NBRM(84355)	NBRM(96433)
			McFadden RSQ	NBRM(0.577)	NBRM(0.575)	NBRM(0.575)
4	NBRM	PHM	VUONG	V(-4.783)<-1.96	V(-5.093)<-1.96	V(-6.201)<-1.96
			AIC	NBRM(71850)<PHM(77481)	NBRM(84248)<PHM(90938)	NBRM(96325)<PHM(104154)
			BIC	NBRM(719536)<PHM(71233)	NBRM(84355)<PHM(91135)	NBRM(96433)<PHM(104354)
			McFadden RSQ	NBRM(0.577) <PHM(0.686)	NBRM(0.575) <PHM(0.684)	NBRM(0.575) <PHM(0.684)
5	NBRM	NBHM	AIC	NBRM(71850)<NBHM(73539)	NBRM(84248)<NBHM(86277)	NBRM(96325)<NBHM(98670)
			BIC	NBRM(719536)>NBHM(73740)	NBRM(84355)<NBHM(86482)	NBRM(96433)<NBHM(98878)
			McFadden RSQ	NBRM(0.57710)<NBHM(0.58866)	NBRM(0.57518)<NBHM(0.586296)	NBRM(0.57467) <NBHM(0.586)

Table 3: Within-sample comparison and selection (60% to 100% sample sizes) Continued

STAGE	NULL	ALT	CRITERION	90% COMPARE STATISTICS	100% COMPARE STATISTICS	PREFERRED MODEL
1	PRM	ZIP	VUONG	V(3.202)>1.96	V(3.729)>1.96	ZIP
			AIC	PRM(117481)>ZIP(117200)	PRM(293962)>ZIP(292859)	ZIP
			BIC	PRM(117583)>ZIP(117403)	PRM(294072)>ZIP(293080)	ZIP
			McFadden RSQ	PRM(0.684)>ZIP(0.683)	PRM(0.289)>ZIP(0.292)	PRM
2	ZIP	NBRM	VUONG	V(6.420)>1.96	V(38.702)>1.96	NBRM
			AIC	ZIP(117403)>NBRM(108393)	ZIP(293962)>NBRM(240502)	NBRM
			BIC	ZIP(104382)>NBRM(108503)	ZIP(294072)>NBRM(240622)	NBRM
			McFadden RSQ	ZIP(0.683)>NBRM(0.575)	ZIP(0.289)>NBRM(0.151)	ZIP
3	NBRM	ZINB	AIC	NBRM(108393)	NBRM(240502)	Second-order optimality condition violated.
			BIC	NBRM(108503)	NBRM(240622)	
			McFadden RSQ	NBRM(0.575)	NBRM(0.151)	
4	NBRM	PHM	VUONG	V(-6.292)<-1.96	V(-38.393)<-1.96	NBRM
			AIC	NBRM(108393)<PHM(117180)	NBRM(240502)<PHM(292778)	NBRM
			BIC	NBRM(108503)<PHM(117383)	NBRM(240622)<PHM(292999)	NBRM
			McFadden RSQ	NBRM(0.57452) <PHM(0.683)	NBRM(0.151) <PHM(0.288)	PHM
5	NBRM	NBHM	AIC	NBRM(108393)<NBHM(111033)	NBRM(240502)<NBHM(249831)	NBRM
			BIC	NBRM(108503)<NBHM(111245)	NBRM(240622)<NBHM(250063)	NBRM
			McFadden RSQ	NBRM(0.576) <NBHM(0.586)	NBRM(0.151) <NBHM(0.161)	NBHM

Table 3 shows that at stage 1, ZIP outperformed PRM in terms of the Vuong's test, AIC and BIC but the McFadden's RSQ for PRM was slightly higher than that of ZIP for all the sample sizes that are reported in this table. ZIP was selected as the best alternative model to PRM and was compared to NBRM at stage 2 where AIC, BIC and Vuong's test favoured NBRM but the McFadden's RSQ was slightly better than ZIP. NBRM is therefore selected over ZIP based on the three comparison criteria and is compared to ZINB in Stage 3. However, for all sample sizes of at least 60%, ZINB failed to converge or in other words did not reach second order optimality hence there are no parameters reported for ZINB in Table 3. Failure of convergence for ZINB is a clear indication that this model's performance weakens with increased sample sizes. Stage 4 compares NBRM and PHM where the former outperformed the latter in terms of AIC, BIC and Vuong's test but PHM had higher values of McFadden's RSQ. As such, NBRM was compared to NBHM in the last stage and all three comparison criteria favoured NBRM. NBRM is therefore selected as the most effective model for fitting the Duration of Marriage for sample sizes of 60% to 100% and is compared with NBRM for the 10% to 50% sample sizes in the between sample comparison phase.

Between-sample comparison phase: This section compares the models that were chosen under each sample size (see Tables 2 and 3) using the McFadden's RSQ, MSE and MAD and aids in selecting the best model form the ten.AIC and BIC are not used in the between-sample comparison because they are theoretically known to increase as the sample size increases hence they will bias the results when comparing models across different sample sizes. The Vuong's test is also not used for the between-sample comparison because it gave some inconclusive results for some models in the within-sample comparison phase.

Table 4: Comparison of best models the ten samples under study

Sample size		Selected model within a sample	Mc Fadden R^2	MSE	MAD
10%	4392	NBHM	0.59	33.961	3.925
20%	8783	NBHM	0.584	37.604	3.985
30%	13175	NBHM	0.587	36.945	4.03
40%	17566	NBHM	0.554	37.161	4.09
50%	21958	NBHM	0.549	43.761	5.101
60%	25107	NBRM	0.577	35.991	4.031
70%	29311	NBRM	0.575	36.886	4.049
80%	33478	NBRM	0.575	36.971	4.059
90%	37667	NBRM	0.575	36.584	4.053
100%	41881	NBRM	0.151	46.833	5.083

Table 4 shows that for NBHM (10% to 50% sample sizes), the McFadden RSQ generally decreases with an increase in sample size whereas the MSE and MAD increases as the sample size increases. Similar results are observable for NBRM (60% to 100%). This implies that count data models (NBHM and NBRM) generally tend to have smaller McFadden's RSQ values and bigger error margins (MSE and MAD) as the sample size increases. Theoretically, an effective model should minimise the error (MSE and MAD) and maximise the amount of variation explained by the model (McFadden's RSQ) hence, the results in Table 5 imply that NBRM and NBHM become less effective as the sample size increases. Table 5 shows that NBHM for the 10% sample size generally has a better McFadden's RSQ and reduces the error rate much better than other proposed models. As such, NBHM for the 10% sample size from Table 5 is selected as the most effective count data model that can best model the Duration of Marriage as compared to other competing models.

Table 5: Likelihood Chi-Square test results for the selected model (NBHM for the 10% sample size)

Model	Log-Likelihood for the null (Intercept Only) Model	Log-likelihood for the full model	Df	Likelihood Ratio Chi-Square	p-value
10% NBHM	-14900.766	- 6117.149	12	17567.235	<0.0001

Table 6: Parameter estimates of the most effective model

Parameter	Variable	Estimate	Standard Error	DF	t −Value	$Pr > \|t\|$
a11	No of Children	-0.292	0.081	3446	-3.59	0.0003
a0	Logit Intercept	-2.465	0.09	3446	-27.26	<.0001
b0	Log-linear Intercept	0.291	0.06	3446	4.81	<.0001
b3	Male Status	-0.096	0.03	3446	-3.18	0.0015
b4	Female Status	-0.104	0.032	3446	-3.30	0.0010
b5	Male No Times Married	-0.195	0.044	3446	-4.45	<.0001
b6	Female No Times Married	-0.268	0.047	3446	-5.65	<.0001
b7	Male Age	0.2	0.017	3446	11.65	<.0001
b8	Female Age	0.448	0.018	3446	25.19	<.0001
b10	Marriage Type	-0.05	0.01	3446	-5.24	<.0001
b11	No of Children	0.161	0.009	3446	17.30	<.0001
b12	Couple Race	0.087	0.007	3446	11.93	<.0001
v	Dispersion Parameter	7.679	0.353	3446	21.78	<.0001

Determining the significance of the overall model and individual parameters: Table 5 shows that for NBHM of the 10% sample size, the log-likelihood for the full model is -6116.8610 and is -14932.5215 for the null model. The chi-squared value is $2 * \left(-6117.1487 - (-14900.7661)\right) = 17567.2348$. Since there are twelve predictor variables in the full model, the degree of freedom for the chi-squared test is 12 yielding a $p - value < .0001$. Thus NBHM for the 10% sample size is confirmed to be statistically significant at 5% level of significance. Table 7 shows all the parameter estimates of NBHM for the 10% sample size. Table 6 shows the parameter estimates for both the log-linear and logit parts of the preferred NBHM. It is worth noting that the log-linear part models the Duration of Marriage (in full years) whereas the log-linear part models the zero-inflation and deviations from equi-dispersion (hurdle part). As such, b1 (Male Occupation), b2 (Female Occupation) and b9 (Solemnisation) are insignificant (at 5% level of significance) in predicting the Duration of Marriage whereas only b11 (number of children) is significant in explaining the hurdle constituent of the preferred NBHM. Figure 1 compares the actual frequencies for the Duration of Marriage to the frequencies estimated using the preferred model as part of the evaluation of the model.

Figure 1: Actual versus NBHM estimated frequencies for the 10% sample size

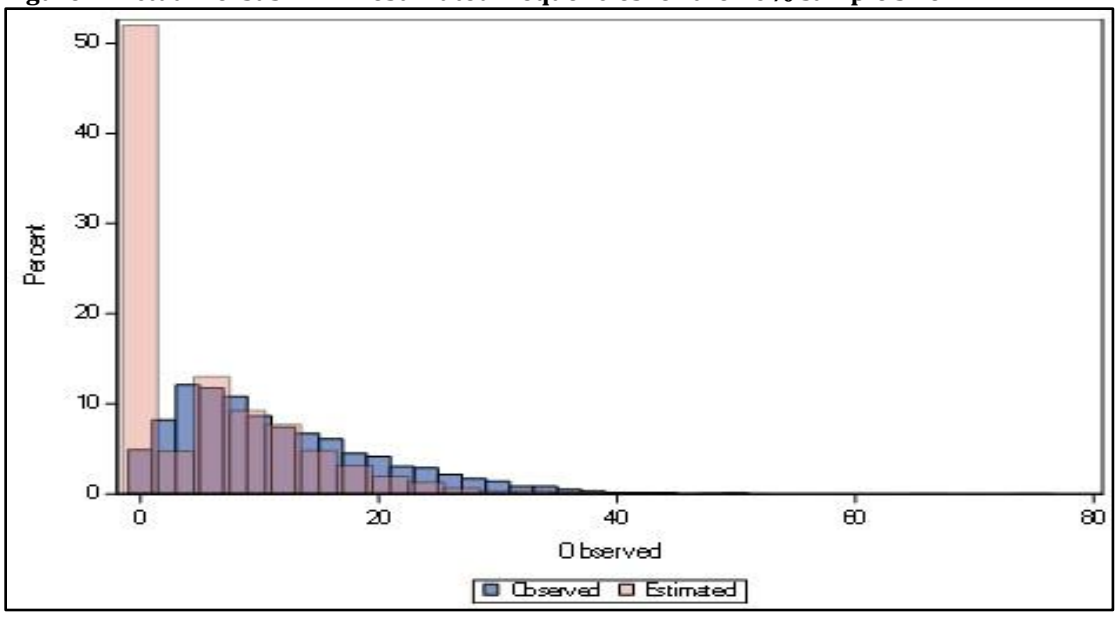

Figure 1 shows that NBHM for the 10% sample size over-estimates the frequency of zero counts, but the estimates of other frequencies are closer to the observed frequencies of Duration of Marriage even though the predicted values are slightly lower than the actual in general.

5. Discussion and Conclusion

This paper generally intended to explore the effect of sample size on the efficiency of count data models. The focus of the study was motivated by the lack of literature about the effect of sample size variations on the performance of popular count data models. Another motivation for this paper is the common practice of having the minimum sample size recommendations as a way of improving the efficiency of multivariate techniques. The study compared the efficiency of PRM, NBRM, ZIP, ZINB, PHM and NBHM under ten sample sizes (4392, 8783, 13175, 17566, 21958, 25107, 29311, 33478, 37667 and 41881) using AIC, BIC, McFadden's RSQ, Vuong's test, MSE and MAD. Empirical findings relative to the within-sample comparison revealed that for sample sizes of 10% (4392) to 50% (21958), NBHM outperformed all models whereas NBRM was favoured by most comparison criteria for sample sizes of at least 60% (25107). The between-sample comparison revealed that generally, the preferred models from the within-sample comparison (NBHM for at most 50% sample size and NBRM for at least sample size) become less effective as the sample size increases. ZINB did not converge when the sample size is at least 50%. The problem of the non-convergence of ZINB is also noted in the study by Famoye and Singh (2006) who also discussed that Lambert (1992) encountered the same challenge. As such, one may remark that ZINB has a disadvantage of not converging especially as the sample size becomes large. NBRM for the smallest sample size under study was selected as the most effective model for fitting the Duration of Marriage and was found to be significant in overall.

Recommendations: Forthcoming research may benefit from applying NBHM which is reported as a better performing model compared to the other five commonly used PRM, NBRM, ZIP, ZINB and PHM. ZINB is the worst performing count data model from the six and as such we suggest that more research should be conducted in order to improve the efficiency of the said model with more focus on its convergence especially in large datasets. The findings of this study revealed that generally, the efficiency of count data models decreases as the sample size increases. As such, sample size has an effect on the efficiency of count data models and imminent research may consider varying sample sizes when applying such models as a way of improving the model selection process. The use of numerous model selection criteria when selecting the optimal count data model may benefit the multivariate analysis by reducing selection bias as opposed using only a few model selection criteria.

This study focused on the six commonly used count data models hence other studies may consider many more count data models such as the Bayesian quintile regression model (Fuzi et al., 2016), the Multivariate Poisson lognormal (MVPLN) (Xiao, Zhang & Ji, 2015) and the Negative binomial-Lindley (NB-L) (Zamani & Ismail, 2010) as alternative models for modelling count outcome data. Future studies may consider the use of other SAS procedures such as GENMOD, GLMIXED, FMM and Macros which can derive count data models as alternatives to NLMIXED which is used in this study. The use of these procedures and other statistical packages such as R and STATA may ease the complexity of deriving the models and probably address issues of non-convergence of ZINB and the computation of Vuong's test statistic for comparing NBHM and other models that were explored in this study. A comparison of the results of the said SAS procedures or statistical packages may help minimise the bias when selecting the optimal count data model.

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Appendix 1

Equations for model comparison criteria adopted in this study

1. Likelihood Ratio Test statistic (Merkle and Smithson, 2013)

$G^2 = -2\left(\mathcal{L}(\widehat{\boldsymbol{\theta}}^V|\boldsymbol{y},\boldsymbol{X}) - \mathcal{L}(\widehat{\boldsymbol{\theta}}^T|\boldsymbol{y},\boldsymbol{X})\right)$

where $\widehat{\boldsymbol{\theta}}^V$ and $\widehat{\boldsymbol{\theta}}^T$ are maximum likelihood estimates of model V and T respectively. The variables $\boldsymbol{y}$ and $\boldsymbol{X}$ denote the Duration of Marriage and its associated predictor variables respectively.

2. Vuong's test statistic (Little, 2013)

$V = \frac{\sqrt{n}\left(\frac{1}{n}\sum_{i=1}^{n} m_i\right)}{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(m_i - \bar{m}_i)^2}}$,

where m_i for each subject *i* is calculated as: $m_i = \log\left(\frac{P_1(Y_i|X_i)}{P_2(Y_i|X_i)}\right)$.

3. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) (Hilbe, 2014).

$AIC = -2\mathcal{L} + 2k$, where $\mathcal{L}$ the log-likelihood function and k is the number of parameters in the model.

$BIC = -2\log\mathcal{L} + k\log n$, where n is the sample size.

4. McFadden *RSQ* (Karlaftis *et al.*, 2010).

$RSQ = 1 - \frac{\mathcal{L}(\boldsymbol{\beta})}{\mathcal{L}(\mathbf{0})}$, where $\mathcal{L}(\boldsymbol{\beta})$ and $\mathcal{L}(\mathbf{0})$ denote the log-likelihood at convergence with the parameter vector $\boldsymbol{\beta}$ and the initial log-likelihood with all parameters set to zero respectively.

5. Mean Square Error (MSE) (Wegner, 2007)

$MSE = \frac{\sum(Y_{Ai} - Y_{Pi})^2}{n}$, where Y_{Ai} is the i^{th} actual value of Duration of Marriage and Y_{Pi} is the i^{th} predicted value of Duration of Marriage.

6. Mean Absolute Deviation (MAD) (Bajpai, 2009)

$MAD = \frac{\sum_{i=1}^{n}|x - \bar{x}|}{n}$, where x is the estimated Duration of Marriage, $\bar{x}$ is the mean DurationOfMarriage and n is the sample size.

7. Wald test statistic Merkle and Smithson (2013)

$\omega = \frac{\hat{\theta} - \theta_0}{\text{var}(\hat{\theta})}$, where $\hat{\theta}$ is the maximum likelihood parameter estimate and θ_0 is the hypothesised value.

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Analysis of Crime Data in the Limpopo Province

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Abstract: South Africa has a very high rate of murders, assaults, rapes and other crimes compared to most countries. Most South Africans who immigrate to other countries cite crime as the major reason. Crime has become a concern for all, the police, private security industry, real estate developer, car manufacturers, businessmen, etc. There is a high demand for crime prevention; and this calls for a continuous use of new, advanced and reliable methods to prevent crime. How bad is the level of crime in Limpopo and what are the major crime types? This study uses secondary data from the 2011 Census conducted by Statistics South Africa; and tries to look at the composition of crime in the province and the variables that influence crime, in order to propose measures to tackle and minimize crime in the province. Multivariate statistical analysis has been employed, and the study shows that the following variables; the population size, number of households, youth unemployment, growth rate, and dependency ratio; have a positive influence in the occurrence of crime. The study recommends the slowing down of population growth rate, decrease in household size and the reduction of youth unemployment to curb crime in the province.

Keywords: *Crime type, principal component analysis, discriminant analysis*

1. Introduction

Crime is rampant and very high in South Africa. The rates of murder, rape (adult, child and infant) and assault, for example, are very high compared to those of most countries. Most South Africans who immigrate to other countries cite crime as the biggest factor that influences their decision to leave the country. Crime rate is often considered to be extremely important index to judge the welfare and the quality of living within a particular area. People value the safety issue when they move or decide to purchase a real estate and maybe to relocate for better career opportunities. We can already imagine many different causes of crime and in fact many studies have been conducted all over the world to strategize how to bring down criminal activities. It is a constant endeavour of governments and policing organizations all over the world to bring down crime rates so that the world becomes a safer place to live in. The fight against crime is not a new one to humanity and security services have, since the establishment of society, tried to bring crimes down. The South African Police Service is responsible for managing 1115 police stations across the country which is fighting against crime in the country (Statistics South Africa, 2011, 2013).This study intends to look at the composition of crime in the Limpopo province and the variables that influence crime, in order to propose measures to minimizing crime in the province. The study aims not only to make the police departments have a sense of dangerous municipalities in order to pay more attention to them, but also to assist the local governments in finding out what variables that they need to manipulate in order to make the province a better and safer place to live in.

2. Literature Review

Crime is a global crisis affecting almost all countries but with different intensity and tempo. The causes of crime have been the investigative topic of many social researchers in the past, and they have been identified to be similar across the world, although they differ from place to place (Simpson, 1998).The current economic turmoil has led governments at all levels to reflect on their approaches to fight crime. According to studies by the Institute for Security Studies (ISS) in 2001, crime in South Africa began to increase in the mid-1980s. Since the 1990s and especially since 1996, the increase has been dramatic. Violent crimes increased at a greater rate than the rest of the crimes. The trends of crime in South Africa's major cities have kept on increasing since 1994. When we compare crime rates among cities, Johannesburg has the highest volume of serious crime, followed by Pretoria, Cape Town and Durban. Crime levels in all these urban centres with the exception of Johannesburg increased between 1994 and 1999(ISS, 2001).Youth unemployment, poverty and proliferation of guns are cited as major contributors of crime. But according to the Centre for the Study of Violence and Reconciliation' survey (CSVR) in 2006, unemployment was regarded as the greatest

concern(33%) with crime in second place (30%), HIV/AIDS in third (15%) and poverty in fourth place (9%). On the other hand, among people in the highest income group (household income of more than R8 000 per month (US$600)), however, crime was regarded as the highest priority among 42%, with unemployment regarded as the highest priority by 24% (CSVR, 2008, 2009).

The rate of murder is increasing. For the first time in 20 years the number of murders and the murder rate has increased for a second consecutive year (CSVR, 2009; Statistics South Africa, 2013).The murder rate is regarded as one indicator of a country's stability – the higher it is, the less stable a country is regarded to be. [The murder rate refers to the number of people who are murdered per 100 000 of the population.]A recent editorial in the Palm Beach Post stated that pressure is on the Criminal Justice Commission (CJC) to demonstrate that cherished programmes, such as the youth empowerment centres, are effective in reducing crime (International Centre for the Prevention of Crime, (ICPC) 2010). Crime prevention implies programmes to train and incapacitate young people with some skills because an adage goes like: "an idle hand causes damage". Crime prevention has been described as "any initiative or policy which reduces, avoids or eliminates victimization by crime or violence (Homel, 2005; CSVR, 2009). It includes governmental and non-governmental initiatives to reduce the fear of crime as well as lessen the impact of crime on victims" (ICPC, 2010).

Crime can be prevented through social prevention, situational crime prevention and legal sanction strategies, among others. Social prevention involves neighbours forming organised watch-dog programmes; situational crime prevention involves measures that tighten access control and surveillance making the opportunities for criminals to work extremely hard, and the risk for them to be apprehended equally very high. Legal sanctions, on the other hand, aim at incarcerating offenders with long-term sentences to serve as a deterrent effect (Schlossman et al., 1984; Clarke, 1977; Homel, 2005). There is clear evidence that well-planned crime prevention strategies prevent crime and victimization, and equally promote community safety and contribute to the sustainable development of countries. Effective crime prevention enhances the quality of life of all citizens. It has long-term benefits in terms of reducing the cost associated with the formal criminal justice system, as well as other social costs that result from crime. Crime prevention offers opportunities for a humane and more cost-effective approach to the problems of crime (Clarke and Homel, 1997; UN, 2002).

3. Methodology

Data based on 13 variables that fall under several general characteristics and categories such as population characteristics, economic characteristics, social characteristics, and housing characteristics all from the 2011 Census have been used (Statistics SA, 2012, 2013).The variables are: population size (POP), population density (POPDEN), number of households (NOH), unemployment rate (UMPR), youth unemployment rate (YUMPR), growth rate (GRTR), youth (YTH), Working age (WKA), elderly (ELDERLY), sex ratio (SRT), average household size (AHS),female headed households (FHH) and dependency ratio (DPR).The dataset totally has 25 entries; each entry represents information of a particular local municipality in the Limpopo province.

Table 1: Glance of the first five entries of the dataset

Local municipalities	CRIME rate	POP	YTH %	WKA %	ELDERLY %	DPR	SEX RATIO	GRTR %
Polokwane	1.6828	628999	30.1	64.8	5.1	54.3	92.5	2.13
Thulamela	1.9729	618462	35.2	58.8	6	70.1	82	0.62
Musina	0.4658	68359	28.7	69.2	2.6	44.5	101.9	5.53
Molemole	0.1359	108321	35.6	56.9	7.6	75.9	85.4	-0.1
Modimolle	0.6786	68513	30.8	63.8	5.4	56.8	102.5	-0.07

Sampling adequacy: Before using any statistical procedure, there is always a need to test the relevance of such procedure for the data in question. Factor Analysis (FA) or precisely, Principal Component Analysis (PCA) has been used in this study therefore Table 2 tests its suitability. Table 2 shows the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett's test of sphericity. The KMO statistic varies between 0

and 1. When it is zero then the sum of partial correlations is large relative to the sum of correlations, which means there is some diffusion in the pattern of correlations and therefore the data is likely to be inappropriate for Factor Analysis (Everitt and Dunn, 2001; Everitt and Hothorn, 2010).

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.730
Bartlett's Test of Sphericity	Approx. Chi-Square	707.254
	Df	78
	Sig.	.000

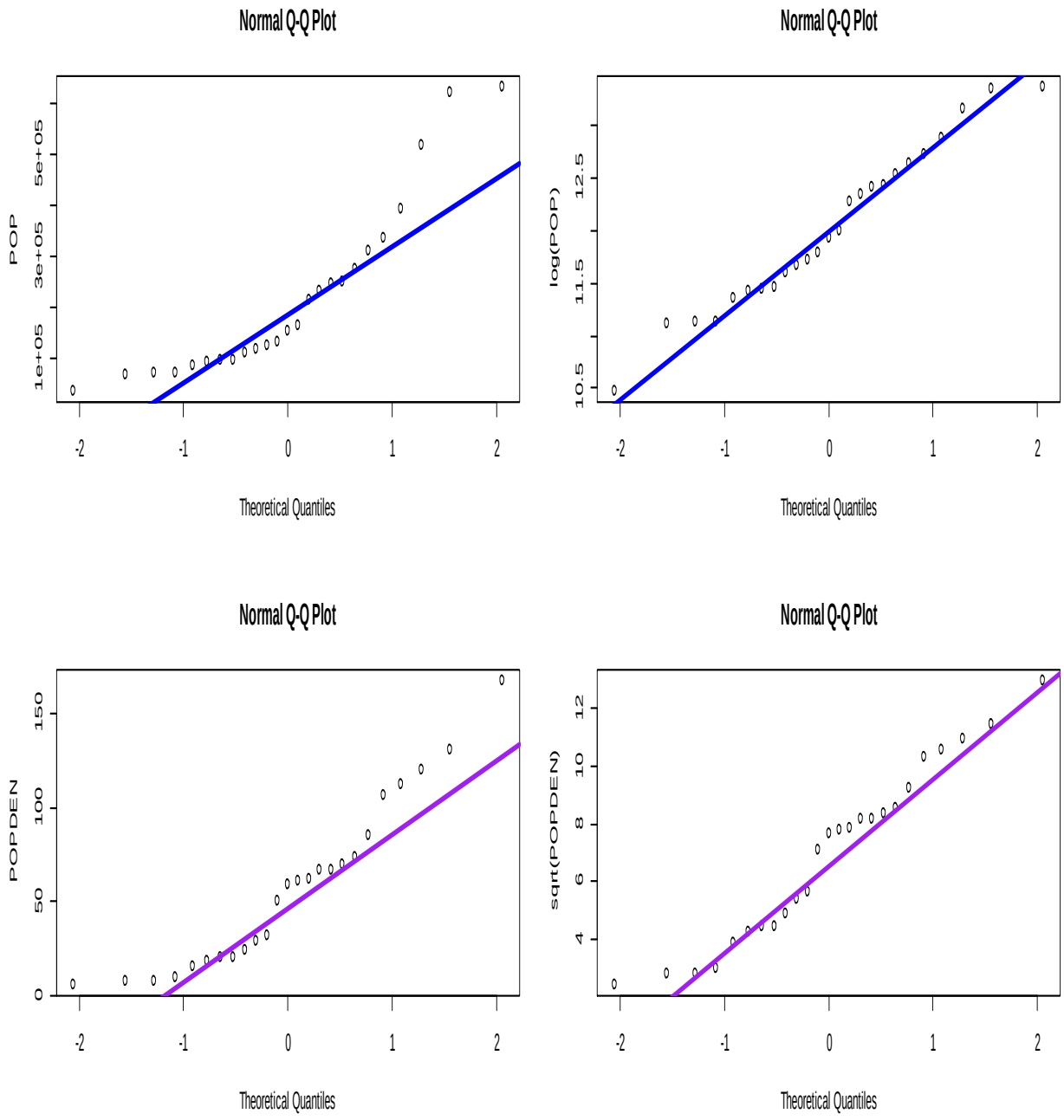
On the other hand when KMO is close to 1 then the patterns of correlations are relatively compact and so Factor Analysis should yield distinct and reliable factors. It is recommended that values greater than 0.5 are acceptable. Values between 0.5 and 0.7 are mediocre, between 0.7 and 0.8 are good, between 0.8 and 0.9 are great and those greater than 0.9 are superb (see Hutcheson and Sofronion, 1999, pp. 224-225).For these data, the value is 0.730, which falls into the range of being good, so we should be confident that FA or more precisely, PCA is appropriate to be used. Distribution assumptions' verification is crucial before doing any statistical modelling. Multivariate normal distribution is one of the most frequently made distributional assumptions when using multivariate statistical analysis or techniques like Principal Component Analysis and Discriminant Analysis. We know that if X=(X1, X2, …, Xp) follows the multivariate normal distribution, then its individual components X1, X2, …, Xp are all normally distributed. Therefore, we need to examine normality of each Xi to guarantee that X=(X1, X2, …, Xp) is normally distributed (Everitt and Hothorn, 2010; Johnson and Wichern, 2014).

Table 3 New Variables which are after transformation

Abbrev	Variables	Transformed Variables
POP	Population	Log(POP)
YTH	Young(0 - 14)	Sqrt(sqrt(YTH))
WKA	Working age(15 - 64)	log(WKA)
ELDERLY	Elderly(64+)	sqrt(ELDERLY)
DPR	Dependency ratio	sqrt(DPR)
SRT	Sex ratio	log(log(SEX.RATIO))
GRTR	Growth rate	log(GRTR)
POPDEN	Population dependency	log(POPDEN)
UMPR	Unemployment rate	Log(sqrt(UMPR))
YUMPR	Youth unemployment rate	log(YUMPR)
NOH	Number of households	sqrt(NOH)
AHS	Average household size	log(AHS)
FHH	Female headed household	sqrt(FHH)

Here, the quantile - quantile plot (QQ plot) has been used to assess normality of data. In QQ plot, we compare the real standardized values of the variables against the standard normal distribution. The correlation between the sample data and normal quantiles measures how well the data is modelled by normal distribution. For normal data, the points plotted should fall approximately on a straight line in the QQ plot. If not, data transformation is applied to make the data to appear more closely normally distributed. For transformation, we can use a variety of methods including the logarithm, square root, power transformation, and/or scale function (Bartholomew et al., 2008).Our QQ plot of each variable revealed that all the 14 variables do not follow normal distribution. We then try different forms of transformation on all the variables to obtain the substitute variables which perform better on normality. **Table 3** lists the specific forms used to get the new variables. **Figure1** is the QQ plot of POP and POPDEN before- transformation and after-transformation. We can see the effectiveness of data transformation method because data tends to be normally distributed after transformation (Everitt and Hothorn, 2010; Johnson and Wichern, 2014).

Figure 1: Normality check samples



In general, a large number of variables in any study make it difficult to do analysis because of multicollinearity between variables (Fajnzylber et al., 2002; Yan, 2011).

Figure 2: Multicollinearity

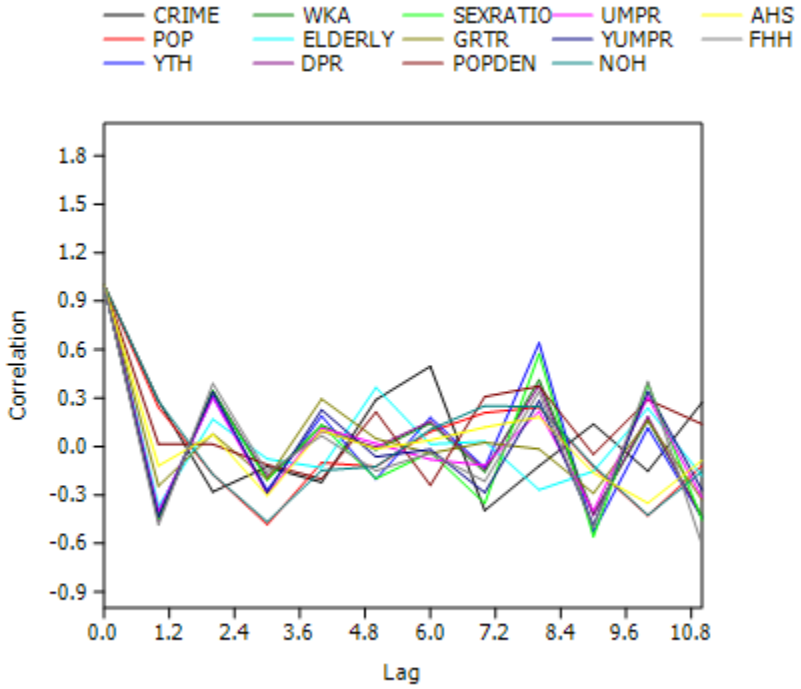


Figure 2 shows the multicollinearity between the variables. Therefore, we introduce Principal Component Analysis in order to rotate the variables matrix X=(X1, X2, …,Xp) to achieve orthogonality to decipher patterns more easily and at the same time reduce the dimension of the data for simpler data process (Everitt and Hothorn, 2010). With the assistance of PCA, we obtain a clear pattern of our municipalities profile data, without much loss of variables to catch up with the whole data information.

4. Results

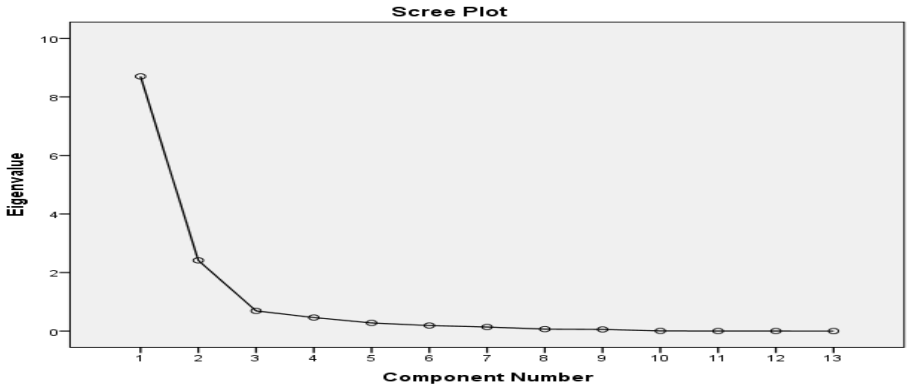
Table 4: Total Variance Explained

	Initial Eigen values			Extraction Sums Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	8.700	66.926	66.926	8.700	66.926	66.926	8.189	62.993	62.993
2	2.414	18.572	85.497	2.414	18.572	85.497	2.926	22.504	85.497
3	.689	5.299	90.796						
4	.462	3.555	94.351						
5	.278	2.135	96.487						
6	.189	1.450	97.937						
7	.139	1.068	99.006						
8	.066	.510	99.515						
9	.056	.429	99.944						
10	.005	.040	99.984						
11	.001	.010	99.994						
12	.001	.006	100.000						
13	5.582E-5	.000	100.000						

Extraction Method: Principal Component Analysis.

The following tables and figures give the results from the principal component analysis. Only two factors were retained, the first could be called *ratio* because it consists of rates or percentages and the second factor called *size*. Table 4 shows that factor 1 explains 66.9% of the variance while factor 2 explains 18.6% and the two factors account for over 85% of the variation. Figure 3 shows the scree plot which proves that indeed only two factors are eligible to be retained.

Figure 3: Screen plot



Earlier on, we mentioned three methods which can be used to determine the number of factors (PCs) to retain; above is the Kaiser's criterion which says we should retain only the factors (PCs) with eigenvalues greater than 1. Figure 3 is a scree plot, the largest change in the slope occurs on PC3, which is the "elbow" of the plot, thus we should retain the first two PCs (Everitt and Hothorn, 2010; Johnson and Wichern, 2014).

Interpretation: Table 5 shows that the variables that load highly onto factor1 are WKA%, DPR, YTH%, FHH, AHS, UMPR%, YUMPR%, SEX RATIO, ELDERLY% and GRTR%. We call factor1 **ratio**; whereas, the variables that load highly onto factor2 are NOH, POP and POPDEN. We call factor 2, **size**.

Table 5: Rotated Component Matrix[a]

	Component	
	1(ratio)	**2 (size)**
WKA %	-.981	
DPR	.981	
YTH %	.944	
FHH %	.928	
AHS	.890	
UMPR %	.883	
YUMPR %	.880	
SEX RATIO	-.877	
ELDERLY %	.848	
GRTR %	-.751	
NOH		.978
POP		.973
POPDEN		.826

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a]
Rotation converged in 3 iterations.

Figure 4: PCA plot

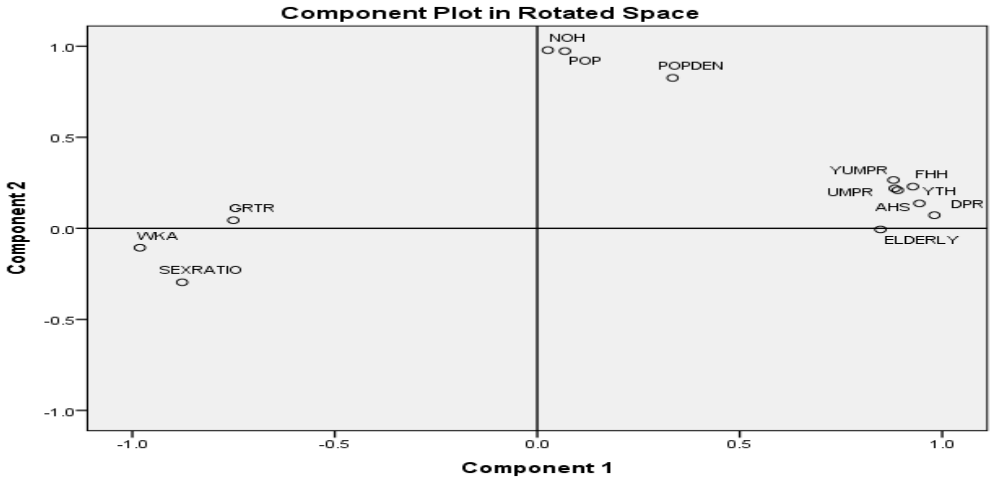


Figure 4 shows that GRTR%, WKA% and SEX RATIO are negatively correlated to the rest of the variables that load onto factor1 (ratio) with WKA% and SEXRATIO also negatively correlated to GRTR%. Table 6 shows the extraction method from PCA.

Table 6: Communalities

	Initial	Extraction
POP	1.000	.951
YTH %	1.000	.909
WKA %	1.000	.974
ELDERLY %	1.000	.718
DPR	1.000	.967
SEX RATIO	1.000	.857
GRTR %	1.000	.565
POPDEN	1.000	.794
UMPR %	1.000	.827
YUMPR %	1.000	.844
NOH	1.000	.958
AHS	1.000	.836
FHH %	1.000	.913

Extraction Method: Principal Component Analysis.

Discriminant Analysis (DA) on Principal Components: Since our PCs capture the majority of the information from the original data, and at the same time, the number of PCs are much less than that of original variables, it is easy to think of using the factors computed from PCA as input factors for DA algorithm. The new factors which are a linear combination of the original variables have the following advantageous properties:

- The interpretation of them allows us to detect patterns in the initial data space.
- Reduce very large factors into a smaller number of factors; hence we can remove noise from the dataset by using only the most relevant factors.
- Algorithms such as Linear Discriminant Analysis (LDA) could have a better behaviour because PCs come from an algorithm basis.
    - Principal Components Analysis is successfully applied into our dataset by extracting two PCs out of the 13 original variables, which implies a great dimensional reduction. In addition, these PCs account for 85.497% variance of the original dataset, thus we did not lose much information. As mentioned earlier Factor1 consists of WKA%, DPR, YTH%, FHH, AHS, UMPR%, YUMPR%, SEXRATIO, ELDERLY and GRTR% which are highly correlated with each other; and we call that

Factor1 the ratio. The Component Plot shows that GRTR%, WKA% and SEXRATIO are negatively correlated to the rest of the variables in factor1 with WKA% and SEXRATIO also negatively correlated to GRTR%.

- Factor2 consists of NOH, POP and POPDEN, we call Factor2 the size. These two factors can be used to classify a municipality as a safe one or unsafe one.

- Discriminant Analysis is applied to classify a Local Municipality by the composition of crime even if there are no data records of crime. For our case, we applied Linear Discriminant Analysis on the original variables and to the Principal Components respectively (Bian, 2005).

- We used the unstandardized coefficients to construct the actual prediction equation which can be used to classify new cases (Johnson & Wichern, 2007). Our analysis gives the following model:

D_i = -1.877 + 2.981factor1 – 0.012factor2 +Ɛ

From the model we can see that to minimize the value of D_i, we have to increase more of factor2 which is **size** and minimize factor1 which is **ratio**

Discussion: The foregoing analysis shows that population size influences crime. Population increase has to be considered seriously because it triggers a quantum effect on the society with negative consequence. It leads to the creation of more people with some form of frustration or resentment towards the society such that they end up engaging in criminal activities, (Statistics SA, 2011, 2013). Increased population leads to congestion (excess population), competition and jealousy; and this is one of the biggest causes of crime and much of the challenges that the world faces. Reduction in the number of households and population density are seen as important factors to fight and bring crime down. Sex ratio is seen to be negatively related to elderly (advanced in age) because when people advance in age, usually the men die faster than the women (their wives) therefore decreasing the sex ratio. The questions again are, what factors may be related to safety? Are there some variables that we can observe to predict the safety and security of communities? What are the strategies needed to reduce crime rates? These are some of the questions that have prompted this study.

5. Conclusion

The study shows that several variables have an influence on crime. Notably, the population size, population density, number of households, unemployment rate, youth unemployment rate, growth rate, and dependency ratio have a positive influence in the prevalence of crime. These variables are all related to the population size of a particular place. Crime increases when population increases, therefore the local authorities should take note of that. Excess population results in high youth unemployment in a shrinking economy like South Africa's, therefore to control crime in the Limpopo Province in particular and in the country as a whole, local, provincial and national governments have an obligation to fight crime by creating job opportunities to reduce unemployment, especially that of youth, and also provide educational facilities to the youth to equip them with skills so that they can get employments or they can be busy doing some trade. The government can also fight crime by increasing the severity of punishment for offenders. Provide educational centres where people are taught about crime and how they can protect themselves from being victimized.

Limitation of the study: The variables chosen are based on the historical study of possible factors causing crime, besides the availability and accessibility of the variables. If data resources were sufficient, additional variables such as alcohol-drug consumption, educational factors and other factors could have been considered in this analysis.

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Customer Service Expectations from South African Alcoholic Beverage Suppliers in Urban and Rural Areas

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Abstract: South African alcoholic beverage suppliers (SAABS) have to focus their efforts on quality customer service as a means of differentiation. Quality of service is a competitive advantage and serves as a marketing tool for many companies; it also contributes to customer loyalty and retention. Offering quality service is considered an essential strategy for success and survival in today's competitive business market. A commitment to quality must start from the top of any organisation, be it a service delivery company or a manufacturing or merchandising business, and spiral down to the bottom. SAABS need to understand their customers' perceptions of the service offering, their existing relationship with the company and their levels of satisfaction. The study set out to measure the service delivery expectations and realisations of customers that receive delivery from SAABS based on their geographical location. It required the implementation of a descriptive research method. The target population comprised customers of SAABS situated in the Gauteng, Western Cape and North West Provinces of South Africa. A sample size of 926 was realised. The results from the study indicate that customers expect the SAABS to deliver on all five service quality dimensions but fail to do so to their satisfaction. If the SAABS used the proposed customer relationship management (CRM) framework, it can improve on their service delivery and customer service. This, in the long run, will improve customer satisfaction, loyalty and retention.

Keywords: *Alcoholic beverage suppliers, Customer service, South African alcoholic beverage suppliers, Service quality, SERVQUAL*

1. Introduction

The concept of service quality is complex, diffuse and abstract, mainly because of the three distinctive features of a service, namely intangibility, heterogeneity and inseparability of consumption (Perez, Abad, Carillo & Fernandez, 2007). In a global world economy, where alcoholic beverage supplying companies (ABSC) are competitive and consumers very demanding, it is also increasingly difficult to hide inefficiencies in a company's service delivery execution and process. If service companies are unable to provide for the needs and wants of their customers they risk losing them to the competition (Boshoff & Terblanche, 1997;Sekolanyane, 2004).Companies are focusing on areas in their operations that give them an advantage over their competitors to ensure that they can compete in an increasingly hostile competitive environment (Pelser & Prinsloo, 2014; Pelser 2001). Abdullah (2005) reports that service quality has been associated with an increase in profitability and is therefore considered as a vital approach to ensure a competitive edge over competitors. Kotler and Armstrong (2001) state that customer satisfaction is closely linked to service quality. Levels of satisfaction is a direct result of the service quality delivered, the higher the service quality the higher the satisfaction.

Over the last 5 financial years (2009-2014) the SAABSI has seen year on year volume growth. Even though there is year on year volume growth it is slowly but surely diminishing. This is a cause of concern to the SAABS in the industry; possible reasons therefore can be established by investigating service delivery. Also in conjunction with the aforementioned problem, there is among employees in the SAABSI a general perception that rural customers are not of the same importance as their urban counterparts. This perceived lack of investment importance is based on return on investment, sales volume, market share and expected profit growth of a SAABS. The perceived tendency automatically creates different levels of service among rural and urban customers.The rural market is further neglected due to the following reasons as supported by numerous executives in the SAABSI:

- Inaccessibility of rural outlets.
- Non-existence of wholesalers or redistribution outlets in rural areas.

- Limited usage of technology by rural customers.
- Inconsistency of rural customers' liquidity.
- SAABS employees' negative perception regarding the rural market.
- Survival approach to business in the rural market limits the potential for growth.

The perceived tendency could create a limiting effect on the potential growth of the rural alcoholic beverage market. Growth is thus focused on the urban market, although the rural market segment adds up to 40% (sales as well as customer base) of the total SAABSI market (rural and urban).To create a healthy balance between the urban and rural market it is imperative that the focus be divided between them. Funds and supplier initiatives must benefit the rural market too. The enhanced focus can lead to rural customers expanding and propagating their business and in turn increase SAABS profits. Bad service quality and poor service delivery over time from suppliers can lead to lower customer satisfaction, which in turn can lead to lower customer retention and in the long run a decrease in company profits. Moreover, it diminishes the communities' opportunities to expand and propagate their businesses and contribute to better living conditions.

Diminishing product growth in any company is an indication of commercial deterioration in general, which might lead to possible retrenchments, restructuring or even closure (Garnett & Pelser, 2007). The problem statement in this study is based on the mentioned negative tendency and read as follows: "The current negative volume growth experienced by the SAABSI pose a possible medium and long term survival threat for the industry". This study focusses on service delivery, in all its dimensions, as a potential resolution.The purpose of this study was to determine service delivery differences between urban and rural customers. The differences between expected service delivery and realized service delivery were established and used in an attempt to develop functional and practical structural guidelines to address these differences. The proposed structure should then assist in improving service delivery to customers, which ought to lead to better customer satisfaction, retention and profit growth.

Research questions: The research questions addressed in this study were the following:

- Do customers of SAABS perceive customer service differently, based on their geographical location (urban vs. rural)?
- What are the perceptions customers have of SAABS regarding service quality in relation to their geographical location (urban vs. rural)?
- Is customer service of equal importance for customers of SAABS within different geographical locations (urban vs. rural)?
- Are there differences between customers' expectations and the realisation of service delivery from SAABS?
- Are customers' experience of actual service delivery received from SAABS is of the same standard within different geographical locations (urban vs. rural)?

2. Literature Review

Customer relationship management: Customer relationship management (CRM) is influenced by customer service and customer satisfaction, both these mentioned concepts also has an influence on each other. As Sheth and Uslay (2007), Hoffman and Bateson (2010) and Wang (2011) point out, CRM and customer service are closely related due to the purpose of CRM to build up long-term relationships with customers by offering them a variety of valuable and desirable experiences. It is especially important in service businesses, to understand that customer service is an important part of relationship building for every business. If a business disregard to take advantage of the opportunities offered by developing customer relationships, such a business is bound to suffer the losses that result in the long-term from damaged relationships and the behaviour of dissatisfied customers. Damage can be done to the relationship between businesses and their customers if businesses fail to offer quality service. It is for this reason that CRM is of utmost importance for the sustainability of a business.

There is a wide range of definitions for the concept CRM. Payne and Frow (2006) states that the way CRM is viewed will influence the way in which companies apply and use the concept. McKenzie (2000) and Wang

(2011) implies that there is no single definition of CRM to which scholars all agree, due to the speed with which CRM is evolving and to the continually changing nature of CRM. A theoretical problem is created for marketing managers and researchers alike due to the lack of agreement on the definition of CRM, as well as practical problems for practitioners who are trying to implement CRM within areas of business that are involved in the maintaining of relationships with customers. Ivens and Shaw (2002) is of the opinion that the most important element in CRM is in which manner a certain business has dedicated itself to maximizing the customer experience and how it is focused on satisfying the needs of their customers.

In his definition, Hill (2007) claims that CRM is the practice of organizing and pursuing all components of an organization's dealings with its customers. This is a view that unfortunately focuses too much on the systems that is used and not enough on the human factor and duration of the relationship. Egan (2008) defines CRM as: "a permanent performance program developed to improve an organization's information of its customers and to sustain access across all the communication channels as well as the establishment of cost-cutting measures". Kotler and Armstrong (2012) define CRM as an overall process of constructing and maintaining profitable customer relationships by delivering superior customer satisfaction and value. This definition is to give priority to the maintaining of long-term relationships by understanding individual customer needs and preferences, and also to add value to a business and supply benefits to its customers. A more comprehensive definition of CRM is supplied by Bligh and Turk (2004). They are of the opinion that the most helpful definition of CRM is one that makes use of a three-tiered approach by incorporating the operational philosophy with the processes and the technologies that are utilized by business.

It is clear that a variety of definitions exist regarding the concept of CRM. There are, however, three main elements on which most authors agree in terms of defining CRM:
(1) CRM is not just intended for use by management neither in the SAABS nor entirely for the marketing department within the company. CRM is instead a culture the entire business should embrace and a strategy that must be implemented across all functions in the business (Anderson & Kerr, 2002; El Essawy, 2012). This needs to happen from director level to shop floor employees within SAABS.
(2) Businesses needs to understand and manage their customers' needs individually, then only will the business be able to treat each individual customer differently (Greenberg, 2004), and develop personalized relationships in this manner.Within the context of this study the SAABS needs to understand that customers in different COTs need to be handled differently; for this reason, sales teams work in different COTs to increase specialized services. Highly satisfied customers are a direct result of this kind of attention to detail, this in turn motivates these customers to remain with the business over the long term (Chen & Lin, 2012).
(3) New customers can be attracted by businesses that understand and satisfies customers' needs, current customers can be retained and relationships with these customers can be enhanced into highly profitable, long-term partnerships that add value not only to the customer but also to the business itself (Peelen, 2005; Richards & Jones, 2006).Through delivering world-class brands and superior service SAABS can attract new customers and ensure they retain their current base; this will ensure a steady stream of profit for the company.

CRM can be categorized into three main types, namely operational CRM, analytical CRM and collaborative CRM. To form relationships with customers are at the base of each of these types. Payne (2006) notes that businesses require practical CRM programs to assist them in identifying valuable customers and to retain not only their loyal and commitment, but also to keep them satisfied with the business product. Payne (2006), Ali (2007) and Malik 2010 explain that *operational CRM* deals with the automation of the business processes that include customers at points of contact between customers and a business. El Essawy (2012) states that the purpose of operational CRM is to integrate all the events and processes toassists customer access, customer interaction and sales. The automation of the business processes is the main purpose of the specific technology that is used in operational CRM. These business processes integrate the functions and value of efficient services, marketing and sales personnel. Typical business functions involved in operational CRM are marketing automation, sales force automation and service automation. The Marketing automation function allows businesses to develop, budget and execute advertising campaigns. Customer calls through the call centre, directing service calls, and handling customer complaints by supervised employees' forms part of service automation and allows businesses to manage their service operations more effectively (Buttle, 2009). An increase in efficiency in marketing and sales is one of the core benefits of operational CRM for SAABS.

According to Ali (2007) and El Essawy (2012), *analytical CRM* provides a basis for analyzing, modeling and evaluating related customer data with a vision to ensure the development of a mutually beneficial relationship between the business and its customers which includes the capturing, storing, processing, extracting, interpreting and implementing of meaningful customer data obtained from the operational part of the business. Analytical CRM assists businesses to obtain accurate and trustworthy information about customer behavior. The quality of the data that is collected is of utmost importance as it determines the quality of information that has been collected through analytical CRM (Tanner et al., 2005). Malik (2010) indicates that customer data storage facilities (data warehouses) that store the information that is gathered from customer's id plays a very important role in this instance. SAABS can obtain information from various sources, such as the customer himself, businesses, market research databases and even the credit bureau. The data collected for use in analytical CRM contains data pertaining to customer behavior, referrals, satisfaction, retention, loyalty and profitability.The focus in *collaborative CRM* is predominantly on the interactions that take place between customers, businesses and employees (Payne, 2006; Greenberg, 2004). Malik (2010) notes that CRM depends on numerous interactions that take place between businesses and stakeholders. Technology streamlines these interactions by means of predominant electronic communication methods such as e-mail and websites that are dedicated to the receiving and resolving of complaints and dissatisfied customers. While collaborative CRM offers all the benefits contained in one-to-one marketing, it also forces a business to find out exactly what information it is that customers' needs from them and to respond to customer queries, complaints and comments as quick and accurate as possible (El Essawy, 2012).

Customer satisfaction: According to Schiffman and Kanuk (2007) many companies identify relationship marketing programs (RMP) as a tool that can be used to enhance customer loyalty and commitment to their company and services offerings. RMP are very important for service companies as these programs provide the business managers with the required understanding of their customers' needs and support them in adjusting their services according to the diverse needs of their customers (Lovelock & Wirtz, 2011).Service delivery companies have also realized that relationship marketing (RM) is a key in creating customer satisfaction, customer loyalty and retention (Hoffman et al., 2009). Within marketing customer satisfaction is one of the most considered areas, this can be proved by the fact that over 15 000 academic articles have been written on the subject (Hoffman & Bateson, 2010). Hoffman et al. (2009) state that a great deal of research was conducted on customer satisfaction during the 1970s when consumerism led to a decline in the provision of services, resulting in customer dissatisfaction. According to Dimitriades (2006) and Thomas (2013) customer satisfaction has been a major focus point for business organizations for many years and loyal and dedicated customers contribute to the company's profitability through spending more on the company's products and services. Dimitriades (2006) warns that one should differentiate between customer satisfaction with services and customer satisfaction with goods as they may be influenced by different factors.

Ehigie and Taylor (2009) state that customer-orientated companies' primary focus should be to satisfy their customers. This forms the base for the establishment of lasting and profitable relations with customers. Homburg and Giering (2001) and Kim and Han (2013) confirm that majority of companies attempt to create high levels of customer satisfaction. To be successful and profitable, companies should aim to form and maintain adequate customer satisfaction levels.Work that was done by Parasuraman et al. (1988) between 1985 and 1988 provides a scientific basis for the measurement of customer satisfaction with a service by using the gap between the customers' expectation of performance and their perceived experience of performance.The concept of service quality is not universally understood and is often used as an umbrella term to cover a range of impressions gathered by customers when dealing with businesses. These impressions are important factors that influence buying behavior; businesses can improve on these aspects either through employee training or direct investment in facilities.

An ideal service quality scale is one that is psychometrically sound and robust enough to provide insight to managers for corrective actions in the event of quality shortfalls. The psychometric properties of the SERVQUAL scale have been the subject of considerable research. Work done for example by Cronin and Taylor (1992 and 1994) proposes the "conformation/disconfirmation" theory of combining the "gap" described by Parasuramanet al. (1988) as two different measures: perception and expectation of performance into a single measurement of performance according to expectation.The disconfirmation paradigm is the most widely accepted customer satisfaction model as suggested by Lamb et al. (2009). Many

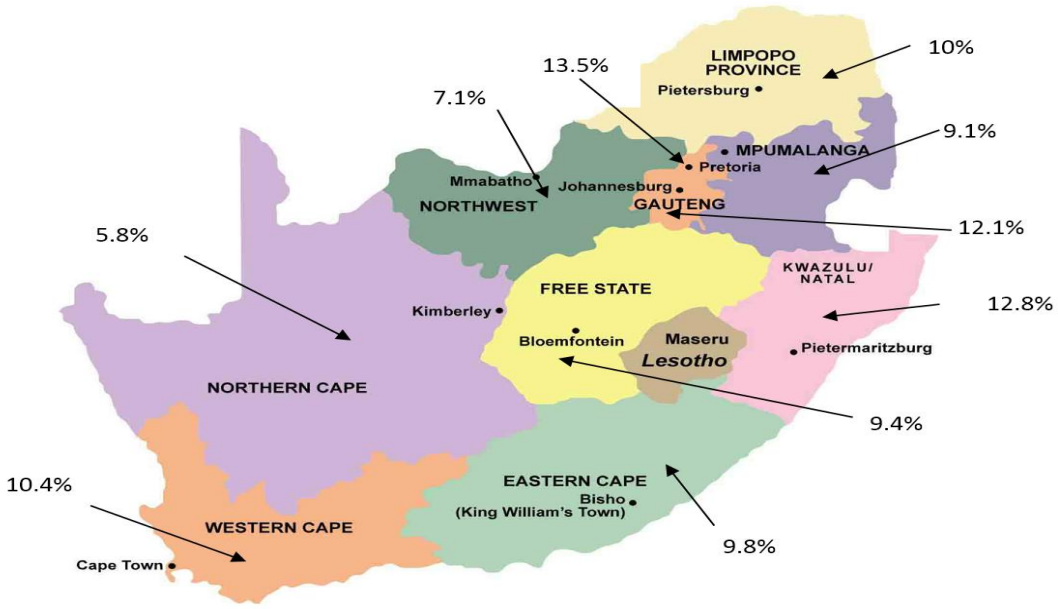
customers will not or cannot express their feelings and opinions, and therefore it is important for businesses to measure levels of customer satisfaction so that they are in a position to determine whether or not customers are satisfied.

3. Methodology

Quantitative research, using the SERVQUAL model as basis, was used for the empirical study. The survey method was employed to collect the primary data. The sample size selected for the study totals 965 alcoholic beverage customers. This was divided based on the percentage representation within each province.

Target population: The target population comprises customers of SAABS situated in Gauteng, Western Cape and North-West provinces of South Africa. Only licensed customers were used in the proposed study; licensed outlets renew their liquor license every year and sell alcohol legally. Shebeens do not have liquor licenses and have therefore been excluded from the study. These three provinces were used in the study because the majority of the total alcoholic beverage industries customers are situated in these provinces and represent both urban and rural customers. The industry consists of ± 30 000 customers in total. A total of 39.3% of these customers are based in the rural areas and 60.7% in urban areas of South Africa. The three provinces feature 29.59% of the total customer population. The database of customers was obtained from an existing SAABS customer database of the mentioned companies. The total SAABS customers by geographical province are represented in Figure 1.

Figure 1: SAABS customers by geographical area

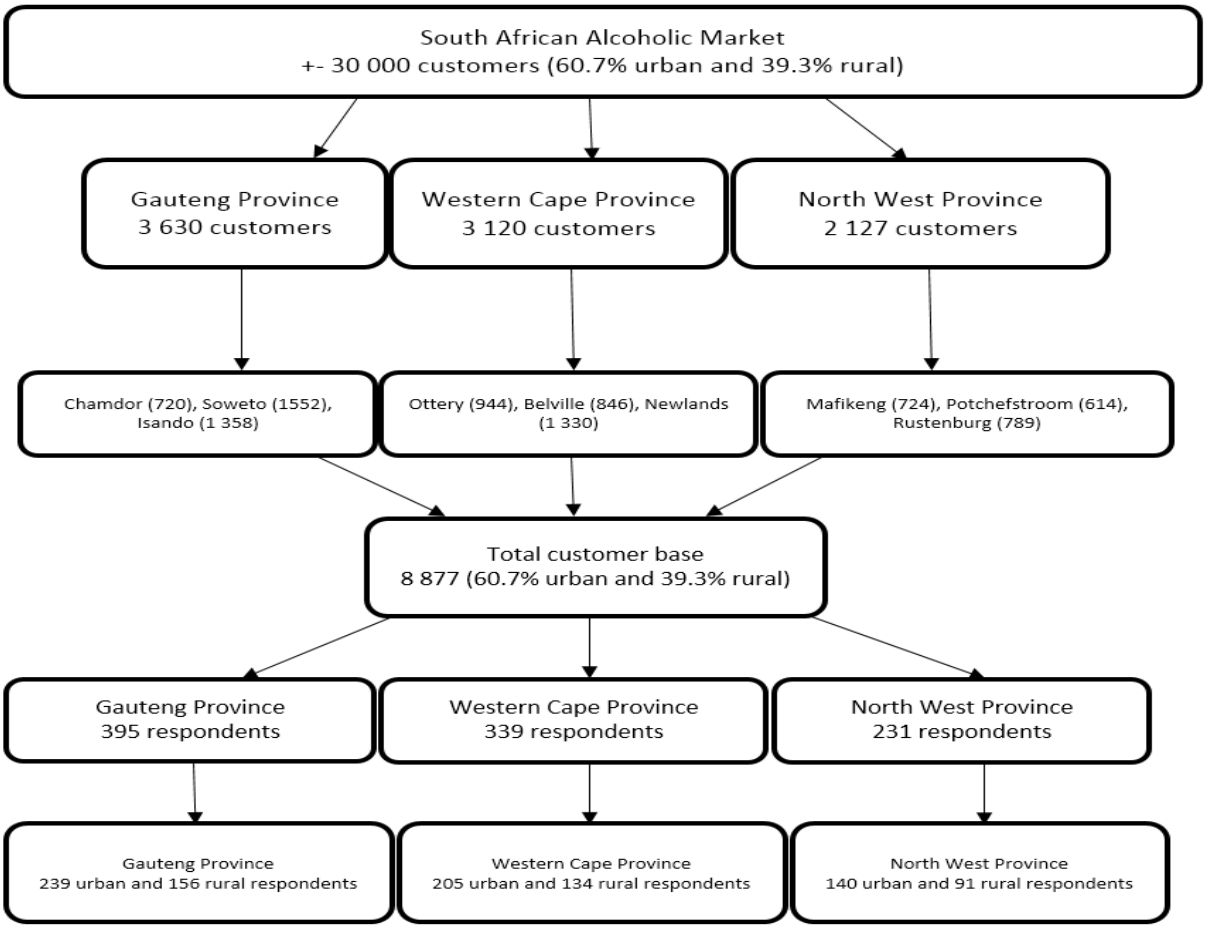


Sampling method: From the given sample frame a non-probability judgment (purposive) sampling method was implemented, which involved choosing sample units subjectively. This study focuses on customers of SAABS. The geographical focus areas within these selected provinces consist of Isando, Chamdor and Soweto in the Gauteng Province; Ottery, Belville and Newlands in the Western Cape Province, and Rustenburg, Mafikeng and Potchefstroom in the North West Province. The selected number of customers within each focus area is graphically depicted in Figure 2.

The total population of customers that receive alcoholic beverages from SAABS in South Africa adds to ± 30 000 customers. Total potential customers in the three main geographical provinces total 8 877. This reflects a representation of 29.59% of the total selected customer population in South Africa. Within this representation Gauteng represents 40.89%, the Western Cape 35.14%, and North-West Province 23.96% within the total population in the three focus provinces. If a confidence level of 90% and margin of error of

0.025 are used, then a sufficient target population for the study is 965 respondents. Based on the % representation of each focus province it adds to 395 respondents in the Gauteng Province, 339 in the Western Cape Province and 231 in the North-West Province. The total number of respondents in these three provinces was then further divided, based on the urban and rural areas compliment in South Africa (60.7% urban and 39.3% rural).

Figure 2: Customers per geographical focus area



Measuring instrument and data collection method: Data was collected by means of a structured questionnaire. Items in the questionnaire were based on the SERVQUAL model adapted to fit this specific study. All questions were adapted to be applicable to the industry of the proposed study; these were collated in the format of a book with a cover page explaining the purpose, objectives and application of the study. Section A comprised of the demographic details of the respondents. Section B consists of a five point Likert scale, based on the 22 items in the SERVQUAL questionnaire. Responses on this scale range from 1 = strongly agree to 5 = strongly disagree.

Reliability and validity: According to Burns and Bush (2010) the success of a research study is greatly influenced by the reliability and validity of the measurement instrument. Iacobucci and Churchill (2010) define a reliable measure as: "one in which the respondent answers in a very similar manner to an identical or near-identical question". Reliable feedback thus indicates the consistency of the measurement instrument.According to Zikmund and Babin (2012) a Cronbach's alpha value between 0.80 and 0.96 indicates very good reliability, a value between 0.70 and 0.80 indicates good reliability, and a value between 0.60 and 0.70 indicates fair reliability. Scales with a Cronbach's alpha value below 0.60 indicate poor reliability. The Cronbach's alpha values obtained for the questionnaire of this study ranged between 0.680 and 0.887 (see Table 1).

As for face validity, the questionnaire was pretested among a sample of 20 respondents from the target population so that they could assess whether the requisite statements had been included in the questionnaire. In terms of construct validity, a confirmatory factor analysis was conducted for each of the SERVQUAL dimensions measured in the questionnaire.

Table 1: Reliability of service quality dimensions: Expectations

Reliability -Expectations			
Factor	**Factor label**	**Cronbach's alpha value**	**Mean inter-item correlation**
1	Tangibility	0.860	0.610
2	Reliability	0.814	0.467
3	Responsiveness	0.640	0.309
4	Assurance	0.756	0.380
5	Empathy	0.680	0.333
Reliability -Realisations			
Factor	**Factor label**	**Cronbach's alpha value**	**Mean inter-item correlation**
1	Tangibility	0.726	0.397
2	Reliability	0.887	0.613
3	Responsiveness	0.782	0.472
4	Assurance	0.853	0.539
5	Empathy	0.833	0.555

4. Empirical Results

In order to comprehend the results obtained from the questionnaire fully, it was important to profile the type of respondent that receives delivery service from a SAABS. The demographic profile of respondents that was determined in terms of gender, age, position in the business, highest qualifications, home language and type of business assisted in this regard. Most respondents were situated in Gauteng Province, followed by the Western Cape and North-West Province. From. The majority of male respondents (63.30%, 418 out of 660) were situated in urban areas. Urban female respondents were slightly more (51.5%, 137 out of 266) than in rural areas. The majority (50.0%) of the respondents was aged between 31 and 40 years, followed by the ages between 41 to50 (24.3%). In the urban areas 50.6% of the respondents were between the ages of 31 to 40 years, followed by the 41 to 50 age group at 24.5%. In the rural areas 49.1% of respondents were between the ages of 31 to 40 years, followed by 24% in the 41 to 50 age groups.

The data also indicates that 81.9% of the respondents were business owners, 14.9% were senior managers and 3.2% middle managers. In both the urban and rural area the majority of respondents were business owners (urban 79.8% and rural 84.9%). As depicted only 34.2% of the respondents had a post-matriculation qualification, with the majority (43.8%) of the respondents having only a matriculation certificate. A total of 38.2% of respondents in the urban areas had a matriculation certificate; in the rural areas 52.3% had a matriculation certificate. There was also a good distribution between the home language of the respondents, with 23.3% of respondents' home language being Tswana, 23.1% being English, 21.4% being Afrikaans, and 20.1% being Xhosa. In the urban areas 27.9% of respondents' home language was English, 22.9% Afrikaans, 19.3% Tswana and 18.9% Xhosa. Within the rural areas 29.4% respondents' home language was Tswana, 21.8% Xhosa, 19.1% Afrikaans and 15.9% English.

The confirmatory factor analysis model for expectations is indicated in Figure 3. Dimensions were grouped based on collected empirical data and are as follows: Tangibility (E1 - E4), Reliability (E5 - E9), Responsiveness (E10 - E13), Assurance (E14 - E18) and Empathy (E19 - E22). The standardized regression weights (β) and correlations between the SERVQUAL constructs based on the items and dimensions for expectations, as indicated in Table 2 are all statistically significant and interpretable. The standardized regression weight for E19 was only 0.088, while all other regression weights were above 0.209. This

confirms results in exploratory factor analysis that E19 does not load together with other empathy items but is loaded as a unique factor – practical expected empathy.

Figure 3: Confirmatory factor analysis model: Expectations

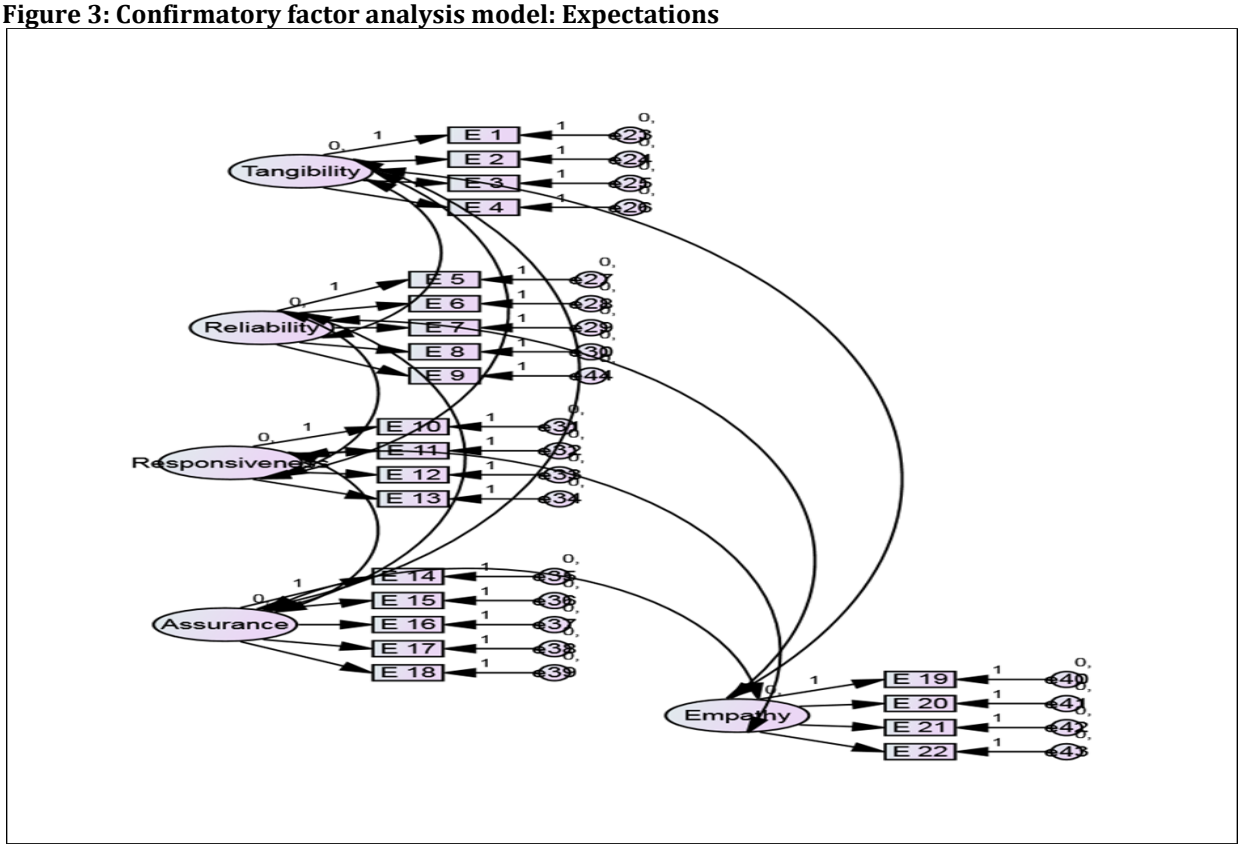


Table 2: Standardized regression weights: Expectations

Expectations - Items				
			p-value	β weight
E1	<---	Tangibility	< 0.001	0.758
E2	<---	Tangibility	< 0.001	0.894
E3	<---	Tangibility	< 0.001	0.709
E4	<---	Tangibility	< 0.001	0.766
E5	<---	Reliability	< 0.001	0.587
E6	<---	Reliability	< 0.001	0.829
E7	<---	Reliability	< 0.001	0.744
E8	<---	Reliability	< 0.001	0.671
E10	<---	Responsiveness	< 0.001	0.798
E11	<---	Responsiveness	< 0.001	0.397
E12	<---	Responsiveness	< 0.001	0.757
E13	<---	Responsiveness	< 0.001	0.209
E14	<---	Assurance	< 0.001	0.530
E15	<---	Assurance	< 0.001	0.686
E16	<---	Assurance	< 0.001	0.831
E17	<---	Assurance	< 0.001	0.711
E18	<---	Assurance	< 0.001	0.371
E19	<---	Empathy	< 0.001	0.088
E20	<---	Empathy	0.012	0.703
E21	<---	Empathy	0.012	0.650
E22	<---	Empathy	0.012	0.916
E9	<---	Reliability	< 0.001	0.571

In Table 3 it is evident that the p-value of three correlations are below 0.05, which indicates a statistically significant correlation. These were on the Tangibility-Reliability, Empathy-Tangibility and Empathy-Assurance dimensions. All three correlation values of these dimensions were small, which indicates that the correlation between the factors are also small (Tangibility-Reliability (r = 0.146), Empathy-Tangibility (r = 0.144) and Empathy-Assurance (r = 0.139). The conclusion can then be drawn that all dimensions of expectation can be seen as different dimensions.

Table 3: Correlation between expectations dimensions

Expectations - Dimensions				
			p-value	Correlation
Tangibility	<-->	Reliability	<0.001	0.146
Tangibility	<-->	Responsiveness	0.463	0.029
Tangibility	<-->	Assurance	0.681	-0.016
Empathy	<-->	Tangibility	0.036	0.144
Reliability	<-->	Responsiveness	0.540	0.025
Reliability	<-->	Assurance	0.463	0.029
Empathy	<-->	Reliability	0.063	0.107
Responsiveness	<-->	Assurance	0.174	0.057
Empathy	<-->	Responsiveness	0.321	0.043
Empathy	<-->	Assurance	0.041	0.139

Figure 4 displays the urban area and rural area respondents' results as per their expectations of the service quality dimensions of service they receive from SAABS. Again the results are based on the Likert scale used (1 = Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree and 4 = Strongly disagree). Respondents in both the urban and rural areas indicated that they expected good service delivery from the SAABS on all five dimensions of service quality.

Figure 4: Urban versus rural areas service dimensions expectations

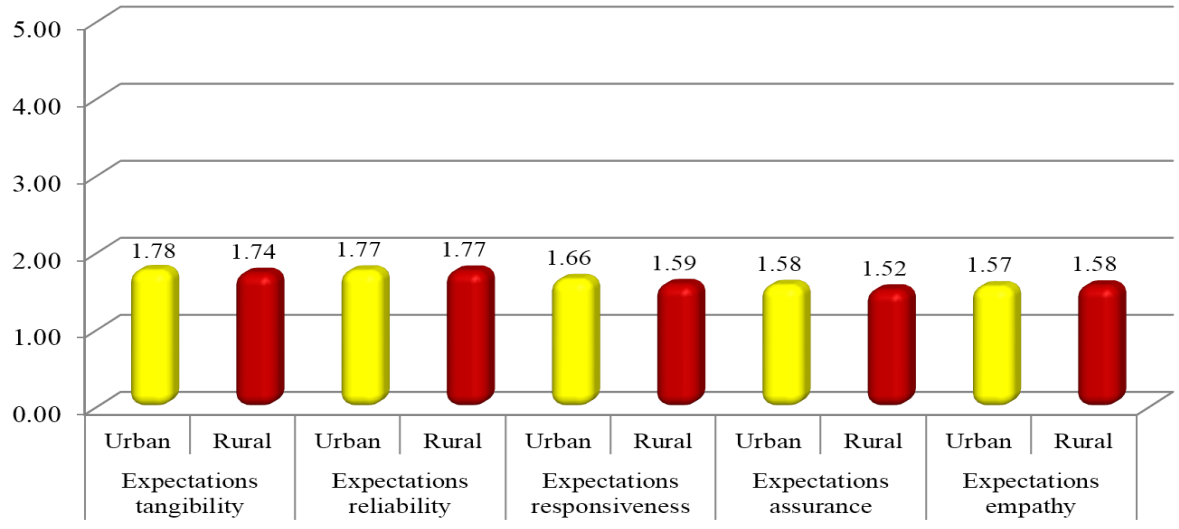


Table 4 displays the effect size and p-values of the T-test done between the urban and rural area respondents on each individual dimension. An 0.2 on the effect size indicates a small practically significant difference, 0.5 indicates a medium practically significant difference and 0.8 a large practically significant difference. There were two dimensions with p-values lower than 0.05, which indicates statistically significant differences. On

these two dimensions the effect sizes were 0.16 (expectations responsiveness) and 0.15 (expectations assurance) respectively. These indicate that there is no practically significant difference. There is thus no practically or statistically significant difference between the urban and rural area respondents' expectations of service quality based on the five service quality dimensions as received by SAABS.

Table 4: Urban and rural areas expectations

Dimension	Urban/Rural	Mean	Std. Deviation	p-value	Effect size
Expectations Tangibility	Urban	1.78	.49116		
	Rural	1.74	.50644	0.293	0.07
Expectations Reliability	Urban	1.77	.44022		
	Rural	1.77	.47294	0.984	0.00
Expectations Responsiveness	Urban	1.66	.39862		
	Rural	1.59	.38537	0.014	0.16
Expectations Assurance	Urban	1.58	.37441		
	Rural	1.52	.39612	0.026	0.15
Expectations Empathy	Urban	1.57	.37268		
	Rural	1.58	.39141	0.655	0.03

In Figure 5 the results of the urban area and rural area respondents' results as per their realizations of the service quality dimensions of service they receive from SAABS are displayed. Respondents in both the urban and rural areas indicated that they do not receive service delivery from the SAABS on all five dimensions of service quality to their satisfaction.When comparing the rural area respondents' realizations results based on the five service quality dimensions as received from SAABS the trend seems similar to the urban respondents' results. All five dimensions' results returned a mean value near to the Disagree option.

Figure 5: Urban versus rural areas service dimensions realizations

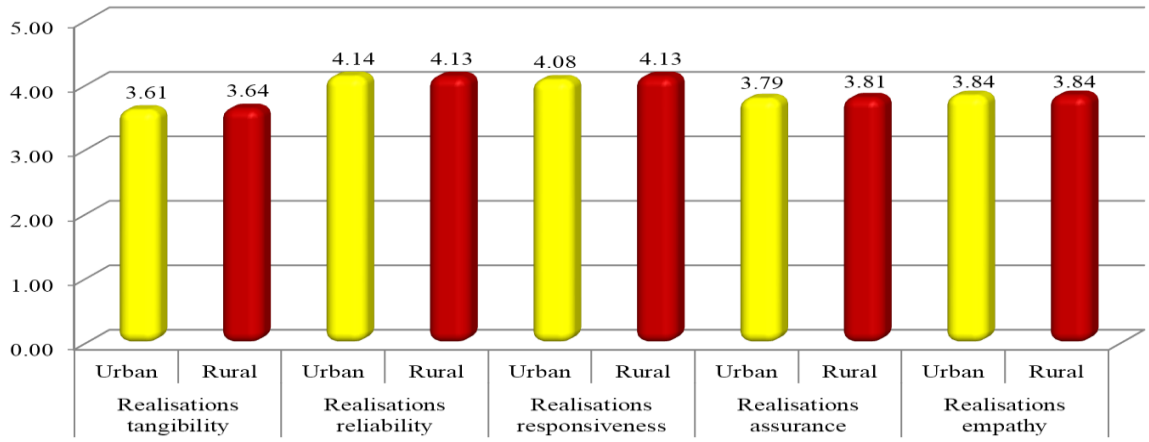


Table 5: Urban and rural areas realizations

Dimension	Urban/Rural	Mean	Std. Deviation	p-value	Effect size
Realisations Tangibility	Urban	3.61	.44859		
	Rural	3.64	.47678	0.448	0.05
Realisations Reliability	Urban	4.14	.58275		
	Rural	4.13	.59580	0.949	0.00
Realisations Responsiveness	Urban	4.08	.58720		
	Rural	4.13	.53464	0.157	0.09
Realisations Assurance	Urban	3.79	.53397		
	Rural	3.81	.51219	0.667	0.03
Realisations Empathy	Urban	3.84	.54280		
	Rural	3.84	.55571	0.957	0.00

The paired effect size and returned p-values displayed in Table 5 show that there is in fact a statistically significant difference between the means. All the dimensions returned a p-value higher than 0.05. This indicates that there is no statistical significant difference. Neither is there a practically significant difference.In summary, no practically or statistically significant difference between the urban and rural area respondents' realizations of service quality based on the five service quality dimensions as received by SAABS, could be found.Table 6 illustrates the difference in the respondents' expectations versus their realizations on all five service quality dimensions. Most of the respondents of SAABS felt that the companies must deliver on all five service quality dimensions, but in their expectations indicated the SAABS did not deliver to the full satisfaction of the respondents.

Table 6: Dependent T-test results

Dimension	Mean	N	Std. Deviation	Std. Error Mean	P-value	Effect size
Expectations tangibility	1.7611	926	.49737	.01634		
Realisations tangibility	3.6239	926	.45999	.01512	<0.001	3.75
Expectations reliability	1.7691	926	.45336	.01490		
Realisations reliability	4.1363	926	.58769	.01931	<0.001	4.03
Expectations responsiveness	1.6331	926	.39443	.01296		
Realisations responsiveness	4.1031	926	.56702	.01863	<0.001	4.36
Expectations assurance	1.5587	926	.38409	.01262		
Realisations assurance	3.7972	926	.52512	.01726	<0.001	4.26
Expectations empathy	1.5699	926	.38013	.01249		
Realisations empathy	3.8404	926	.54771	.01800	<0.001	4.15

It is also evident in Table 6 that there is a practically significant difference between the means on all the service delivery dimensions when considering the respondents' responses. All effect sizes were above 3.74; this indicates a large practical significance. The p-values that were returned on all the dimensions were smaller than 0.05 which indicates a statistically significant difference between the respondents' expectations and realizations of service delivery form SAABS.In summary, there are a practically and statistically significant difference between the respondents' expectations and realizations of service quality based on the five service quality dimensions as received by SAABS.

Major findings, implications and recommendations: The following section indicates all the main findings pertaining the study results. Conclusions, implications (if applicable) and recommendations are discussed in relation to the main findings.

B1	The confirmatory factor analysis supports the fact that the five factors identified through the theoretical exploration of the study are valid and correspond to the SERVQUAL instrument that measures service quality for expectations.

Conclusion 1: It has been observed that the exploratory and confirmatory factor analysis done in confirms the validity of using the SERVQUAL measures that have been identified in this study to determine service quality within the alcoholic beverage supplying industry in South Africa.

Recommendation 1: SAABS can consider using the SERVQUAL measures that have been identified in this study to assess their own levels of service quality.

B2	The five factors confirmed by the confirmatory factor analysis are sufficiently reliable to measure service quality expectations and realizations.

Conclusion 2: The reliability analysis that was done confirms the usage of the SERVQUAL measures that have been identified in this study to determine service quality within the alcoholic beverage supplying industry in South Africa.

Recommendation 2: SAABS can consider using the SERVQUAL measures that have been identified in this study to assess their own levels of service quality.

B3	The study's respondents indicated that the SAABS need to deliver on all the service quality dimensions but fail to do so to their satisfaction.

Main finding B3 is discussed and recommendations are made in detail in combination with main finding B13.

B4	There is no practically or statistically significant difference between male and female respondents' expectations and realizations on all service quality dimensions.

Conclusion 3: There is no statistically or practically significant difference between male and female respondents' expectations and realizations on all five service quality dimensions.

Recommendation 3: SAABS should not differentiate between genders when delivering a service; the same level of service delivery should apply to all genders on all five service quality dimensions.

B5	Respondents do not differ in their expectations or their realizations of a service that they receive from SAABS even though the position that they hold in the business differs.

Conclusion 4: Even though respondents differ in terms of their position in the business, their expectations and realizations of service delivery from SAABS do not differ statistically or practically.

Recommendation 4: SAABS should not give priority of service delivery to customers that hold different positions in their business. This entails (for example) that SAABS should not give better service to an owner of a business than to a middle manager.

B6	There is no statistical difference between the means of respondents with different qualifications.

Conclusion 5: Respondents with different qualifications do not differ in their expectations and realizations of service delivery as received by SAABS.

Recommendation 5: SAABS should not treat customers differently when delivering a service to them even though their qualifications differ. The employees of SAABS should not treat customers differently even though they know what their qualification background is; a person with only a secondary qualification views the importance of service delivery in the same light as a person with a post-graduate degree.

B7	There is no statistically significant difference between the means on all service quality dimensions expectations and realizations of respondent results based on their home language.

Conclusion 6: Respondents' expectations and realizations of service delivery as received from SAABS do not differ even though their home language does.

Recommendations 6: SAABS should not differentiate between their customers on grounds of home language. Especially sales force and telesales agents should not have pre-conceived ideas of what their customers expect of service delivery from their ABSC even if they differ in home language. The execution of daily service delivery should not differ even though the companies have knowledge of the customers' home language.

B8	There was no statistically significant difference between the respondents' realizations and expectation on all service quality dimensions based on their type of business (COT).

Conclusion 7: Respondents' data did not show any statistically significant difference relating to their expectations and realizations of service delivery from SAABS despite practicing different types of business in the SAABSI

Recommendation 7: This result can be viewed as very important as employees within SAABS view customers within different COT as being of different importance to the industry. A customer within the restaurant and bar COT is usually not viewed as important as a customer in the IRD, SPL COT or tavern COT when it comes to executing service delivery across all five dimensions. This is mainly due to the difference in volume. The finding indicates that even though the customer is in a "less important" COT (as viewed by employees) he or she still views the expected and realized service delivery from SAABS in the same manner as a customer in a more important COT. The main recommendation regarding this finding is that all customers (irrespective of COT) should receive the same level of service delivery from SAASBC across all five service quality dimensions.

B9	There is no practically significant difference between the expectations and realizations of respondents based on their provinces.

Conclusion 8: This study included respondents and customers of SAABS within three provinces in South Africa, namely North West, Gauteng and the Western Cape Province. The statistical results returned in this study indicate that respondents in all three provinces do not differ in their expectations of service delivery from SAABS, with these respondents indicating that they expect the SAABS to deliver on all five service quality dimensions. There is no statistically or practically significant difference between the means of respondents' expectations of service delivery.

Recommendation 8: Due to this significant finding, the recommendation in this instance is several recommendations. Firstly, if the company has an area/region/province approach to training the sales force and customer call centre employees, the customer service training should be standardized. The employees in these roles will then receive the correct applicable training that will enhance their skills and knowledge to be able to serve customers on the same service delivery levels, even if the customers are from different provinces. Secondly, if such a company has a centralized or national approach to the customer service approach and interaction with customers, the SAABS can use the findings from the study to improve/amend or adapt their current customer service training.

B10	There is no practically or statistically significant difference between the urban and rural area respondents' expectations of service quality based on the five service quality dimensions as provided by SAABS.

Conclusion 9: Respondents indicated that they all expect the SAABS to deliver on the five service quality dimensions. What is significant in this result is that the respondents in the urban and the rural area did not

differ in their opinions about what they expected the SAABS to deliver on. Both areas (urban and rural) tended to agree that the SAABS need to deliver on all five service quality dimensions.

Recommendation 9: SAABS need to focus their attention on all five service quality dimensions to improve their service offering to their customers. The SAABS should not deem any of the dimensions more important than another dimension, as the respondents indicated that there is a minimal difference between what they expected in each dimension (they tend to agree that the SAABS should deliver on all five service quality dimensions). Results do not indicate that one dimension is more important than another dimension. The SAABS must not go about improving on certain dimensions that they feel are important to their company, but should do so holistically and improve on all dimensions.

B11	There is no practically or statistically significant difference between the urban and rural area respondents' realization of service quality based on the five service quality dimensions as received by SAABS.

Conclusion 10: There are no significant differences between urban and rural respondents' realization of SAABS actual service delivery on all five service quality dimensions. They indicated that the SAABS does not deliver to their full satisfaction on all five service quality dimensions. The urban areas realizations do not differ from the rural area realizations. Overall the respondents indicated that the SAABS fail to deliver on all five service quality dimensions.

Recommendation 10: The SAABS need to ensure they deliver on all five service quality dimensions; the data analysis shows they deliver poor customer service to their customers across the board. They need to improve their sales/call centre employees'/operational teams' interaction skills when dealing with customers; customer service training is also encouraged. The SAABS can present a customer service course for their drivers and crew; a further recommendation is made in Recommendation 11 for other service quality dimensions. SAABS should also not deem urban areas customers more important than rural customers and vice versa when delivering a service. Differentiation between urban and rural customers can lead to customer defection, loss of sales and loss of profit.

B13	There is a practically and statistically significant difference between the respondents' expectations and realizations of service quality based on the five service quality dimensions as received by SAABS.

Conclusion 11: Respondents indicated that they expect the SAABS to deliver on the five service quality dimensions but that these companies fail to do so to their satisfaction.The fact that customers of SAABS indicated that they do not receive the expected service delivery to their satisfaction can have numerous implications for the SAABS; these include the following:

- Loss in customer retention.
- Bad company image and reputation.
- Loss in sales, volume and overall profit.
- Reduction in loyal customers.
- Increase in cost to retain customers and to re-establish the image and reputation.

Recommendation 11: Recommendations are made per service quality dimension.
Recommendation 11.1: SAABS can improve on their service levels in respect to the *tangibility dimension*:

- Companies can improve the look of their fleet (trucks and trailers) overall; this can be budgeted for on a yearly basis.
- They can implement a truck/trailer washing and scrubbing plan to improve the appearance of the trucks.
- Yearly fleet audits to ensure that the appearance of trucks/trailers is maintained can be introduced
- SAABS can upgrade their delivery equipment on a continuous cycle (devices that print invoices/statements when delivering to customers); this will ensure the neatness, correctness and overall modern look of the companies' equipment.
- Companies can ensure the upkeep of the equipment to ensure invoicing can take place correctly.

- SAABS must also ensure that their crewmen/drivers/sales force and any employee of the company that interacts with customers are neat in their appearance on a daily basis; this includes wearing neat working outfits so that they look presentable when dealing with customers.

Recommendation 11.2: SAABS can improve on their service levels with regard to the *reliability dimension*:

- Companies need to execute their promises to their customers timeously.
- Employees of SAABS should not make promises to customers that they cannot honor.
- SAABS should resolve customers' problems and complaints timeously and accurately.
- They should ensure that the service is delivered correctly the first time.
- When a time is promised to the customer (being it delivery or resolution time of a complaint or problem) then the employee or company representative needs to ensure he/she adheres to the time promised.
- SAABS must ensure that the equipment they have in place is not faulty, and if found faulty that there is a backup procedure in place to ensure error-free invoicing.

Recommendation 11.3: SAABS can improve on their service levels with regard to the *responsiveness dimension*:

- Companies need to offer their customers prompt service delivery.
- Employees need to be truthful about when a service will be performed.
- Companies must ensure that all employees that interact with customers have completed a customer service training course.
- They should ensure that employees are always willing to assist customers to resolve queries and complaints and pay attention to questions and requests.
- SAABS can also ensure that their call centre agents do not let people wait for a call to be answered; this can be done by ensuring that when a line is engaged the call is diverted to an open line.

Recommendation 11.4: SAABS can improve on their service levels with regard to the *assurance dimension*:

- SAABS need to ensure that their employees who interact with their customers have the necessary skills and knowledge to answer customers' questions, queries and complaints.
- They must ensure employees treat customers courteously at all times.
- Employees need to ensure that they give customers individual attention.
- Employees' attitude and behavior must instill confidence into their customers at all times.
- The SAABS need to make sure that their customers feel safe when transacting with the company.

Recommendation 11.5: SAABS can improve on their service levels with regard to the *empathy dimension*:

- SAABS can ensure that they have convenient operating hours; this will entail having the call centre open and making deliveries to customers at convenient times.
- Employees of the SAABS need to understand the needs of their customers.
- Employees must be sincere in their dealings with customers.
- Call centre and sales staff need to be trained on a customer service course or programs to ensure they entrench good customer service principles.

Limitations of this study and areas for further research: Existing research on CRM and the South African alcoholic beverage supplying industry is limited, which implied that the researchers had to rely on other service industry sources (that are mainly founded in the banking industry) and apply this to the South African alcoholic beverage supplying industry. It was not possible to include all provinces and customers of SAABS, due to the size of the industry in South Africa.The CRM model composed in this study can be tested in other service industries to determine its relevance and applicability. In this study only overall service quality dimensions were evaluated; a similar study can be conducted to establish if there are certain specific items within each dimension that are deemed more important than others.

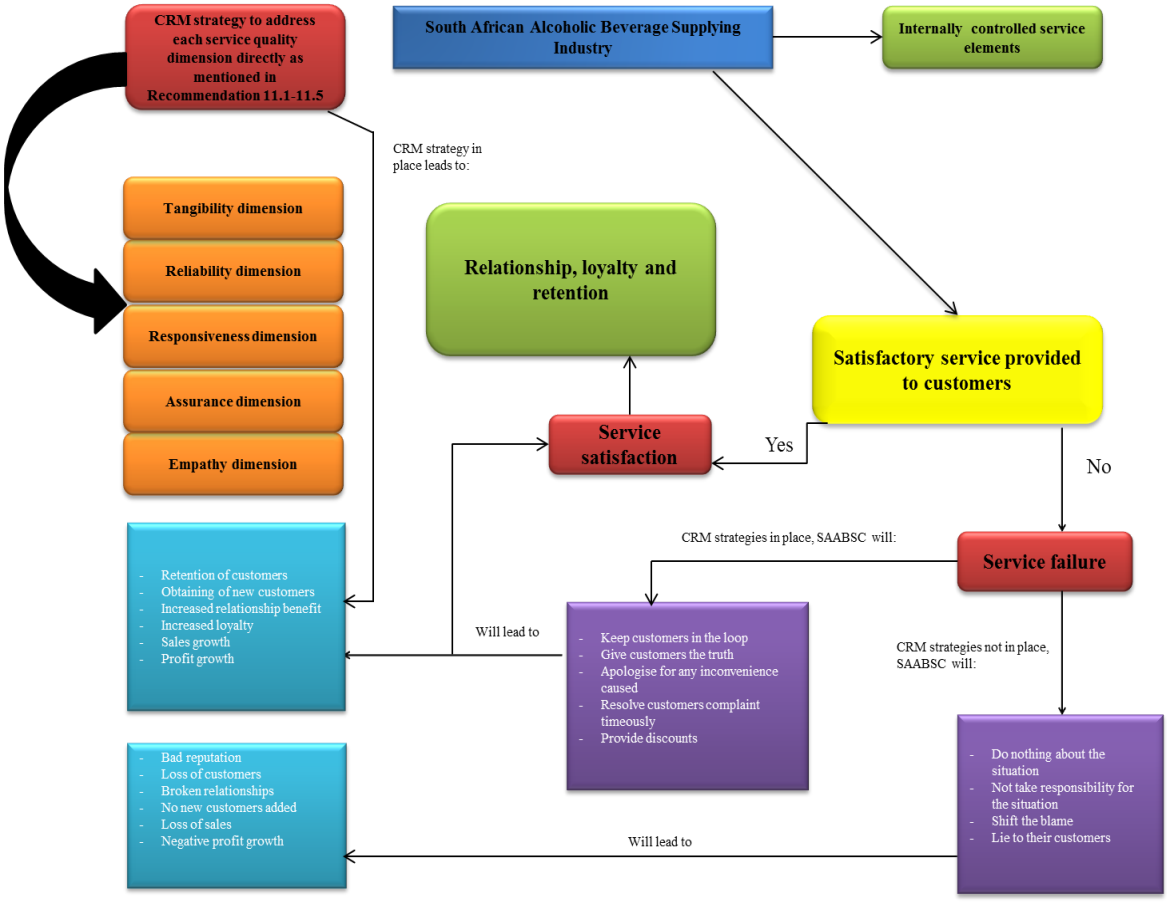
In the current highly competitive FMCG (Fast Moving Consumer Goods) market there is huge emphasis on service delivery and customer service due to the fact that these two aspects can be the determining factor in overall customer satisfaction and for overall business performance. There has been an overall decline in

volume growth in the SAABSI; possible reasons could be poor service delivery from the SAABS. The findings of the study confirm this concern in the industry. As depicted in Figure 6 the SAABS can address their poor service delivery by implementing the proposed structure. The proposed structure will ensure that the SAABSC deliver high quality service to their customers.

5. Conclusion

In a global world economy, where ABSC (alcoholic beverage supplying companies) are competitive and consumers very demanding, it is increasingly difficult to hide inefficiencies in a company's service delivery execution and process. The primary objective of the study was to determine if differences exist between customer expectations and customer realizations of SAABS (South African alcoholic beverage suppliers)service delivery to their customers, based on their geographical location (rural vs. urban). The SAABS need to establish which service element is important to their customers. As reported in this study, the customers in urban and rural areas indicated that all five service quality elements are deemed important and that customers do not get satisfactory service in all the dimensions. Recommendations on how to improve on these dimensions were given in the form of CRM strategies that SAABSC can implement. Ensuring that these recommendations are implemented will ensure a higher level of service quality and customer satisfaction. This should lead to increased customer retention, sales and profit growth, increased loyalty, the addition of new customers and overall better customer relationship. It is also important to note that if there is any sort of unsatisfactory service delivery or customer unhappiness regarding SAABSC service delivery; it will be regarded as a service failure. If and when there is a service failure, the SAABSC can also use the CRM proposed structure recommendations to ensure the damage is minimal and that they can deliver superior recovery customer service to their customers.

Figure 6: Proposed structure for the SAABSI



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Effectiveness of Monetary Policy and the Growth of Industrial Sector in China

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Abstract: China is viewed as the pillar of Emerging Market Economies (EMEs), deems to surpassed United State, and become the topmost industrialized country in the world with the prospects of major shift in the future world power. However, growth rate has slow down since the third quarter of 2014. Through this paper, we aim at investigating the impacts of monetary policy on industrial sector growth, and determine whether the long-run industrial sector growth in China can be foster by the effectiveness of monetary policy. It also examines the interrelationships among the variables employed and determines the steady-state relationships between industrial sector growth and monetary policy. Time-series econometric techniques such as unit roots, ARDL and ECM are employed to monthly data for the year 1994:1 to 2013:12.According to the empirical results derived, the effectiveness of monetary policy significantly affects industrial sector growth and the short-run impact of monetary policy on industrial output production is established.

Keywords: *Monetary Policy, industrial sector Growth, ARDL Model*

1. Introduction

The issue of how monetary policy affects industrial sector growth and stimulates output has been widely debated over the years. A major source of the debate is centered around the degree of impact the monetary policy has on the industrial sector in stimulating output growth. The debate has thus been does monetary policies have any impacts on industrial sector growth. While it is generally agreed upon that monetary policy impacts economic activities and industrial sector growth, others have different views on the extent to which the phenomenon occurs. This growing concern about how effective monetary policy is in affecting industrial sector growth rooted the researchers' desire to carry out an empirical investigation on the effectiveness of monetary policy and industrial sector growth in China. There is also the need to better understand the links between the monetary policy and the industrial sector growth. It is worthy to note that the monetary policy environment in China has been challenged over the years where the country has struggled to move to a more market oriented financial system (see Liao and Tapsoba, 2014). There has been instability in the recent past, with the economy being vulnerable to global shocks and competiveness from the United State (US) on which economy controls the global market. For example, the mounting problems on Chinese economy in which Exports, which have declined throughout the first quarter of 2015, fell again in July by 8.3%. Imports were also down, dropping 8.1% in July from a year earlier, after a decline of 6.1% in June, pointing to a slowdown in demand from Chinese industries for raw materials. This led to a surprise move by the monetary authority to lower by 2% the value of its currency.

Historically, the China's monetary policy has in general implemented three major strategies since 1984 in order to stabilize the economy and achieve industrial sector growth. First, in 1984–1992, China's monetary policy was based on flexible and tight monetary policies; second, in 1993–1996, the monetary policies were some moderately tight monetary policies; thirdly, (1997–date), mature and judicious monetary policies have been implemented (see Zhou, 2015). The relationship between money supply, prices and economic growth shows different characteristics and some inbuilt mechanism through which industrial output is also stimulated under these three strategies. However, famous researchers in the field of monetary economics in China have tried through their studies to unravel those inbuilt mechanisms through which monetary authority stimulates the economy. Geiger (2008) focuses on instruments of monetary policy (interest rate and money supply) in China and their effectiveness in achieving economic growth target. Recently, Fernald et al. (2014) expanded on it and concentrated on monetary policy effectiveness in stabilizing economic activities in China. Liao and Tapsoba (2014) in the same vein looked at monetary policy and interest rate liberalization. They studied the stability of money demand function in the light of progress in financial sector reform that can stimulate economic growth. All these were just to mention a few of monetary researches on the effectiveness of monetary policy. However, a common feature of most of these studies is the fact that they were based on partial assessment to unravel the degree to which monetary policy can affects the economy.

None of the study has focus on industrial sector, the fastest engine through which domestic prosperities can be achieved. This research work tends to focus on this and other issues relating to the effectiveness of monetary policy on the China's economy. Our understanding of how these monetary instruments (interest rate, exchange rate and money supply) and the control variable (prices) relate with our industrial sector growth will provide insights to whether or not the monetary policy can stimulate industrial output growth. It will further allow the study to unravel the inbuilt mechanism through which policy actions are formulated to guide against unstable monetary environment in the economy. Finally, it will also help in understanding the need for a stable exchange rate to curb the slow growth rate, exchange rate depreciation and other challenges that is currently seeing in the country.

2. Literature Review

The link between monetary policy and output growth has been widely discussed in the literature. IMF (2000), in one of its publications focuses on the need to determining the extent to which a nation's monetary policy affects her industrial output and affect economic growth. According to the publication, the effectiveness of monetary policy is vital to the achievement of economic stability in any nation. However, Sun (2013) asked; does monetary policy matter in China and does it affects industrial output growth? To answer this question, divergence views erupted. Gong and Li (2006) indicate that there exists a limited effect of monetary policy on industrial output and that the change in money supply is not associated with the change of price index in stimulating industrial output in China. Ping (2004) found evidence that there exists long-run monetary neutrality in China, and the margins of price fluctuation are proportionally associated with changes in money supply. In this regard, Uhlig (2005) concur and reveals that monetary policy has no clear effect on the GDP especially on the industrial output growth. In South Africa, Precious and Makhetha-Kosi (2014) share the same view and show that money supply, repo rate and exchange rate are insignificant monetary policy instruments that drive output growth. In addition, Kutu and Ngalawa (2016) further demonstrate that monetary authorities have very limited control over industrial output growth using instruments of monetary policy.

On the contrary, the finding of Fasanya et al. (2013) opposes what Precious and Makhetha-Kosi (2014) reveals in South Africa. Their study shows that inflation rate, exchange rate and external reserve are significant monetary policy instruments that drive industrial output growth. Muneer et al. (2011) and Dong (2012) found a relationship between monetary policy and economic development and that monetary policy plays an important role in the macro-economic control in China including industrial output growth. Similarly, Kutu et al. (2016) reveal that monetary policy (money supply) is observed to exert a significant positive impact on output growth in the short-run from about the eighth month. Liu et al. (2002) also provides an empirical support of the stable relationship between CPI and money supply in stimulating industrial output growth. The mechanism in such that an increase in money supplies will lower interest rate, low interest rate will increase the borrowing capacity of investors and increase investment and on timely, boost output production and stimulate industrial output production (growth).

Nevertheless, neither of the two contrary opinions mentioned above on the Chinese economic performance and the practice of monetary policy can be discarded, but established consensus of economists believe that monetary policy plays an important role on economic activities of a nation. For example, on the global happenings, Kim (1999) reveals that monetary policy matters and has significant effects on output in the short-run and that a proportion of output fluctuation in postwar G-7 is caused by monetary policy shocks. This view is also in line with Nagel and Parker (2003) that innovations (shocks) of any of the monetary policy variables have the potential for stimulating the economy and in particular, the industrial output. Chuku's (2009) study further highlights the effects of monetary policy shocks on output and prices on the Nigerian economy with the affirmation that monetary policy shocks have both real and nominal effects on economic parameters. His conclusion is that an innovation in the quantity-based money supply (M2) affects economic activities, and that monetary policy shocks have been a modest driver of the business cycle in Nigeria. Finally, Bernanke et al. (2005) are of the same mind that monetary policy is relevant and can impacts industrial output growth. According to them, monetary authorities are tasked with the duty of analysing thousands of variables in their decision-making process to determine how to respond to a shock in the economy. Their decision is usually well guided on price stability and output growth, hence, affects economic activities. Base

on the forgoing, the debate on the effectiveness of monetary policy in stimulating industrial output in China need to be empirically studied and resolved.

3. Methodology

Achieving the study's objective will help answer the following research questions:

- Do monetary policies affect industrial output growth in China?
- Is there a stable relationship between industrial sector growth and the variables employed?
- Can the long-run industrial sector growth in China be foster by the impact of monetary policy?
- Is there a steady-state relationship between industrial sector growth and monetary policy?

From the standard growth equation, this study employs the endogenous growth model (AK model). The industrial output production is assumed to take the form of production function because the first version of the endogenous growth model (AK model) takes its root from the Cobb-Douglas production where the steady state (convergence theory) is established (see Muneer & Rehman, 2012). Therefore, from the industrial output growth equation, we derive the estimable form using a Cobb-Douglas specification as follows:

$$Y_t = AK_t^a L_t^b,\ 0 < a < 1,\ 0 < b < 1, \quad \ldots\ldots(1)$$

where Y_t, K_t and L_t are output, capital, and labor, respectively, and A is a total or technology factor productivity (TFP). It further signifies other factors not captured by labor and capital, and sometimes refer as an unconventional input. As employed in this study, we assume TFP is a function of interest rates (IN), exchange rates (EX), money supply (MS) and inflation (IF) over a given period of time t which is specified as:

$$A_t = f(IN_t, EX_t, MS_t, IF_t) \quad \ldots\ldots(2)$$

Therefore, substituting A_t in equation (2) into equation (1), we get a new extended Cobb-Douglass production function given by:

$$Y_t = IN_t^{\alpha 1} EX_t^{\alpha 2} MS_t^{\alpha 3} IF_t^{\alpha 4} K_t^a L_t^b,\ 0 < a < 1,\ 0 < b < 1, \quad \ldots\ldots(3)$$

Following Omar and Hussin (2015:102), we linearize and take logs of the equation (3) given as:

$$logY_t = \alpha_0 + \alpha_1 logIN_t + \alpha_2 logEX_t + \alpha_3 logMS_t + \alpha_4 logIF_t + alogK_t + blogL_t + \varepsilon_t, \quad \ldots\ldots(4)$$

Note that interest rate (IN) is in its natural log and does not necessarily re-logged. Equation (4) above characterizes our industrial output growth model for the Chinese economy where Y_t is viewed as industrial output production that captures the industrial sector contribution to GDP. Our industrial output production (IP)can be substituted into the equation as:

$$logIP_t = \alpha_0 + \alpha_1 logIN_t + \alpha_2 logEX_t + \alpha_3 logMS_t + \alpha_4 logIF_t + alogK_t + blogL_t + \varepsilon_t, \quad \ldots\ldots(5)$$

Where IP_t is a proxy of Y_t to capture industrial output production; α_o is constant; $\beta_1 logIN_t + \beta_2 logEX_t + \beta_3 logMS_t + \beta_4 logIF_t$ capture $logA$(TFP) that are not captured by labor and capital; $alogK_t$ and $blogL_t$ are capital and labor respectively and ε_t is the error term.

However, to model data appropriately and extract both long-run and short-run relationships in achieving the study's objective, we take into account the existence of unit roots and cointegration associated with the data to determine the appropriate methodology. To achieve this, Giles (2013) enumerates four guides to choose an appropriate methodology; firstly, when all of the series are stationary at I(0), in this case, an Ordinary Least Square (OLS) estimation is appropriate. Secondly, when all the series are integrated of the same order (*e.g.*, I(1)), but they are not cointegrated. In this case, Vector Autoregressive (VAR) estimation in first differences involving no long-run estimation is very suitable. Thirdly, when all series are integrated of the same order, and are also cointegrated, in this case, there are two types of regression models that can be estimated: (i) An OLS regression model using the levels of the data (Johansen's method). This will provide the long-run equilibrium relationships between the variables. (ii) An Error Correction Model (ECM), estimated by OLS. This model will represent the short-run dynamics of the relationship between the variables. Finally, in a more complicated situation where some of the variables in question are stationary at levels I(0) and some are I(1)

or even fractionally integrated leading to no clear cut in the three situations noted above. This situation is particular to series employ in this study and hence, forms the bases of the adoption of the advance methodology of Pesaran et al. (2001) Autoregressive Distributed Lag (ARDL) model that is most suitable.

Estimating Technique: The estimating technique adopted in this study is the ARDL approach of Pesaran et al. (2001) to test for existence of long-run and short-run relationship between the industrial output production and monetary policy using industrial production data, monetary variables and control variable. The choice of the ARDL methodology for this study is based on a number of features that give it some advantages over conventional cointegration testing. For instance:

- It is the most recent estimation technique to estimate long-run and short-run dynamics (Giles, 2013).
- It can be used with a mixture of I(0) and I(1) data: This means that this approach can be applied to sequence whether they are I(0), I(1), mutually co-integrated, or irrespective of their order of integration but not I(2) (Sari et al., 2008 and Katircioglu, 2009).
- It allows different variables to be assigned different lags in the model (Giles, 2013).
- It can accommodate more than two lags and up to six variables (Giles, 2013).
- It allows the short-run and long-run of the model to be estimated simultaneously (Dritsakis, 2011).
- It is good for both small and large sample size (see Narayan, 2005; and Rafindadi and Yosuf, 2013).
- Lastly, it involves just a single-equation set-up, making it simple to implement and interpret (Giles, 2013).

In line with the above justification for the choice of the estimation technique, the ARDL further enables this study to conduct empirical comparison and determine the fundamental factors the monetary policy has on the growth of industrial sector (output) in the short-run and in the long-run and also establish the bond testing approach to cointegration for the Chinese economy. Therefore, equation (5) can be simplified into a basic ARDL regression model in a matrix form to capture the Chinese economy given as:

$$\Delta IP_t = \beta_0 + \sum_{j=1}^{n} \beta_1 \Delta IP_{t-1} + \sum_{1=0}^{n} \beta_2 \Delta EX_{t-1} + \sum_{1=0}^{n} \beta_3 \Delta IF_{t-1} + \sum_{1=0}^{n} \beta_4 \Delta IN_{t-1} + \sum_{1=0}^{n} \beta_5 \Delta MS_{t-1} + \alpha_1 IP_{t-1} + \alpha_2 EX_{t-1} + \alpha_3 IF_{t-1} + \alpha_4 IN_{t-1} + \alpha_5 MS_{t-1} + \varepsilon_t, \quad (6)$$

where IP_t is a (5x1) vector of endogenous variables capturing industrial production; β_o is a (5x1) vector of constant components; Δ denotes the first difference operator; IP_{t-1}, EX_{t-1}, IF_{t-1}, IN_{t-1} and MS_{t-1} are lagged endogenous variables; $\beta_1 - \beta_5$ represent short-run dynamics of the model; $\alpha_1 - \alpha_5$ correspond to the long-run relationship, and ε_t is a (5x1) vector of random disturbance term (error term). As earlier stated, all variables are in their logarithm form except the interest rate that is on its natural log.

Furthermore, the ARDL method estimates $(n+1)^k$ number of regressions in order to obtain the optimal lag length for each variable, where p is the maximum number of lags to be used and k is the number of variables in the equation. The appropriate lag selection is based on the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC) as popularly used in the literature (see Pesaran et al., 2001; Dritsakis et al., 2011 and Saibu and Apanisile, 2013). In line with the above model in equation (6), there are five steps to carry out ARDL estimation: the ARDL Unit Root Testing, the ARDL Lag Lengths Determination, the ARDL Regression, and the ARDL Bond Testing for Cointegration and the ARDL Error Correction Model (ECM).

The ARDL Unit Root Testing: As a pre-condition for cointegration analysis, this study estimate time series data to test the unit root hypothesis. What then is unit root? A unit root is a process that evolves through time that can cause problems in statistical inference involving time series models. According to Omolade et al. (2013), a unit root implies that the time series under scrutiny is non-stationary while the absence of a unit root means that the stochastic process is stationary. To determine the order of series, we follow Sari et al. (2008) and conduct six different unit root tests. We conduct the tests using the augmented Dickey and Fuller (ADF), Dickey-Fuller test, Phillips and Perron (PP), Elliot test, Kwiatkowski (KPSS) test and Ng and Perron (2001). All tests produced similar results. However, for us to preserve space, we report the robust version of Augmented Dickey-Fuller Test (ADF) and Phillips and Perron (PP) at the individual intercept and the individual intercept plus trend. The unit root null hypotheses tested for the ADF and PP are:

- $H0: \alpha = 1$, the series is non-stationary.

- $H1: \alpha \neq 1$, the series is stationary.

According to Pesaran et al. (2001), the ARDL approach is applicable irrespective of whether underlying variables are purely I(0), I(1) or mutually co-integrated. However, they further revealed that the dependent variable must be I(1) and the independent variables I(0) or I(1) (see Kouakou, 2011:5).

The ARDL Lag Lengths Determination: One of the advantages of ARDL is that different variables can be assign different lags as they enter the model (Giles, 2013). The lag length gives an indication of the time to which monetary policy action to promote industrial sector growth is implemented. According to Ali et al. (2008), the order of lag selection criteria for ARDL model is usually obtained from an unrestricted VAR by the use of SIC and AIC that selects the lowest value in the overall model. The benchmarks is that, the lower the value of the SIC and AIC, the better the model.

The ARDL Regression: In econometrics, regression analysis is a statistical process for estimating the relationships among variables. It involves many techniques for modeling and analyzing several variables when the focus is on the relationship between a dependent variable and one or more independent variables. The ARDL regression model has been used in most recent times and has been more valuable vehicle for testing for the presence of long-run and short-run relationships between economic time-series. The models can be used to test for cointegration, and estimate long-run and short-run dynamics, even when the variables in question may include a mixture of I(0) or I(1) data (Pesaran et al., 2001).

The ARDL Bond Testing for Cointegration: Following the empirical literature of Ozturk and Acaravci (2013), a long-run cointegration relationship between industrial output productions and the variables employed for the ARDL estimation is carried out. What then is Cointegration? Cointegration is defined when the error term in the regression modeling is stationary. This theory was developed in the late 1980s as a statistical property of time series variables where two or more-time series are cointegrated and share a common stochastic drift (variables in the regression equation move together, e.g., they do not drift apart over time). Robinson and Marinucci (2003) reaffirmed that time series econometrician has developed cointegration techniques and generated much applied interest to be used for non-linear time series data. The testing for cointegration using Johansen cointegration test and Erik and Pär (2007) prevents the regression of non-stationary variables on other thereby avoiding results that are entirely spurious or spuriously correlated. Based on literature, there are three leading methods of testing for cointegration: The Engle-Granger two-step method, the Johansen test method and the Phillips-Ouliaris cointegration test method. However, before a time series data can be consider for cointegration, it must satisfy the condition of been integrated in the same order (first-order I(1)) and form a linear stationary combination. If residuals are in I(1), one cannot use the estimated standard errors and the associated t-values of the estimated coefficients (Gujarati, 2004), but a model containing only first differences I(1) should be estimated (Brooks, 2002). However, the ARDL model relaxes all the conditions of the conventional (Engle-Granger two-step method, Johansen test method and the Phillips-Ouliaris) cointegration test assumptions and hence, can accommodate a mixture of I(0) and I(1) variables.

The ARDL Error Correction Model: A cointegrated variable needs an Error Correction Mechanism (ECM) that must be incorporated into the regression model. The ECMs are a category of multiple time series models that directly estimate the speed at which a dependent variable (Y) returns to equilibrium after a change in independent variable (X). More so, the ECM is a theoretically driven approach useful for estimating short-term and long-term dynamic effects of one variable on another. In line with Saibu and Apanisile (2013), all coefficients of the short-run equation are coefficients relating to the short-run dynamics of the model's convergence to equilibrium and further contain the speed of adjustment that is employ in the ARDL estimation of this study.

Brief Definition of variables: In line with Omoniyi and Olawale (2015), we examine monthly data for China's economy over the period of 1994:1 to 2013:12 to determine the impacts of monetary policy on

industrial output production. The variables employ for the model are based on literatures and can be briefly define as follows.

The Dependent variable: the industrial sector (IP) contribution to GDP is the dependent variable, this is the total volume of goods and services produced and are proxy by manufacturing sector contribution to GDP as employed by Naudé et al. (2015).

The Independent variables: these are monetary variables and control variable as shown below.

- The monetary variables are policy variables usually employed by monetary authorities to achieve a certain goal. These variables are: the interest rates (IN), exchange rates (EX) and money supply (MS). The exchange rate is treated as a monetary variable since it is under the control of monetary authority in China (operating managed floating exchange rate system). All these variables are in line with Ncube and Ndou's (2011) study.
- Control variable is Consumer Price Index (CPI) that is proxy to captured inflation rates (IF) in the economy, which is in line with Ngalawa and Viegi (2011). Control variable strongly influences values and are determined by market behavior since inflation (prices) determine the total output produced.

Source of Data: The data employed in this paper are monthly time series data from 1994 to 2013. All data are sourced from the statistical database of the Central Bank of China (CBC), International Monetary Fund (IMF), International Financial Statistics (IFS), World Bank's World Development Indicators (WDI) and the Organization for Economic Co-operation and Development (OECD). All variables are in 2010 base year. They were also transformed to log except interest rate that was already in its natural log so that they have same magnitude and to improve the data analysis.

4. Results

This section deals with various analytical tests. We begin by testing for unit roots (stationarity of the data). In addition, there is a test for the ARDL lag determination. A test is also conducted to measure the strength of the model selection. The study also carries out a diagnostic test before embarking on the cointegration test.

The ARDL Unit Root Test: This study tests for the presence of unit roots using a robust version of Augmented Dickey-Fuller Test (ADF) and Philips-Perron test at the individual intercept and the individual intercept plus trend. The testing using these approaches are to compare and validate the results and further ensure consistency (See Moon and Perron, 2004; Demetriades and Fielding, 2012; Ishibashi, 2012 and Frimpong, 2012). As shown in Tables 1 and 2, these tests are conducted under the null hypothesis ($H_0: \alpha = 1$), variable is non-stationary (that is, there is unit root) as opposed to the alternative hypothesis ($H_1: \alpha \neq 1$) of stationarity (no unit root). The aim here is to establish that no variable is I(2) as suggested by Pesaran et al. (2001). Base 0n the test, two of the variables are I(0) while others are I(1) and none is in I(2). The P-Values are shown at 1%, 5% and 10%, which show that all the variables are statistically significant and stationary (has no unit roots). This satisfies Pesaran et al. (2001) that the dependent variable must be I(1) and the independent variables I(0) or I(1).

Table 1: ADF unit root tests

Variables	ADF Unit root-test (individual intercept)			ADF Unit root-test (individual intercept and trend)		
	Order of integration	t* Statistics	P- Value	Order of integration	t* Statistics	P- Value
IP	I(1)	151.640	0.0000***	I(1)	127.601	0.0000***
EX	I(0)	361.007	0.0000***	I(0)	346.251	0.0000***
IF	I(1)	197.042	0.0000***	I(1)	159.730	0.0000***
IN	I(0)	40.8427	0.0000***	I(0)	59.9770	0.0000***
MS	I(1)	289.576	0.0000***	I(1)	251.973	0.0000***

"***" "**" and "*" represent statistical significance at 1%, 5%, and 10% respectively.

Table 2: PP unit root tests

Variable	PP Unit root-test (individual intercept)			PP Unit root-test (individual intercept and trend)		
	Order of integration	t* Statistics	P Value	Order of integration	t* Statistics	P- Value
IP	I(1)	468.942	0.0000***	I(1)	460.835	0.0000***
EX	I(0)	344.903	0.0000***	I(0)	326.665	0.0000***
IF	I(1)	268.564	0.0000***	I(1)	352.520	0.0000***
IN	I(0)	26.3052	0.0034***	I(0)	38.6539	0.0000***
MS	I(1)	217.336	0.0000***	I(1)	160.643	0.0000***

"***" "**" and "*" represent statistical significance at 1%, 5%, and 10% respectively.

The ARDL Lag Determination: The orders of lags are selected using the Schwarz Information Criterion (SIC) and Akaike Information Criterion (AIC) that are commonly used in literature of ARDL estimation (see Pesaran et al., 2001 and Ozturk and Acaravci, 2011).

Table 3: The Panel ARDL Lags Selection Criteria

Serial number	Variables	Lag selections
1	Industrial Production (IP)	4
2	Exchange Rates (EX)	1
3	Inflation Rates (IF)	0
4	Interest Rates (IN)	2
5	Money Supply (MS)	1

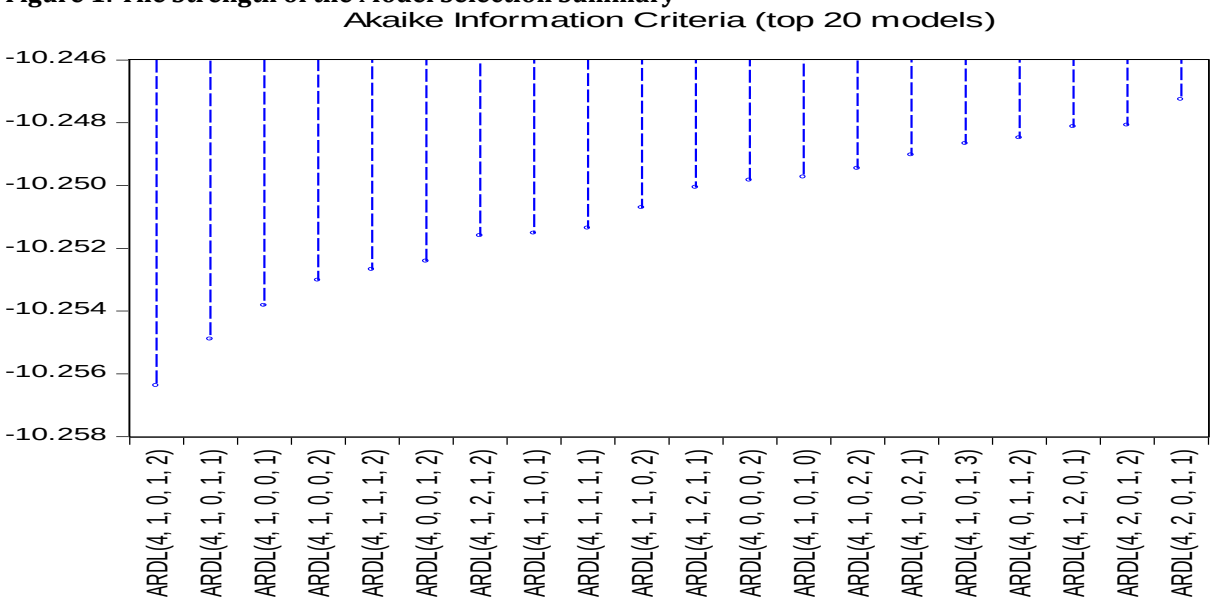
As shown in Table 3, the results show 4-lags for Industrial Production (IP), 1-lag for Exchange Rates (EX), 0-lag for Inflation Rates (IF), 2-lags for Interest Rates (IN) and 1-lag for Money Supply (MS). These lags are obtained on each I(0) and I(1) variables (as revealed by the unit root tests) in line with Dritsakis (2011). More so, the study further allows an automatic lag selection dynamic regressor to choose an optimum lag for the model. This is done by carrying out a statistical unrestricted likelihood ratio test using the minimum criteria for the value of SIC and AIC. The study found the most appropriate automatic lag length selection for the entire model to be 4 as shown in Table 4. The 4-lags for the ARDL model is consistent with Christiano et al. (1996) and Sharifi-Renani (2010). Furthermore, the comparison between the SIC and AIC for the optimum 4-lags (-7.550924* and -7.685606*) selected shows that the AIC gives the lowest value (most negative), hence, adopted for the ARDL regression.

Table 4: The ARDL Optimum Lag Selection Criteria

Lag lengths	SIC	AIC
2	-7.525843	-7.671150
3	-7.475190	-7.569456
4	-7.550924*	-7.685606*
5	-7.489073	-7.675214

Measuring the Strength of the Lag Selection: In order to determine the strength of the Akaike Information Criterion (AIC) model selection criteria over the Schwarz criterion in the regression and also determining the long-run and short-run relationships in this study, we employ the criteria graph to determine the top twenty (20) different ARDL models. Based on the benchmark analysis for the model, "the lower the value of the AIC, thus the better the model". As shown in figure 1, the first ARDL (4, 1, 0, 1, 2) model appears to be strongly preferred over the others as it gives the lowest (most negative) value of the Akaike Information Criterion. In addition, the ARDL (4, 1, 0, 1, 1) and (4, 1, 0, 0, 1) models appear to be the top second and third respectively as they record -10.256 and -10.254 values as indicated by their own criteria graph.

Figure 1: The Strength of the Model Selection Summary



Diagnostic Tests: Since the model with 4-lags is chosen to be the best model, this study tests the model against serial correlation, heteroskedasticity and stability. The benchmark hypotheses that are tested are:

- $H_0: \alpha = 1$, no serial correlation, no heteroskedasticity and no stability in the model
- $H_1: \alpha \neq 1$, there is serial correlation, heteroskedasticity and stability in the model

The result in Table 6 shows that there is no serial correlation (similarity between observations) in the model. In addition, Table 7 reveals that the model is free from heteroskedasticity (a process in which the variability of a variable is unequal across the range of values that are predicted). These results have shown that our model is consistent and favorable in analyzing the effectiveness of monetary policy and industrial sector growth in China. Finally, figure 2 shows the stability test for the ARDL model. Stability test is the test to investigate the stability or instability of the estimated coefficients in the model. The Recursive Chow test suggests the benchmark ARDL be stable over the sample period. The graph shows the Cusum test for the model. Since the line capturing our data passes within the 5% confidence interval, it means that the model is stable.

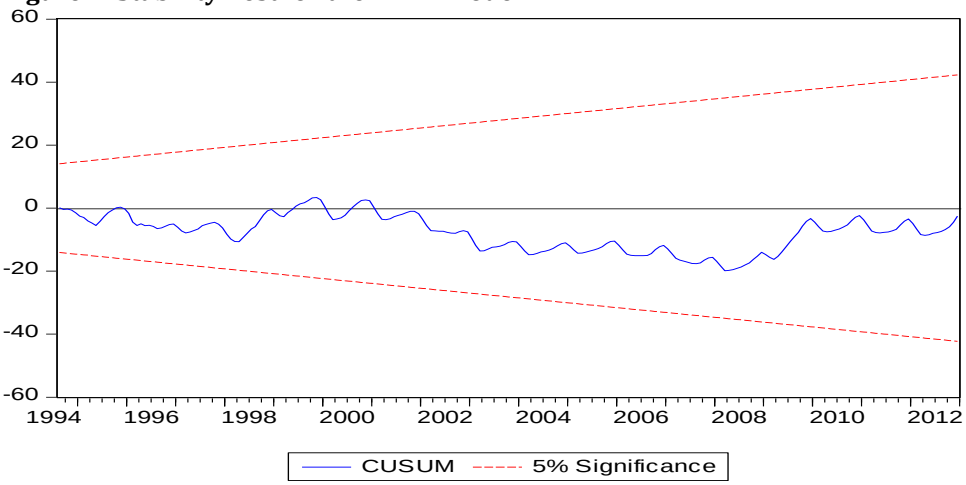
Table 6: Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.309156	Prob. F(2,220)	0.2721
Obs*R-squared	2.763939	Prob. Chi-Square(2)	0.2511

Table 7: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.308578	Prob. F(12,222)	0.2147
Obs*R-squared	15.52437	Prob. Chi-Square(12)	0.2140

Figure 2: Stability Test for the ARDL Model



ARDL Regression Model: The estimation result is presented in Table 5. According to the estimates, all the variables in the model are statistically significant in explaining industrial output production. The result implies that monetary policy actions taken by monetary authority can impacts industrial output production in China. As expected, the interest rate is negative, indicating that an increase in the interest rates will lead to an unfavorable reduction in investment, thereby affecting industrial output production while an increase in money supply, prices and stable exchange rate will lead to an increase in industrial output production and thus, leads to an increase in economic growth. Conversely, currency appreciation EX(-1) reduces industrial output production and affects economic growth due to high technological cost as China is still a victim of technological importation. This relationship is in line with expectations, economic theory and empirical evidence (see Omolade and Ngalawa, 2014) that currency appreciation affects industrial output production owing to lower export (e.g. it causes trade deficit, which can exert a negative or contractionary effect on the economy). Overall, the finding has reveals that monetary policy is observed to exert a significant impact on industrial output production. This finding is in line with Liu et al. (2002), Fasanya et al. (2013), Dong (2012) and also similar to Kutu et al. (2016) that monetary policy plays an important role in the industrial output growth in China. Considering the results derived especially on the negative significant impact of the interest rates on industrial out production, policymakers should be conscious about their policy actions when pursing their mandate of price stability (fighting inflation). This is because sound economic policy is important for industrial output production in China while poor policy will result in a nexus of constraints from which escape may be difficult (or impossible). There should be policy consistence that will lead to stable interest rates in the economy.

The ARDL Bunds Testing for Cointegration: For robustness check, this study employs both bounds testing approach and Wald test to determine whether the variables have a cointegration relationship in our model when we have a group of time series, some of which are stationary at I(0) while others are at I(1). In the estimation result for the bounds testing approach, the F-statistic value of 5.517202 is bigger than the upper band (I1 Bound) at all levels. There is a significant and positive value of F-statistical value indicating a cointegration relationship among variables employed. In addition, the Wald tests result also confirms that all the variables have cointegration association. The F- statistics value of 9.71128 is greater than the Pesaran critical value at 5%. This evidence reveals that we strongly reject the hypothesis of no cointegration relationship among the variables employed.

Table 5: The ARDL Regression

Dependent Variable: DLOGIP
Method: ARDL
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): DLOGMS DLOGIF LOGEX IN
Selected Model: ARDL(4, 1, 0, 1, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DLOGIP(-1)	0.305984	0.065467	4.673836	0.0000
DLOGIP(-2)	0.197632	0.066978	2.950705	0.0035
DLOGIP(-3)	0.172108	0.066505	2.587898	0.0103
DLOGIP(-4)	0.158273	0.065519	2.415690	0.0165
DLOGMS	0.002819	0.008759	0.321867	0.0419
DLOGMS(-1)	0.014789	0.008862	1.668945	0.0865
DLOGIF	-0.006855	0.011469	-0.597721	0.0506
LOGEX	0.076250	0.035638	2.139596	0.0335
LOGEX(-1)	-0.057399	0.035269	1.627464	-0.0051
IN	-0.000119	0.000944	0.126359	-0.0096
IN(-1)	-0.002032	0.000971	2.093353	-0.0375
IN(-2)	-0.001451	0.000972	1.493081	-0.0968
C	0.001172	0.000474	2.470975	0.0142

R-squared	0.566779	Mean dependent var	0.008438
Adjusted R-squared	0.543361	S.D. dependent var	0.002066
S.E. of regression	0.001396	Akaike info criterion	-10.25637
Sum squared resid	0.000433	Schwarz criterion	-10.06499
Log likelihood	1218.124	Hannan-Quinn criter.	-10.17922
F-statistic	24.20334	Durbin-Watson stat	2.009473
Prob(F-statistic)	0.000000		

Table 8: The ARDL Bound Testing for Cointegration

ARDL Bounds Test
Included observations: 235
Null Hypothesis: No long-run relationships exist

Test Statistic	value	k
F-statistic	5.517202	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

Table 9: The ARDL Cointegration Testing

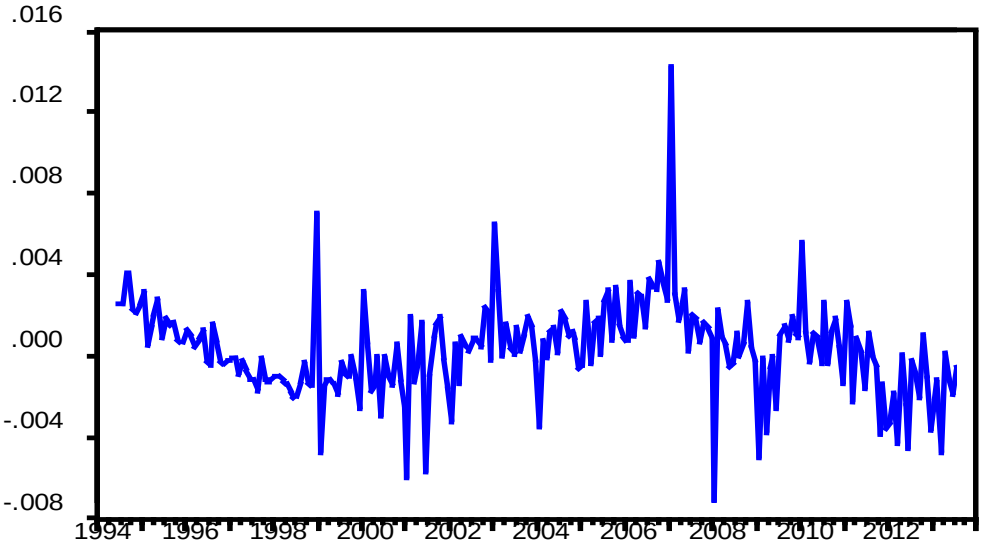
Wald Test
Equation: ARDL

Test Statistic	Value	df	Probability
F-statistic	9.71128	(4, 222)	0.0000
Chi-square	26.38885	4	0.0000

The Cointegration Graph: With the establishment of cointegration relationship among the variables employed, this study further employed the cointegration graphical form of the unrestricted ARDL to validate the above results and show the movement of the variables. Cointegration involves the co-movement of variables in a similar direction. For example, if there is a combination of two stationary variables in a

regression model, then in general the linear combination of them will also be stationary; while the opposite is the case when two non-stationary variables are combined. However, if the two I(1) variables have an economic relationship, then they should move together such that the stochastic trends are similar (Brooks, 2002). As previously stated that ARDL model can accommodate a mixture of I(0) and I(1) variables. Figure 3 shows an unrestricted cointegration graph of the results of the model. It shows the cointegration results for the variables employ to determine the real effects of monetary policy on industrial sector growth in China. The graph looks stationary, because the fluctuation seems to revert to a "Mean" around zero. Overtime, the variable(s) in the model revert to its original value. Although some spikes were observed at some points in time, in particular 2006 and 2008. Nevertheless, the variables move together overtime until it reverts to zero.

Figure 3: Cointegration Graph



The ARDL Short-run and Long-run Cointegration Test Results: In table 10, the estimation results show that in the short-run all the explanatory variables are statistically significant at 5%, hence, there is a strong evidence of short-run impact of monetary policy on industrial output production. These have shown that both the monetary variables and the control variable are major drivers of industrial output production in China. All the short-run coefficient estimates show the dynamic adjustment of all the variables as indicated by Dritsakis (2011). However, apart from inflation rates (prices), all the long-run coefficients in the model have an insignificant impact on industrial production. This means that the analysis does not reveal the long-run impact of monetary policy on industrial output production. Nonetheless, the long-run impact of prices (control variable) on industrial output production indicate that an increase in the general price level will lead to an increase in industrial output production both in the short-run as well as in the long-run. This is consistent with economic theory and empirical evidence that prices stimulate industrial output production (see López-Villavicencio and Mignon, 2011).

The ARDL Error Correction Model (ECM): A negative and significant coefficient of ECM is needed for a long-run cointegration equilibrium to be established**.** The ECM coefficient shows how quickly or slowly (speed of adjustment) the variables return to long-run equilibrium. However, in table 11, the coefficient estimate of the ECM is negative but statistically insignificant. The negative coefficient sign of the ECM(-1) shows that there was disequilibrium in the past and the adjustment is in the right direction but the system will not revert to equilibrium. Though the error is corrected in the present but not significantly done, hence, no convergence of the system in the long-run. This has further confirmed the short-run impact of monetary policy on industrial output production. The ECM value of -0.162399 suggests the relatively low speed of adjustment of about 16%. However, the ECM is statistically insignificant at 5% level, indicating that no long-run equilibrium can be attained. That is, no long-run impact of monetary policy on industrial output production in China but rather a short-run impact is established. This finding is in line with Sari et al. (2008) that investigate the relationship between disaggregate energy consumption and industrial production in the united states and

Omolade et al. (2013) that investigate the impact of monetary policy and Nigeria's economic growth. Therefore, the policies enacted by monetary authorities can have a great short-run impact on industrial sector growth in China.

Table 10: The ARDL Long-run and short-run Cointegration Testing

Dependent Variable: DLOGIP
Selected Model: ARDL(4, 1, 0, 1, 2)
Included observations: 235

Short-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOGIP(-1)	0.528490	0.070886	7.455460	0.0000
DLOGIP(-2)	0.332433	0.073937	4.496162	0.0000
DLOGIP(-3)	0.160399	0.063439	2.528393	0.0122
DLOGMS	0.002178	0.006296	0.345924	0.0297
DLOGIF	0.014759	0.009544	1.546451	0.0234
LOGEX	0.075226	0.030309	2.481986	0.0138
IN	-0.000052	0.000857	-0.060450	0.0419
IN(-1)	-0.001425	0.000869	-1.640823	0.0023

Long-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGMS	0.106074	0.077657	1.365929	0.2133
LOGIF	0.041294	0.072631	0.568544	0.0102
LOGEX	0.113555	0.218679	0.519278	0.1941
IN	-0.004217	0.006526	-0.646205	0.1188
C	0.007061	0.001209	5.841845	0.0000

Table 11: Error Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM(-1)	-0.162399	0.049534	-3.278565	0.2012

5. Conclusion

In this study, the effectiveness of monetary policy and industrial sector growth was examined through a time series data analysis method in China. Monthly data between 1994 and 2013 periods was used. The empirical result has led to some revelations regarding the relationship between monetary policy and the industrial production. Firstly, the empirical findings reveal that there exists a short-run relationship between industrial sector growth (output production) and monetary policy in China during the period under review. Again, it can be deduced from the results that monetary policy variables (interest rates, money supply and exchange rates) have a significant impact on the industrial sector growth in China. It can therefore be concluded that the impact of the monetary policy on China's economy is increasingly becoming very important and that it is important for policymakers to pay more attentions to policy instruments in their attempt to correcting and guiding the economy in stimulating industrial sector growth. However, only price (control variable) is statistically significant in the long-run. Hence, no long-run impact of monetary policy on industrial output production in China. Finally, as a policy guideline and recommendation, there should be balanced approach in the use of instruments to achieve certain targets or goals and to stimulate the industrial sector growth. The balanced approach is needed because, a sound economic policy is important for industrial sector development while poor policy results in a nexus of constraints from which escape may be difficult (or impossible) and hence, have adverse effects on industrial sector growth. The monetary authority should devise strategies to ensure the long-run stability of exchange rates by allowing the market forces to completely determine the value of Renminbi rather than the fixed exchange rate system and the managed floating exchange rate system currently adopted in the country. There should also be long-run stability of the

interest rates in order to allow investors to forecast and make investment decisions that can boost industrial output production in the country. Finally, the money supply should also be adequately managed and there should be price stability in the economy.

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The Effectiveness of the Expanded Public Works Program in Promoting Local Economic Development: A case study of Zibambele Project, eThekwini Municipality

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Abstract: In South Africa, with the advent of democracy, the Expanded Public Works Programme was conceived as an employment strategy by government in order to alleviate poverty and promote a better standard of living for marginalised groups, particularly youth and women in South Africa. This is a qualitative exploratory research in which the data was collected through face-to-face interviews with beneficiaries. The researcher utilised the exploratory research in order to explore the effectiveness of the Zibambele Project at the local level, and to see how it creates employment opportunities for marginalised groups. The key focus of the literature review is on local economic development, with special reference to the poverty alleviation strategies as a guideline for economic growth at local levels. The findings show that the government-led programmes that eliminate poverty at the grassroots level as well as creating employment opportunities for marginalised are crucial. Furthermore, the study shows that the government programmes are more needed in order to tackle poverty and also increase local economic development in South Africa.

Keywords: *Poverty, employment, empowerment, LED, EPWP*

1. Introduction

Unemployment is one of the most critical social ill that the South Africa faces today. According to Statistics South Africa (2015), the percentage growth of the unemployed (73.3%), however, has been higher than the growth of the employed (69.2%) within the country. Hence, prior 1994, the issue of unemployment became the focus of the newly elected government (Agbaam and Dinbabo, 2014; Bernard, 2015). The issue of unemployment in the country continues to be a challenge (StatsSA 2015; Agbaam and Dinbabo, 2014). The Quarterly Labour Force Survey (StatsSA, 2015) shows that the number of jobless individuals increased by 87 000 within the same period to 5.2 million, the highest level since the inception of the Quarterly Labour Force Survey in 2008. This caused an upsurge in the joblessness rate to 25.5% (up by 0.3 of a percentage age point), while the absorption rate remained virtually unchanged (StatsSA, 2015). The imbalance between the skilled and unskilled labor is great. Although the metropolitan municipalities are enjoying expanding economic progress, unfortunately this is not reflected in the inner metro areas (StatsSA, 2015). Chapter 7 of the South African Constitution of 1996, the responsibilities that local governments should include the elevation of social and economic expansion within their societies. Department of Cooperative Government and Traditional Affairs is charged with responsibility to ensure that all municipalities properly performs their basic duties and responsibilities.

The South African government has also indicated its intention of halving poverty levels in the country since 2008 (Stibbe, 2008; Rogan, 2012). Several approaches have been put in place to support local governments to realize the government's task of economic progression (Agbaam and Dinbabo, 2014; Ferrerai, 2015). Local Economic Development (LED), as a process, has been presented in South Africa for local government to use as a mechanism towards the economic growth of people at the municipal level (Patterson, 2008). The Department of Cooperative Government and Traditional Affairs has also supported the use of LED as an economic development tool by drawing up a framework to serve as a guiding tool for municipalities (Patterson, 2008; Agbaam and Dinbabo, 2014). In 2004, the South African government propelled the EPWP with a purpose of stimulating economic growth as well as ensuring that sustainable development is created. EPWP can be viewed as a mechanism that is designed to promote employment opportunities amongst the unemployed. Furthermore, it can be viewed as a conceptually complex intervention for poverty alleviation, in which there is training in community development work (Rogan, 2012). The EPWP initiative has been described as a nationwide process which will enable the unemployed to gain productive employment. Skills development is the mainstay of the program, which promotes an increase in people's capacity to earn an income (DSD, 2006). According to the Infrastructure Sector Plan for the Expanded Works Program (n.d.: 2), "The EPWP aims to increase employment in the infrastructure sector by increasing the labor-intensity of

government funded infrastructure programs". This is partly because the infrastructure sector is broad and there can be employment opportunities for the masses.

This aim of this study is to examine the impact of EPWP on local levels of economic development, specifically in the growth and stability of employment and skills development in KwaMashu Township.The target of the study, the Zibambele Poverty Alleviation Programme under the Expanded Public Works Programme (the Department of Public Works) has been highlighted in the study. The problem statement incorporates both unemployment rates as well as employment rates, with special reference to the Quarterly Labour Force Survey of 2016; so as to bring forth an understanding of the current situation in as far as employment in South Africa is concerned.

2. Literature Review

The vulnerable groups are perceived as being it hard due to a lack of economic progression (Agbaam and Dinbabo, 2014).The emphasis was based on the role of the United Nations as well as the South African framework with regards to acknowledging the plight faced by vulnerable groups who are in need of poverty eradication as well employment strategies. The important factor is to understand if the employment opportunities designed for the EPWP's beneficiaries are sustainable, and if those beneficiaries are able to market their credentials for improved prospects in the formal economy. The role of LED will be discussed in-depth, especially with regard to the promotion of economic development at grassroots levels. There is an extended history of poverty measurement; Alexander McDougall, Charles Booth, and Seebohm Rowntree, and were part of "the provision in the 1870 [British] Elementary Education Act requiring school boards to develop criteria of poverty". Therefore, although poverty was initially measured according to economic positions such as the Growth Domestic Product and in terms of income, its theory and measurement has made way to include the ability of individuals and households to successfully meet their basic needs, as well as to promote an equivalent balance in their societies (Muneer & Rehman, 2012; Rogan, 2012). There are three approaches which are applicable for estimating poverty –the absolute, relative and subjective approaches. Each views poverty and the experience of poverty differently. In this paper, the researchers focus on two approaches which are absolute and relative poverty.

The context of unemployment in KwaZulu-Natal: Statistics South Africa (StatsSA) defines unemployment as people within the economically active population who (StatsSA, 2011):

- were not able to work during the past seven days;
- have the desire to work and are available to start work; and
- are in the process of looking for work or starting some form of entrepreneurial business

Ten years ago, the province of KwaZulu-Natal contributed almost 16.5% to the national GDP, but was home to 19.8% of the South African population (Bhorat and Van Der Westhuizen, 2008). The quarterly labor force survey for the third quarter of 2015 estimated that the unemployment rate for South Africa was 25.5%; of the 4.4 million people who remained unemployed, just over three million (68.2%) had been without work for at least one year (StatsSA, 2015). Furthermore, 60.2% of job searchers had not completed Grade 12, which further limited their chances of finding employment. It is against this backdrop of high numbers of unemployed (and largely unemployed) but able-bodied South Africans that Public Works Programs are conceived and implemented. The below table highlights the gaps in distribution of monthly earnings that exists, particularly in KwaZulu-Natal, where it's evident from above table that this province had monthly earnings that were R470 or less which is equivalent to bottom 5 % of the lowest earning income group.

a) The Poverty Line Approach: South Africa's historical background of poverty lines stem from Edward Batson, who has been acknowledged for the development of South Africa's first poverty lines in 1942 (Budlender, 1985, cited in Budlender, Liebbrandt and Woolard, 2015). Furthermore, these poverty lines were broken down to groups such as food, washing and cleaning, fuel, clothing, rent and transport, which are perceived to be the most important aspects of living. In the early 1970s, Batson's methodology was utilised in institutions to create a new poverty lines called Minimum Living Levels and Household Subsistence Levels (Budlender et al., 2015).

Table 1: Distribution of monthly earnings by province

Provinces	No. of employees Thousand	Bottom 5% Rand	Bottom 10%	Bottom 25%	Median	Top 25%	Top 10%	Top 5%
South Africa	**11 058**	**570**	**845**	**1 500**	**2 800**	**6 500**	**12 000**	**17 000**
Western Cape	1 617	950	1 200	1 733	2 700	5 500	11 000	16 000
Eastern Cape	1 064	470	600	1 200	2 200	5 200	11 110	15 000
Northern Cape	253	500	780	1 200	2 100	6 000	11 000	15 167
Free State	662	433	600	1 000	1 900	5 000	11 000	15 300
KwaZulu-Natal	2 055	470	700	1 200	2 487	5 900	11 000	15 000
North West	627	600	830	1 350	3 000	6 000	11 800	15 000
Gauteng	3 338	867	1 200	1 950	3 683	8 500	15 000	20 000
Mpumalanga	733	600	800	1 300	2 777	7 500	13 000	18 000
Limpopo	710	400	500	900	1 800	4 500	11 000	14 000

Source: Adapted from StatsSA (2010)

After the Apartheid era, the Poverty Line approach was applicable due to the fact that it is viewed as a mechanism which is able to single out the poor from the rich. This can be done in two ways – monetary, which measures the consumption of the poor, as well as non-monetary, which views literacy as an aspect that can be measured within the poverty line(Barker, 2003; Agbaam and Dinbabo, 2014; Bernard, 2015). Households that fall within the poverty lines are perceived as poor, and there are a range of reasons which can contribute towards this state. These include physical weakness, isolation, powerlessness and vulnerability (Barker, 2003; Ferrerai, 2015).

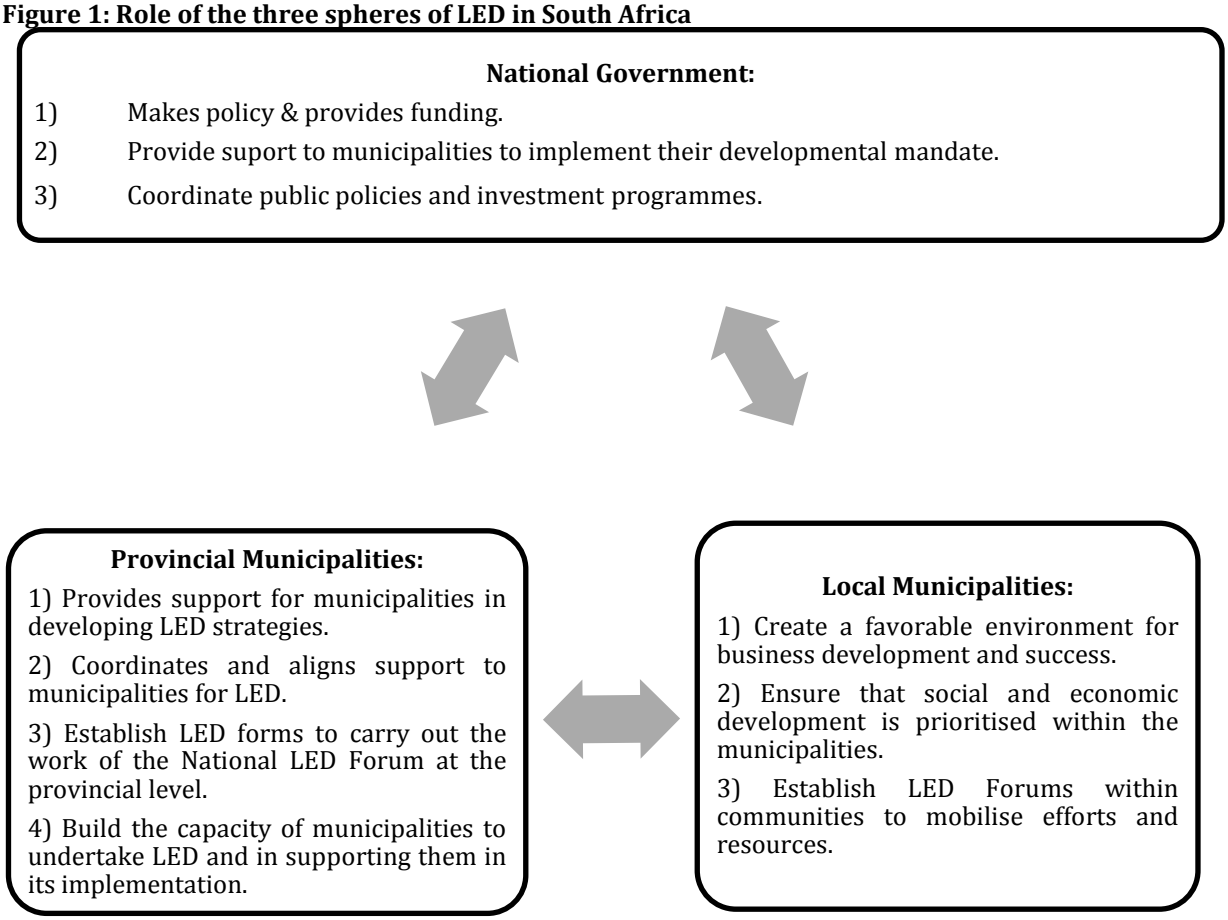
b) Gender employment inequalities: Inequalities are preventing women from having robust careers (Hames, Koen, Handley and Albetyn, 2006).In particular, these inequalities include lower incomes, fewer skills, a lack of education and a lack of decision making. The above mentioned are perceived as the most predominant features which make women vulnerable, in particular in economic growth (Kabeer, 2008). There has, however, been a shift from the traditional household make-up from male-headed households to female-headed households. With the advent to democracy, the South African government has developed numerous strategies that will empower and develop the women. This has caught the attention of the economic development within these households, as now the females have the duty of multi-tasking, i.e. being breadwinners, nurturers and actively engaging in their community - the predominant roles witnessed in the 21st century (Frey and Stutzer, 2010). The negative economic pressures have led to women pursuing employment due to high poverty-related aspect, and the rising cost of living.

LED as a promotion of employment opportunities at the local level: The inclusion of LED in this study was based on its significance at the grassroots level, in particular the community. LED takes place mostly within a municipal setting, where interventions govern the process that promotes LED. South Africa has embraced LED across all three spheres (national, provincial and local) of government. Within the three spheres, there is a need for systematic interventions to address the issues of unemployment, lack of entrepreneurship and the promotion of foreign direct investment (Bernard, 2015; Jonas, 2014). According to Patterson (2008:3), "Local Economic Development is an ongoing process which is driven by local actors from different societal sectors, which implies collaboration and even co-responsibility between the public and private sector for the economic development of a region or location". Within the Expanded Public Works Programme, there are collaborations between the spheres of government so that employment opportunities for unskilled labour are created (Bernard, 2015; Ferrerai, 2015). The origins of LED date back to the early 1990s within the industrialised nations, at which time it was not yet defined. Patterson (2008:3) added that "in the early stages of LED, activities focussed strongly on the marketing of locations to external investors, often linked with incentive systems such as tax breaks and/or reduced costs of public services (such as water and electricity) and infrastructure development".

The abovementioned highlights the motive behind LED, which was based on economic growth which involved investors, fiscal policies and labour markets embedded in public services. In the second phase, according to Patterson (2008:3), "attention shifted to endogenous economic potentials, striving to support the competitiveness of existing firms, promoting entrepreneurship and business start-ups". The shift is evident as now business start-ups are assisted in the form of financial assistance, business support, and the build-up of an entrepreneurial mind-set for those who have entrepreneurial potential. This shift opened the way for a more complex method of sustainable economic development. Patterson (2008:3) stated, "The third and latest phase of local economic development improves the individual business support and sectorial development approaches of the second development phase by making the entire business and community environment more conducive to economic development". The third stage views the community at large whereby economic development is distributed at the grassroots level, such as small-scale agricultural development as well as fishing. Patterson (2008:3) further elaborated on the importance of partnerships amongst the designated actors who are in support of economic growth and distribution. "The third phase promotes public/private and community partnerships, facilitating workforce development and education, focusing inward investment to support cluster growth and supporting quality of life improvements".

a) The South African perspective on LED: Patterson (2008) acknowledged that within South Africa, the role of the Reconstruction and Development Program (RDP) and the ANC in 1994were positioned in a way that shaped the early beginnings of LED through the obvious provision for community-based development and locally based initiatives. LED operates mainly at the local government with the supporting spheres such as national government and provincial government district municipalities and local municipalities. The figure 1 below outlines the role of the three spheres of LED in South Africa.

Figure 1: Role of the three spheres of LED in South Africa



Source: Authors contribution (2016)

b) Contributions towards the LED debate in South Africa: Patterson (2008) highlighted that the South African legislature acts as a guideline for the Local Economic Development process. The below mentioned legislative process was/are the pillar of the promotion of LED in the South African context:

- The Constitution of RSA (1996)
- White Paper on Local Government (1998)
- Local Government: Municipal Systems Act (2000)
- A policy paper on Integrated Development Planning (2000)
- LED Guidelines to Institutional Arrangements (2000)
- Draft LED Policy (2002)
- Policy Guidelines for implementing LED in South Africa (2005)
- National Framework for Local Economic Development (LED) in South Africa (2006 – 2011).

The Local Economic Development Guidelines to Institutional Arrangements (2000) and the draft LED Policy (2002) advocate for a more community-based method for LED, emphasising that LED should be pro-poor in orientation and focus on previously disadvantaged individuals as well as deprived towns and areas (Patterson, 2008). Clearly, the notion behind the support for the poor is of great importance, especially for disadvantaged populations. The inclusion of marginalised towns where living conditions may threaten economic growth are also receiving attention via the above-mentioned policies. Patterson (2008:7) also emphasised the part that local government plays in the campaign for LED: "Ideally, municipalities should support local initiatives, which encourage local job creation while still responding to changes in the national and global economy".

The National Framework for Local Economic Development of 2006 emphasised that "municipalities should play a connector role in respect of LED drawing upon resources locked in a range of different government support instruments into their localities" (Patterson, 2008:8). An example of this is that the municipalities can advocate for the provision of Sector Education and Training Authorities (SETAs) in support of skills development. Local Economic Development as a policy tool has been presented in South Africa for local government to apply it towards the economic growth of people at the municipal level. The Department of Cooperative Government and Traditional Affairs has also supported the use of LED as an economic development tool by drawing up an LED framework to serve as a guiding tool for municipalities in South Africa(Bhorat and Van Der Westhuizen, 2008; Ferrerai, 2015). Scaling down to EPWP, can be viewed as a mechanism that is designed to promote employment opportunities amongst the unemployed, and can be viewed as a conceptually complex intervention for poverty alleviation, in which there is training in community development work, HIV/Aids counselling and gardening skills(Bhorat, Van Der Westhuizen, and Naidoo, 2006).

In addition to the above, poverty and unemployment are the main challenges facing South Africa. LED strategies and programmes are the main instruments used at the local level to tackle job creation and poverty alleviation (Patterson, 2008). LED can be labelled as a regionalisation tool which makes way for both local and regional governments and their communities to benefit in all the economic activities that would make the GDP to increase thus contributing to the economy (Patterson, 2008). A positive aspect of LED is that it further aims to support previously disadvantaged people, communities, black empowerment enterprises and Small Medium Enterprises to participate fully in the economic growth of the country (Patterson, 2008). It is of great importance to incorporate both the formal and informal economies to reduce inequality in the country. According to the South African LED Network (2011), there has been engagements and linkages between the formal and informal sectors of the economy. There is a need to understand reasons to diversify local economic development strategy. Furthermore, LED reinforces local, national and international collaborations between communities, businesses and government to create combined business ventures and build up local areas. LED uses local resources and skills to create economic opportunities for development at the local level. This includes increasing specialised training and providing information and advice services to employment seekers. This, in turn, can promote economic development at a community level, as well as employment opportunities for persons who are long term unemployed. The South African LED Network (2011:19) advises that "adopting LED strategies, people in a local economy can work out ways of attracting investment to grow the local economy and also start businesses which will retain income in their area". This can benefit both the

formal and informal economies, so those communities who rely heavily on informal economy production will have the chance to benefit in remuneration as well as in the economy.

c) South African skills development process: The Skills Development Act (Act 97 of 1998) and Skills Development Levy Act (Act 9 of 1999) outlined the provision of learnership programmes to grow the skills of the South African labour force, and in particular, to advance the employment prospects of people who have been previously disadvantaged, such as people with disabilities. The EPWP involves programmes which are labour-intensive, therefore skills development is of great importance for the beneficiaries involved in the programme (Department of Public Works, 2005). The need for collaborating with relevant departments as well as institutions would assist in the progression of the beneficiaries. According to the Infrastructure Sector Plan for the Expanded Public Works Programme (Agbaam and Dinbabo, 2014). 8), "the Department of Public Works will develop capacity of training on the scale, required by the EPWP which involves train the trainer courses amongst a few". To be able to move from being unskilled to a skilled employee has its advantages for the beneficiaries. McCord (2005:570) commented that "In South Africa unmet labour demand is primarily for labour with intermediate and high skills, and there is no easily identifiable unmet labour demand for semi or low skilled labour (cited from Kraak, 2003), which most closely describes EPWP labour at the point of exit from public works employment". Again, the issue of skills provision has been raised in the promotion of employment opportunities, and the same can be said about the role that government can play in the provision of programmes directed at the populations who do not have any skills but are in need of employment.
According to the EPWP, it endeavours to provide accredited training to its beneficiaries in the form of:

- Skills programs: work-focused programs that are inclusive of a pre-registered collection of unit standards.
- Learnerships: organized learning programs within a specific industry, which are unit standard based and comprise of more than 120 credits.
- Artisan development: technical training systems, including practical, theoretical and workplace learning components offered in designated trades to achieve artisan status.

The situational context of unemployment in KwaZulu-Natal is remarkable, particularly in the employment gaps amongst the vulnerable groups. The issue of sustainable employment opportunities beyond EPWP has raised many discrepancies, as some argue that more needs to be done by the state in order to sustain employment. Local Economic Development, as a promotion of employment opportunities at the grassroots level, paves ways for local government to promotion the integrated development opportunities at grassroots levels. Skills development, training and capacity building as an empowering process has shown to be a much needed aspect with regards to the promotion of income generating activities.

Study area: The study was located in KwaZulu-Natal Province, South Africa, at the eThekwini Metropolitan Municipality. The researcher conducted three site visitations in order to conduct research. Kwa-Mashu is the area of focus which is situated in the eThekwini Municipality, which has tried to provide the best services, yet high levels of unemployment amongst its citizen's means they are very often unable to pay for these services. Kwa-Mashu is situated north west of eThekwini Municipality and has high levels of joblessness, social displacement, poverty and crime, which are worsened by insufficient physical infrastructure and severe degradation, as noted in the eThekwini Municipality Integrated Development Plan of 2012. The Zibambele Poverty Alleviation Programme was designed particularly for women and women-headed households, which fall within the vulnerable group category (Kwa-Zulu-Natal Department of Transport Pamphlet, 2005).

3. Methodology

This study employs a qualitative exploratory research with the utilisation of semi-structured face-to-face interviews. Semi-structured interviews were chosen by the researcher as an appropriate data collection tool because it allowed for probing and additional questions during the interview process (Cox, 2008). Qualitative research is a form of research methodology that permits a researcher to gather data that are filled with written descriptions of how a target population is experiencing a phenomenon (Cox, 2008). The target population was the beneficiaries of the EPWP as well as their immediate supervisors. Within the EPWP there are approximately 250 beneficiaries.The study focused on 25 participants, which was inclusive of 23 beneficiaries and two supervisors of the program, who are directly involved in conducting labor intensive

road management. The participants were randomly selected from employees who were recruited from the inception of the program until 2015. This method was based on systematic sampling, which allowed the researcher to request permission to use the participants' daily workplace register.
The main aim of this study is to examine the impact of EPWP on local levels of economic development, specifically in the growth and stability of employment and skills development in KwaMashu Township. The objectives are to:

- understand how the Zibambele Project assists in poverty eradication, employment generation and skills development;
- investigate whether the Zibambele Project has met its target of empowering vulnerable groups with employment opportunities; and
- Establish the extent to which the beneficiaries of the EPWP are able to sustain employment beyond their participation in the Zibambele Project.

4. Discussion and Findings

Categorisation and formulation of themes: Four categories emerged from the research. There are several themes which were generated under each category that were relevant to the study. The table 2 below shows this categories and themes.

Table 2: Categories and themes developed in the research

CATEGORIES	THEMES
Sustainable livelihoods	Promotion of income relief. Poverty reduction process. iii) The promotion of breadwinners at household levels.
Income generating practice	Culture of savings/stokvels amongst beneficiaries.
Opportunity for learning	Recognition of learning needs for beneficiaries. Practical opportunities for beneficiaries.
Community engagement	The role of local government at grass-root integration.

Source: Authors contribution 2016

Sustainable livelihoods

Promotion of income relief: The promotion of income relief can be easily associated with the United Nations' Sustainable Development Goal #8, which aims to "promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all". The objectives are to: firstly, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities. Secondly, improve regional and trans-border infrastructure to promote effective regional economic integration and facilitate trade. And lastly, promote formalisation of informal sector activities and employment. In essence this speaks to the Expanded Public Works Programme, which needs constant government interventions directed at the promotion of EPWP at grass root levels.

In South Africa, this is further supported by the National Development Path (NDP) within the South African economic policy. This identifies where job creation is possible and then targets limited capital and capacity so as to maximise the creation of decent work opportunities, using both macro and micro economic policies to create a favourable environment (South African Local Economic Development Network, 2011). Furthermore, the SA LED Network (2011) has broken down processes of the decent work opportunities as follows:

- Short-term: direct employment schemes, targeted subsidies and/or a more expansionary macroeconomic package.
- Short- to medium-term: support labor absorbing activities, especially in the agricultural value chain, light manufacturing and services.
- Long-term: as full employment is achieved, increasingly support knowledge and capital intensive sectors in order to remain competitive (SA LED Network, 2011: 9-10).

According to the EPWP's objectives as mandated in the State of the Expanded Public Works Programmes in South Africa (2012-2013:77), they aim to "provide ongoing and sustainable work opportunities for destitute households in an effort to break the poverty cycle". The beneficiaries who were targeted for the research study acknowledged that the EPWP provides their livelihoods, as now they are able to purchase groceries which are perceived as their most rewarding experience. Furthermore, the participants stipulated that the ability to provide for the household has emancipated them from being unable to provide. Hence, all the participants indicated that the Zibambele Programme actively promotes income relief. This is evident from one of the beneficiaries who said that:
The Zibambele Program helps me a lot. This is because I make a living out of the income that I receive from participating in this programme.
On other hand, few participants has highlighted that the income they receive from this programme is not enough to cover numerous necessities for the households. One of the beneficiaries said:
The income is too small as I cannot afford a lot of necessities such as foods, clothing, electricity, and savings.

The study conducted by Moeti (2013) on the effective implementation of EPWP in South African municipalities found that the key general benefits of the EPWP was creation of employment, skilling of the unskilled and earning of an income by the poor. The participation of beneficiaries in the EPWP projects has improved their lives. Both results of McCord (2004) and Moeti (2013) found that there was a real measurable impact on the participants in the EPWP programmes undertaken in both KwaZulu-Natal, Limpopo and Tshwane. The findings of this study are in line with the results of this study. The Bill of Rights Section 27(1) specifically states that "everyone has the right to have access to sufficient food and water". The majority of the income received from the programme was used for purchasing food, as this was perceived to be the most important feature of the beneficiaries of the EPWP. According to the Food and Agricultural Organisation (FAO), food security is "access by all people, at all times, to the food required for a healthy life". The World Bank cited form the Department of Agriculture (2002:7) argued that food security is "the physical, social and economic access to sufficient, safe and nutritious food by all, at all times, to meet their dietary and food preferences".

Poverty reduction maintained: According to the United Nations Sustainable Development Goal Number 1 - *End poverty in all its forms everywhere* - this goal is supposed to be reached in 2030. This focuses primarily on eradicating poverty through various interventions: firstly, by fully implementing nationally appropriate social protection measures with a focus on coverage of the poor, the most marginalised and people in vulnerable situations. Secondly, by pursuing sustained and inclusive economic growth as a key enabler for achieving poverty eradication. And lastly, ensuring and achieving an equal access to productive employment and decent work for all, including the poor, persons with disabilities, and other people in vulnerable situations as well as women and young people. Although the Public Works Programme (PWPs) are not adequate to solve South Africa's unemployment problem, they are of great use in ameliorating poverty, as they provide temporary relief to the jobless, would-be workers who are poor. Within five years, the EPWP was anticipated to create one million poverty lessening job opportunities in the following sectors - environment, social, infrastructure and economy. With regards to this aspect, EPWP is viewed as the most important determinant of success. Much emphasis has been placed on poverty reduction mechanisms with regards to the EPWP in general. On the issue of poverty reduction and better living conditions after the Zibambele Programme's inception, the beneficiaries highlighted that this being part of the programme has assisted them in many ways i.e. able to purchase groceries; able to participate in women's organisation as they feel emancipated; and able to pay debt as well as taking their kids to school.

Mothapo (2011) also found that the EPWP are such a relief to the beneficiary given their dire poverty situation. Furthermore, the author's results showed that the EPWP enables the beneficiaries to participate actively in the local economy through buying food items, purchasing clothing, furniture, and other necessities to improve their standard of living. These results are in line with the findings of this study that clearly shows that the beneficiaries of EPWP directly benefit from participating in this programme. According to Kostzer, Lal, Lieuw-Kie-Song & Miller, 2010, the public works programme (PWP) such as India's Mahrashtra Employment Guarantee Scheme (EGS) which main aim was to reduce poverty and address structural unemployment through PWPs has been successful. "PWPs do not necessarily move participants out of poverty, but instead offer short-term relief" (Ghiassi-Razavi, 2012: 3).

The promotion of female breadwinners at household levels: Frey and Stutzer, (2010:33) highlighted that "A breadwinner is defined as the primary source of financial income in the household and was considered previously as an exclusively male role in the familial structure". The current era has seen an increase in women being the heads of households, as well as a shift from women being dependent on men. According to Cunningham, Potts, Hartley & Ormerod (2008: 169), "women's schooling and employment increased substantially during the latter decades of the 20th century, and these factors are especially likely to come into conflict with ideas about gender specialised roles". The abovementioned takes into account the patriarchal system, which has dominated gender empowerment within the South African context. Furthermore, the rise of gender education and employment opportunities made way for single parents as well as female breadwinners. Employment has brought forth significant changes in household structures, especially among the ever increasing female breadwinners. Cunningham et al., (2008:167) stated that "women who are employed would be expected to adopt less supportive attitudes towards gender-specialised marital roles because they value the opportunity to work for pay". This influx of female breadwinners not only supports the household but also the economy.

Out of the 25 participants, there were 23 females and two males. This acts as a stern reminder that the establishments of the Zibambele Poverty Alleviation Programme were based on women empowerment. When the beneficiaries were asked how many family members are dependent on them for their survival, most of them stated that there are more than five family members who are depending on them. One of the participants said:
There are 10 family members who depend on me; this is inclusive of 5 grandchildren and 3 children of my own. I also reside with my mother who receives Old Age Pension, and my brother who is unemployed, currently looking for employment.
The most predominant factor that kept coming up during the interviews was the active engagement of Social Assistance, which the families rely on. Friedman and Bhengu (2008:106) argued that "Social Assistance as an income transfers can be viewed as a form of a grant or financial award issued by government which is then provided to a resident who is unable to sustain themselves". Social Assistance consists of various grants which are readily available to the public which are: Old Age Grant, Disability Grant, War Veterans Grant, Care Dependency Grant, Foster Child Grant, Child Support Grant or a Grant-in-aid (Friedman and Bhengu, 2008).

Income generating practices

Culture of savings/stokvels amongst beneficiaries: Within South African households, the culture of savings/stokvels plays a crucial role. Lukhele (1990:1) defined stokvels as "a type of credit union in which a group of people enter into an agreement to contribute a fixed amount of money for a common pool weekly, fortnightly or monthly". Furthermore, Lukhele (1990) highlighted that stokvels are most trusted method of gaining financial support, especially in hard times. With no savings, households are likely to borrow more to deal with shocks to their income and expenditure. The South African government encourages the citizens to utilise different methods of savings available in the country, even if it is little money from the various grants that is being received, rather than get into debt. Here, the role of informal savings like Stokvels comes in handy as they pool savings for purposes like meeting burial expenses, Christmas spending, and education". During the interviews, the beneficiaries shared their experiences of what they are able to do with the income that they get from the Zibambele Programme. Nine beneficiaries stated that through the Zibambele Programme, they are able to save in the form of stokvels as well as in trusted banking institutions. On other hand, the majority of the beneficiaries (sixteen) stated that they could not join any stokvels because the majority of money is being spent on the necessary needs of the households. Meaning that they do not have any savings mechanisms. The stokvels are perceived as more of a safety net, and have been recognised as a critical element for a consistent society (African Response 4: 2011).

Opportunity for learning: Sustainable Development Goal #4 emphasises school-going children, especially the promotion of educational opportunities for girls, however the larger issue lies with vocational training and such institutions. Furthermore, the Sustainable Development Goal #4 promotes the *inclusive and equitable quality education and promotes lifelong learning opportunities for all*. According to the EPWP's objectives as mandated in the State of the Expanded Public Works Programmes in South Africa (2012-2013:

77), there is a need to "provide exit strategies in an endeavour to create other sustainable work opportunities, inside or outside the programme, for beneficiaries who complete the trainings programmes".

Recognition of learning needs for beneficiaries: Looking back to the EPWP's objectives as mandated in the State of the Expanded Public Works Programmes in South Africa (2012-2013:77), it clearly states that it is necessary to "increase the potential for skills-based and knowledge-based development of all the programme's beneficiaries through targeted accredited training programmes". The majority of the beneficiaries' ages range from 40-59 years and they have some level of education. They also possess some skills, which can improve through on the job training designed to enhance their job performance.

The need to keep abreast with the latest skills developments is applicable both at national and international scales in order to allow a competitive and productive pool of beneficiaries. Providing the training that will allow the beneficiaries to be marketable is crucial for their personal growth and development. The beneficiaries' supervisors highlighted they have been exposed to some training which was organised by the eThekwini Municipality. The beneficiaries' supervisors said:
We were trained in Health and Management, First Aid Training, Environmental Management Training as well as Poverty Alleviation Trainings.
When the supervisors were asked if they were able to find lucrative employment with their training, one replied as follows:
I have tried to apply to Municipality of eThekwini but you find that they want more educational back ground like some form of Higher Educational Training qualification which I don't have.
The results of this study is also in line with the findings of Moeti (2013) where state that the majority participants/ beneficiaries in the EPWP projects doesn't get an opportunity to be absorbed once they complete their training. Furthermore, the results of Ghiassi-Razavi (2012) showed that the EPWP does not put more emphasis on the training and skills development of the beneficiaries as it has been considered unproductive and inefficient for short and medium programmes. As PWPs are designed to assist the poor households, it therefore, becomes crucial for government to properly organise and channel the resources into the PWPs for the benefit of the poor.

Practical opportunities for beneficiaries: According to the EPWP's objectives as mandated in the State of the Expanded Public Works Programmes in South Africa (2012-2013), the safety management of the beneficiaries should be taken seriously. "Each beneficiary undergoes an introduction to the programme, as a measure to ensure that the beneficiaries are well informed and thus the promotion of safety working measures" (EPWP, 2012-2013: 78). The beneficiaries involved in the actual labour intensive programme shared that they were trained on road safety, especially with regards to the nature of their employment which is external and has an environmental background. This is further supported by the below beneficiary:
We were trained on road safety, this included being told how to protect ourselves from oncoming traffic by meticulously placing of cones so that there will be no car accident as well how to wear our protective gear such as gum-boots and identifiable bibs so that we are visible at all times.

One beneficiary indicated that they were very fortunate to have been chosen to attend one of the workshops about creative art skills as well as financial saving workshops. Unfortunately, the abovementioned training and workshops have not helped the beneficiaries much, as they cannot find employment elsewhere. They now feel that they have to await their old age pension in order to support themselves further.

Community engagement: The involvement of the community is crucial in the local development process in that the community must have a core of local, capable and respectable leaders who are willing to listen and ensure the support of the community. Community mobilization is performed mostly in the municipality, and in this case, the eThekwini Municipality has played a very active role in mobilizing the community - particularly the ward councilor.

The role of local government at grassroots integration: Local government in South Africa is guided by the concept of developmental local government, as described in the White Paper on Local Government, of 1998. Its vision is that local government should work with local communities to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives. It was discovered in the study that

the role played by the ward councilor had an effect on who gets employed. This was shared by the majority of the beneficiaries, who stated that they approached the ward councilor for employment opportunities. According to Paradza, Mokwena and Richards (2010), ward councilors are responsible for: evaluating whether the municipalities' plans are having their envisioned effect; evaluating whether facilities are being distributed justly, efficiently and in a maintainable way; determining whether capital projects are being undertaken in accordance with the Integrated Development Plan; and transmitting important information from the council to the residents. Furthermore, Paradza et al., (2010) stipulate that the ward councilors serve as the border between the people they represent and the municipal officials who design and implement development policies. The ward councilor, as chairperson of his or her ward, must also raise concerns to council on behalf of ward members when residents experience problems relating to the councilor. Clearly, the role of the councilor is of great importance, as they are perceived as the eyes and ears of the community as a whole, and are able to note the needs of the community such as programs for poverty eradication.
When the beneficiaries were asked how they were made aware of the Zibambele Programme, the majority of them stipulated that they were chosen per ward via the councillor and committee. Of the 25 respondents, one had a different response regarding the councillor's involvement in the programme:
I do not believe the community knows Zibambele Programme but it are aware that we work for the municipality.
As South African government emphasis on rural development and LED, it becomes vital for municipalities to create inclusive and robust local economies for the benefit of the poor through addressing socio-economic issues. In other words, it is important that the local communities are included or made aware of any developmental programmes that intend to benefit them.

Summary of findings and discussions: The importance of discussing the data allowed for the birds eye view of the role of the Zibambele Poverty Alleviation Program assists in poverty eradication, employment generation and skills development. Furthermore, the discussion of the data allowed to view how the Zibambele Program has reached its employment target as well as to promote sustainable employment opportunities for the beneficiaries particularly for the women. As discussed in the research, the Zibambele Poverty Alleviation Program has managed to alleviate poverty substantially, particularly among the vulnerable groups as well as those who are unskilled. A fraction of the beneficiaries is now able to save some of their income various institutions of their choice. The Zibambele Poverty Alleviation Program has the ability to sustain households, particularly women-headed ones; women are now able to play an active role in the economy, but more so in sustaining their families through purchasing food as well as maintaining the entire household. The research also unveiled that skills development training is being conducted, but this does not necessarily advance the skills of the beneficiaries beyond their employment. This is contrary to the EPWP's statement that the beneficiaries would be trained so as to find employment beyond the EPWP.

5. Conclusion and Recommendations

The EPWP Zibambele Project has to a certain extent improved the lives of the beneficiaries through employment opportunities targeted at unskilled labour. But this programme has not been fully effective in terms of developing and capacitating the individuals with other critical skills that are needed. The development of economic prospects for the deprived must, nevertheless, include more than employment: - it should also include increasing access to productive assets for the poor who are self-employed. This can be achieved by growing funds in infrastructure (e.g. rural roads and irrigation works), credit schemes via the banks, funding from the government which targets the poor, and extensive technical assistance which is inclusive of sharing information and skills development to increase efficiency levels in economic activities. The involvement of the community is crucial in the form of uplifting the community through local economic development. The role that is ultimately played by local government is also important when addressing the issue of community development. There is also a need for attentive focus of the empowerment of those who fall within marginalised categories, particularly with employment opportunities, skills/training development or even Adult Basic Education and Training. This initiative can be viewed as a form of capacitation of the marginalised groups with the opportunity to find better employment opportunities, or better yet, to make informed decisions with regards to economic matters or community empowerment matters. The EPWP decision makers need time and dedication to the maintenance of strong, multi-sectorial initiatives from all relevant stakeholders, including non-government organisations and community-based organisations, in order

to actively promote not only partnerships, but also collaboration on informed ideas regarding the promotion of sustainability of all EPWP programmes across the board.

The main aim of this study was to examine the impact of EPWP on local levels of economic development, specifically in the growth and stability of employment and skills development**.** Hence, the following are the recommendations based on the results of the study:

- Inclusive policies and strategies: The government, particularly at the local level, should ensure that the EPWP policies and strategies are inclusive, in a way that everyone in need can participate in the programs. The abled-bodied mostly participate in EPWP programs with the exclusion of the disable people. Therefore, this study recommends that government should also create the policies that also accommodate disabled people, so that they can participate in EPWP programs.
- Training and skills development: It is crucial that the government provide the beneficiaries of EPWP with the market related trainings, not only basic trainings so that the beneficiaries can also be employable when opportunities arise. This is because of the reason that most of EPWP are short to medium term projects. Therefore, the beneficiaries find themselves falling back into poverty immediately after the closure of the projects.
- Design of EPWP Programs: The EPWP programs are normally seem as short to medium term relief from poverty. The study recommends the EPWP programs' training and skills development to be future orientated. In that way, beneficiaries are able to stand by themselves after the program. Findings reveal that beneficiaries find EPWP programs as laborious projects instead of opportunity for development.

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The Significance of Mining Infrastructural Development on South African Economy from 1980–2013: An Econometric Approach

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Abstract: In this present paper we investigate the relationship between mining infrastructure and economic growth in South Africa from 1980-2013. The importance of this paper is to examine if there is both short and long run significant relationship between mining infrastructure and economic growth in South Africa. The data mining was collected from South African Reserve Bank (SARB) covering the range from 1980-2013 of the paper. Both Augmented Dickey Fuller (ADF) and Phillip Perron (PP) where used for stationarity tests. Johansen Cointegration test is employed in this paper; also Vector Error Correction Model (VECM) is also employed in this paper. In the results we obtained that there is a positive significant relationship between mining infrastructure and economic growth. There is also a causal relationship between mining infrastructure and economic growth, meaning the development of mining infrastructure does promote economic growth. In conclusion the policy makers should improve private infrastructure which will equip human capital to be more useful in contributing towards knowledge and innovation. This means South African government and mining industry should priorities the development of infrastructure as component that will be sufficient towards economic development.

Keywords: *Mining Infrastructure, Economic Growth, Vector Error Correction Model, Granger Causality*

1. Introduction

The relationship between infrastructure and economic growth has been one of the most important topics to be discussed in recent years both academics and policy makers. This has also been the case for the South African economy as it is largely linked with the mining sector. However, South Africa is known to be one of the most important countries when coming to variety and quantity of minerals produced. In addition, "South Africa was built on the back of mining over 150 years and as a driving force behind the country's economy" Smit (2013). The mining sector continues to shape economic, socio political and cultural development. Furthermore, the mining industry has continued to be the third largest sector in South Africa. Many studies have proven how infrastructural development does play a major role as a factor of productivity both directly and indirectly towards economic growth. The significance of mining sector in South Africa has long been seen as of the driving force in an economy. Although, there have been numerous challenges associated with the achievement of the mining sector. The promotion of Infrastructure remains to be the challenge in South Africa, upholding the progress of economic growth to be stable in order to correct the triple challenges. In this instance, the mining sector has not been delivering more in terms of generating infrastructure more especially within the regions where mines are located. Many studies encompass the positive relationship between infrastructure and economic growth. Even though, there have been various arguments concerning the level of maximum output generated by infrastructure.

Solow (1956) in his study advocates that labor and capital are only two factors of production that enhance level of output. The theory did hold into two assumptions, firstly which was constant return to scale and diminishing marginal of returns. Romer, Mankiw and Weil (1992) in their study they further criticized Solow by endogenousing technology and include human capital in their model. They saw human capital as an important factor contributing directly to growth. The importance of this paper is to verify if the basis of Solow's growth model can be used to contribute in the economic growth of emerging countries and advance industrialized countries. Fedderke and Garlick (2008) and Kumo (2012) also concur that investment in infrastructure has the positive relationship with economic growth. However, infrastructure also contributes to economic growth when it's related to investment. Following the controversy regarding mining infrastructure, the objective of this paper is to examine the long run and short run association between mining infrastructure and economic growth. However, this paper continues to examine the casual relationship between mining infrastructure and economic growth. Specifically, the paper seeks to ascertain if mining infrastructure may possibly solve economic challenges faced by South Africa. Only selective variables

where brought into attention such as: Mining output, mining infrastructure, employment, export and taxation. The study seek to contribute to the going debate that lack of production output in South Africa is caused by inefficiency of infrastructure, Lack of skills and demand for wages or due to escalating unemployment rate of mining sector are magnitudes towards economic problems which mining sector seeks to alleviate. The study regarding literature of mining infrastructure in South Africa and developing countries is not sufficient; therefore the study will contribute to the little current literature regarding controversy thereof. The present paper is organized in the following manner, section 1 provides with the introduction and the overview how mining infrastructure and economic growth have been performing over the years, section 2, narrate both theoretical and empirical literature review. Section 3 endow the study with data and methodology of Vector Error Correction Model, section 4 present the results and interpretations and lastly section 5 presents summary and conclusion of the study.

Overview of the study: The discovery of minerals in South Africa influenced the country's growth positively especially with regards to employment and attracting foreign investments. As Malherbe and Segal (2000) the discovery of gold and diamond in the last half of the 19th century laid foundation for transformation of South Africa more basically from agricultural economy to a modern industrialized economy. According to Fedderke and Pirouz (2002) the mining sector contribution to value added has been declining ever since the year 1970 to 1998. The industry faced numerous challenges where employment and economic growth have been declining. Rodrik (2008) also argues that South Africa has been going under remarkable transformation since democratic transition in 1994. However South African mining industry has been experiencing high rate of unemployment and low economic growth. According to Curtis(2009), the South African mining companies are enjoying generous tax treatment were they can be able to deduct 100 percent of their capital expenditure against tax, however gold mining companies do pay corporate income tax according to the formula which payments are lower to government. The gold mining companies pay corporate income tax according to the formula that keeps government payments low. When the economy is not stable companies are entitled to pay less than what is required by the South African government. The purpose of creating a formula is to create a life span for gold mining companies in South Africa after the decline in volume of gold output.

Mangondo (2006) mentions that before 1997 gold producers in South Africa were forced to sell their commodity output of gold to South African Reserve Bank and they were paid with US dollars. The Reserve bank still purchases some of the gold and they make decisions about the reserves compositions (South African Reserve Bank, 2002). The share of mining sector products in South African Merchandise exports has declined from 58% percent in 1994 to 31.4 % percent in 2003; largely the smaller growth of gold mining did contribute to the decline in mining sector. Gold exports appealed about 10.1 % percent of share contribution to export basket followed by platinum group metals 9.3% percent, iron– ore 8.8% percent and coal exports 8.2% percent (Industrial development Corporate, 2013). The importance of mining industry as the relative employer to South Africa has essentially mirrored the predicament of output in past three decades (Fedderke and Pirouz, 2002).

2. Literature Review

Theoretical literature review: This section concentrates more on existing economic theories available. The theoretical literature is much important in this paper to confer much on historical background about developments. Many studies have brought much argument on how could emerging economies can converge with industrialized economies. Such arguments have opened interests on how government can play major role in making sure that sustainable development and economic development are reached. The theoretical underpinnings came from the classical and linear grow economists who discussed growth by formulating growth theory for development.

Robert Solow: In 1956 an American economist Robert Solow developed the study of a *contribution on the theory of economic growth.* He developed this study after criticizing Harrod Domar that savings is not the only variable that could expand the growth. In his study he presented the logical dynamic model with an explicit description of the process of capital accumulation in which savings and investment are being into new capital. In the Solow model, competitiveness of clearing factor markets are output produced within a year or each period are determined by available supplies capital and labor. The savings and investment are assumed to be

exogenous, while the labor force are expected or assumed to grow at the given rate. The essential need about Solow model is that it incorporates dynamic link between savings and investment and stock of capital (Solow, 1956). According to Sorensen and Jacobsen (2005), Solow model accounts for two successive years, so the stock of capital will increase by the amount of capital minus depreciation which will be the net investment. The stock of capital is equal to the net investment after deducting depreciation. Fourie and Burger (2015) present the assumptions of which were applied by Solow growth model, firstly there is a constant return to scale and secondly diminishing marginal of returns of both labor and capital.

Endogenous growth theory: Mankiw, Romer and Weil (1992) in their study developed the model which is similar to the Solow Swan model. However in their study they added human capital and endogenous technology contrary to Solow swan model where technology was given as exogenous. The theory focuses on positive externalities and spillover effects of knowledge based economy that will lead to economic development. In the endogenous growth theory, the spillover effects are disseminated indifferent investment as the results of human capital and reduce the diminishing of returns to capital accumulation. In their controversial study, the long run growth rate of the economy does holds into policy measures. This model is also seen similar because it assumes that there is constant return to scale beside human capital which is included in the model. Mankiw, Romer and Weil (1992) saw the gap in the Solow Swan model by including human capital in their production function as a form of expanding output per worker. One of the assumptions used in the theory is that production function does not exhibit diminishing returns to scale that will lead to endogenous growth. Various rational assumptions are given such as positive spillovers where capital investment would lead to growth as economy as in the whole and improvement in technology leading to improvement in learning and various institution. In the production function, Agenor (2006) argues that an important way from Solow Swan model is the small changes in resources devoted to both physical and human capital accumulation which may lead to large changes in output per worker. Furthermore, Romer (1992) regarded technology as outcome from individual abilities to create new commodities, ideas and including human capital accordingly.

Empirical literature review: Several studies have been conducted by researchers regarding the importance of mining sector in the economy. Hajkowiez, Heyenga and Moffat (2011) presents the study in Australia examining the relationship between quantity of life indicators and gross value materials, using 71 local government areas containing mining activities of household income, housing affordability and others. Tonts, Plumber and Lawrie (2012) examined the relationship between socio economic wellbeing and resource dependence in mining towns. It is evident that these researchers have employed identical methodology but with different dataset. However, the results of the researchers were established to be identical meaning that mining sector remains to be essential in promoting economic social well-being. Although, both of the studies could not place attention into supply side of the economy by reflecting the relationship between mining employment and capital with mining production. Solomon, Katz and Lovel (2008) mention that social dimensions of mines are increasingly acknowledged as critical towards business success but yet remain to be the least of business concept of sustainable development, economy environment and society.

Akabzana and Darimani (2001) developed the study in Ghana explaining that the mining sector has attracted 3billion of foreign direct investment and representing more than 60% of all the investments in the country. The mining industry in Ghana is known to be the leading sector by generating large investments of which the economy relies on. Amankwah and Sackey (2003) put forward their study by looking at the development in small scale of gold and diamond mining industry in Ghana and propose the strategies that can be implemented towards sustainable development within an industry and improve sustainable development within an industry. However, income generated from the mines is used to rehabilitate the existing mines and developing projects which will enhance both economic and social dimensions. Such strategies are proposed based on promoting social welfare. Fedderke and Bogetic (2002) developed the study in South Africa of infrastructure based on public investment and how does it contributes towards productivity growth.

Smit (2013) proposes that mining industry spend about 78 billion in wages and salaries, continues to be largest contributor in black economic empowerment. Kumo (2012) also made the study in South Africa about infrastructure and economic growth furthermore granger causality test was employed in a study using annual data from (1960-2009). The results were found to be that there is a causal relationship between

economic infrastructure and investment on economic growth. Mining industry has been the backbone of emerging economies in terms of economic sphere although there have been numerous challenges affecting the social welfare of emerging economies. The results obtained from both industrialized and emerging economies ought to be different. Moncur and Jones (1999), Fedderke and Pirouz (2002), Jones (2003), Kantor (2013), Hope (2014) and Abraham (2015) have examined the study of mining sector and their challenges in South Africa. However, the study regarding literature of mining infrastructure in South Africa and developing countries is not sufficient; therefore the study will contribute to the little current literature regarding controversy thereof.

3. Methodology

The study adopts a Vector Error Correction Model (VECM) to estimate the importance of mining infrastructure and economic growth in South Africa. Initially the data set is used to test for stationarity using Augmented Dickey Fuller test and Phillip Perron test. Subsequently, Johansen cointegration test is employed to examine the existence of cointegration. Error Correction Model is employed to examine the short run and long run relationship, and also to examine the existence of error correction term. Diagnostic checks are performed in order to test for normality (Jaque-Bera), heteroscedasticity (White) and Serial correlation (Lagrange Multiplier). Granger causality test is employed in this paper to examine the causality between mining infrastructure and economic growth.

Empirical model estimation: The paper adopted the model developed by Solow (1956) and Romer (1992) and it was explained further by Fedderke and Pirouz (2002). The purpose of using both neoclassical and endogenous growth model is to establish the significance of mining sector as a contributor towards economic growth. It is also important for econometric evaluation for certain alternative strategies for both mining sector and government could employ in the basis of decision making. The empirical model is presented below as follows:

$$Y = K^{\alpha}(AL)^{1-\alpha}$$

Where

Y – Output ratio
K – Stock of Human capital
A – Technological Progress
L –Labour

In order to avoid the fallacies of empirical spurious results, the description of estimated variables is given below. Some of the variables in this present paper are converted into logarithm in order to remove the trends. Such variables like employment and export where not converted into logarithm because they were collected in percentages. The above model is modified by employing the variables of Fedderke and Pirouz (2002) and was converted into estimable form as:

$$INGDP = \beta_0 + \beta_1 INGTAX + \beta_2 EXPORT + \beta_3 EMPLY + \beta_4 ININFRS + \mu$$

Where

INGDP - Gross Domestic Product
INGTAX - General Taxation
EXPORT - Merchandise Export
EMPLY - Total Employment
ININFRS- Infrastructure

Data issues: The present paper employed annual time series data to examine the relationship between mining sector and economic growth in South Africa from 1980-2013. Data on all variables were collected from the electronic data source of South African Reserve Bank (SARB).The variables were transformed into stationarity since macroeconomic variables are normally carrying a random walk or being non stationary. The Augmented Dickey Fuller and Phillip Perron unit root test were employed and the test results are presented in the table below as:

Table1: Unit root test

Order of integration	Variable	Augmented Dickey Fuller			Phillip Perron		
		Intercept	Trend& Intercept	None	Intercept	Trend& Intercept	None
2nd dif	GDP	-5.659*	-5.550*	-5.662*	-11.468*	-11.273*	-8.888*
2nd dif	INFRS	-5.611*	-5.520*	-5.714*	-11.189*	-10.543*	-11.539*
2nd dif	GTAX	-6.103*	-6.182*	-6.605*	-12.305*	-14.663*	-10.810*
2nd dif	EMPLY	-5.850*	-5.744*	-5.949*	-6.252*	-6.061*	-6.386*
2nd dif	EXP	-6.151*	-6.063*	-6.305*	-34.204*	-33.325*	-35.038*

Note: reject at 5% (*) significance level and 1% (**) significance level

In table 1, the Augmented Dickey Fuller and Phillip Perron test where performed and the null hypothesis of both test were rejected at 1% significance level. All the variables were reported to be stationary at second differences. The importance of carrying such test is to confirm if all variables are integrated at the same order. In this case all the variables are report to be integrated at the same order of I (2).

4. Findings

Since it is established that all variables are integrated at the same order, Cointegration test is performed in order to determine the number of cointegrating vectors or examining the long run equilibrium relationship among variables. Cointegration means the linear combination of variables being stationary although the individual variables being non stationary. The Johansen technique of maximum likelihood is performed in this present paper to test for cointegration. The study employed the Johansen technique which requires the lag order of selection and the deterministic trend assumptions of VAR. To select the lag order under VAR, the information criteria is provided as the direction to choose the appropriate lag order. In this present paper, the maximum lag of 3 was employed to allow adjustments in the model and undertake well behaved residuals (Murwirapachena, Maredza, Choga, 2013). However, according to Liew (2004) and Mah, Petersen, Miruka and Petersen (2013) argue that it is important to focus more on Akaike Information Criteria and Final prediction Error are superior when having less than 60 observations.

Table2: Lag order of selection criteria's

lag	logL	LR	FPE	AIC	SC	HQ
0	-232.700	N/A	1.948	-14.856	-15.085	14.932
1	-35.065	321.155	4.111	-4.066	-5.440*	4.522*
2	-6.252	37.817*	3.660*	-3.828*	-6.347	4.663

Note: asterix (*) indicates lag order selection of criterion, LR: Sequential modified LR test statistics (each test at 5% level).FPE: Final Prediction Error. AIC: Akaike Information Criterion. SC: Schwarz Information Criterion. HQ: Hannan Quinn Information Criterion

The results in Table 2 show that most of the lag order of selection criteria (LR, FPE and AIC) depicted lag two as a best lag for our data. The agreement of lag length selection method agreed with two so the study will use lag order of two in the coming tests. The Johannsen cointegration test is conducted using lag order of 2. The present paper has employed Johansen cointegration and do confirm if there is cointegration between the variables. In Table 3 Johansen cointegration is estimated were both trace test and maximum eigenvalue test are employed to determine number of cointegrating vectors in this paper. The results obtained show that in the case of trace test the null hypothesis of no cointegration was rejected since the test statistics of 85.082 was greater than the critical value of 69.818; hence long run relationship exists at none. Moving to another test of null hypothesis at most one the test statistics was 49.098 greater than the critical value of 47.856 so in this case we reject the null hypothesis of no cointegration, hence the long run relationship also exist at most one. Moving to another test of null hypothesis at most two the test statistics was 26.518 less than the critical value of 29.797, hence we stopped and conclude by saying there are only two cointegration relationship under trace test.

Table3: Johansen Cointegration Test

Hypothesised no of CE(S)	Eigen value	Trace statistics	Critical value (5%)	Maximum Eigen statistics	Critical value (5%)
None	0.693	85.082*	69.818(0.001)	36.704*	33.876(0.022)
At most 1	0.517	49.098*	47.856(0.038)	22.579	27.584(0.192)
At most 2	0.477	26.518	29.797(0.113)	20.100	21.131(0.069)
At most 3	0.184	6.418	15.494(0.646)	6.333	14.26(0.570)
At most 4	0.002	0.085	3.841(0.770)	0.085	3.841(0.770)

The results of maximum eigenvalue test also show that in none the maximum Eigen value statistics of 36.704 is greater than the critical value of 33.876. The null hypothesis of no cointegration is also rejected and concludes by saying there is a long run relationship at none. At most 1, 2, 3 and 4 their maximum Eigen values statistics where less than the critical values and failed to reject the null hypothesis of no cointegration. The maximum Eigen value probability was significant at none; hence the maximum Eigen test also confirms one cointegrating vector. Both the trace and maximum eigenvalue tests do confirm the long run relationship of mining sector and economic growth in South Africa. Murwirapachena, Maredza and Choga (2013) in their paper declare that, the VECM allows to distinguish both the long run and short run variables and also to establish the influence of explanatory variables towards and explanator variable. The VECM permits to separate long run and short run effect of on the model. The long run model shows the change of explanatory variables and also the behavior of economic growth in South Africa over years. Our normalized cointegration coefficients are: $INGDP_t = -18.470 - 0.041EXPORT + 0.014EMPLY - 1.466ININFRS = +\mu_t$

Table 4: Long run estimated equation

Variables	Coefficients	Std Errors	T statistics
INGDP(-2)	1.000		
EXPORT (-2)	0.041	0.019	2.163*
EMPLY (-2)	-0.014	0.011	-1.204
ININFRS (2)	1.466	0.356	4.108*
Note : the asterix represents significance of variables at 5% (*) and 1% (**)			

Table 5: Error Correction Model: INGDP

Variables	Coefficients	Std Error	T-Statistics
D(INGDP(-1))	0.442	0.206	2.142
D(INGDP(-2))	-0.365	0.211	-1.725
D(INGTAX(-1))	0.146	0.197	0.741
D(INGTAX(-2))	0.382	0.188	2.023
D(EXPORT(-1))	0.011	0.078	0.152
D(EXPORT(-2))	-0.054	0.060	-0.904
D(EMPLY(-1))	0.002	0.002	1.311
D(EMPLY(-2))	0.009	0.002	0.388
D(ININFRS(-1))	-0.025	0.155	-0.163
D(ININFRS(-2))	-0.144	0.182	-0.790
COINT Eq2	-0.323	0.134	-2.412
CONSTANT	-0.038	0.034	-1.107
Note: the asterix represents significance of variables at 5% (*) and 1% (**)			

The long run relationship between variables as described by the equation above suggest that there is positive significant relationship between mining infrastructure and economic output in South Africa. The results obtained in a model are consistent with the study conducted by Fedderke and Garlick (2008) and Cawood (2011). However, the mining industry has been experiencing share decline of commodities together with high demand of real wages. Furthermore, the study has approved a negative insignificant relationship between

mining employment and economic growth in South Africa. There is also positive significant relationship between export and economic growth. In the nutshell, the results confirmed that mining infrastructure is imperative when coming to economic growth towards South Africa. The coefficient of an Error Correction Model (ECT) is (-0.323) and statistically significant with a t-value of (2.412). This indicates that, the speed of adjustment is 32%, implying that if there is a deviation from equilibrium then 32% of the economic growth is corrected in one year as the variables will be moving back to its trend. Furthermore, the model will go back to its normal trend with a coefficient of 32%.As a result, mining infrastructure has more direct effect on economic growth in the long run and confirms the findings from the work of Perkins, Fedderke and Luiz (2005) and Kularatne (2006) who found positive significant relationship between infrastructure and economic growth.

Table 6: Diagnostic test

Test	H_0:	Test statistics	P value
Jarque Bera	There is normal distributed	4.891	0.898
Lagrange Multiplier	No serial correlation	23.444	0.551
White	No conditional Heteroscedasticity	358.783	0.508

In this present paper the diagnostic test was performed to confirm parameter evaluation of outcomes estimated in the model of the study. There are various methods to be employed when examining the exact outcomes and testing the fitness of the model, however, in this present paper we employed only three methods which are Jarque Bera used for normality test, Lagrange Multiplier for testing serial correlation and lastly White is employed to test for heteroscedasticity. The table above suggests that the model is normally distributed, there is no serial correlation and there is no conditional heteroscedasticity.

Table 7: Granger Causality

Null hypothesis	Obs	Fstats	Prob	Conclusion
ININFRS does not granger cause INGDP	32	5.309	0.011	Causality
INGDP does not granger cause ININFRS	32	1.147	0.332	No causality
EMPLY does not granger cause INGDP	32	5.378	0.010	Causality
INGDP does not granger cause EMPLY	32	1.460	0.250	No Causality
INGTAX does not granger cause INGDP	32	5.449	0.010	Causality
INGDP does not granger cause INGTAX	32	0.211	0.810	No causality
EXPORT does not granger cause INGDP	32	0.267	0.767	No Causality No
INGDP does not granger cause EXPORT	32	0.696	0.507	Causality
INGTAX does not granger cause ININFRS	32	4.235	0.025	Causality
ININFRS does not granger cause INGTAX	32	0.636	0.537	No causality
EMPLY does not granger cause ININFRS	32	2.730	0.083	No Causality
ININFRS does not granger cause EMPLY	32	2.325	0.117	No causality
EXPORT does not granger cause ININFRS	32	0.378	0.688	No-causality No
ININFRS does not granger cause EXPORT	32	1.167	0.326	causality
EMPLY does not granger cause INGTAX	32	0.532	0.593	No causality
INGTAX does not granger cause EMPLY	32	1.884	0.171	No causality
EXPORT does not granger cause INGTAX	32	3.447	0.046	Causality
INGTAX does not granger cause EXPORT	32	0.259	0.773	No causality
EXPORT does not granger cause EMPLY	32	0.023	0.976	No causality No
EMPLY does not granger cause EXPORT	32	0.596	0.557	causality

In this present paper we employ 2 lags to test for granger causality among the variables. The study presents granger causality where probabilities of variables are expected to be less than 5% then variables will granger cause each other. Granger causality test does reflect causality between Gross Domestic Product and infrastructure. The results play a major role with the study since other studies have obtained opposite results. There is sufficient evidence that infrastructure, employment and general taxation does granger cause

economic growth. In the other hand, variables are reported to have no causal relationship. There is only one direction which runs from mining infrastructure to economic growth. Consequently, we conclude by saying there is an exact relationship between economic growth and mining infrastructure.

5. Conclusion

The study has examined a causal relationship between mining infrastructure and economic growth in South Africa using time series data of (1980-2013). The analysis is used to determine an impact of mining infrastructure on economic growth in South Africa using the Vector Error Correction Approach. The study has established several policy implications which were undertaken to be discussed. Firstly there is sufficient evidence suggesting that increasing mining infrastructure will expand economic growth. The current existence of infrastructure will form employment together with skills development that will constitute an increase in promoting human capital and economic growth. Furthermore, the importance of supplying skills development to employees is that they will be able to handle high value added task more efficiently and quickly. In particular, increasing infrastructure investment in human capital would endow with new ideas and more innovation. Secondly the causality of infrastructure and economic growth of the study does also support economic theory. In the study investment in infrastructure will greater allow more total output in the given input with efficient cost of input. The evidence in the study showed how infrastructure could bring growth in South Africa but more are still to be done in promoting and enforcing both public and private investments. South Africa has an adequate infrastructure but still facing triple challenges which are poverty, inequality and unemployment. Due to the rapid structural change occurred by globalization and technological change, mining employees with less education should further their studies in order to control physical capital. Acquiring expensive physical capital at the aim of containing maximum output would occur with escalating costs of producing outputs.

Thirdly, according to empirical results obtained from the study, there are more than one cointegrating vectors both in short and long run relationship in South Africa. The public sector infrastructure will only be effective in the short run and corrects the economic challenges temporarily however, including private infrastructure brings along solutions that are effective in the long run. In conclusion, the findings concerning the study are in line with current literature. The mining infrastructure has an effect on economic growth both in short and long run. In the theory of Solow both labor and capital remains to be key objective of growth. Therefore, the study recommends that policy makers should improve private infrastructure which will equip human capital to be more useful in contributing towards knowledge and innovation. This means South African mining industry should priorities the development of infrastructure as component that will be sufficient towards to economic development. Infrastructure in telecommunications, electricity, railways and other infrastructure which are directly related to production are quite imperative to create employment and increasing capacity of export promotion.

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Brand Consciousness of BOP Consumers in South Africa

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Abstract: Bottom of the pyramid (BOP) consumers are not just basing their purchase decisions on price and affordability but on the value derived from good-quality brands. Hence, this study assesses the brand-consciousness of South African BOP consumers in terms of brand awareness, differentiation, recognition, loyalty, trust and preferences for leading brands. The aim is to understand the brand consciousness of the South African BOP market so that suitable brand management strategies may be formulated to profitably serve the needs of this market. The population (2 556 422 elements) included BOP consumers living in relative poverty within the rural areas of South Africa from which a sample of 600 subjects was drawn using area sampling. Data was collected using a self-development questionnaire whose psychometric properties were statistically assessed and analyzed using descriptive and inferential statistics. The findings reflect that there is a high degree of brand awareness amongst BOP consumers, the majority of BOP consumers are able to easily differentiate between the various brands based on the brands' logos, design and/or coloring, a significant segment displays brand loyalty which alters when price becomes a factor for consideration and BOP consumers lack trust where new brands are concerned and prefer good quality brands. Furthermore, BOP consumers' brand consciousness and purchase decisions are influenced by education and income respectively. It can also be concluded that the majority of South African BOP consumers are brand-conscious; hence, brands play an influential role in their consumer decision-making process. Beneficial recommendations are presented for business organizations.

Keywords: *Bottom of the pyramid (BOP); brand consciousness; brand loyalty; brand awareness; brand recognition; brand trust*

1. Introduction

Prahalad (2005) advocates that the plight of approximately 4 billion people who survive on less than $2 per day can be alleviated by an unconventional approach to global poverty eradication. This approach involves the joint collaborative effort by government, non-governmental organizations (NGOs), large domestic firms, multinational corporations (MNCs), as well as the poverty stricken citizens themselves. By co-creating unique solutions, Prahalad (2005) believes that the consumers residing at the bottom of the economic pyramid (BOP) will be able to derive the benefits of dignity, respect, choice and self-esteem and, hence, will be afforded the opportunity to break out of the poverty trap. The basis for this process of co-creation is that the poor are perceived as value-conscious consumers and joint problem solvers who collectively possess vast entrepreneurial potential and purchasing power. It is essential for profit-seeking businesses to develop an understanding of the needs of the BOP market in order to adapt their marketing approach to meet the characteristics of the consumers at the bottom of the pyramid. In order to actively engage with and service the needs of the BOP consumers, it is imperative for businesses to develop a commercial infrastructure that is suited to the needs and challenges of this market (Prahalad & Hart, 2002). Four elements (creating buying power, shaping aspirations, improving access and tailoring local solutions), which require innovation in technology and management processes; need to be taken into account in developing this commercial infrastructure (Prahalad & Hart, 2002). In retrospect, this multi-trillion dollar market segment requires business strategists to focus their efforts on providing low-cost but good quality products and harnessing creative and novel approaches in order to convert the problem of poverty into a lucrative business opportunity that benefits all constituents involved (Prahalad & Hart, 2002).

Prahalad (2012) posits that one of the foremost reasons for the reluctance of MNCs to serve the needs of BOP consumers is deeply rooted in the presumption that these consumers are unfamiliar with, nor have embraced the conception of branding due to their restricted education, access to information and purchasing power. However, the rapid growth in the adoption of modern technology (televisions, internet, mobile cell phones) is shaping consumer behavior and increasing product and brand awareness at the bottom of the pyramid (Prahalad, 2012). BOP consumers, who are becoming increasing brand conscious, are not basing their

purchase decisions on price and affordability but on the value derived from good-quality brands (Barki & Parente, 2010; Majumder, 2012; Nakata & Weidner, 2011; Neuwirth, 2012; Nyanga, 2015; Prahalad, 2012; Rijke, Diehl & Schoormans, 2009; Subrahmanyan & Gomez-Arias, 2008; Variawa, 2010).

Purpose of the article: This article purports to analyze the brand-consciousness of South African BOP consumers in terms of brand awareness, differentiation, recognition, loyalty, trust and preferences for leading brands, thereby, enabling the articulation of brand management strategies in order to profitably serve the needs of the South African BOP market. The study therefore, has the potential to contribute to understanding and better serving the South African BOP market thereby contributing to socio-economic perspectives and national and global imperatives.

2. Literature Review

Before delving into the theoretical framework of the BOP proposition and the brand-consciousness of BOP consumers, an understanding of the concept of branding and its constituents is necessary.

The Concept of Branding: Brands are crucial features of a product that can be described as the "verbal and physical cues" that assist consumers in identifying the products that they wish to purchase and these cues also influence consumers when deciding which alternatives to choose in the buying decision making process (Dibb, Simkin, Pride & Ferrell, 2012, p. 319). A brand can be defined as a name, term, symbol, sign, design, or a combination of these that are used to identify one seller's products and services from that of another and are especially valuable to marketers when they want to develop a brand identity that differentiates the firm's products and services from those of competitors (Keller, 2013). In addition, brands help consumers to evaluate the quality of products, reduce the perceived risk of purchase and offers psychological rewards and status appeals that originate from owning certain brands (Dibb et al., 2012). Brands benefit organisations in that they create value for the firm, act as a pertinent barrier to competition, have a favourable influence on consumers' perception of products, improve profits and provide the basis for brand extensions, in which new products are added to the existing brand (Jobber & Ellis-Chadwick, 2013).

Brand equity refers to the marketing and financial value of the brand and a brand that has a high level of awareness, brand loyalty and perceived quality, is likely to have high brand equity (Dibb et al., 2012; McDaniel, Lamb & Hair, 2013). According to Keller (2013), customer-based brand equity (CBBE) is the differential effect that brand knowledge has on consumer response to the marketing of that brand. Keller (2013) states that brand knowledge comprises brand awareness, which is itself a function of recognition and recall, and brand image, which reflects the associations that consumers hold for the brand in their memory. Building awareness necessitates the repeated exposure of consumers to the brand and being able to link the brand in consumer memory to its product category as well as to purchase, usage and consumption situations (Keller, 2013). Keller (2013) advises that creating a positive brand image requires establishing strong, favorable, and unique associations for the brand.

It is imperative for organisations to differentiate their brands from that of competitors. Brand differentiation is simply the means by which a firm is able to set its brands apart from the competition through superior quality, novel features and customer value. Consumer trust in a brand is developed through the positive reinforcement of his/her purchase decision, thereby fostering a feeling of security by the consumer that the particular brand will meet his/her desired expectations. Brand loyalty is the strongly motivated or consistent decision to purchase one brand over another in the same product category and enables organizations to retain existing customers and avoid having to spend large amounts of time and money in gaining new customers (Dibb et al., 2012; McDaniel et al., 2013). Keller (2013) believes that brand loyalty is of paramount importance to businesses as it results in repeat consumer purchases, reduced marketing communication costs, warrants premium-pricing and leads to positive word-of-mouth. McDaniel et al. (2013) further add that brand loyalty is critical in creating a barrier to market entry for competitors, forms a basis for a competitive advantage and makes it easier for the organization to engage in brand extensions.

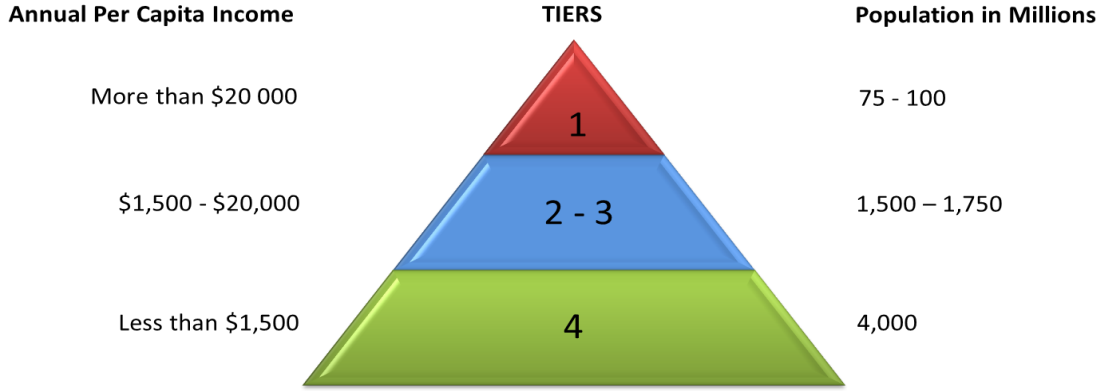
Dibb et al. (2012) outline that there are three distinct degrees of brand loyalty, namely, brand recognition, brand preference and brand insistence.

- *Brand recognition* is the mildest degree of brand loyalty and occurs when the consumer is aware of the brand's existence and views it as an alternative to purchase should the current preferred brand be unavailable.
- *Brand preference* is a stronger degree of brand loyalty than brand recognition and is characterized by a situation in which the consumer displays a definite fondness for the brand over competing brands. The consumer is highly inclined to purchase the brand should it be available but if it is unavailable, the consumer will then settle for the substitutes in order to avoid expending time and effort in search of the preferred brand.
- *Brand insistence* is the least common degree of brand loyalty in which the consumer displays a very intense preference for a specific brand and will take extra time and effort to find and purchase the desired brand as this consumer is unwilling to settle for a substitute brand.

It is crucial for organizations that want to explore the BOP markets to understand the needs and disposition of these consumers, as well as their purchase behavior, which embodies the concept of brand-consciousness.

The BOP market: Before delving into an elucidation of the nature of the BOP market, one needs to firstly understand the concept of poverty and the estimation thereof. An elementary definition of poverty is that it is a situation in which there is a shortage of sufficient resources that are required to obtain the vital necessities for survival. In addition, poverty can also be described as material or multi-dimensional (income, education, security, health) deprivation. According to Statistics South Africa (2007), an official poverty line should be created as a measure of the monetary income needed to attain a basic minimal standard of living. There are three basic approaches to estimating poverty lines, namely, an absolute, a relative and a subjective approach, each of which views poverty and the appropriate quantification thereof, differently. Relative poverty defines the basis for the South African BOP market in this article. IHS Global Insight Southern Africa, Regional eXplorer *ver 566* (2011, cited in the South African Institute of Race Relations Survey, 2010/2011, p. 307) defines people living in relative poverty as "those living in households with incomes less than the poverty income which varies according to household size and changes every year – the larger the household, the larger the income required to keep its members out of poverty". According to Prahalad and Hart (2002), a four-tiered economic pyramid can be used to represent the global distribution of wealth and the capacity to generate income (Figure 1).

Figure 1: The Economic Pyramid



Prahalad, C.K. & Hart, L.H. (2002). The Fortune at the Bottom of the Pyramid. *Strategy+Business,* [Online]. 26. Accessed December 2, 2010, from the World Wide Web: http://www.cs.berkeley.edu/~brewer/ict4b/Fortune-BoP.pdf, p. 4.

Tier 1, which is positioned at the top of the pyramid, consists of wealthy individuals with plentiful opportunities to generate high levels of income. Tiers 2 and 3 (middle of the pyramid) comprise of individuals whose annual per capita income is between $1,500 and $20,000, which when converted to the South African rand as at the average rand-dollar conversion (1 US$ = 13.00 ZAR) as at 28 February 2017 is between R19 500 – R260 000 (Moneyweb, 28 February 2017). More than 4 billion people live at the bottom of the pyramid on less than $2 or R26 per day (conversion as per average rand-dollar conversion for 28 February 2017) and

this tier has been identified as the bottom of the pyramid (BOP) market which consists of impoverished individuals who transact predominantly in the informal market economy (Moneyweb, 28 February 2017). Prahalad and Hart (2002), who are renowned for initiating the concept of selling to the poor and for coining the term B24B (business-to-4-billion), state that there is voluminous untapped purchasing power at the bottom of the economic pyramid which accounts for approximately two thirds of the world's population. Large MNCs are best suited to lead the commercialization of this multitrillion dollar market by focusing on low profit margins and a large volume of sales. By selling to the poor, companies will be able to bring dignity, empowerment and prosperity to BOP markets by creating employment opportunities and thereby eradicating poverty (Prahalad & Hart, 2002).

Targeting the BOP markets has presented many challenges in terms of communication, distribution of goods and provision of credit due to the illiteracy or low levels of education, volatile income and poor infrastructure of BOP markets. Prahalad and Hart (2002) believe that these challenges can be overcome as MNCs have the necessary financial and physical resources, infrastructure, knowledge, expertise, experience and capabilities to:

- restructure their current business models to adapt to the needs of the BOP markets;
- design novel and inexpensive product and service offerings that will enhance lifestyles, nutrition and well-being of BOP consumers and
- Articulate business strategies that will not only increase profitability but also form the basis for establishing a competitive advantage and propagating market share at the bottom of the pyramid.

According to Prahalad and Hart (2002), MNCs need to alter their perceptions of the BOP markets in order to appreciate its true vibrant market potential. The BOP market was not considered a lucrative market based on certain assumptions that were made by MNCs that the poor cannot afford the products and services sold by MNCs and that the costs associated with serving this market will be exorbitant thereby eroding profits (Prahalad & Hart, 2002). In addition, meager and sporadic incomes, lack of infrastructure, absence of proper legal and political frameworks and insufficient information about consumer behavior at the bottom of the pyramid also serve as deterrents in targeting this market (Chipp, Corder & Kapelianis, 2012; Nakata & Weidner, 2011; Prahalad, 2012). Prahalad (2012) refutes the notion that BOP consumers purchase the cheapest products available to them on the market and do not indulge in the purchase of luxury products or branded items.

Brand-consciousness of BOP consumers: Evidence suggests that BOP consumers are often prone to purchasing products that are regarded as superfluous items and engage in the purchase of non-luxury items (also known as occasional and festival purchases) in order to satisfy traditional customs and in a bid to keep up with society (Banerjee, Deaton & Duflo, 2004; Banerjee & Duflo, 2007; Prahalad, 2005; Subrahmanyan & Gomez-Arias, 2008). In his book entitled, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*, Prahalad (2005) cites the success story of a large retailer in Brazil that sells premium-quality brands on credit to BOP consumers. Casas Bahia sells brands like Sony, Toshiba, JVC and Brastemp (Whirlpool) on credit to BOP consumers with meager and sporadic incomes, thereby affirming that BOP consumers are indeed brand-conscious (Prahalad, 2005). Michael Kline, the founder of Casas Bahia, believes that when BOP customers enter the company's store they have the intention of buying not just a top-quality television set or stove, but are buying a dream, and it is part of the company's mission to ensure that these dreams are fulfilled (Sadri & Sadri, 2011).

Neuwirth (2012) agrees with Prahalad (2005) that BOP consumers are in fact brand-conscious and are motivated to purchase products of a good quality and affirms that it will be a mistake to assume that poor consumers are naturally inclined to purchasing 'cheap' products because of their low and erratic incomes. Gordon (2008 cited in Louw, 2008) advises that it is imperative for businesses to note that the poor have similar aspirations towards branded consumer products and are just as susceptible to brand advertising as non-poor consumers with the only difference being that the poor lack funds and storage space to purchase large quantities. Variawa (2010) found, in a study of the South African BOP market, that these low-income consumers are very brand loyal to more expensive brands that are perceived to be of a better quality than the cheaper brands that are available to them. These low-income consumers enjoyed a more fulfilling brand experience with 'premium' brand products compared to that of 'cheaper' brand products (Variawa, 2010).

Moore (2006 cited in Louw, 2008) asserts that although poor consumers have meager incomes and cannot purchase very large quantities of goods, they are nevertheless still interested in good quality products, access to credit and the attraction to brand names as is the case with affluent consumers. Subrahmanyan and Gomez-Arias (2008) add that BOP consumers are sophisticated and creative in their needs and are not purely driven by survival and lower-order (physiological) needs but aspire to buy better products in order to satisfy their higher-level needs.

Bhan and Tait (2008) believe that low-income consumers prefer superior product brands, not because they are particularly brand conscious but desire value for money. Due to limited access to information about new products, BOP consumers are likely to rely upon positive word-of-mouth, the advice and opinions of people that they trust and respect and the favorable product experiences of family and friends has a strong influence on the goods and brands that they purchase (Bhan & Tait, 2008; World Economic Forum, 2009). Hamilton (2003) found that BOP consumers have a great preference for leading brands but that the inability to purchase them leads to frustration. It was also found that BOP consumers are hesitant to try new unfamiliar brands for fear of wasting valuable resources on under-performing products (Hamilton, 2003). The BOP consumers are smart shoppers who cannot afford to make mistakes in purchasing decisions and are, therefore, more inclined to purchasing branded products that are reputable and whose quality they can trust (Bhan & Tait, 2008, Louw, 2008; Prahalad, 2005 cited in Davidson, 2009; World Economic Forum, 2009). Louw (2008) found that this practice lead to high levels of brand trust and loyalty amongst BOP consumers. Varadarajan (2008) believes that the firm's use of promotional tools such as cents-off coupons and in-store specials may be vital in retaining the patronage of the price sensitive BOP consumers and can reduce the likelihood of brand switching. The lack of brand trust is an important challenge that businesses need to overcome in order to be successful in BOP ventures. Brand differentiation and awareness are crucial as BOP consumers are less likely to try new brands on the market. Therefore, businesses need to clearly demonstrate the merits of offering their brands to these consumers.

3. Methodology

Respondents: The population for this study included South African BOP consumers living in relative poverty within the rural areas of South Africa. Upon request to the South Africa Institute of Race Relations, the researchers were provided with a Desktop Research Service report which outlined the 2012 relative poverty statistics for the 278 districts and municipalities in South Africa. The population sizes and rates of poverty for each of the districts and municipalities (which were categorized according to provinces) were provided and based on these figures, the researchers were able to calculate the number of people living in relative poverty in each of these regions. The researchers defined the population for the study as those individuals residing in districts with a poverty rate of 70% or more but owing to the fact that there are provinces with a higher prevalence of poverty than others, the researchers further defined the population to include individuals from the top three municipalities with the highest poverty rates (above 70%) per province resulting in a population of 2 556 422 elements. The sample size for the study was calculated using an online Sample Size Calculator (Sample Size Calculator, 2014). The population for this study (2 556 422 elements), a confidence level of 95% and a confidence interval of 4% were used to generate a sample size of 600 subjects (Sample Size Calculator, 2014).

The area sampling approach was used for this study. According to Blumberg, Cooper and Schindler (2008), area sampling is the most important form of cluster sampling which involves the division of the entire population into groups of elements which can be randomly selected for the study. Sekaran and Bougie (2010) add that the area sampling technique is appropriately suited to research in which the goal is confined to a certain locality or area. Based on this sampling design, homogeneous clusters of BOP consumers in South Africa have been identified according to the different municipalities. Due to time constraints and exorbitant costs associated with data collection, the researchers decided to conduct fieldwork in the provinces with the highest prevalence of people living in relative poverty (Eastern Cape, KwaZulu-Natal and Limpopo). The researchers acknowledged that the rural areas within these selected provinces housed predominantly Black South Africans and in order to gain a diverse perspective from the inclusion of another racial group in South Africa, Western Cape was included in the sample as the rural regions within this province consisted primarily of Colored South Africans.

As mentioned previously, the minimum sample for this study was calculated as 600 subjects. However, the researcher received 631 correctly completed questionnaires. The adequacy of the sample was further determined using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (0.826) and the Bartlett's Test of Spherecity (1788.895; p = 0.000) for factors relating to branding, which respectively indicated suitability and significance. The results indicate that the normality and homoscedasticity preconditions are satisfied. In terms of the composition of the sample, the highest percentage of respondents for this study was from the Eastern Cape (36.6%) and KwaZulu-Natal (36.5%). The Limpopo province had 22.2% of the respondents and 4.8% of the respondents for this study was from the Western Cape. There were more female (58.5%) than male (41.5%) respondents and the sample of this study comprised respondents from just two race groups. Black South Africans accounted for 95.2% of the respondents whilst Colored South Africans constituted the remaining 4.8% of the respondents of this study. The highest proportions of respondents were from the 30-39 years (22.3%) and 40-49 years (22.2%) age group categories. The 18-29 years age category had 20.9% of the respondents, followed by the 50-59 years (17.6%) and 60 years and over (17%) age categories. The majority of the respondents (37.9%) had a high school educational background. Thirty-five percent of the respondents were in possession of a primary school educational qualification whilst 15.2% of respondents had no formal education. Respondents who had diploma qualifications accounted for 9.4% of the sample and a meager 2.5% of the respondents of this study were graduates with degree qualifications. The majority of the respondents (26.5%) earned between R1001 and R1500 per month, followed by the R251-R500 (20.9%) and R501-R1000 (20.8%) monthly income categories. Respondents who earned between R1501 and R2000 per month comprised 11.3% of the sample whilst 10.9% of the respondents earned above R2000 per month. Respondents who earned below R250 per month accounted for 9.7% of the sample for this study. It should be noted that the population for this study is defined in terms of people living in relative poverty which means that these individuals reside in households with incomes lower than the poverty income and varies in accordance to household sizes. Evidently, the larger the size of the household, the more income is required in order to keep its members out of poverty.

Measuring instrument: Data was collected using a questionnaire. Sekaran and Bougie (2010) advice that the language of the questionnaire must suit the level of understanding of the respondents and that the choice of words selected must be dependent on the level of education of respondents. It is for this reason that the researchers compiled a very simple questionnaire with statements that were very easy to understand by the BOP respondents of this study. Further to this, the questionnaire was translated by a reputable company into three African languages of preference (isi-Zulu, Tshivenda and Xhosa) – certified, for the various provinces. Closed-ended questions were utilized in the questionnaire. The educational levels of respondents and the magnitude of this study (sample of 600 elements) warranted the use of closed-ended questions. The questions were both positively and negatively worded in order to avoid respondents mechanically circling responses on one end of the scale. The questionnaire was divided into two sections. Section A of the questionnaire used a nominal scale to record the biographical details (age, highest educational qualification, monthly income, number of people living in a household, gender and race) of the BOP consumers. Section B of the questionnaire used an ordinal scale in which consumers were requested to rank certain variables in order of importance to them, as well as an interval scale in the form of a 5-point Likert scale. Statements 1 to 11 in Section B of the questionnaire related to the branding dimension of this study which was further categorized according to brand awareness, differentiation and recognition (statements B1, B2, B3), brand loyalty (statements B4, B5, B6), brand trust (statement B7, B8, B9) and preference for leading brands (statements B10, B11). A pilot test was conducted (prior to the actual commencement of the study) on a small group of 15 BOP consumers from the KwaZulu-Natal region to investigate the feasibility of the proposed procedure, as well as detect possible shortcomings and flaws in the measurement procedures. The suitability of the design of the questionnaire was also tested and the findings reflected that it was not necessary to implement any changes before the actual commencement of this study.

Research procedure: The research was only conducted after ethical clearance was obtained for the study and upon completion of the pilot study.

Measures/statistical analysis of questionnaire: *The validity of the questionnaire was statistically assessed* using Factor Analysis. When undertaking the Factor Analysis, only items with loadings greater than 0.4 were considered. Furthermore, when an item loaded significantly on two factors only that with the highest value was considered. The item loadings determining the factors are depicted in Table 1.

Table 1: Factor Analysis: Validity of the questionnaire assessing Branding

Component	1	2	3	4
B1	0.819	0.080	0.193	-0.051
B2	0.777	0.271	0.084	0.057
B3	0.790	0.004	0.237	-0.014
B4	0.369	0.194	0.632	0.083
B5	0.169	0.073	0.805	-0.048
B6	0.027	0.687	0.402	0.005
B7	0.096	0.193	0.713	-0.195
B8	0.105	0.742	0.150	-0.066
B9	-0.063	-0.072	-0.103	0.929
B10	0.199	0.813	0.005	-0.067
B11	0.591	0.115	0.087	-0.368
Eigenvalue	2.475	1.862	1.858	1.060
Percent of Total Variance	22.50	16.93	16.89	9.64

Table 1 indicates that 4 items load significantly on Factor 1 and account for 22.5% of the total variance. Three items relate to brand awareness, differentiation and recognition and 1 item relates to preference for leading brands. Since the majority of items relate to *brand awareness, differentiation and recognition*, Factor 1 may be labeled likewise. Table 1 indicates that 2 items load significantly on Factor 2 and account for 16.9% of the total variance. One item relates to brand trust and 1 item relates to preference for leading brands. Since there is a higher significance in the item relating to *preference for leading brands*, Factor 2 will be labeled likewise. Table 1 indicates that 4 items load significantly on Factor 3 and account for 16.9% of the total variance. Three items relate to brand loyalty and 1 item relates to brand trust. Since the majority of items relate to *brand loyalty*, Factor 3 may be labeled likewise. Table 1 indicates that 1 item loads significantly on Factor 4 and accounts for 9.6% of the total variance. Since this item relates to *brand trust*, Factor 4 may be labeled likewise.

Administration of measuring instrument: Questionnaires were administered personally and trained fieldworkers assisted respondents to complete the questionnaires. This approach was suitable owing to the fact that these respondents have limited education or is illiterate and required assistance in the completion of the questionnaire. A team of fieldworkers from the four selected provinces (Eastern Cape, Western Cape, Limpopo and KwaZulu-Natal) were recruited and trained by the researchers in terms of the requirements of the data collection process. The advantage of having trained fieldworkers to assist respondents in completing the questionnaire was that a low-response rate and incomplete questionnaires were avoided in this study.

Statistical analysis of data: Descriptive statistics (mean, variance, standard deviation) and inferential statistics (correlation, Kruskal-Wallis One-way ANOVA, Mann-Whitney U-Test, Kruskal-Wallis t-Test) were used to evaluate the objectives and hypotheses of the study. These parametric and non-parametric statistics were selected to fulfill the aims of the study whilst establishing the extent to which the results may be generalized to the BOP market.

4. Presentation of results

The results obtained relating to the 'branding' dimension of the study will be presented using descriptive statistics (Table 2). BOP consumers were asked to rate their perceptions of the 'branding' dimension of the study using a 1 – 5 point Likert scale.

Table 2: Descriptive Statistics: Branding Dimension of the Study

Key Dimensions of the Study	Mean	95% Confidence Interval for Mean Lower Bound	Upper Bound	Std Dev.	Min.	Max.
Branding	3.598	3.553	3.643	0.573	1.636	5.000

In terms of BOP consumers' perceptions of the key dimension of branding (Table 2), the higher the mean score, the more positively the sub-dimension is viewed. Against a maximum attainable score of 5, it is evident from Table 1 that South African BOP consumers are relatively brand conscious (Mean = 3.598). Their level of brand consciousness (Mean = 3.598) is a synthesis of their brand awareness, differentiation, recognition, loyalty, trust and preference for leading brands for which frequency analyses were undertaken.

The results of the study reveal that there is a high degree of brand awareness amongst BOP consumers as the majority (88%) are strongly aware of the existence of different brands of items that they purchase. In terms of brand differentiation, 55.3% of the BOP consumers agree and a further 28.5% strongly agree that they are able to easily differentiate between the various brands based on the brands' logos, design and/or coloring. The results of the study reveal that the majority of BOP consumers (86.1%) are able to easily recognize the packaging of the products that they customarily purchase. In terms of brand loyalty, 46.6% of the respondents agree and a further 27.1% strongly agree that they have purchased the same brand of an item in five consecutive instances and the results also reveal that 43.1% of the BOP consumers agree and a further 20% strongly agree that they do not change brands often. The degree of brand loyalty does alter once price becomes a factor for consideration, as 32.8% of the BOP consumers agree and an additional 17.3% strongly agree that they purchase their preferred brands irrespective of price increases; however, 27.4% of the respondents disagree that they continue to purchase their preferred brands once the prices have escalated. In terms of brand trust, 46% of BOP consumers agree and an additional 16.2% strongly agree that they prefer to purchase the same brands in order to avoid the potential risk of wasting money on unfamiliar brands that may be unsatisfactory. However, 20.1% of respondents disagree that they engage in repeat purchases of the same brands in an attempt to avoid the wastage of resources on untried brands.

In terms of deriving value-for-money from the purchase of customary brands, 45.3% of respondents agree and a further 13.3% strongly agree that they acquire good value-for-money from the purchase of their preferred brands. The results of the study reveal that there is a lack of trust where new brands are concerned, as 34.1% of the BOP consumers disagree and a further 16.5% strongly disagree that they are accustomed to purchasing new brands of products that have unfamiliar levels of quality. In terms of preference for good quality brands, 38.7% of BOP consumers agree and an additional 16.6% strongly agree that they do not mind paying premium prices for the brands that they consider to be of a good quality. However, 20.9% of respondents disagree that they are inclined to pay extra for brands that are perceived as good quality. The majority of respondents (75.1%) are convinced that using a good quality brand will enhance their confidence and self-esteem. Two important aspects of branding, namely, brand trial and brand switching were also assessed in order to determine whether or not there is potential for MNCs to create brand loyalty amongst BOP consumers (Table 3).

Table 3: Descriptive Statistics: Branding, Brand Trial and Brand Switching

Key Dimensions of the Study	Mean	95% Confidence Interval for Mean		Std Dev.	Min.	Max.
		Lower Bound	Upper Bound			
Brand Trial	2.710	2.620	2.810	1.204	1.000	5.000
Brand Switching	3.390	3.300	3.490	1.189	1.000	5.000

In terms of the brand trial and brand switching sub-dimensions, the higher the mean score, the more positively the sub-dimension is viewed (Table 3). Against a maximum attainable score of 5, it is evident from Table 6.2 that BOP consumers engage in more brand switching (Mean = 3.39) than brand trial (Mean = 2.71). Frequency analyses were conducted in order to analyze how these BOP consumers view each of these sub-dimensions. The results of the study reveal that 34.1% of the BOP consumers disagree and a further 16.5% strongly disagree that they are inclined to purchase new brands of products that have unfamiliar levels of quality, thereby confirming that there is a lack of trust where new brands are concerned. When the prices of products that are usually purchased increases, 42.5% of the BOP consumers agree and a further 15.5% strongly agree that they switch to products that are cheaper in price; however, 16.5% of respondents disagree that they engage in brand switching. Two hypotheses were also tested regarding branding.

Hypothesis 1: There exists significant intercorrelations amongst branding and the other key dimensions (savings potential/ability to pay off debt, price/affordability, quality, appearance/acceptability, adaptability of existing products, functionality/performance, packaging/quantity, advertising/awareness, accessibility/availability and partnering with MNCs) of the study relating to BOP consumers (Table 4).

Table 4: Correlation: Branding and Other Key Dimensions of the Study

Key Dimensions of the Study	r / p	Branding
Branding	r	1.000
Savings potential/ability to pay off debt	r	0.255
	p	0.000*
Price/affordability	r	-0.083
	p	0.038**
Quality	r	0.099
	p	0.013**
Appearance/ acceptability	r	0.295
	p	0.000*
Adaptability of existing products	r	0.296
	p	0.000*
Functionality/ performance	r	0.232
	p	0.000*
Packaging/ quantity	r	0.004
	p	0.925
Advertising/ awareness	r	0.273
	p	0.000*
Accessibility/ availability	r	-0.231
	p	0.000*
Partnering with MNCs	r	0.084
	p	0.036**

*p<0.01, **p<0.05

Table 4 indicates that there is a significant relationship between branding and savings potential/ability to pay off debt, appearance/acceptability, adaptability of existing products, functionality/performance and advertising/awareness and, a significant but inverse relationship between branding and accessibility/availability, respectively, at the 1% level of significance. As evident in Table 4, there is a significant relationship between branding and quality and partnering with MNCs, respectively, at the 5% level of significance. Furthermore, there is a significant but inverse relationship between branding and price/affordability at the 5% level of significance. The implication is that BOP consumers who are more brand-conscious are less price-sensitive and strongly feel that a wide variety of products is inaccessible to them. Therefore, Hypothesis 1 may be partially accepted.

Hypothesis 2:
There is a significant difference in the perceptions of BOP consumers, varying in biographical profiles (age, highest educational qualification, monthly income and number of people living in a household, gender and race) regarding branding (Table 5 and Table 6).

Table 5: Kruskal-Wallis One-way ANOVA/Mann-Whitney U-Test/Kruskal-Wallis t-Test: Biographical Variables and Branding

Biographical Variables	Kruskal-Wallis One-way ANOVA/ Kruskal – Wallis T-Test Chi-Square	Mann-Whitney U	Z	P
Age	2.535			0.638
Highest Educational Qualification	36.318			0.000*
Monthly Income	21.832			0.001*
Number of People Living in a Household	29.219			0.000*
Race	2.034			0.154
Gender		44644.000	-1.640	0.101

*p<0.01 , **p<0.05

Table 5 indicates that there is a significant difference in the perceptions of BOP consumers varying in highest educational qualification, monthly income, number of people living in a household regarding branding at the 1% level of significance. As is evident from Table 5, no other significant differences exist. In order to assess where the significant differences lie, mean analyses were undertaken (Table 6).

Table 6: Mean Analyses: Biographical Variables and Branding

Biographical Variables		Mean	Std Dev.	N
Highest Educational Qualification	No education	3.313	0.562	96
	Primary school	3.592	0.611	221
	High school	3.659	0.522	239
	Diploma	3.783	0.480	59
	Degree	3.790	0.595	16
	Total	3.598	0.573	631
Monthly Income	Under R250	3.475	0.553	61
	R251-R500	3.448	0.572	132
	R501-R1000	3.670	0.563	131
	R1001-R1500	3.689	0.633	167
	R1501-R2000	3.522	0.450	71
	Above R2000	3.713	0.494	69
	Total	3.598	0.573	631
Number of People Living in a Household	1-3	3.549	0.530	184
	4-6	3.756	0.532	236
	7-9	3.503	0.590	153
	10 or more	3.359	0.661	58
	Total	3.598	0.573	631

Table 6 indicates that:

- The BOP consumers who have no education are comparatively less brand conscious than the consumers from the other educational qualification categories. The consumers from this category are more likely to switch brands and are more susceptible to purchasing new brands that are cheaper in price, irrespective of quality.
- Although BOP consumers from all monthly income categories are fairly brand-conscious, the BOP consumers, with a monthly income less than R500, are comparatively less brand-conscious than the BOP consumers from the other monthly income categories. These individuals are less likely to pay premium prices for good quality brands and are not as loyal to brands as the BOP consumers from the other monthly income categories are.

- Although BOP consumers from all household-size categories are fairly brand-conscious, the BOP consumers living in households consisting of 10 or more people are comparatively less brand-conscious than the BOP consumers from the other household-size categories. These individuals are unlikely to pay higher prices for better-quality brands and are comparatively less loyal to brands than the BOP consumers from the other household-size categories.

From the results reflected in Table 5 and Table 6, it is evident that Hypothesis 2 may be partially accepted.

Discussion of results: Several pertinent aspects of branding were examined in this study and the overarching evidence reveals that South African BOP consumers are indeed very brand conscious and that brands play a decisive role in their purchase decisions. This study's evidence concurs with Prahalad's (2005) contention that BOP consumers are brand-conscious and strikingly value-conscious by necessity. This finding is also supported by Majumder (2012 cited in Nyanga, 2015) who found that there is a growing degree of brand-consciousness amongst low-income consumers who are not basing their purchase decisions solely on price, but are seeking value-for-money from the brands that they purchase. However, a study conducted in three African countries by Dinica and Motteau (2012) found that these BOP consumers are not particularly interested in brands but acknowledge that certain brands are synonymous with good quality.

In terms of brand awareness, the findings of this study indicate that BOP consumers in South Africa are strongly aware of the existence of different brands of items that are available on the market. The high prevalence of brand awareness is pivotal in creating a favorable attitude towards a brand in a market that encompasses vulnerable consumers who are not easily prone to trusting unfamiliar brands and organizations. This outcome is congruent to the conclusions drawn by Nyanga (2015) and Prahalad (2005) that marketing communications efforts that create awareness of brands in BOP markets is of paramount importance in familiarizing BOP consumers with good-quality brands that will enhance their lifestyles. Rowley and Dawes (2000 cited in Nyanga, 2015) suggest that one of the reasons for BOP consumers disengaging themselves from certain products or brands is due to the lack of awareness of these brands and the value-added properties that they incorporate. Creating strong corporate brands in BOP markets is critical to success considering that BOP consumers are conspicuously brand-conscious (Dansk Industry International Business Development, 2007).

BOP consumers are not only exposed to the product attributes of competing brands but also to an array of brand-related stimuli such as, brand colors, shapes, slogans, background design elements, mascots and brand characters which assist with brand identification and the development of strong brand associations (Brakus, Schmitt & Zarantonello, 2009 cited in Variawa, 2010). The outcomes of this study uncover that South African BOP consumers have a high propensity to easily distinguish brands from each other on the basis of the brands' logos, design and/or coloring and are able to effortlessly recognize the packaging of the products that they ordinarily purchase. This finding is particularly useful to marketers in that, there is assurance that South African BOP consumers will be able to distinguish premium-quality brands from lower-quality generic brands on the market. Marketers can take solace in the fact that South African BOP consumers, despite their low levels of education or illiteracy, are able to identify brand names and packaging of products and use these as a mechanism of recognizing trusted brands. The study by Dinica and Motteau (2012) corroborates this finding that BOP consumers use brand logos as a safety measure for judging the quality of brands. Viswanathan, Rosa and Harris (2005 cited in Nakata & Weidner, 2011) add that visual cues (pictures on packaging) are more relevant than written words in aiding product and brand identification, understanding and selection amongst BOP consumers who are barely able to read. Visual comprehension is able to strengthen BOP consumers' interest and understanding of products and invoke sentiments of trust and brand loyalty behavior (Sridharan & Viswanathan, 2008). According to Sehrawet and Kundu (2007), an effective choice of package shapes and features, brand colors, trademarks and logos will enable an organization to differentiate its offering from a plethora of competing products in BOP markets. In addition, easily-recognizable brand-related stimuli were found to have saved time and effort during the purchase process (Rijke, Diehl & Schoormans, 2009). However, the existence of generic brands that are similar or almost identical to premium brands in terms of names, logos, slogans and/or symbols can sometimes cause confusion amongst BOP consumers (Dansk Industry International Business Development, 2007). It is, therefore, crucial that organizations firmly safeguard their brands from copycat brands (Dansk Industry International Business Development, 2007).

The results of this study show that there is a high degree of brand loyalty amongst South African BOP consumers who have attested to purchasing the same brand of items in consecutive instances. Brand loyalty is further substantiated by the fact that a fairly moderate proportion of the South African BOP consumers are not inclined to frequently switch between competing brands of products. This outcome is espoused by the findings of Nyanga (2015) who discovered that BOP consumers were consistent in their purchase of specific brands of consumables and durables for well over a year and were hesitant to switch brands. Quality, brand experience and brand trust are vastly instrumental in BOP consumers building purchase loyalty and attitudinal loyalty towards certain brands, which subsequently contributes significantly to increased market share (Chauduri & Holbrook, 2001 cited in Neuwirth, 2012; Nyanga, 2015). Barki and Parente (2010) further state that, albeit limited budgets and lower self-esteem, BOP consumers are brand loyal and are driven by positive and personal relationships with organizations and/or business people when selecting consumption alternatives.

The findings of this study, however, reveal that the degree of brand loyalty becomes negligible once price increases become a factor for consideration, whereby, only half of the respondents affirm that they continue to purchase preferred brands despite the escalation in prices. This outcome is confirmed by Nyanga (2015) who found that despite price increases, BOP consumers still expressed willingness to purchase their preferred brand provided that they could still afford them. Nyanga (2015) also reported that quality, reliability, trust, satisfaction and brand experience were the dominant motivators for BOP consumers remaining loyal to their preferred brands despite price escalations. This notion is supported by Rijke et al. (2009) and Variawa (2010) who discovered that contrary to popular belief, BOP consumers place greater significance on branded products than generic brands, enjoy more satisfying brand experiences with premium brands than cheaper brands and favor higher quality over lower prices. Conversely, Chikweche and Fletcher (2010 cited in Nyanga, 2015) affirm that the constituents of the BOP markets are deal-prone consumers who are constantly searching for the lowest price and are, therefore, unlikely to be brand loyal. Furthermore, in today's business environment that is characterized by increased brand options and heightened price competition, brand loyalty amongst BOP consumers may become trivial, in that most consumers are variety-seekers who are likely to be multiple brand users (Aaker, 2012 cited in Nyanga, 2015; Kumar, Pozza & Ganesh, 2013 cited in Nyanga, 2015). Dinica and Motteau (2012) uncovered that BOP consumers in Africa are not brand loyal and do not feel a bond between themselves and brands. The plausible reason for this is that these BOP consumers are primarily focused on satisfying their elementary survival needs and simply cannot afford to be loyal to higher-priced branded goods in instances of extreme price-sensitivity. Karnani (2007) further indicates that although BOP consumers desire the same types of products that affluent consumers do, they are unable to afford these branded goods without having to forgo essential products that are indispensable to their health and survival. In addition, BOP consumers, with their insufficiency in education and knowledge, may be unethically lured into purchasing inconsequential products that may be detrimental to their survival.

In terms of brand trust, the outcomes of this study reveal that, a fairly moderate proportion of the South African BOP consumers have an inclination to purchase their preferred brands of products because they derive value-for-money from these purchases and want to avoid the potential risk of wasting money on new, unfamiliar brands that may be unsatisfactory. These results coincide with that of Barki and Parente (2010) who advocate that BOP consumers are more disposed to being loyal to branded products due to the excessive financial risk involved in making a mistake in their choice of brands. Due to the paucity of financial resources, BOP consumers are not prone to experimenting with new, unfamiliar brands and are more compelled to purchase 'tried-and-tested' brands that are long-lasting (Bhan & Tait, 2008; D'Andrea, Ring, Aleman & Stengel, 2006; Louw, 2008). According to Prahalad (2005) and Moriarty, Massen, Findlay and Kelusky (2011), BOP consumers do not have the means to purchase a replacement product in instances where they may have erred in terms of their purchase decision. Hence, purchasing a branded product will assure BOP consumers of an expected level of reliability, quality and performance at competitive prices. Nyanga (2015) and Rijke et al. (2009) add that BOP consumers' appreciation for good-quality brands stems from the fact that these brands are durable and need not be replaced regularly, thus saving them purchase time and money. Brands often translate into quality certificates and guarantees in BOP markets and building brand trust enables companies to reap tangible returns in terms of customer loyalty (Dansk Industry International Business Development, 2007; Rijke et al., 2009). D'Andrea et al. (2006) report that owing to BOP consumers' hesitancy to purchase

unfamiliar value-brands, intermediate and leading brands represent the greatest share of purchases and are strongly preferred by these consumers. The absence of credible product information and the superfluity of fake, low-quality brands augment BOP consumers' reluctance to purchase new brands that have been launched onto the market (Neuwirth, 2012). Acknowledging that BOP consumers are extremely cautious about purchasing new brands due to the possibility of poor quality and unsuitability, Dubey and Patel (2004) suggest that small package sizes or sachets will be useful in encouraging trial purchase of new brands on the market. According to the World Economic Forum (2009), low-income consumers are generally more inclined to purchase an unfamiliar, new product if it carries a well-recognized brand name or is endorsed by a reputable and trustworthy organization. The conception of marketing branded products to BOP consumers has, however, raised skepticism and ethical concerns (Davidson, 2009). According to Davidson (2009), brands become widely recognized, trusted and preferred through intense and costly marketing communications efforts, the costs of which are absorbed by consumers in the form of increased product prices. Davidson (2009) questions whether this is feasible in a market that warrants lower product prices. Furthermore, Davidson (2009) argues that in functional terms, most branded products are almost identical to their generic unbranded counterparts and, therefore, does not impart any real value to BOP consumers.

According to the results of this study which relate to the preference for good-quality brands, an average proportion of the South African BOP consumers support the notion of paying premium prices for the brands that they consider to be of good quality. This finding validates Prahalad's (2005) affirmation that BOP consumers are undeniably value-conscious, aspire to purchasing superior-quality brands and are prepared to spend a little more on those products that they can derive maximum utility from. D'Andrea et al. (2006 cited in Nakata & Weidner, 2011) support this assertion as these authors have discovered that BOP consumers spend financial resources on leading brands in a bid to secure quality, reliability and value from their purchases. According to Prahalad (2005), two large retailers, Casas Bahia in Brazil and Elektra in Mexico, are highly profitable from the sale of branded consumer durables such as, televisions, washing machines, radios and other appliances to BOP consumers through agreed-upon incremental payment schemes. This corroborates the notion that since brands are a signal of quality, better performance and status, brand-loyal BOP consumers are intent on purchasing better-quality brands in order to attain a new and improved quality of life (Essoussi & Merunka, 2007; Lall, 2011; Louw, 2008; Nyanga, 2015; Prahalad, 2005, Variawa, 2010). In addition, research has shown that the susceptibility to brand advertising and brand preferences for consumables in the South African BOP market, closely mirrors that of the non-BOP market and that BOP consumers are constantly seeking the best possible price-performance offers (Chipp et al., 2012; Gordon, 2008 cited in Louw, 2008). This evidence echoes the sentiments of Jaiswal (2007) and Prahalad (2005) that rural consumers have become just as discerning about brands as the urban wealthy consumers, provided that these brands offer them acceptable value propositions, that is, greater quality at affordable prices. The findings of this study, however, contradict the arguments put forward by Karnani (2007) and Webster (2000 cited in Variawa, 2010) that the poor consumers, who are typically price-sensitive, often purchase the cheapest, lowest-quality brands that are available on the market because they are unable to afford premium brands. The results of this study demonstrate that the majority of the South African BOP consumers are convinced that using a good-quality brand will enhance their self-esteem and confidence.

The evidence of this study authenticates the conclusions drawn by Kempen (2004 cited in Barki & Parente, 2010) and Tripathi and De (2007) that poor consumers (particularly the youth) are willing to pay more for designer labels, have a strong inspirational attraction to high-quality brands that increase their self-esteem and view designer labels as symbols of status and a mechanism for integration with society. Marcoux, Filialtrault and Chéron (1997 cited in Essoussi & Merunka, 2007) have found that the desire for branded products is heightened amongst consumers in emerging markets as it empowers them to exhibit their social status. The proclamations of Barki and Parente (2010) indicate that BOP consumers demonstrate great concern in upholding their self-respect and being treated with dignity. These consumers, therefore, view the consumption of superior brands as a counterbalance for their inferiority complex and as a means of gaining social recognition and acceptance (Barki & Parente, 2010). In addition, Rijke et al. (2009) observed that BOP consumers are also fanatically concerned about the opinions of their neighbors and that being in possession of new and visibly attractive products tends to draw attention and admiration from others who perceive them as being 'wealthy' and in a comparatively superior position. This postulation was substantiated by the findings of Mahajan (2008 cited in Variawa, 2010) and Rimmell (2008 cited in Variawa, 2010) that BOP

consumers in South African townships often display good-quality branded detergents, like Unilever's Handy Andy, on counter-tops that are clearly visible by guests, in order to proudly convey the indication that they are utilizing status brands. Dubey and Patel (2004), however, caution that companies need to ensure that the images of premium brands are maintained when targeting low-income segments so as to not lose customers who purchase these brands as a status symbol. The outcome of this study refutes the evidence documented by Dinica and Motteau (2012) that BOP consumers are not riveted by brands or the status that they convey. Baudrillard (1998 cited in Majumder, 2012) analyzed the theory of consumerism by substituting use-values with that of sign-values and consequently, uncovered that some products do not add value but instead provide gratification from owning the brand or indulging in buying behavior. This raises an argument that it is unethical to fuel BOP consumers' desire for status through owning branded products as these high-priced 'luxuries' are not truly in their self-interest (Karnani, 2007). Davidson (2009) concurs with Karnani's (2007) viewpoint that BOP consumers should not be enticed to purchase branded products if they do not impart any real value in functional terms.

As per the results of this study, BOP consumers have a greater affinity to switch between known, competing brands than try new, unfamiliar brands that have been introduced on the market. During periods of price escalations, a fairly moderate proportion of South African BOP consumers attest to switching from their preferred brands to cheaper, generic brands due to the unaffordability of better-quality brands. This implies that South African BOP consumers are value-conscious, appreciate good-quality brands and are willing to purchase them, provided that the prices are affordable. This outcome corroborates with Nyanga's (2015) finding that, even though the majority of the BOP consumers are satisfied with their preferred brands, a moderate proportion of these consumers will engage in brand-switching in instances of price increases. According to the findings of the study, a below average proportion of South African BOP consumers steadfastly demonstrate reluctance to experiment with new brands of products that have an uncertain level of quality. This infers that BOP consumers are cautious about the brands that they spend their incomes on and want to avoid encountering tremendous dissatisfaction from choosing the wrong brand. The outcome of this study corroborates the findings that BOP consumers do not trust new and unfamiliar brands and display hesitancy to switch from their current brands to new brands (Barki & Parente, 2010; Bhan & Tait, 2008; D'Andrea et al., 2006; Louw, 2008; Mendoza, 2008). However, Prahalad and Hart (2002) state that single-serve packaging offers BOP consumers the benefit of switching brands each time they purchase. Dubey and Patel (2004) assert that single-serve sachets are suitable for encouraging trial usage of brands, particularly new introductions on the market, as it does not result in BOP consumers tying up too much of their financial resources in the purchase of large quantities. According to the results of this study, there are significant relationships between branding and the other key dimensions of this study.

Intercorrelations between branding and other key dimensions of the study

The results of this study indicate that there is a significant relationship between branding and savings potential/ability to pay off debt, quality, appearance/acceptability, adaptability of existing products, functionality/performance, advertising/awareness and partnering with MNCs and, a significant but inverse relationship between branding and price/affordability and accessibility/availability, respectively. The implications of the significant relationships are that South African BOP consumers who have a higher degree of brand loyalty have a greater propensity to collaborate with MNCs and save money for the future in order to secure better lifestyles. These consumers have a high appreciation for products that are of a superior quality, aesthetically appealing, durable, reliable and astutely designed for their adverse living conditions. Furthermore, brand-conscious South African BOP consumers are likely to be influenced by the brand preferences of trusted opinion leaders and reference groups (family and friends) when making their selection of brands. Research has found that brands are positively related to quality (Chauduri & Holbrook, 2001 cited in Neuwirth, 2012; D'Andrea et al., 2006; McKinsey & Company, 2012 cited in Nyanga, 2015; Prahalad, 2005; Rijke et al., 2009), functionality/performance (Nyanga, 2015; Rijke et al., 2009), appearance/acceptability (Nyanga, 2015) and advertising/awareness (Human, Ascott-Evans, Souter & Xabanisa, 2011).

The inferences of the significant but inverse relationships are that South African BOP consumers who are more brand-conscious are comparatively less price-sensitive and zealously believe that a suitable array of products is highly inaccessible to them. This outcome supports the findings that BOP consumers are willing to pay extra for good-quality brands that will yield the best price-performance deal (Nyanga, 2015; Rijke et al.,

2009, Variawa, 2010). Conversely, those BOP consumers who exhibit high price-sensitivity are unlikely to be brand loyal. According to research, BOP consumers who are highly price-sensitive are not brand loyal as they are constantly searching for the lowest prices (Aaker, 2012 cited in Nyanga, 2015; Chikweche & Fletcher, 2010 cited in Nyanga, 2015; Kumar, Pozza & Ganesh, 2013 cited in Nyanga, 2015; Webster, 2000 cited in Variawa, 2010). There are no other significant relationships between branding and the key dimensions of this study.

Influences of biographical variables on branding

As per the evidence of this study, branding is influenced by certain biographical variables of South African BOP consumers, namely, education, monthly income and the number of people living in a household. It is apparent from the findings of this study that South African BOP consumers who are better educated appear to have a higher intensity of brand-consciousness than those consumers with lower levels of education. Evidently, South African BOP consumers who belong to the lower monthly income categories and who live in households with a greater number of occupants are less cognizant of brands and their influences on purchase decisions.

Recommendations: Based on the findings of this study in terms of the South African BOP consumers' perceptions of branding, the following recommendations are suggested for business organizations:

- *Aim to ensure that the company's brand becomes synonymous with quality, reliability and durability*: Owing to the fact that South African BOP consumers are noticeably brand-conscious and steadfastly value-conscious, MNCs need to ensure that their brands offer maximum utility, value-for-money and enhancement of lifestyles to South African BOP consumers. In order to avoid brand-switching behavior, MNCs need to make certain that their good-quality brands are reasonably priced.
- *Utilize marketing communications efforts (such as, entertaining product road shows, billboards and product demonstrations) to ensure a high prevalence of brand awareness in the South African BOP market*: Driving brand awareness is pivotal in gaining brand recognition and creating a favorable attitude towards the brand.
- *Utilize mobile-marketing in order to build brand awareness in the South African BOP market*: As per the findings of this study, South African BOP consumers spend a considerable proportion of their incomes on telecommunications (airtime) which indicates that these consumers have embraced mobile technology and its life-enhancing attributes, such as, staying connected to the world around them and learning through information obtained via the internet. It is, therefore, pivotal for MNCs to use mobile technology in order to inform South African BOP consumers about new products or brand extensions via text messages or short video clips.
- *Encourage trial usage of newly-launched, unfamiliar brands through the use of free samples*: As evident from the findings of this study, South African BOP consumers have a very low propensity to engage in experimental purchases of new and unfamiliar brands. It is, therefore, imperative for MNCs to use sales promotion tactics, like free samples, to encourage trial usage of the brand and to convince these consumers of the superior level of quality of the brands.
- *Explicitly differentiate the company's brand through the use of highly pronounced brand-related stimuli (such as, logos, packaging, brand colors)*: According to the results of this study, South African BOP consumers display a clear ability to distinguish between competing brands based on brands' logos, design and/or coloring. Therefore, MNCs need to ensure that the use of brand-related stimuli (such as, brand colors, shapes, slogans, background design elements, mascots and brand characters) is distinct enough to aid brand identification and the promotion of robust brand associations.
- *Aim for trust and identity in branding through certification and labeling*: Certified products can assist companies in differentiating their offerings from that of competitors and increase consumer trust because a certified product is representative of a product that meets acceptable standards of quality. Once a company has established trust and strong brand recognition in these BOP markets, it can launch additional products and brand extensions (Oodith & Parumasur, 2014).
- *Promote continuous improvement in products' designs*: MNCs are required to add new features to existing products once they have established the trust and loyalty of BOP consumers. Enjoying the patronage of BOP consumers will enable MNCs to offer a variety of good-quality, low-cost products

that fully satisfy consumers' needs and enable these companies to secure long-term profitability and growth in market share (Oodith & Parumasur, 2014).

- *Ensure sustainable brand loyalty by offering good-quality brands at affordable prices*: As per the findings of this study, South African BOP consumers demonstrate intense brand loyalty provided that product prices are within their purchasing power. MNCs need to take cognizance of the affordability threshold of these consumers and guard against setting prices that lie beyond the threshold, as this will ultimately render their offerings unaffordable.
- *Develop loyalty points and money-back programs*: This will enable businesses to build brand loyalty and will increase the costs of switching brands for consumers in the South African BOP market. Loyalty points are earned through each purchase and the associated rewards or cash refunds will provide incentives for South African BOP consumers to engage in repeat purchases (Oodith & Parumasur, 2014).
- *Position the company's brand as a status symbol and as a means of enhancing self-esteem, confidence and social inclusion*: MNCs need to ensure that the desired brand imagery is created in the minds of South African BOP consumers in order to imbue these brands with qualities like status, prestige and social acceptance. Branding should be strongly linked to the organization's policy on social inclusion as this will enhance the brand image and the image of the organization.
- *Aim to build ardent brand loyalty amongst South African BOP consumers who are better educated, have higher levels of monthly income and who reside in households with fewer inhabitants*: Organizations need to target individuals who encompass these biographical variables as these groupings of individuals demonstrate a greater appreciation for good-quality brands and have a higher inclination to remain loyal to their preferred brands. Such an approach can become a fundamental aspect of the organization's communication strategy.

Future Research: It will be highly insightful to compare and contrast the South African Bop consumers' perception of branding from a provincial perspective in order to determine the similarities and disparities in terms of brand awareness, differentiation, recognition, loyalty, trust and preferences for leading brands.

5. Conclusion

The results of this study, in relation to the key dimension of branding, reveal that the majority of South African BOP consumers are brand-conscious; hence, brands play an influential role in the consumer decision-making process. South African BOP consumers are aware of competing brands on the market and able to differentiate between them based on brand-related stimuli (such as logos, packaging, brand colors). These BOP consumers use brand names, packaging and logos as a safety measure for judging the quality, reliability and performance of brands. South African BOP consumers are very loyal to their trusted brands and willing to pay premium prices for them. In addition, these consumers are value-conscious and are likely to switch to cheaper brands should their preferred brands become grossly unaffordable. The BOP consumers in South Africa do not trust new, unfamiliar brands on the market due to the uncertainty of their quality and are reluctant to purchase new brands for fear of wasting financial resources on unsatisfactory products. Furthermore, South African BOP consumers believe that using good-quality brands will boost their self-esteem, confidence and status.

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The Dynamics of Foreign Direct Investment in BRICS Countries

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Abstract: Recent studies which investigated the determinants of foreign direct investment (FDI) in BRICS include Hsin-Hong and Shou-Ronne (2012), Nandi (2012), Jadhav (2012), Darzini and Amirmojahedi (2013), Nischith (2013), Ho et al. (2013), Kaur et al. (2013) and Priya and Archana (2014). The findings from these studies shows lack of consensus and confirm that a list of agreeable determinants of FDI in BRICS countries is still an unsettled matter. This paper was therefore initiated in order to contribute to the debate on the discourse on FDI determinants in BRICS countries.This paper deviates from earlier similar studies in five ways: (1) uses most recent data, (2) is the first to investigate whether a combination of financial development, trade openness, human capital, economic growth and inflation influence FDI in BRICS countries, (3) uses different proxies of the variables that affect FDI, (4) employed both fixed effects and pooled ordinary least squares (OLS) approaches and (5) used a stacked data approach.The results of the study showed that economic growth, trade openness and exchange rate stability positively impacted on FDI, financial development positively influenced FDI under fixed effects, FDI was positively influenced by human capital development using the pooled OLS and inflation negatively affected FDI in line with literature. Taking into account these findings, this study urges BRICS to implement policies that increase financial sector efficiency and economic growth, maintain stable exchange rates, keep inflation rates at lower levels, enhance trade openness and human capital development in order to increase FDI inflows.

Keywords: *FDI; Determinants; Panel Study; BRICS*

1. Introduction

According to Branco (2015), the expansion of the BRICS economies was slowed down by the end of the commodity super cycle, negative spill overs emanating from the financial crisis in developed countries and the inappropriate macro-economic policies that they adopted to respond to these two challenges. Following the eclectic paradigm theory of FDI which mentions that economic growth is a locational advantage of FDI, the slowdown in the growth of BRICS economies meant that they also gradually became unattractive foreign investment destinations.For China, the credit-inspired investment growth models which have been recently exhibiting signs of exhaustion could be one of the reasons for the slowdown in FDI inflows into China. From the World Bank (2015) data, this is supported by a 1.24 percentage points decline in FDI net inflow (% of GDP) during the period from 2010 to 2014 in China (from 4.04% of GDP in 2010 to 2.70% of GDP in 2014). Inefficient financial markets in China which had been characterised by negative real interest rates also played a major role in impeding FDI inflows into China, following Ezeoha and Cattaneo (2012).The deterioration of the macro-economic fundamentals and seemingly exhausted credit-inspired consumption growth model in Brazil are the two challenges at the centre of the slowdown in FDI inflows (Branco, 2015) in line with the output and market size hypothesis founded by Jorgenson (1963). Brazil experienced a budget deficit of 10.9% of GDP, inflation rates could not be contained within target levels and economic growth rate went down from 4.5% between 2004 and 2010 to 1.5% per annum between 2011 and 2014 (Branco, 2015:20). These factors, among others contributed to the deterioration of the macroeconomic environment, which according to the eclectic paradigm theory is a locational disadvantage of FDI inflow into Brazil.

On the other hand, the escalation of geopolitical disputes which led to Russia being put under sanctions by developed countries and the rent seeking activities involving the extortion of funds from both state enterprises and the private sector to the politically connected contributed to the slowdown in economic growth and FDI inflows in Russia (Branco, 2015:21). From the World Bank (2015) data, this is evidenced by a 1.60 percentage points decline in FDI net inflow (% of GDP) during the period from 2010 to 2014 in Russia (from 2.83% of GDP in 2010 to 1.23% of GDP in 2014). According to Nandi (2012), factors such as administrative barriers, poor intellectual property rights enforcement and low quality of infrastructure were the key problems affecting FDI inflow into Russia. Another constraint according to Nandi (2012) has been that certain sectors of the Russia economy for example the banking sector have been allowed by the

government to receive FDI only to a certain extent.The major stumbling block to FDI inflow into South Africa according to Branco (2015) has been the escalating protracted strikes and fight for improved wages that are completely disconnected to the productivity of the labour force. This argument is imbedded in the eclectic paradigm theory which also states that labour cost and the quality of labour are key determinants of FDI inflow into the host country. High poverty levels linked to the fact that 69% (according to World Bank, 2014) of the population in India resides in rural areas reduces the market size and consequently FDI inflows, consistent with Jorgenson (1963)'s market size hypothesis.

It is evident that the challenges faced by the individual BRICS countries in terms of attracting FDI are not uniform and more so, there is no consensus with regard to a list of factors that influence FDI in BRICS countries.The ambiguity with regard to the determinants of FDI in BRICS countries can only be solved by carrying out additional empirical tests.It is for this reason that the current paper studied the determinants of FDI in BRICS countries. Recent studies which attempted to investigate the determinants of FDI in BRICS include Pao and Tsai (2011), Hsin-Hong and Shou-Ronne (2012), Nandi (2012),Jadhav (2012),Darzini and Amirmojahedi (2013),Nischith (2013),Ho et al. (2013), Kaur et al. (2013) and Priya and Archana (2014), among others. This study deviates from previous in the following ways: uses the most recent data available, is the first to investigate whether a combination of financial development, trade openness, human capital development, economic growth and inflation influence FDI in BRICS countries, this study uses different proxies of the variables that affect FDI, compares results of a fixed effects model and a pooled OLS panel data analysis and employed a stacked data panel regression approach.Findings from this study help BRICS authorities to develop and implement proper FDI promotion policies that scale up economic growth in the long run. Specifically, the results inform the BRICS policy makers on which absorption capacities must be put in place in order to trigger significant FDI inflows.The study is organized as follows: Section 2 discusses an empirical view of the determinants of FDI in BRICS, section 3 focus of FDI trends analysis in BRICS whereas section 4 investigates the determinants of FDI using an empirical model. Section 5 looks into the FDI inflow promotion policies in BRICS countries from an empirical literature review point and section 6summarizes the study.

2. Literature Review

FDI Determinants in BRICS Countries: Using regression analysis, a study by Hsin-Hong and Shou-Ronne (2012) revealed that low inflation rate and larger market size as represented by GDP significantly attracted FDI inflow into Brazil. The same study found out that trade openness had an insignificant positive impact on FDI inflow into Brazil. Previous studies which show high inflation rate as a deterrent to FDI inflows include the one done by Shamduddin (1994) and the other by Nath (2005). Nandi (2012) discovered that liberal reform policies such as financial markets liberalisation played a positive influential role in attracting FDI inflows into Brazil. A study by Vijayakumar et al. (2010) using panel data analysis discovered that larger market size, low labour cost, good infrastructure, stable currency and economy were the factors that significantly and positively attracted FDI inflow into BRICS countries. Just like in the study by Hsin-Hong and Shou-Ronne (2012), Vijayakumar et al. (2010) revealed that trade openness (the ratio of total trade to GDP) had a negligible impact on FDI inflow into the BRICS nations. Low labour costs, large consumer base and large production capacity were found by Nandi (2012) to be the critical factors that attracted FDI inflow into China. A study by Angelo et al. (2010) observed that exchange rates and country risk had an invisible influence on FDI inflow into Russia whilst low interest rates and high levels of consumer sales were the key factors that positively and significantly affected FDI location decisions in Brazil.

In a study using panel data analysis, Jadhav (2012) discovered that economic factors were more influential in attracting FDI into BRICS countries as compared to institutional and political factors. Market size as measured by real GDP was found by the same study to be the most influential factor in attracting FDI into BRICS countries whilst natural resources availability had a negative effect. Jadhav (2012) further noted a negative correlational relationship between rule of law and accountability versus FDI inflow into BRICS countries. This finding concurs with Cuervo-Cazura (2006) who showed that foreign investors from corrupt countries where anti-corruption laws are rarely enforced choose to operate in similar nations when they internationalise their operations. Although the quantity of FDI inflow was found to differ depending on the economic sector, Duan (2010) discovered that resources availability and good business environment had a significant positive

impact on FDI inflows into BRIC (Brazil, Russia, India and China) countries. Lo and Liu (2009) noted that host country's industry-specific technological capabilities played a significant impact in determining the differences in quantity of FDI inflows received by India and China. China received more FDI inflows as compared to India due to superior industry-specific technological capabilities, argued Lo and Liu (2009).The level of macro-economic stability and socio political variables were found by Giner and Giner (2004) to have had an influential role in determining the quantity of FDI inflow into China and Russia. A study by Wei (1995) also revealed that the larger domestic consumer market in China was the main reason why China received a huge FDI inflow from OECD countries. The same study further highlighted that closer foreign trade relationship with OECD countries was also influential in attracting more FDI inflows into China from the OECD group of countries. Furthermore, the study by Wei (1995) suggested that apart from being in proximity to the OECD countries, lower labour cost and lower country risk accounted for a huge FDI inflow that was experienced by India not only from OECD countries but from other destinations as well.

Using Vector Error Correlation Model (VECM), Sridharan et al. (2009) discovered the existence of the feedback effect between economic growth and FDI inflows in three BRICS countries, namely Brazil, Russia and South Africa. The same study also reveals a uni-directional relationship running from FDI inflows to economic growth in India and China. A study by Pao and Tsai (2011) resonated with findings by Sridharan et al. (2009) by revealing that economic growth positively influenced FDI inflows into BRIC (Brazil, Russia, India and China) countries.The net rate of investment return and risk profile of FDI liabilities were discovered by Fedderke and Romm (2006) to be the main factors which determined FDI inflow into the South African economy. However, Zheng (2009) identified low labour costs, low political risk, high levels of GDP and liberalisation of the economic policy as factors that formed an integral part in attracting FDI inflows into both India and China. The same study noted that large consumer market size, and low cost of borrowing were particularly very crucial in attracting FDI inflow into Chia whilst low transaction costs played an influential role in determining FDI inflows into India. In addition, Darzini and Amirmojahedi (2013) found out that economic growth was influential in unlocking FDI inflows not only into BRIC countries but into Iran as well. Priya and Archana (2014) discovered that low political risk, low labour costs, high return on investment rates, high levels of economic liberalisation, size of the consumer market and flexible exchange rates were key main factors that attracted FDI inflows into the BRIC countries during the period 1991 to 2010. Nischith (2013) found out that stability of the local currency was instrumental in attracting FDI inflows into BRICS countries.

Using panel data analysis methodology, Ho et al. (2013) discovered that high economic growth, economic policy liberalisation, government expenditure, investment rate of return and trade openness positively impacted on FDI inflows into all the BRICS countries. The same study also revealed that economic liberalisation and infrastructural quality played a key role in attracting FDI inflows into BRICS nations. The impact of other factors on FDI inflows were more pronounced in other BRICS nations as compared to the others. For example, the same study by Ho et al. (2013) found out that high interest rates attracted FDI inflows into Brazil whilst discouraging FDI inflows into other BRICS countries. The size of the consumer market was discovered to have influenced FDI into Russia, China and Malaysia whilst it had no impact on FDI inflow into India and South Africa (Muneer & Rehman, 2012; Ho et al., 2013). Level of financial market development had a significant positive impact on FDI inflows in all other BRICS countries except in Russia, revealed Ho et al. (2013).Kaur et al. (2013) revealed that banking sector and stock market development variables played a crucial role in attracting FDI into BRIC (Brazil, Russia, India and China) countries. More specifically, a larger banking sector size and higher stock market capitalisation were discovered to have positively influenced FFDI into BRIC nations. The same study however found out the existence of a negative relationship between domestic credit by banking sector and FDI inflow into BRIC nations understandably because the need for foreign capital decreases as domestic capital availability increases. In a study for the period between 1986 to 1998, Sun et al. (2002) discovered that high labour quality and good infrastructure positively influenced FDI inflows into the 30 Chinese provinces. Political stability and trade openness were more instrumental in deciding the quantum of FDI inflows into the Chinese economy as a whole, revealed Sun et al. (2002).

Pan (2003) discovered that the strength of the local currency (Yen) played a negligible role in influencing positive FDI inflows into China from different source countries. Contrary to other previous studies, low

country risk profile did very little to trigger FDI inflows into China, revealed Pan (2003). The same study observed that proximity between China and source countries played a huge positive impact on FDI inflows into China. According to Fung et al (2005), more FDI from United States of America (USA), Japan, Hong Kong, Taiwan and Korea was attracted into China mainly by transparent institutions and high level of market reforms. The same study showed that hard infrastructure such as the state of the roads and railway lines had a negligible impact on FDI inflow into China. However, Canfei (2006) discovered that Chinese provinces with greater autonomy in economic decision making processes and tight fiscal budget managed to attract more FDI. High level of government economic participation and more government legal spending in the Chinese provinces chased away FDI, revealed Canfei (2006). According to Iwasaki and Suganuma (2007), the extent of natural resources endowment, consumer market size and economic growth played a huge role in influencing the distribution of FDI inflows across all the regions in Russia. Specifically, Russia regions which had more natural resources, higher consumer market size and better economic growth attracted more FDI, revealed Iwasaki and Suganuma (2007). Ali and Guo (2005) revealed that consumer market size played an influential role in attracting FDI into China from USA firms whilst low labour cost positively influenced FDI into China from other Asian firms. However, high investment rate of return was revealed by the same study to have attracted FDI from both USA and Asian firms into China.

An Empirical Perspective of FDI Promotion Policies in BRICS: Hsin-Hong and Shou-Ronne (2012) argued that Brazil could attract more FDI by boosting its GDP (market size). Increasing government expenditures lead to increased aggregate demand, consumption and GDP levels and that in turn attract FDI inflow into Brazil (Hsin-Hong and Shou-Ronne, 2012; Lubis et al., 2015). The same study also suggested that Brazil should maintain a tight monetary policy that keep inflation rates at lower levels in order to stimulate increased FDI inflows into the country. This policy recommendation agrees with the findings by Bengoa and Sanchez-Robles (2003).Vijayakumar et al. (2010) noted that policies aimed at stabilising BRICS's local currencies needed to be put in place and strengthened in order to attract more FDI inflow. The same study suggested that economic reform and liberalisation policies in BRICS countries needed to be accelerated to enable more FDI inflows.According to the consolidated FDI policy (2014), the government of India designed measures to make it easy for FDI to flow into the country and these include the automatic route and government route policy of FDI. The automatic route policy stipulates that non-resident investor does not require pre-approval from the Indian government whilst the government route requires that government approves the non-resident investor first before investing in certain sectors of the economy (consolidated FDI policy, 2014).

According to Nandi (2012), the dropping of protectionist policies in favour of FDI inflow friendly policies in the 1990s by Brazil led it to become arguably one of the largest FDI destinations in the world. The same study pointed out that the reformed FDI policies implemented since early 1990s has led China to be largest beneficiary of FDI inflows among the emerging economies in the last two decades. China made it easy for potential foreign investors to see which sectors of the economy are there more and brighter prospects through their guiding directory, argued Nandi (2012). Angelo et al. (2010) suggested that policies that stimulate consumer demand works better in attracting FDI inflows as compared to the fiscal and monetary policies for a larger emerging market such as Brazil. Fedderke and Romm (2006) recommended that South African authorities should reduce political risk, increase GDP (market size), lower down corporate tax and ensure property rights are respected in order to attract more FDI inflow. Integrating South African economy into the world economy not only attracts more FDI inflows but ensure that South Africa benefits maximally from the foreign capital, argued Fedderke and Romm (2006). Moreover, Zheng (2009) encouraged Chinese authorities to maintain economic, political and policy stability in order to continue attracting more FDI inflows. The whole economy of China and India should be opened up to FDI, property rights respected and corruption index reduced in order to create an attractive FDI climate, argued Zheng (2009). India should adopt an export-led growth strategy if it was to accelerate FDI inflows into its economy (Zheng, 2009).

Ali and Guo (2005) recommended that China should accelerate its economic and political reform policies in order to gain not only increased FDI inflows but to enable FDI benefits to successfully permeate throughout the whole economy. In order to narrow the huge gap of development among the Southern, Western and Eastern regions, Ali and Guo (2005) urged China to invest more into infrastructural and human capital development policies that will attract more FDI inflows. Moreover, Kamath (2008) encouraged the Indian

government to implement policies aimed at improving employer-employee relations, financial market reforms and economic policy consistency in order to attract more FDI inflow. Darzini and Amirmojahedi (2013) urged BRICS countries to develop their financial markets in order to boost FDI inflows and economic growth beneficiation.The same study showed that high level of financial markets development attracted FDI inflow into BRICS countries as foreign investors were more interested in the economy that efficiently allocates financial resources. Ho et al. (2013) suggested that policies aimed at stimulating financial development and economic policy liberalisation needed to be accelerated in order to attract more FDI inflows into BRICS countries. On the other hand, Kaur et al. (2013) recommended that BRIC authorities should formulate and implement policies that ensure both banking sector and stock markets are efficient in order to attract more FDI inflows.

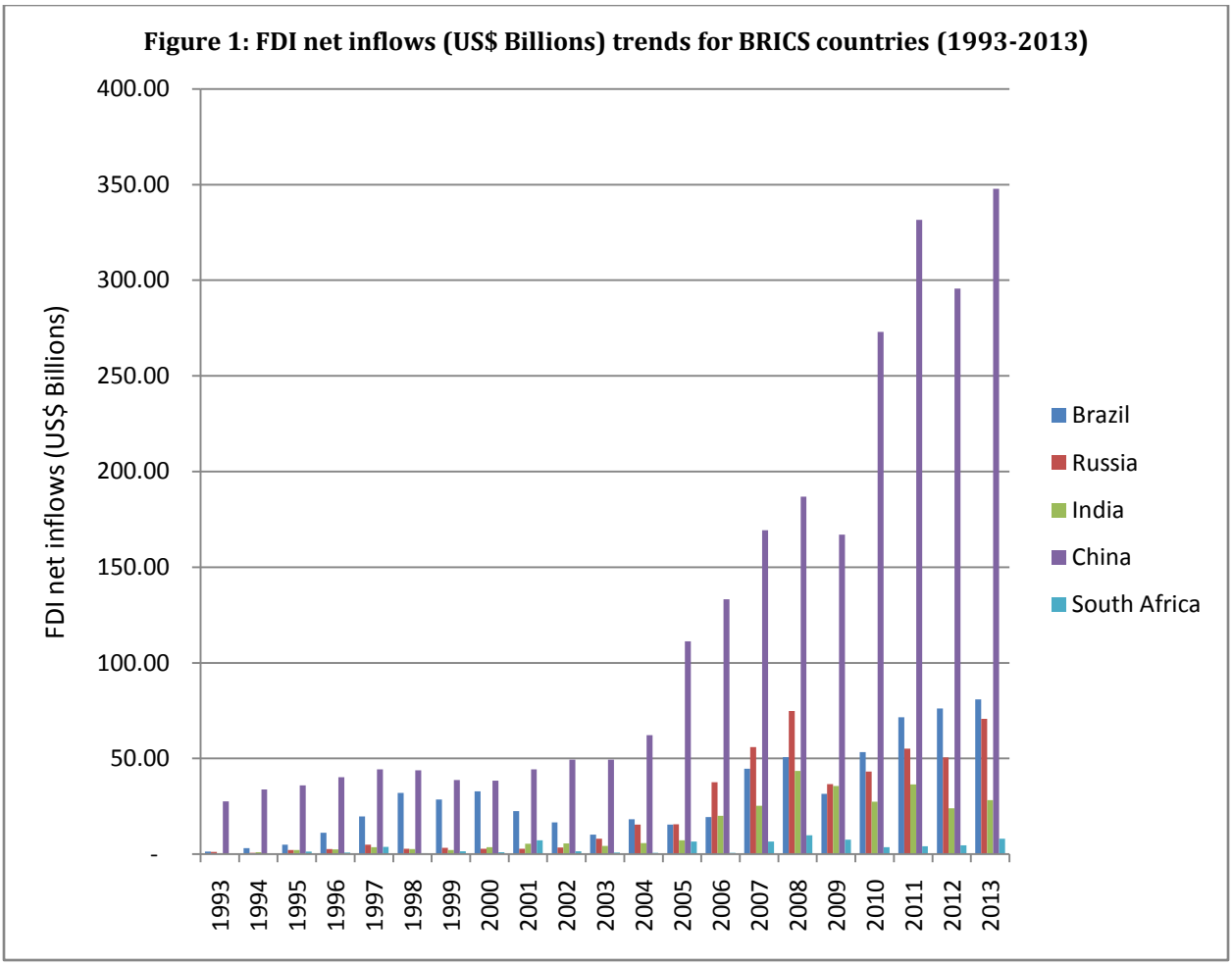
FDI Trend Analysis in BRICS Countries: Due to the fact that BRIC countries have attracted much of the world's FDI and become more important in the global market, it is reasonable to know the overall trends of FDI inflows into BRICS countries (Duan, 2010).

FDI net inflow trends in BRICS countries (United States Billion Dollars): According to World Bank (2015) statistics, FDI net inflows went up by 276.08%(US$1.29 billion in 1993 to US$4.86 billion in 1995) in Brazil, 70.52%(US$1.21 billion in 1993 to US$2.07 billion in 1995) in Russia, 289.49%(US$0.55 billion in 1993 to US$2.14 billion in 1995) in India, 30.29%(US$27.52 billion in 1993 to US$35.85 billion in 1995) in China and 10 957%(US$0.01 billion in 1993 to US$1.25 billion in 1995) in South Africa – see Figure 1.However, the five year period between 1995 and 2000 saw FDI net inflows going up from US$4.86 billion to US$32.78 billion in Brazil, from US$2.14 billion to US$3.58 billion in India, from US$2.07 billion to US$2.71 billion in Russia and from US$35.85 billion to US$38.40 billion in China. On the contrary, FDI net inflows recorded a negative growth during the same time period (from US$1.25 billion to US$0.97 billion) in South Africa.In Brazil, FDI net inflows declined by 52.84% (from US$32.78 billion in 2000 to US$15.46 billion in 2005), positively grew by 245.05% to close the year 2010 at US$53.34 billion before recording an increase of 51.55% (US$53.34 billion in 2010 to US$80.84 billion in 2013). FDI net inflows consistently continued on an upward trend from 2005 to 2013 in Russia. It went up by 471.36% (from US$2.71 billion in 2000 to US$15.51 billion in 2005, 178.36% to close the year 2010 at US$43.17 billion before recording a further 63.67% growth between 2010 and 2013 in Russia.

India also experienced positive growth of FDI net inflows between 2000 and 2013. Between 2000 and 2005, FDI net inflows grew by 102.82% before further increasing by a massive 276.88%, from US$7.27 billion in 2005 to US$27.40 billion in 2010. The period between 2010 and 2013 saw FDI net inflows going marginally up by 2.76% to close the year 2013 at US$28.15 billion. On the other hand, FDI net inflows in China increased by 189.62% between 2000 and 2005, further grew by 145.47% between 2005 and 2010 before further recording another growth by 27.42% (from US$272.99 billion in 2010 to US$347.85 billion in 2013). However, South Africa was characterised by FDI net inflow growth of 573.19% (from US$0.97 billion in 2000 to US$6.52 billion in 2005) before experiencing a 43.37% negative growth to end the year 2010 at US$3.69 billion. The subsequent three year period saw FDI net inflow going up by 119.81% to end the year 2013 at US$8.12 billion.

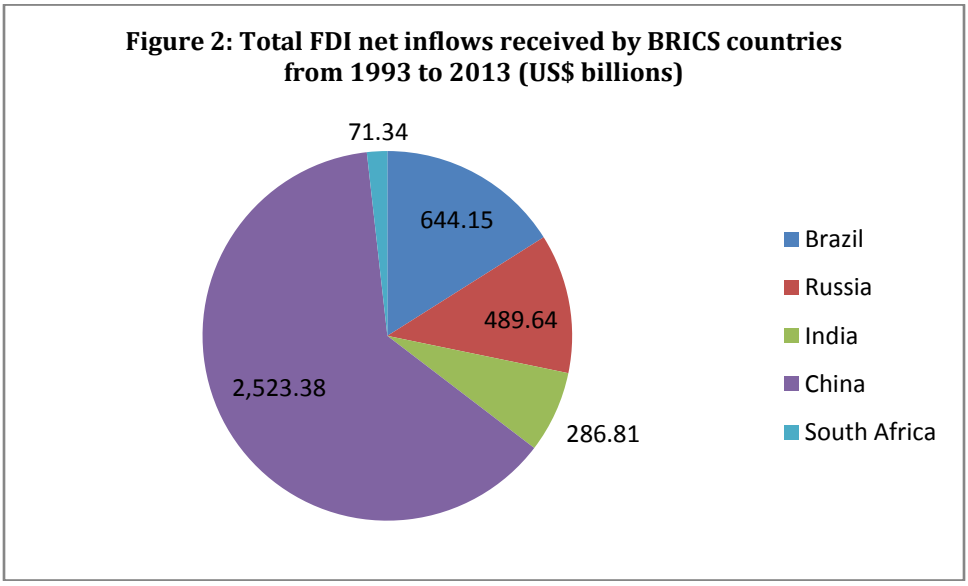
According to Figure 2, China received the most net FDI inflows during the period 1993 to 2013, followed by Brazil (US$644.15 billion), then Russia (US$489.64 billion), India (US$286.81 billion) and lastly South Africa (US$71.34 billion). There is a clear uneven distribution of net FDI inflow into BRICS countries with China having received 63%, Brazil 16%, Russia 12%, India 7% and South Africa 2%. This raises the question as to whether countries such as India and South Africa benefit much by being part of the BRICS economic group. The fact that South Africa only recently joined BRICS could help to partly explain why the country's FDI net inflows is negligible in comparison to other BRICS countries.

Figure 1: FDI net inflows (US$ Billions) trends for BRICS countries (1993-2013)



Source: World Bank (2015)

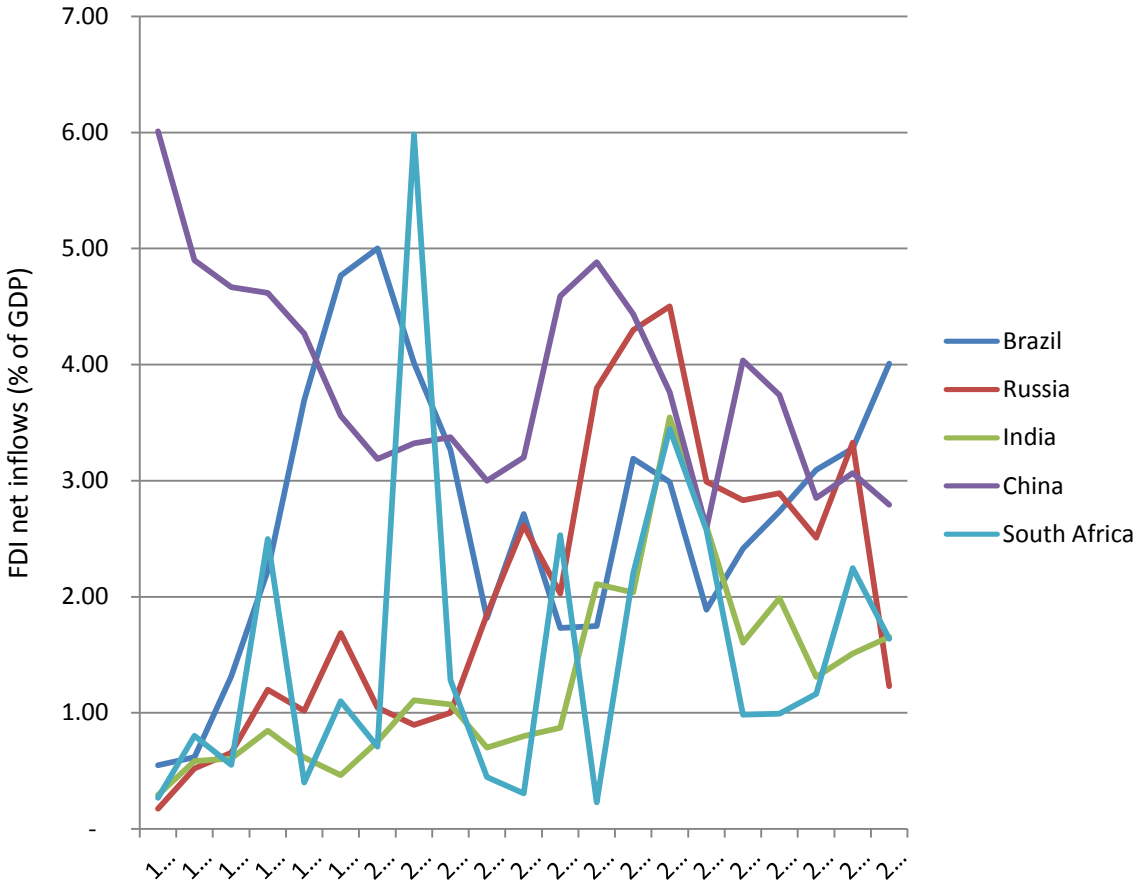
Figure 2: Total FDI net inflows received by BRICS countries from 1993 to 2013 (US$ billions)



Source: World Bank (2015)

FDI net inflow (as a share of GDP) trends in BRICS countries: World Bank (2015) statistics shows that FDI net inflow as a share of GDP in BRICS nations is characterised by both positive and negative trends during the period from 1994 to 2014 (see Figure 3 and 4).

Figure 3: FDI net inflows (% of GDP) trends for BRICS countries (1994 - 2014)

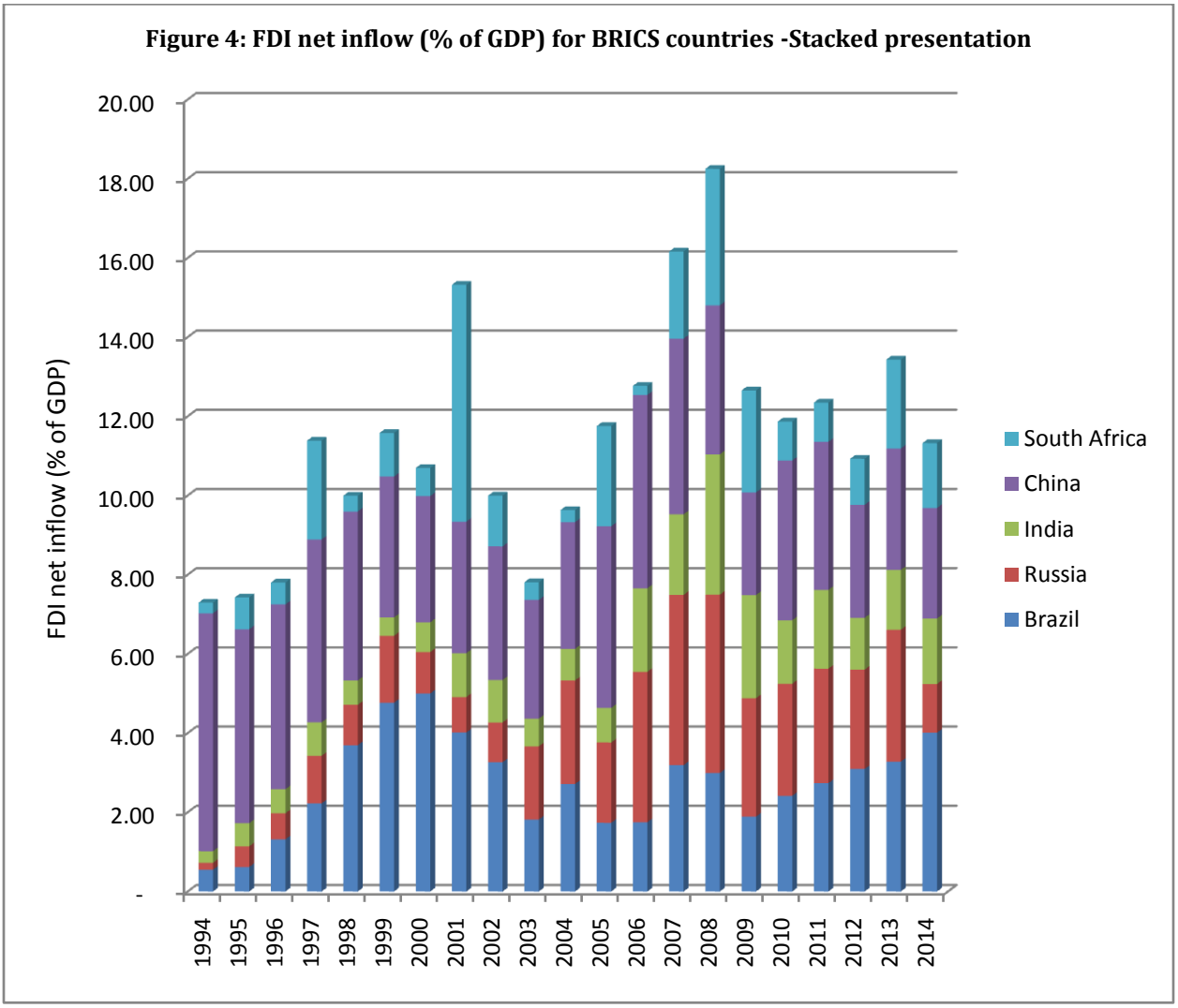


Source: World Bank (2015)

Russia, India and South Africa recorded the highest positive growth in FDI net inflow (% of GDP) between 1994 and 1995 whilst net FDI inflow (% of GDP) into China experienced a negative growth by 1.11 percentage points. The five year period between 1995 and 2000 saw Brazil recording a positive growth of 4.38 percentage points in net FDI net inflow (% of GDP), followed by Russia (0.52 percentage points) and then India (0.17 percentage points). China and South Africa experienced a negative growth in net FDI inflow (% of GDP) of 1.71 and 0.09 percentage points respectively during the same time period. South Africa experienced a huge net FDI inflow (% of GDP) positive growth of 1.82 percentage points, followed by China (1.40 percentage points), Russia (0.98 percentage points) and then India (0.12 percentage points) during the period from 2000 to 2005. The same time frame saw Brazil's net FDI inflow (% of GDP) declining by 3.27 percentage points, from 5% in 2000 to 1.73% in 2005.The subsequent five yearperiod saw Brazil, Russia and India recording positive growth in net FDI inflow as a share of GDP of 0.68, 0.80 and 0.73 percentage points respectively whilst China and South Africa were characterised by negative growth in net FDI inflow (% of GDP) of 0.55 and 1.55 percentage points respectively during the same time frame. Last but not least, Brazil, India and South Africa recorded positive growth in net FDI inflow (% of GDP) whilst Russia and China's net FDI inflow (% of GD) negatively grew during the period from 2010 to 2014. Overall, Brazil experienced the highest increase in net FDI net inflow (% of GDP) of 3.46 percentage points, followed by South Africa (1.37 percentage points), India (1.36 percentage points) and then Russia (1.06 percentage points) during the

period from 1994 to 2014. China is the only BRICS country whose net FDI inflow (% of GD) declined during the period under study, from 6.01% in 1994 to 2.79% in 2014 (World Bank, 2015 statistics). It is the author's view that the uneven and fluctuating FDI inflow statistics which characterised the BRICS countries during the period under study provide a reason why the FDI determinants in BRICS need to be investigated.

Figure 4: FDI net inflow (% of GDP) for BRICS countries -Stacked presentation



Source: World Bank (2015)

3. Investigating FDI Determinants in BRICS Using an Empirical Model

The major determinants of FDI as derived from literature are summarised by the following general model specification.

FDI = f(FIN, GROWTH, INF, EXCH, OPEN, HUM) [1]

Where FDI is foreign direct investment, GROWTH represents economic growth, FIN is financial development and INF stands for inflation. EXCH represents exchange rates, OPEN is trade openness whilst HUM represents human capital development.The choice of the independent variables and their proxies was guided by the empirical studies on similar research work (Pan. 2003; Kaur et al. 2013; Sridharan et al. 2009; Giner and Giner. 2004; Vijayakumar et al. 2010; Branco. 2015). FIN is proxied by stock market capitalisation as a ratio of GDP, GROWTH is measured by GDP per capita whilst EXCH is proxied by exchange rate (local currency/US$). OPEN is measured by total exports and imports of goods and services (% of GDP) and the proxy for HUM is the human capital development index.

The data used for the purpose of this study was obtained from World Development Indicators, international financial statistics, international monetary fund, African Development Indicators Global Financial Indicators and United Nations Development Programme several reports. According to Nnadi and Soobaroyen (2015), the risk of discrepant data and bias is dealt away with since the sources of data used are all in the domain of the public.Following literature ((Pan. 2003; Kaur et al., 2013; Sridharan et al., 2009; Giner and Giner. 2004; Vijayakumar et al., 2010; Branco, 2015), financial development, economic growth, trade openness and human capital development is anticipated to positively affect FDI. On the other hand, inflation is expected to negatively affect FDI (Hsin-Hong and Shou-Ronne, 2012; Branco, 2015; Bengoa and Sanchez-Robles, 2003) whilst a weak currency in the host country is anticipated to positively attract more FDI (Vijayakumar et al., 2010; Nischith, 2013).

Table 1: Descriptive statistics

	FDI	FIN	GROWTH	INF	EXCH	OPEN	HUM
Mean	2.29	75.43	4 273	33.48	17.03	43.17	0.69
Median	2.20	45.34	3 288	6.64	8.28	46.85	0.71
Maximum	6.01	276.60	14 487	2 075	61.03	72.87	0.82
Minimum	0.17	0.04	353	0.26	0.66	15.64	0.45
Standard dev.	1.45	69.57	3 654	204.45	16.83	14.84	0.08
Skewness	0.44	1.46	1.10	9.66	0.93	-0.23	-0.65
Kurtosis	2.31	4.13	3.42	96.72	2.44	1.88	2.61
Jarque-Bera	5.47	42.69	22.02	40 062	16.39	6.42	8.14
Probability	0.06	0.00	0.00	0.00	0.00	0.04	0.02

Source: Author compilation from E-Views (8)

FIN, GROWTH, INF, EXCH AND OPEN are characterised with very high standard deviation from the mean whilst the high range values for all the variables shows the presence of extreme values or outliers. The Kurtosis figures shows that all the variables used in this study are skewed to the right, a sign of the absence of a normal distribution. The Jarque-Bera statistics shows that the data for FDI, FIN, GROWTH, INF, EXCH, OPEN and HUM does not follow a normal distribution. It is against this backdrop that this paper converted the data sets for all variables into natural logarithms in order to make it suitable for econometric analysis, in line with Odhiambo (2008) who argued that normality of datasets is a pre-requisite in econometric modelling. Consistent with Nobakht and Madani (2014), converting the data into natural logarithms ensures that both auto-correlation bias and the impact of abnormal data values are dealt away with.

Table 2: Correlation analysis

	FDI	FIN	GROWTH	INF	EXCH	OPEN	HUM
FDI	1.000						
FIN	-0.2137	1.000					
GROWTH	0.1626*	0.1741*	1.000				
INF	-0.1580	-0.0918	-0.0369	1.000			
EXCH	-0.2705	-0.1617	-0.2661	-0.1119	1.000		
OPEN	0.0191	0.4289***	0.0369	-0.1359	0.1201	1.000	
HUM	0.2534***	-0.1847	0.4641***	0.1317	-0.5253	0.0937	1.000

Source: Author compilation from E-Views (8)
*** and * indicate 1% and 10% significance levels respectively

Descriptive statistics describes the nature of the data whilst correlation matrix shows the direction and the nature of association between all the variables used in this study (see Table 2). As expected, GROWTH, OPEN and HUM are positively correlated with FDI whilst a negative association between INF and FDI was also observed. Contrary to literature, FIN is negatively correlated with FDI. Moreover, GROWTH and OPEN are positively associated with FDI whilst INF as expected was negatively correlated with FDI. In contrast to theory, EXCH and HUM are negatively associated with FDI.OPEN and HUM are positively correlated with GROWTH whilst INF and FDI is negatively associated as expected and contrary to literature, EXCH is negatively correlated with FDI.Majority of the correlations between the variables under study are in sync

with the dictates of the literature.In Table 2, all the correlational relationship are below 53%. According to Stead (1996), this means the challenge of multicollinearity does not exist.

Empirical model specification: This paper used the following empirical model to test the determinants of FDI in BRICS countries.

$FDI_{it} = \alpha_i + \beta_1 FIN_{it} + \beta_2 GROWTH_{it} + \beta_3 INF_{it} + \beta_4 EXCH_{it} + \beta_5 OPEN_{it} + \beta_6 HUM_{it} + \varepsilon it$[2]

Where FDI_{it} is the net FDI inflows as a ratio of GDP in country i at time t, FIN_{it} represents financial development in country i at time t, $GROWTH_{it}$ is gross domestic product, INF_{it} stands for inflation in country i at time t, $EXCH_{it}$ represents exchange rates in country i at time t, $OPEN_{it}$ is trade openness in country i at time t whilst HUM_{it} represents human capital development in country i at time t.$\varepsilon it$is the error term and α_i is the intercept.β_1 and β_2 up to β_2 are the coefficients of the independent variables.

4. Results and Interpretation

Panel data analysis was used to investigate the determinants of FDI for BRICS countries with annual data ranging from 1994 to 2014. Employing stacked panel data approach, this study found out results contained in Table 3.

Table 3: Panel regression results for FDI

Variable	Dependent variable: FDI			
	Fixed effects		Pooled OLS	
	Co-efficient	t-statistic	Co-efficient	t-statistic
GROWTH	0.1117	1.1122	0.0721	0.6630
HUM	-0.6024	-0.6432	2.0249**	2.3894
INF	-0.0381	-0.5362	-0.3343	-4.7433
FIN	0.0568	0.6596	-0.0683	-0.8301
OPEN	0.5793**	2.0463	0.0006	0.0025
EXCH	0.6120***	3.3742	0.0378	0.4234
C	-4.2106	-3.7208	1.5866	1.3812
	R-squared	0.6062	R-squared	0.2617
	Adjusted R-squared	0.5643	Adjusted R-squared	0.2165
	F-statistic	14.4698	F-statistic	5.7893
	Prob (F-statistic)	0.0000	Prob (F-statistic)	0.0000

Source: Author compilation from E-Views (8)
*** and ** indicate 1% and 5% significance levels respectively

According to Table 3, economic growth positively but non significantly influenced FDI whilst the opposite was true in the case for inflation rate and FDI nexus under both fixed effects and pooled OLS panel regression approaches. Moreover, high levels of trade openness and exchange rate stability positively and significantly impacted on FDI under the fixed effects panel regression estimation technique whereas the same variables positively but non-significantly affected FDI in the pooled OLS panel regression framework. These results concur with literature.Whilst human capital development positively and significantly influenced FDI under the pooled OLS panel method in line with the literature, the fixed effects approach shows that human capital development negatively affected FDI. A scenario where high human capital development levels increases the cost of labour can end up acting as an FDI locational disadvantage. Financial development as measured by stock market capitalisation ratio had a positive and a non-significant impact on FDI under the fixed effects in consistent with literature. On the other hand, financial development negatively affected FDI in the pooled OLS panel regression approach. The possible explanation is that the financial markets in BRICS were inefficient during the period under study in line with Ezeoha and Cattaneo (2012) whose study observed that inefficient financial markets in China which were characterised by negative real interest rates stifled the flow of FDI into China. The finding also resonates with Kaur et al. (2013) whose study found out that domestic credit by banking sector negatively influenced FDI flow into BRICS countries.

5. Conclusion

The major aim of this study was to investigate the determinants of FDI in BRICS countries. The study also discussed the various factors which determined FDI in BRICS countries from both a theoretical and empirical point of view. Recent trends indicate increased FDI outflow from BRICS countries or reduced FDI inflow into BRICS countries (see section 3). The possible reasons for such FDI net inflow trends in recent years in BRICS countries have also been unpacked.The study discussed some of the challenges facing FDI inflows as well as policies that could be implemented to rejuvenate FDI inflows in BRICS countries.The investigation of FDI determinants using an econometric empirical model (see equation 2) produced the following findings for BRICS: (1) both fixed effects and pooled OLS approaches show that economic growth, trade openness and exchange rate stability had a positive impact on FDI, (2) financial development positively influenced FDI under the fixed effects approach, (3) FDI was positively influenced by human capital development using the pooled OLS and (4) inflation negatively affected FDI under both panel data analysis methods in line with literature.Taking into account these findings and the ongoing debate on the dynamics of FDI, several policy mix implications are applicable to BRICS countries.This study urges BRICS countries to implement policies and programmes that increase the efficiency of the financial sector, economic growth, maintain stable exchange rates, enhance trade openness and human capital development in order to trigger significant FDI inflows.A tight monetary policy that keep inflation rates at lower levels and ensure exchange rates stability should be put in place in order to attract more FDI inflow into BRICS countries.Subject to availability of data, the author suggests that future studies should empirically examine the applicability to BRICS of all the determinants of FDI mentioned in the literature review. Such a study can be done using generalised methods of moments (GMM), an econometric approach which addresses the endogeneity problem.

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A Look at the Liquidity Management Practices of Banks in South Africa

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Abstract: In an effort to strengthen bank liquidity-risk management practices, the Basel Committee proposed new liquidity requirements for banks in 2010 under the Basel III framework. However, despite the good intentions of the liquidity requirements the new regulations are likely to present some challenges for banks in the course of managing their liquidity. However, before any inference can be made about the possible implications of the liquidity standards on bank liquidity management practices, it is imperative to have insight into the current liquidity management strategies of banks. This paper seeks to determine the current liquidity management practices of banks in South Africa by examining whether South African banks have target liquidity levels which they pursue and also by determining the variables that drive bank liquidity ratios. The study sample comprised six commercial banks operating in South Africa over the period 1993 to 2009. For analysis, a partial adjustment model was developed and estimated using the generalized method of moments (GMM) estimator. The rate at which South African banks adjust their balance sheets was estimated at 8%. This adjustment speed implies that South African banks adjust their balance sheets slowly – probably due to high adjustment costs. Thus, South African listed banks have passively managed their liquidity and partially adjust their liquidity levels in an attempt to reach the optimal level. Furthermore, the following variables were considered to be the main drivers of liquidity ratios in South Africa: bank size, capital adequacy, loan loss reserves, and financial crisis.

Keywords: *Liquidity management, commercial banks, South Africa, partial adjustment model, GMM*

1. Introduction

During the global financial turmoil that began in mid2007, many banks experienced liquidity problems. Bank liquidity problems reached a climax in late 2008, following the failure of Lehman Brothers in September 2008. Farag et al. (2013) and Vodová (2013) attributed liquidity problems that banks faced to imprudent liquidity-management practices. The fact that liquidity was easily, cheaply and readily available, made banks complacent in terms of their liquidity management (Basel Committee on Banking Supervision, 2010). Similarly, Accenture (2015) observed that banks did not develop proper liquidity projection models and over relied on volatile short-term wholesale funds like Repurchase Agreements (Repos) and Asset Backed Commercial Paper (ABCP) to finance their activities. At the same time, banks invested heavily in structured products like Asset Backed Securities (ABS) which are vulnerable to illiquidity during episodes of severe financial distress such as occurred during the 2007 to 2009 financial turmoil (Kowalik, 2013). Bank liquidity can be described as the dexterity of a bank in funding asset growth and paying off obligations as they fall due (Basel Committee on Banking Supervision, 2008). Liquidity is vital to the ongoing viability of a bank; therefore, liquidity management ought to be a routine activity in bank operations. Liquidity management is not only important at individual bank level, because liquidity shortfalls are contagious (Basel Committee on Banking Supervision, 2000). A shortfall at one bank (especially systemically important banks) can quickly transcend to other banks – causing system-wide disturbances.

The need for banks to efficiently manage their liquidity stems from their maturity-transformation function in the economy. Typically, banks accept short-term deposits from surplus economic units and issue long-term loans to deficit economic units. Banks engage in maturity transformation on the assumption that depositors will not make '*enmasse*' withdrawals (Elliot, 2014)– or that they can easily replenish withdrawals with new deposits. However, during periods of financial crisis, depositors can lose confidence in a bank or the banking system as a whole (due to solvency concerns), and engage in panic withdraws (Covas and Driscoll, 2014). Under these circumstances, if the troubled institution(s) do not have adequate liquidity buffers or fail to get external support timeously, they are likely to experience "bank runs" and failure becomes inevitable (Vodová, 2013). Thus, liquidity management remains one of the most important occupation of bank managers (Basel Committee on Banking Supervision, 2000).

Liquidity management is connected to both sides of a bank's balance sheet. It looks at the optimal mix of assets and liabilities that a bank needs to hold on an ongoing basis in order to remain liquid. Banks can ameliorate liquidity risk by financing themselves with fairly stable funding sources (mainly retail deposits) that are resilient – even during episodes of market-wide stress. Furthermore, banks can build liquidity buffers during good times, which they draw down during episodes of crisis – especially when the bank cannot renew its funding sources or when other assets are illiquid (Farag et al., 2013). Besides stable funding sources, bank managers can mitigate liquidity risk by holding a large stock of liquid assets such as treasury bills, central bank reserves, quasi-government securities, sovereign bonds, and non-financial corporate bonds. These securities can be liquidated when the need arises in order to cover liquidity shortfalls. Despite acting as a cushion against liquidity shortages, liquidity buffers however have a signaling effect. A bank with a large stock of liquid assets signals its ability to pay off imminent liabilities to the market (Aspachs et al., 2005). For this reason, liquidity buffers build depositor confidence in the institution, which prevents panic withdrawals and ultimately reduces demand for withdrawals. Banks can also make use of the interbank market to meet their liquidity needs on a daily basis. However, this source of liquidity can be unreliable because it is susceptible to systemic disturbances and can even dry up – as occurred during the 2007 to 2009 financial crisis.

In an effort to strengthen bank liquidity-risk management practices, the Basel Committee on Banking Supervision proposed new liquidity requirements for banks in 2010 under the Basel III framework – in the form of the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). The two rules have different but complementary objectives. The LCR aims to promote a bank's short-term resilience in terms of liquidity shocks – by demanding that it holds adequate, high quality liquid assets (HQLA). The NSFR seeks to minimize liquidity risk (asset and liability mismatches) by ensuring that banks finance their activities with long-term stable sources of funding (Basel Committee on Banking Supervision, 2010). Despite their significance, however, the new liquidity regulations are likely to present some challenges for banks in managing their liquidity – because banks have never before been exposed to binding liquidity charges.[1]

Before any inference can be made about the possible implications of liquidity standards on bank liquidity-management practices, it is imperative to have insight into the current liquidity-management strategies of banks. In this regard, DeYoung and Jang (2016) state that if banks actively manage their balance sheet liquidity, then blanket imposition binding of liquidity regulations would only have idiosyncratic effects on bank liquidity management. On the other hand, if banks passively manage their liquidity, then blanket imposition of mandatory liquidity charges would have systematic effects on bank balance-sheet liquidity management and their ability to extend credit. Therefore, this study sought to investigate liquidity management practices being pursued by South African banks. In particular, this paper examines whether South African banks actively or passively managed their balance sheet liquidity during the period under review.

2. Literature Review

To gain insights into liquidity-management practices of banks, Schertler (2010) examined how German banks manage their regulatory liquidity based on three stylized strategies: liquidity purchases, cash-flow matching, and accounting exchanges. Using a dynamic panel regression model on a quarterly dataset covering the period 2000 to 2008 on three types of banks in Germany – commercial, savings and cooperative – Schertler found that banks have diverse liquidity-management strategies which are based on their type. Commercial banks were found to depend more on capital (wholesale) markets for funding, while savings and cooperative banks concentrated on cash-flow matching – i.e. they match cash inflows and outflows between assets and liabilities in each time bucket, in order to manage their liquidity. All three forms of banks were found to engage in asset side accounting exchanges, and also cutting back lending when confronted with higher payment obligations from maturing obligations. De Haan and van den End (2013) examined how banks react to funding liquidity disturbances emanating from financial market volatility, using a dataset of the 17 largest Dutch banks for the period January 2004 to April 2010. They modeled bank liquidity dynamics using a panel Vector Autoregressive specification. Orthogonal impulse response showed that banks react to

[1]Until 2010 there were no liquidity requirements for banks – only capital charges existed.

funding gaps in three stylized ways: (i) reducing lending, particularly wholesale; (ii) hoarding liquidity, mainly liquid bonds and central bank reserves; and (iii) engaging in fire sales, particularly equity.

Duijm and Wierts (2014)applied the Fully Modified OLS (FMOLS) estimator to examine the long-run relationship between actual and required liquidity for Dutch banks and evaluated bank balance sheet adjustment dynamics. They established a long-run relationship between liquid assets and liabilities, and therefore went on to develop an Error Correction Model (ECM) to identify how banks rebalance their balance sheets when confronted with liquidity shocks. The ECM shows that Dutch banks adjust their liquidity on the liability side – particularly when they are off their target liquidity level. Furthermore, the Dutch LCR (macro prudential regulation) was found to be weak in stemming aggregate liquidity cycles, as evidenced by procyclical trends in balance sheet size and risk-taking behavior of banks. DeYoung and Jang (2016) examined whether US commercial banks have target liquidity levels which they pursue, and how fast they adjusted their balance sheets to revert to their target liquidity ratios for the period 1992 and 2012. For analysis, they developed a partial adjustment model similar to that of Berger et al. (2008), and estimated the model using Blundell and Bond's (1998) generalized method of moments estimator. DeYoung and Jang established that US commercial banks actively managed their liquidity during the period 1992 to 2012.

3. Methodology

Empirical Model: The methodology of this paper is drawn from capital-management studies that explored bank capital-management practices. Accordingly, the researchers developed a partial adjustment model in line with Berger et al. (2008), Flannery and Hankins (2013) and (Kok and Schepens, 2013). Firstly, the researchers specify and estimate a model of the factors that influence banks' target liquidity of the form:

$$LIQ_{it}^{*} = \beta X_{i,t-1} \quad (1)$$

Where:

LIQ_{it}^{*} : is the target liquidity level for bank i at time t, which is perceived to vary across banks and over time. Bank liquidity level was proxied by the liquid asset ratio (LaR).

β : is a vector of coefficients to be determined.

$X_{i,t-1}$: is a vector of bank specific characteristics that influence bank liquidity (see Table 1).

The bank's target liquidity is assumed to oscillate around an unobservable target. In each time period the bank looks at deviations from the target and takes appropriate action to close the gap. Due to adjustment costs, banks may not be able to instantly close the gap, so leading to the following partial adjustment model:

$$LIQ_{it} - LIQ_{i,t-1} = \lambda\left(LIQ_{it}^{*} - LIQ_{i,t-1}\right) + \varepsilon_{it} \quad (2)$$

Where:

λ : is the speed of adjustment.

ε_{it} : is the error term

If λ is high, it indicates that banks are actively managing their liquidity and face minimal adjustment costs. On the other hand, if λ is low, it means that banks are passively managing their liquidity and face substantial adjustment costs.

Considering that the target liquidity is not directly observable, Equations (1) and(2) are integrated and rearranged to yield:

$$LIQ_{it} - LIQ_{i,t-1} = \lambda\left(\beta X_{i,t-1}\right) + (1-\lambda)LIQ_{i,t-1} + \varepsilon_{it} \quad (3)$$

From equation (3), the complete model can be specified as:

$$LIQ_{it} = \alpha + \lambda LIQ_{i,t-1} + \beta_1 SIZE_{it} + \beta_2 CAR_{it} + \beta_3 NII_{it} + \beta_4 LLR_{it} + \beta_5 Ownership_{it} + \beta_6 FC_t + \varepsilon_{it} \quad (4)$$

Equation (4) enables us to estimate the bank's target liquidity level, establish the cross-sectional bank-specific variables that influence bank liquidity ratios, to estimate bank adjustment speed towards their desired liquidity level rate, and to investigate whether banks actively or passively manage their liquidity.

Equation (4) is estimated using system Generalised Method of Moments (GMM) developed by Blundell and Bond (1998)– for the following reasons. As pointed out by Arellano and Bover (1995), Blundell and Bond (1998) and Roodman (2009), system GMM can eliminate autocorrelation arising from the inclusion of the lagged dependent variable among covariates, endogeneity problems emanating from the correlation of the one or more covariates with the error term, or omitted variable bias and unobserved heterogeneity due to differences in firm characteristics like management quality, organization culture, investment policies, and which static panel regression models like random effect, fixed effect and pooled ordinary least squares cannot handle. In addition, system GMM overcomes the weak instrument problem in the difference GMM estimator (Blundell and Bond, 1998). System GMM estimator furthermore caters for biased adjustment speeds which arise in the dynamic structure of the model (Kok and Schepens, 2013).

Data and Variables: The study sample was drawn from six commercial banks operating in South Africa over the period 1993 to 2009. The choice of commercial banks was based whether they were more involved in maturity transformation relative to other forms of banks. The study focuses on bank-specific drivers of liquidity. LikeMarozva (2015) and Molefe and Muzindutsi (2016), data for the study were sourced from the BFA McGregor database, because it is the most comprehensive database containing financial statements of firms (financial and non-financial) listed on the Johannesburg Stock Exchange. Based on Bonner and Hilbers (2015) and Delechat et al. (2012), bank-specific variables considered in this study were (see Table 1, below):

Table 1: Bank-specific characteristics that influence the LDR

Variable	Description	Measurement	Expected Sign
Dependent variable			
Liquid asset ratio (LaR)	Measure of bank liquidity that reflects the ability of the bank to absorb liquidity shocks.	$\frac{Totalliquidassets_{it}}{Totalassets_{it}}$	Dependent variable
Independent variable			
Bank-specific			
Lagged LDR	Lagged dependent variable	$LaggedLaR_{it} = LaR_{i,t-1}$	Positive
Net interest income to Earning Assets (NII)	Profitability measure: Profitable banks are expected to hold lower levels of liquidity, since they are perceived to have a low default probability and they are less liquidity constrained.	$\frac{Interestearned_{it} - interestpaid_{it}}{EarningAssets_{it}}$	Negative
Capital Adequacy Ratio (CAR)	Measures the soundness of a bank. Healthy banks are expected to hold lower liquidity because of their favorable access to external debt funding.	$\frac{EquityCapital_{it} + RetainedEarnings_{it}}{RiskWeghtedAssets_{it}}$	Negative
Loan Loss Reserves (LLR)	Illustrates the riskiness of the loan portfolio. The riskier the loan portfolio, the more liquid the bank is expected to be.	$\frac{Bad\&DoubtfuldebtsProvision_{it}}{GrossAdvances_{it}}$	Positive
Bank Size (SIZE)	Big banks are expected to be less liquid because of their easy access to debt markets.	Natural log of Total Assets (Excluding Intangible Assets)	Negative
Ownership (Ownership)	Foreign banks, due to their access to external parent company support, are expected to hold low levels of liquidity.	Dummy variable with the value of 1 for domestic ownership and 0 for foreign ownership. Foreign banks, because of their access to parent company support, are expected to hold lower levels of liquidity compared to their domestic counterparts.	Negative for foreign and positive for local

FC	Dummy variable to account for the financial crisis. It is presumed that financial crisis motivates banks to increase their liquidity buffers to mitigate liquidity risk which may arise from bank runs or large unexpected cash withdrawals.	Dummy variable which takes the value of 1 for the period of the crisis - i.e. 2007 to 2009; otherwise the value is 0.	Positive

Source: Researchers' own design.

Unit root test: Before running regression models, Gujarati and Porter (1999) recommend that it is imperative to first check for unit roots in the data in order to prevent spurious regression. Accordingly, all the variables were tested for stationarity using the Maddala and Wu unit root test which is applicable to unbalanced panel data (Baltagi, 2005). The panel dataset employed in this paper is unbalanced due to some missing observations; thus, the Maddala and Wu test was regarded to be the most appropriate test.

4. Results and Discussion

Descriptive Statistics: Table 2 (below) presents estimates of descriptive statistics:

Table 2: Descriptive Statistics

Variable	Mean	Standard deviation	Min	Max
LaR	65.50423	16.5014	29.6275	85.5079
NII	10.48168	19.92949	2.1346	83.6508
LLR	88.81537	65.73206	35.0698	410.0575
SIZE	11.76143	1.943447	6.074035	14.22341
CAR	13.03774	13.40593	5	83.4

Source: Model output.

The average liquid asset ratio for the period under review was estimated at 65.50%, which is relatively high. This ratio means that for every R1.00 received by banks, R0.655 is maintained in liquid assets. This suggests that South African banks are very liquid and thus can withstand severe liquidity shocks. The average net interest income to earning assets ratio was estimated to be 10.48% for the period under review. This ratio implies that commercial banks in South Africa – for the period under investigation – have been able to earn 10.48% from their earning assets. This indicates that South African banks are profitable and can efficiently 'sweat' their capital. The ratio of loan loss reserves to gross advances was estimated to be 88.82%, which is fairly high, and indicates that South African banks are very conservative; they manage liquidity risk prudently by keeping a large buffer of provisions to cater for bad debts. Turning to capital adequacy, the average Tier 1 ratio was 13.04%. This figure suggests that South African banks are adequately capitalized, considering that they are above the minimum capital adequacy ratio of 8% set by the Basel Committee on Banking Supervision.

Pairwise Correlation

Table 3 presents results of pair correlation analysis.

Table 3: Correlation matrix

Variable	LaR	LagLaR	NII	LLR	SIZE	CAR
LaR	1.0000					
LagLaR	0.9124	1.0000				
NII	-0.4826	-0.3807	1.0000			
LLR	-0.2037	-0.2407	0.4419	1.0000		
SIZE	0.3503	0.3567	-0.5936	-0.0739	1.0000	
CAR	-0.3892	-0.4798	-0.0143	-0.0213	-0.7133	1.0000

Source: Model output.

From the correlation matrix (Table 3) it can be shown that data used for the study does not exhibit multicollinearity, because the correlation among independent variables is low; in all cases it is below 60% – save for the lagged dependent variable which is 91.24%. The high correlation of the lagged dependent variable with the regress and indicates persistence – that is to say past values of the dependent variable influence future values. Therefore, current values of the liquid asset ratios are heavily influenced by their past values. According to Gonzale et al. (2007) and Louzis and Vouldis (2015), if the dependent variable exhibits persistence, the best model to use for fitting the data will be a dynamic error component (partial adjustment) model. This justifies the adoption of a partial adjustment model in this paper.

Unit Root Test Results: As shown in the Appendix, the results of the unit root test demonstrate that all the variables are stationary; hence, they can be regressed without problems of unit roots. All variables were stationary at the 5% significance level – save for bank size which became stationary at the 10% significance level.

Empirical Results

Results of regressing equation 4 with system GMM are presented in Table 5.

Table 5: Model results

Variable	Coefficient	Standard Error	p-value	Significance level
Constant	0.8023089	0.5478032	0.143	5%
Lagged LaR	0.9223649	0.0469652	0.000	5%
NII	0.0017551	0.0077879	0.822	5%
LLR	0.0791261	0.0230416	0.001	5%
SIZE	-0.713565	0.4233576	0.427	10%
CAR	-0.022192	0.0279324	0.000	5%
FC	0.0529322	0.021442	0.014	5%
Ownership	-0.0053233	0.0050777	0.294	5%

Source: Model output.

Lagged Dependent Variable: The coefficient of lagged LDR is positive and statistically significant at 5%. The significance of this variable implies that current values of liquidity ratios are influenced by their past values. In other words, these results demonstrate that liquidity ratios are persistent. Therefore, the partial adjustment model used in this study is justified. The rate at which South African banks adjust their liquidity following a liquidity shock was estimated to be 0.077635, i.e. (1-0.92236). This adjustment speed is relatively low – implying that South African banks face high adjustment costs, since a low speed of adjustment is associated with high adjustment costs. Taken as a whole, the study established that South African listed banks have passively managed their liquidity and they partially adjust their liquidity levels in an attempt to reach the optimal level.

Size: *A priori*, a negative relationship was expected between liquidity and firm size. To the expectation of researchers, results indicate a negative association (coefficient of -71.36%) between liquidity and bank size. Therefore, in the South African context, bank size can be considered to have a significant influence on the liquidity holdings of banks. Thus, the bigger the size of the bank, the less liquidity it maintains. These findings concur with DeYoung and Jang (2016) – who established that size positively influences the loan to deposit ratio in the United States.

Net Interest Income: Contrary to researchers' expectations, the coefficient for net interest income is positive, although statistically insignificant. The lower explanatory power of this variable suggests that profitability does not influence commercial banks in South Africa to hold liquidity buffers. Such findings can be explained by the fact that as an emerging market, South African banks are more tailored towards the traditional intermediation function of deposit collection and loan extension – with less reliance on debt funding.

Loan Loss Reserves: As predicted, the relationship between liquidity and loan loss reserves is positive and statistically significant. This confirms the hypothesis that banks hold more liquid assets to self-insure against potential defaults. Delechat et al. (2012) also established that banks which are perceived to be risky increase their loan loss reserves, which ultimately boosts their liquidity.

Capital Adequacy Ratio: A negative statistically significant association between liquidity and capital adequacy was identified, as expected. This result can be explained by the fact that capital regulations motivate banks to hold low risk weight assets which are generally liquidity (Bonner and Hilbers, 2015). Furthermore, healthy institutions are expected to hold lower liquidity because of their favorable access to funding markets. However, these findings contradict Vodova (2013) who established that capital does not significantly influence the liquidity holdings of banks in the Visegrad Group.

Financial Crisis: A significant, positive correlation was identified between liquidity and financial crisis. These findings imply that the recent global financial crisis significantly influenced commercial banks in South Africa to boost their level of liquidity – in order to manage liquidity risk which could emanate from bank runs or large unexpected cash withdrawals. Therefore, it can be argued that crisis periods induce banks to increase their liquidity holdings. Nevertheless, Vodova (2013) provides contradicting results, and found that the recent financial crisis did not significantly influence Visegrad banks to hold more liquid assets.

Ownership Structure: Since 75% of banks used in the study are indigenous, *a priori* the researchers expected the relationship between liquidity and ownership to be positive. Nevertheless, our study indicates a weak, negative and statistically insignificant relationship between liquidity and ownership. From these findings it can be argued that ownership does not significantly influence the liquidity holdings of banks in South Africa – contrary to Delechat et al. (2012) who found that ownership positively influences banks to hold liquid assets in Central America.

5. Conclusion

The main aim of this study was to shed light on the current liquidity-management practices of banks in South Africa. This aim was achieved by examining whether South African banks have target liquidity ratios which they pursue and by establishing the main drivers of bank liquidity ratios. The study results indicate that bank size, capital adequacy, loan loss reserves and financial crisis significantly influence bank liquidity holdings. On the other hand, net interest income and ownership were found to have a low explanatory power relative to banks' desire to hold liquidity. Turning to the adjustment speed, the rate at which South African banks adjust their balance sheets following a liquidity shock was estimated to be approximately 8%. This implies that the adjustment speed is relatively slow hence – and hence these banks face high adjustment costs. Consequently, South African commercial banks passively manage their liquidity. In other words due to high adjustment costs, these banks take time to revert to their target liquidity levels. Furthermore, liquidity ratios were persistent over time. Based on these findings, it can be suggested that a blanket imposition of mandatory liquidity charges in South Africa would have systematic effects on banks' balance-sheet liquidity management, and also their ability to extend credit to the real economy.

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Antecedents of Affective Commitment of Human Resource Management Practitioners Attending a Professional Body Convention

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Abstract: In this paper, affective events theory (AET) is used to develop a model that can be used by organizations to enhance propitious work conditions that will encourage human resource management (HRM) practitioners to be affectively committed to their organizations. AET states that there are certain antecedents (i.e. distributive justice, job-related well-being, and employee engagement) that positively correlate with job satisfaction. According to AET, positive emotions have a positive indirect correlation between antecedents and job satisfaction. AET states that job satisfaction positively relates to affective commitment. The research design was cross-sectional and correlational, and the sample size was (n=205).From the 300 questionnaires distributed to HRM practitioners, the response rate was 68.33%. The main finding is that respondents rated the positive emotions items below the mean, and there was a significant positive relationship between distributive justice and job satisfaction ($\beta = 0.61$; $p \leq 0.001$). The data showed that job satisfaction positively correlated with affective commitment ($\beta = 0.70$; $p \leq 0.001$).Positive emotions only mediated the relationship between distributive justice and job satisfaction ($\beta = 0.36$; $p \leq 0.001$). The study results have implications for managers' efforts to keep HRM practitioners affectively committed, as the latter were not satisfied with their remuneration. The data created awareness that when a remuneration policy is drafted, it should take cognisance that HRM practitioners who have positive emotions will be affectively committed and stay longer in organizations.

Keywords: *Affective events theory, antecedents, affective commitment, human resource management practitioners, professional body*

1. Introduction

Unlike other employees, HRM practitioners are faced with the challenge of performing a dual role (Pereira & Fontinha, 2016). Given the dualistic nature of their role, HRM practitioners tend to focus on the commitment of other employees while neglecting their own. HRM practitioners face an ongoing challenge of improving the organization's productivity and striving to find ways of encouraging employees to be more committed and to enhance levels of engagement in their organizations (Agarwala, 2003; Chew & Chan, 2008; Tladinyane & Van der Merwe, 2016). According to Fareed, Isa and Noor (2016), the current labor market requires highly capable and committed HRM practitioners to sustain long-term competitive advantage. The commitment of HRM practitioners becomes critical for realizing organizational success (Gubbins & Garavan, 2016). It is thus of paramount importance for organizations to have practices that foster commitment amongst HRM practitioners. Research shows that employees who are committed, are motivated (Mohapatra & Sharma, 2008; Nohria, Groysberg & Lee, 2008; Sharma, Mohapatra & Rai, 2013), productive (Giffords, 2009), and stay in organizations (Abbott, White & Charles, 2005; Giffords, 2009; Liou, 1995; Stallworth, 2003) (also see Meyer & Allen, 1997, for a review of benefits). Organizational commitment is defined as a psychological attachment felt by the employees of an organization (Andolsek & Stebe, 2004; Meyer & Herscovitch, 2001; O'Reilly & Chatman, 1986; Mohapatra & Sharma, 2008). Allen and Meyer (1990) proposed a three-component conceptualisation of organizational commitment; however, for the purpose of this paper, the focus is on affective commitment, which means "employees wish to remain with the organization because of emotional attachment". Research studies during the last two decades have concentrated mostly on affective commitment (Sharma, Mohapatra & Rai, 2013).

Prior to this study, no similar study has been conducted in the South African context and this is the gap this study aims to address. In this paper, the primary objective was to develop a model for testing the relationship between constructs that have been identified in the literature as antecedents of affective commitment. The secondary objectives are as follows:

- To explore if there is a relationship between distributive justice, job-related well-being, employee engagement, and job satisfaction.

- To explore if positive emotions mediate the relationship between distributive justice, job-related well-being, employee engagement, and job satisfaction.
- To explore if job satisfaction positively correlates with affective commitment.

Theoretical model: Discussed in this section are the theoretical framework and research hypotheses. The section concludes with a proposed theoretical model.

2. Theoretical framework

In order to develop a model for testing the affective commitment of HRM practitioners, affective events theory (AET) was used as a theoretical framework for this study. This theory was developed by Weiss and Cropanzo (1996). Wegge, Van Dick, Fisher, West and Dawnson (2006) found that certain antecedents (i.e. autonomy, supervisory support, etc.) positively correlated with job satisfaction, and job satisfaction positively correlated with affective commitment. Wegge et al. (2006) study also revealed that positive emotions have a positive indirect link between antecedents and job satisfaction. Expanding on the work of Wegge et al. in this present study, we explored the relationship between antecedents (i.e. distributive justice, job-related well-being, and employee engagement) and the relationship between job satisfaction and affective commitment, and whether positive emotions mediated the relationship between antecedents and job satisfaction.

Relationship between distributive justice and job satisfaction: Distributive justice has its roots in Adam Smith's (1965) equity theory and is defined as "the fairness of outcomes for employees' fair distribution of resources" (in Keramati, Eslamieh and Mozaiini, 2015:962) and the benefits and workload in the organization (Ali & Saifullah, 2014). On the other hand, job satisfaction is defined as the feeling an employee has about his/her job and/or reality (Locke, 1976). Numerous researchers have discovered a positive relationship between distributive justice and job satisfaction (Ali & Saifullah, 2014; Altahayneh, Khasawneh & Abedalhafiz, 2014; Fatt, Khin & Heng, 2010; Hao, Hao & Wang, 2016; Heidari & Saeedi, 2012; Rahman, Haque, Elahi & Miah, 2015; Saadati, Saadati, Asghari, Bidgoli, Ghodsi & Bidgoli, 2016). Based on this reason, it is hypothesized as follows:
Hypothesis (H) 1: A positive relationship exists between distributive justice and job satisfaction.

Relationship between job-related well-being and job satisfaction: Another AET construct that emerged from Adams Smith's theory is job-related well-being, which has many definitions (see Diener, Sandvik & Pavot, 1991; Rothausen, 2013). For the purpose of this study, job-related well-being comprises the feelings that make employees ecstatic, excited, inspired and energetic (Kirsten, Van der Walt & Viljoen, 2009). Being energetic is also a dimension of employee engagement (see discussion in the next paragraph).Well-being also refers to how workers are fulfilled, joyous, and happy (Bakker & Oerlemans, 2011).As satisfaction increases, so does job-related well-being (Faragher, Cass & Cooper, 2005; Tufail et al., 2016). Happier employees tend to develop social resources from other employees, making them more effective in their roles (Bakker & Oerlemans, 2011).The following hypothesis was therefore developed to test the relationship between job-related well-being and job satisfaction in this study:
H2: A positive relationship exists between job-related well-being and job satisfaction.

Relationship between employee engagement and job satisfaction: Employee engagement is how an employee is energized (Shuck & Reio, 2013), absorbed, dedicated, enthusiastic, and shows vigor towards his/her job (Macey & Schneider, 2008).Engaged employees are deeply involved, interested in their work, and they have high levels of job satisfaction (Biswas & Bhatnagar, 2013), where as disengaged employees are disconnected from work rationally, emotionally, and motivationally (Sunny & Joshua, 2014). Studies have shown a positive relationship between employee engagement and job satisfaction (Hanaysha, 2016; Imam & Shafique,2014; Kamalanabhan, Prakash Sai & Mayuri, 2009).The present study hypothesizes the following:
H3: A positive relationship exists between employee engagement and job satisfaction.

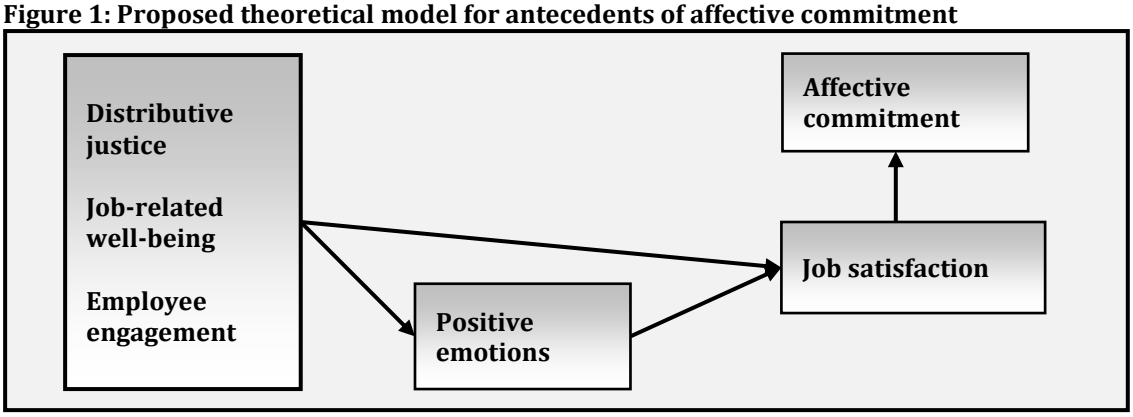
Positive emotions mediating the relationship between distributive justice, job-related well-being, employee engagement, and job satisfaction: Robbins and Judge (2015) explained positive emotions as happiness, pleasure, pride, and enthusiasm. Positive emotions generate well-being (Hochwarter & Thomson, 2010), as well as behaviour like job satisfaction (Akram, Khan, Yixin, Bhatti, Bilal, Hashim & Akram, 2016),

higher employee satisfaction (Ouweneel, Le Blanc & Schaufeli, 2011; Schiopu, 2015), and higher levels of engagement (Lyubomirsky, King & Diener, 2005). Positive emotions enhance well-being and personal success. This, in turn, benefits organizations because employees appreciate their organization's efforts to improve their well-being, which results in greater commitment (Cabrera, 2017).It can be surmised that an increase in positive emotions lead to an increase in job satisfaction, employee engagement, distributive justice, and job-related well-being. Hence the following hypothesis is advanced:
H4: Positive emotions mediate the relationship between distributive justice, job-related well-being, employee engagement, and job satisfaction

Positive relationship between job satisfaction and affective commitment: Affective commitment is defined as employees' attachment to the organization (Azeem, 2010; Eslami & Gharakhari, 2012; Kumar & Eng, 2011). Employees who are attached to the organization tend to be fulfilled in their work (Kanchana & Panchanatham, 2015). Rhoades, Eisenberger and Armeli (2001) mentioned that employees are attached to organizations when there is a synchronization between their values and organizations' value systems(Bilgin & Demirer, 2012; Fu, Bolander & Jones, 2009; Karim, 2008; Kaplan, Ogut, Kaplan & Aksay, 2012; Lumley, Coetzee, Tladinyane & Ferreira, 2011; Tat, Pei-Nid & Rasli, 2012; Yucel, 2012). It is believed that satisfied employees will be committed to their jobs and remains in the organization, while dissatisfied employees will intend to quit (Amos, Acquah, Antwi & Azifome, 2015). These arguments lead tithe following hypothesis:
H5: A positive relationship exists between job satisfaction and affective commitment.

Based on the discussion in the theoretical section, the following theoretical model is proposed:

Figure 1: Proposed theoretical model for antecedents of affective commitment



Source: Adapted from Wegge et al. (2006)

The authors of the present study included job-related well-being and employee engagement and did not include autonomy, supervisory support, and workload as antecedents of job satisfaction, Maleka, Skosana and Lekgothoane's (2016) study.

3. Methodology

In order to address the study's hypotheses, the research design is a survey, pre-experimental and correlational in nature. The latter assisted the researchers to test the relationship between the variables (Christensen, Johnson & Turner, 2015). Three hundred (N=300) questionnaires were distributed to HRM practitioners who attended the IPM convention in November 2016 at Emperors Palace in Kempton Park. The final sample consisted of (n=205) respondents, suggesting a response rate of 68.33%. The questionnaire comprised two sections, namely Section A: Biographical information (see Table 1) and Section B, which comprised validated scales. The job satisfaction scale was taken from Spector (1985), and for affective organizational commitment, four items were taken from Meyer and Allen (1997). For positive emotions, four items were taken from Watson, Clark and Tellegen (1998); four distributive justice items were taken from Price and Mueller (1986); and four items were taken from the employee engagement scale developed by Schaufeli and Bakker (2003). The scales had a seven-point Likert scale, where 1 = strongly disagree and 7 = strongly agree. The questionnaires stated the research purpose on the front page. Respondents were also

informed on the front page that they must not include their names, that their participation is voluntary, and that they may withdraw from participating for any reason. This assisted in anonymising the respondents' identity. Prior to analysis, the data were coded in Microsoft Excel and exported into STATA version 13 for statistical analysis.

4. Data analysis

Discussed in this section are descriptive statistics (i.e. frequencies, means, and standard deviations) and inferential statistics (i.e. confirmatory factor analysis and structural equation modelling).

Sample characteristics: Presented in Table 1are sample characteristics, with the majority (n=204) of respondents earning R10 000 and more a month, implying that they were middle and income workers.

Table 1: Sample demographic

Variable	Frequency
Gender	Male (n=86)
	Female (n=112)
Employment status	Employed full-time (n=191)
	Employed part-time (n=6)
Educational level	Certificate (n=7)
	Diploma (n=36)
	Degree (n=80)
	Postgraduate (n=74)
Age	18-24 (n=2)
	25-34 (n=39)
	35-44 (n=71)
	45-54 (n=59)
	55-65 (n=27)
Household monthly income before tax	Less than R10 000 (n=3)
	R10 000 to R19 999 (n=10)
	R20 000 to R29 999 (n=29)
	R30 000 to R39 999 (n=32)
	R40 000 and above (n=122)
Trade union membership	Yes (n=71)
	No (n=128)
People in the household	1 (n=11)
	2 (n=26)
	3 (n=43)
	4 (n=55)
	5 (n=40)
	6 or more (n=24)

Table 2 presents the mean scores and constructs. All the mean scores of job satisfaction were above 4, suggesting that the respondents were moderately satisfied. In terms of affective commitment, the mean scores were above 4, with the exception of the item "I would be very happy to spend the rest of my career with the organization", which had a mean score of 3.82. This can be interpreted as that the respondents moderately disagreed that they intended to spend the rest of their career in their current workplaces. Also, the mean scores of distributive justice were above 4, which can be interpreted as that the respondents perceived their rewards as being fair. Interestingly, the mean scores of positive emotions were below 4. This suggested that the respondents moderately disagreed that they were inspired by, enthusiastic about, and proud of their remuneration. The mean scores of employee well-being were above 4, suggesting that the respondents felt energetic, inspired, and excited at their workplaces. Lastly, all the mean scores of employee engagement were above 4, suggesting that the respondents were moderately engaged at their workplaces.

Table 2: Means, standard loadings, Cronbach's alphas, Dillon-Goldstein's (DG) rho, and average variance extracted (AVE)

Construct and scale item	Mean	Standardised loadings	Cronbach's alphas	DG rho	AVE
Job satisfaction					
I feel I am being paid a fair amount for the work I do (B1)	4.179	0.83	0.84	0.90	0.75
I receive a bonus once in year (B2)	5.77	0.27			
I am appreciated by the organization when I think about the way they pay me (B3)	4.27	0.84			
I feel satisfied with my chances for salary increases (B4)	4.38	0.74			
Affective commitment					
I would be very happy to spend the rest of my career with the organization (B5)	3.82	0.77	0.8	0.91	0.72
I really feel as if this organization's problems are my own (B6)	4.47	0.67			
I feel a strong sense of belonging to my organization (B7)	4.51	0.90			
I feel emotionally attached to this organization (B8)	4.38	0.79			
Distributive justice					
Overall, the rewards I receive here are quite fair (B9)	4.29	0.80	0.94	0.96	0.85
I am rewarded fairly for the amount of effort I put in (B10)	4.03	0.99			
I am rewarded fairly for the work I have done (B11)	4.01	0.97			
I think my current pay level is fair (B12)	4.11	0.85			
Positive emotions					
I generally feel excited about my remuneration (B13)	3.87	0.99	0.97	0.99	0.97
I generally feel enthusiastic about my remuneration (B14)	3.84	0.99			
I generally feel inspired about my remuneration (B15)	3.77	0. 96			
I generally feel proud about my remuneration (B16)	3.79	0. 96			
Job-related well-being					
My job makes me feel	4.55	0.92	0.97	0.98	0.92

ecstatic (B17)					
My job makes me feel excited (B18)	4.76	0.95			
My job makes me feel energetic (B19)	4.71	0.98			
My job makes me feel inspired (B20)	4.80	0.92			
Employee engagement					
When I am working, I forget everything around me (B21)	4.57	0.72	0.83	0.89	0.67
I feel happy when I am working intensively (B22)	5.00	0.74			
To me, my job is challenging (B23)	4.93	0.78			
It is difficult to detach myself from the job (B24)	4.60	0.73			

Table 2: Confirmatory factor analysis: $\chi 2 = 561.98$, $p<005$, CFI=0.93; RMSEA =0.93; TLI = 0.92 and SRMR = 0.57

Reliability and validity assessment: As can be observed from Table 2, the Cronbach's alphas for each of the constructs were above 0.7, suggesting that the questionnaire was reliable (Field, 2013). The DG rho was greater than 0.7, suggesting uni-dimensionality (Ravand & Baghaei, 2016). In Table 2, the AVE scores were above 0.5 and most of the standardized loadings were >0.7, suggesting convergence validity (Ravand & Baghaei, 2016). Discriminant validity (i.e. not shown in the study) was achieved by determining which loadings of each construct (i.e. job satisfaction, affective commitment, distributive justice, job-related well-being, and employee engagement) "were higher than loadings on other constructs" (Ravand & Baghaei, 2016:4).

Hypotheses testing: To develop the statistical model that shows the antecedents of affective commitment of HRM practitioners (i.e. refer to Figure 1), structural equation modelling (SEM) was conducted. Before testing the hypotheses developed in the theoretical section, the authors conducted model fit indexes (refer to Table 3). The model showed an acceptable fit based on the comparative fit index (CFI) = 0.92 (Hu & Bentler, 1999, recommend from 0.90 to0.95) and root mean square era (RMSEA) = 0.10 (Hu & Bentler, 1999, recommend greater than 0.05). The other goodness of fit indicators were poor, $\chi 2 = 567.06$ with 219 degrees of freedom ($p<0.001$), standard root mean square (SMMR) = 0.89 (Hu & Bentler, 1999, recommend less than or equal 0.08). It is argued that $\chi 2$ is usually affected by the sample size (Kline, 2011).

The data from Table 3 indicate a strong significant positive relationship between distributive justice and job satisfaction ($\beta = 0.61$; $p \leq 0.001$). Therefore, Hypothesis 1 is supported. Similarly, Saadati et al. (2016) found that distributive justice positively related with job satisfaction. The data from Table 3 show that there is an insignificant low positive relationship between job-related well-being and job satisfaction ($\beta = 0.05$; $p \geq 0.001$). Therefore, Hypothesis 2 is not supported. Elsewhere, it was found that as job satisfaction increased, so did job-related well-being (Faragher et al., 2005) and the result was happy employees (Bakker & Oerlemans, 2011) who enjoyed their work (Rothausen, 2013) and who were productive (Bakker & Oerlemans, 2011). As can be observed from Table 3, there is an insignificant low negative relationship between employee engagement and job satisfaction ($\beta =-0.02$; $p \geq 0.001$). Therefore, Hypothesis 3 is not supported. This finding contradicts previous research where it was found that employee engagement positively related with job satisfaction (Hanaysha, 2016). Table 4indicates that positive emotions only mediated the relationship between distributive justice and job satisfaction ($\beta = 0.36$; $p \geq 0.001$).Based on this finding, Hypothesis 4 is partially supported. A closer look at Table 3 shows that there is a strong significant positive relationship between job satisfaction and affective commitment ($\beta = 0.70$; $p \leq 0.001$). Therefore, Hypothesis 5 is supported. All the means of positive emotions were below the mid-point of 4, suggesting that the respondents were not happy or satisfied with their wages. This finding is surprising because 183 out of 300 respondents earned R20 000.00 and above per month. It also emerged from the data that there was a strong significant

positive relationship between job satisfaction and affective commitment (β = 0.70; p≤ 0.001). This finding is consistent with previous research (Bilgin & Demirer, 2012; Kaplan et al., 2012; Lumley et al., 2011).

Table 3: Direct effects between distributive justice, job-related well-being, employee engagement, job satisfaction, and affective commitment

Structural job satisfaction←	**Coefficient**	**P > |z|**	**Standard error coefficient**
Positive emotions	0.32	0.00***	0.67
Distributive justice	0.61	0.00***	0.10
Job-related well-being	0.05	0.53	0.09
Employee engagement	-0.02	0.87	0.12
Structural affective commitment←	Coefficient	P > |z|	Standard error coefficient
Job satisfaction	0.70	0.00***	0.10

Table 4: Positive emotions as a mediator

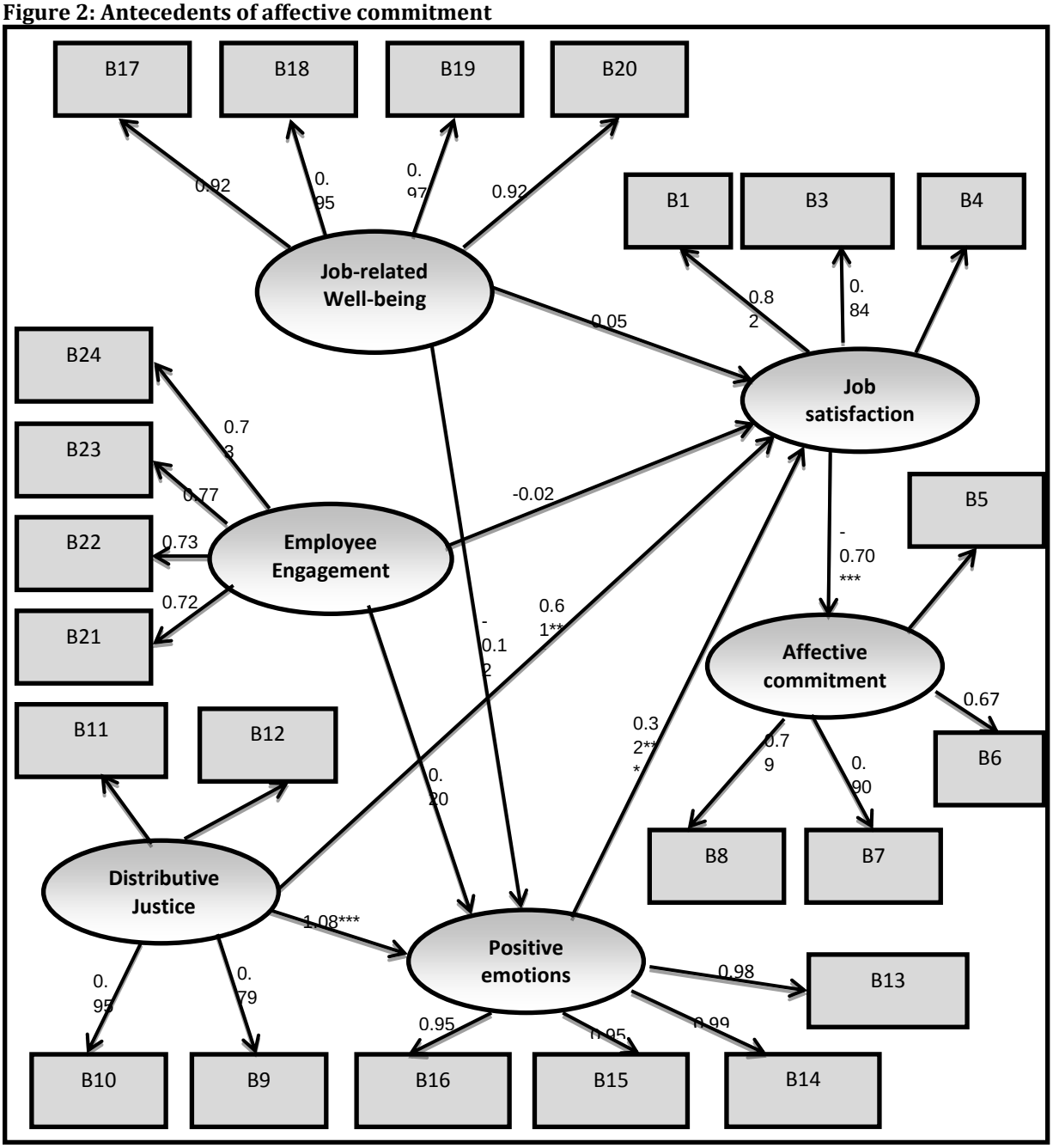
Structural job satisfaction←	**Coefficient**	**P > |z|**	**Standard error coefficient**
Distributive justice	0.36	0.00***	0.20
Job-related well-being	-0.00	0.33	0.04
Employee engagement	0.06	0.24	0.05

5. Conclusion and Recommendations

Based on the study findings, it can be concluded that HRM practitioners rated measures used in this study positively, with the exception of the positive emotions items, which were remuneration related, and as a result organizations might find it difficult to retain HRM practitioners and motivate to perform their dual role effectively. The literature and data showed that AET is an appropriate theoretical framework to determine antecedents of affective commitment. It is thus recommended that organizations should investigate the reasons why HRM practitioners rated the affective commitment items negatively and why HRM respondents would not spend the rest of their careers with their organizations. HRM practitioners implement people-related policy to enhance positive employee emotions but they are employees themselves, and positive work emotions also influence their work performance. Organizational policy should therefore also focus on developing HR talent (soft skills) in the organization and not solely focus on hard-core business skills. The researchers recommend that a similar longitudinal study should be conducted, using a mixed-methods research design. Future research can also determine significant differences in terms of age, gender, and educational levels.

Based on the study results, the SEM model as developed is shown below:

Figure 2: Antecedents of affective commitment



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Factors Influencing Quality of Life among Rural Populace in Nigeria

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Abstract: The study investigates factors influencing quality of life (QoL) among rural people in Nigeria. Two hundred and Twenty one (221) consenting adults within the rural area were sampled. Multi stage sampling technique was used to select respondents. Results revealed that respondents with low level of life stressor significantly reported higher score on quality of life than those with high level of life stressors. More also, there was no gender difference in the level of quality of life among the rural people. Age, gender, marital status, number of wives, number of children, and experience in rural area, occupation and educational attainment predicted quality of life. It was concluded that rural life stressor and demographic characteristics are significantly related to rural dwellers quality of life.

Keywords: *Rural behaviors, stress, demographic characteristics and quality of life*

1. Introduction

Quality of life for the rural populace is multifaceted and involves an aggregate interaction of factors such as level of income, living standard, quality of habitation and access to infrastructure facilities (Zaid & Popoola, 2010). Central to the quality of life among rural dwellers is the occupation and environment induced stressors; factors that lower the wellbeing of this populace. Quality of life is defined as the quality of the social indices qualifying a society. Among the arrays defining the rural society is the feeling of psychological and physical wellbeing among its populace (Zaid & Popoola, 2010). Rural Nigeria is endowed with abundant productive land, mineral resources and teeming labor force. Despite the availability of human and material resources, the rural populace is still populated with people with low quality of life. Quality life has been identified to be out of reach for the majority of rural dwellers in Nigeria due to lack of access to clean water, health care and good roads, making the rural areas less enjoyable and difficult to live in (Meludu & Bajowa, 2008). Therefore, the rural populace is described as people with poor mental health and closely linked to occupational and environment stress factors (Meludu & Bajowa, 2008).

Besides the lack of infrastructure and basic services identified to contribute to poor quality of life among rural communities in Nigeria, occupational induced stress remains the major factor limiting positive psychological health in these communities. Farming activities are the major important occupation of people in the rural areas in Nigeria (Mgbada, 2010; Ekong, 2010). Some combine these activities with artisan work or public services (Adepoju and Obayelu, 2013). Lack of infrastructure leaves the farmers working with crude technology and stressful processes which greatly affects their quality of life (Nzenwa, 2005). Farming stress defines facets of farm work and environmental factors inducing distress among farmers. These include farm operations such as land clearing, preparation and harvesting. Farming stresses also include anxiety about environmental uncertainties such as weather, the health of the crops, the market and policy that may present challenges to a successful farming season. Uncontrollable factors common to weather seasonality are unpredictable; and these include adverse weather conditions, disease epidemics and natural disasters (flooding and drought). Factors relating to human activities include instability of market prices and government policies.

Available literature indicates that no study has empirically ascertained the role of farming stress factors in rural Nigerian communities. Further, several works on quality of life have focused on characteristics and access to infrastructure of rural people, with no investigations on the role of the occupational stressors on quality of life of rural communities (Akinyemi, Owoaje, Popoola & Ilesanmi, 2012). This paper sought to answer four research questions, which are:

- What is the relationship between dimensions of rural farming stress, family stressors, government policy, illness, financial problems, machinery, workers, weather problems and quality of life?
- Does farming stress affect the level of quality of life in rural communities?
- Is gender a determinant in quality of life of rural people in Nigeria?

- What contributions do age, gender, marital status, family size, number of wives, residency experience in the rural area, and educational attainment have on quality of life

2. Literature Review

Studies have indicated that rural residency poses a serious challenge to mental health of the rural populace (Akinyemi et al., 2012). There are a number of factors that literature has consistently identified as making farming a distinctively stressful occupation. Causes of agricultural stress include financial problems, the political climate, workload and time pressures, diseases and acute crises, seasonality and adverse weather conditions, mechanical failures, family problems, health problems, acquisition and transfer issues, security, isolation and negative press coverage. Farming is the predominant employment in the rural areas and it has demonstrated to be very stressful (Meludu & Obajowa, 2008). The United Nations Development Program's Human Development Report (2014) found that financial issues, work overload are the most prevalent stressors among farmers. The report also found that 80% of the farmers, both big and small, worry about their finances. Working for longer periods of times daily was found to have aggravated the physical and mental health of rural farmers (United Nations Development Program's Human Development Report, 2014). The Legatum Institute (2013), in a study, identified adverse seasonality, epidemics, falling prices, increasing prices of farm inputs, technological failures, governmental policy somersault and lack of child care facilities as major stressors influencing poor mental health among rural farmers. Har and Zia (2014) also corroborated that poor policy implementation, financial and time pressures induced acute stress among Welsh farmers.

Thorn*'s* (2010) research with farmers using the Revised Clinical Interview Schedule established that farmers had a lower-than-average level of psychiatric problems, but higher levels of suicidal thoughts, particularly amongst rural and semi-rural households. Many of the factors causing mental and emotional stress are viewed as uncontrollable, and include weather, diseases or pests, commodity prices, input costs, equipment failure, media portrayal of the agricultural industry, government policies and lack of adequate, affordable and accessible child care. Ramesh and Madhavi (2009) demonstrate that poor working conditions and prevalent negative economic situations induce high stress among farmers. As a result, Ramesh and Madhavi (2009) conclude, a significant percentage attend health clinics due to stress-related illnesses. Fasoranti (2008) found that high work demands and expectations, coupled with low control and lack of social support can lead to a poor psycho-social work environment, with increased stress levels, ill mental health, depression, and, in the worst cases, suicide. Internationally, farmers with mental illnesses have different health service options depending on their location. Regardless of location, it is initially the responsibility of the individual farmer and farmer family to handle mental health and stress, which can be of short or long-term duration. In Nigeria, Meludu and Bajowa (2008) found the influence of farming related problems in social and psychological related stress but found differences between poultry and cassava farmers. Momodu (2002) developed a measure for farm stress. With the help of the data collected from 362 farmers using factor analysis they came up with factors like life satisfaction, emotional strain, illness frequency, personal finances and time pressures. Among these five factors, personal finances and time pressures were found to be the most significant predictors of farm stress.

Eurofound (2014) found gender differences in wellbeing in rural Australia and significant lower prevalence of mental health problems in rural areas. Women demonstrate positive well-being than their men counterpart as a result of differences in adaptation to mental health problem. Qualitative research in Australia suggests that within the rural community, mental illness is equated with severe mental illness such as psychosis, which often requires detention (Firth, 2001). Other symptoms of mental illness were more likely to be attributed to problems such as financial worries. A comparative study found that young men with mental health problems in rural Australia were less likely to seek help than their urban counterparts (Hembry, 2008). Likewise, research in rural Scotland (Scottish Executive, 2006) found that stress, anxiety and depression were less likely to be recognized as mental health problems requiring treatment.

Theoretical Orientation-Integrative quality of life theory: The Integrative quality of life theory seeks to measure the quality of life at a global level. It is a comprehensive theory or meta-theory that includes eight theories in a subjective-existential-objective spectrum. According to this theory, quality of life refers to a pleasant life lived in high quality. There are different meanings attached to quality of life by different religions

and philosophies. These may include the notion that a good life is enhanced by having a positive attitude towards life or by knowing oneself deeply. Quality of life can be divided into three groups, each dealing with an aspect of a pleasant life. There is the subjective quality of life that has to do with life satisfaction and how happy the individual is in life. It has many aspects, which include satisfaction with life, happiness, and meaning in life. When an individual is positive in all these aspects it is believed that such a person is having good quality of life. However, a good life is far more than being satisfied, happy and having meaning for life. The existential quality of life indicates how pleasant an individual feels deep down or how harmonious one's life is. In actual sense it simply means that quality of life is the agreement between a life lived and a sense of deep inner feeling of self-actualization. Two aspects constituting the biological view of quality of life are realizing life's potential and fulfillment of needs.

The objective quality of life on the other hand refers to how others view one's life, which is influenced by culture. It refers to how a person is able to conform to the values of his/her culture, which can be seen in such a person's life. Some of the aspects of objective quality of life include income, marital status, state of health and the amount of relationships with others. In essence, objective quality of life emphasizes the conformity to societal norms and values as a sign of quality of life. This theory provides an elaborate way of measuring quality of life that includes concepts that are expressible and measurable and those that are inexpressible and immeasurable. However, the existential level, which is deep down in a human, is the center that produces the meaning to life and the center of human being. It is the reflector of quality of life and where in-depth knowledge of a human being could be attained. However, this experience at this level cannot be expressed because it is not rational and it is from this deepest pool that humans consider essence of life to emanate. Rural dwellers are subjected to denial of many amenities of life as a result of deliberate neglect by government. Such infrastructure as tarred roads, electricity, pipe borne water and good health care facilities are mostly not available in many rural areas and these have a toll on the quality of life (Development Support Monitor, 2012). Their life experiences, both subjective and objective, in most cases are negative and this may denote their quality of life. However, considering the integrative quality of life theory, both subjective and objective experiences may not be enough to measure their quality of life as it is possible for them to have the real meaning of life deep down within them despite their subjective and objective life experience. They may be satisfied with life despite what life has to offer them.

3. Methodology

This study adopted a cross-sectional design. The population of this paper was made up of people living within Otu town, the headquarters of Iwajowa LGA of Oyo state, Nigeria. Two hundred and twenty one (221) consenting male and female adults aged 18 years and above were sampled as respondents using the multi stage sampling technique. The town was divided into 10 enumeration areas using the cluster sampling method. A total of four (4) enumeration areas were randomly selected from the 10 clusters. Each enumeration area had 15-30 households and about 350-450 people. The purposive sampling technique was used to select participants at their various households. The research instrument used in the study was a standardized self-report questionnaire divided into four sections. The questionnaire elicited biographical information, which included years of experience and occupations of respondents. The WHO quality of life (WHOQOL-BREF) questionnaire was used to measure physical health, psychological (mental) health and social relationships of respondents. The WHOQOL-BREF has a meritorious reliability ($\alpha = 0.86$) (Gureje, Kola, Afolabi & Olley, 2012). High scores on the WHOQOL-BREF indicate better quality of life. Rural people life stressors were measured using items adapted from the Farm Stress Scale developed by Araquistain (1992). The 13-item scale measures stressors experienced by the rural populace in farming activities, with a good psychometric property (α=.85). The research instrument was translated to Yoruba, the predominant local language and the data back-translated to English to ensure the original meaning was retained. A pilot study was conducted in a town not included in the study. Twenty questionnaires were pretested and appropriate amendments were made after the Pilot study. For this paper, the scale recorded a reliability index of 0.87 cronbach alpha. Informed consent was obtained from participants before the administration of questionnaires. Useable questionnaires were analyzed using descriptive statistics, the Pearson Product Moment Correlation analysis, t-test and multiple regression analysis at 0.05 level of significance to test inferred relationship and differences among the variables.

4. Results

The relationship between farming stressors and quality of life was tested using the Pearson Product Moment Correlation. This is illustrated in table 1 below.

Table 1: Pearson Product Moment Correlation of farming stressors and quality of life

Variables	Mean	SD	1	2	3	4	5	6	7
1.Quality of life	42.46	4.36	-						
2.Family Stressor	13.51	1.88	-.69**	-					
3.Government policy	3.59	.93	-.63**	.58**	-				
4.Illness	7.47	3.75	-.69**	.61**	.51**	-			
5.Financial problem	14.44	2.32	-.63**	.59**	.50**	.54**	-		
6.Machinery/workers Problems	9.86	2.13	-.79**	.67**	.65**	.68**	.73**	-	
7.Weather problem	7.52	1.21	-.52**	-.32**	-.22**	-.31**	.-22**	-30**	-

****Correlation is significant at the 0.01 level (2-tailed).**
***Correlation is significant at the 0.05 level (2-tailed).**

Table 1 above reveals that there was a significant inverse relationship between family stressors and quality of life (r = -.69, p<.01), indicating that increasing family stressors significantly relate to a decrease in quality of life. There was significant inverse relationship between government policy and quality of life (r = -.63, p<.01). This implies that an increase in implementation of government policies was significantly associated with poor quality of life within rural communities. Further, significant inverse relationship was observed between frequent experience of illness and quality of life (r = -.69, p<.01). The rural people were experiencing frequent bouts of illness and this denoted poor quality of life. Negative inverse relationship was also observed between financial problems (r = -.63, p<.01), machineries and workers stressors (r = -.79, p<.01) on one hand and quality of life on the other. This demonstrates that an increase in financial problems significantly relates to a decrease in the quality of life. Analysis also revealed that there was a significant relationship between machineries and workers on one hand and quality of life on the other. This implies that an increase in problems of machineries and workers significantly relates to a decrease in the quality of life. There was a significant inverse relationship between weather unpredictability and quality of life (r = -.52, p<.01). This indicates that unfavorable weather conditions significantly induced poor quality of life. Differences in the respondents' quality of life, based on the level of farm stress, were tested using the t-test for independence and the results are presented in Table 2 below.

Table 2: Here t-test summary table showing difference in the level quality of life based on level of exposure to Farming Stressors

	Farm Stress	**N**	**Mean**	**S.D**	**df**	**T**	**P**
Quality of life	Low	121	42.52	4.29	221	2.29	<0.05
	High	100	35.50	9.19			

The data presented in Table 2 above show that farmers who experienced low farm stress ($\bar{x}$=42.52, S.D= 4.29) significantly reported better quality of life than those high on farm work stressors ($\bar{x}$=35.50, S.D =9.19),t (150) = 2.29, p<.05. This implies that life stressors significantly influence quality of life. Differences in the quality of life between male and female farmers were analyzed using the t-test for independence and the results are presented in Table 3 below.

Table 3: t-test summary table showing the influence of gender on quality of life

	Gender	N	Mean	S.D	df	T	P
Quality of life	Male	115	42.28	4.28	220	-.79	>0.05
	Female	107	42.74	4.38			

Analysis of data in table 3 shows that male respondents ($\bar{x}$=42.28, S.D=4.28) were not significantly different in the level of quality of life when compared to female respondents ($\bar{x}$= 42.74, S.D=4.38) t (220)= -.79, *p*>.05. Gender did not influence the quality of life among the respondents sampled. The joint contributory influence of age, gender, marital status, number of wives, number of children, and experience in rural area, occupation and educational attainment was investigated using Multiple Regression Analysis (MRA). The results are presented in Table 4 below.

Table 4: Summary of Multiple Regression Analysis showing the contributions of socio-demographic variables to quality of life

Predictors	β	t	P	R	R^2	F	P
Age	-.12	-1.21	>.05				
Gender	.08	1.14	>.05				
Marital status	.02	.31	>.05				
Number of wives	.15	1.91	>.05	0.50	0.25	8.58	<.01
Number of children	.27	2.95	<.01				
Years of residency in rural area	-.42	-5.42	<.01				
Occupation	-.10	-1.60	>.05				
Educational attainment	-.26	-3.52	<.01				

Results revealed that age, gender, marital status, number of wives, number of children, experience in rural areas, occupation and educational attainment jointly predicted and accounted for 25% of the change observed in the quality of life (R^2 = 0.25, F (8,212) = 8.58, p < .01). The results also revealed that the number of children (β = .27, p<.01), experiences in rural area (β = -.42, p<.01) and educational qualification (β = -.26, p<.01) were significant independent predictors of quality of life. Age (β = -.12, p>.05), gender (β = -.08, p>.05), marital status (β = .02, p>.05), number of wives (β = .15, p>.05) and occupation (β = -.10, p>.05) had negligible influence on quality of life. Increasing number of children, negative experiences and educational qualifications significantly influenced quality of life.

Discussion: The relationship between family stressors, government policy, illness, financial problems, machineries and workers and weather problems on one hand and quality of life on the other was confirmed. There was significant inverse relationship between quality of life and such factors as family, government policy, illness and financial problem, faulty machineries, problems with workers and weather problems. This was expected as rural areas in Nigeria were largely underdeveloped, with poor health care and finance facilities. The various agriculture policies have since been hijacked by politicians. Distribution of fertilizers and farm inputs is largely politicized and beneficiaries are short-changed. The findings above support the findings from Ward and Tanner (2010) who found that farm stressors were associated with poorer HRQOL in farm workers. In the same vein, Morais, Miguéis and Camanho (2013) demonstrated that policy implementation, financial issues and work overload were stress inducing factors affecting QOL. Najafpour, Bigdeli Rad, Lamit and Fitry (2014) also demonstrated that incidence of illnesses affected quality of life. In consonance, Norouzian-Maleki, Bell, Hosseini and Faizi (2015) also associated levels of psychiatric problems with farm stressors. Findings of the current study are similar to Stimson and Marans (2011) who indicated that financial pressures and longer work durations reduced quality of life among rural farmers.

The results of the current study also demonstrate that significant differences did not exist in the level of quality of life between male and female rural inhabitants. This is rather unusual as females tend to bear the greater part of family burden and problems with farm workers compared to their male counterparts. These findings, however, are similar to those of Meludu and Obajowa (2008) as they also found no gender

differences in stress levels and wellbeing among farmers. This, though, is in contrast with Ramli, Yassin, Idris, Hamzah, and Abu Samah, (2013) who found gender differences in rural Australia. Larger numbers of children, years spent living in the rural area and educational qualifications were significant predictors of quality of life while the influence of age, gender marital status, number of wives and occupation were not significant. Increasingly, family size is no longer advantageous to poor rural farmers as the cost of child rearing is getting higher. For example, with the collapse of social facilities such as education and health care services in rural areas, farmers spend greater part of their income securing better education and health care for their children in the urban centres. These findings are similar to findings by Flor, Campos and Laguardia (2013) who established that good quality of life was explained by sex, age, education, number of aggravations and smoking. Young, well-educated and healthy younger individuals had better quality of life than older people. Rural dwellers in Nigeria cannot score high on the global measurement of quality of life because, subjectively and objectively, they are very low according to integrative quality theory. These rural dwellers are subjected to stress as a result of farming activities and are often victim to ill health, which reduces quality of life. Non availability of amenities and infrastructure are factors that increase stress, which in turn affects the health of the rural people. Quality of life is all about health and illness. Better quality of life for the rural populace in Nigeria would, therefore, be a situation whereby stressors are removed through provision of infrastructure and amenities through which there can be balance of the subjective-existential-objective spectrum.

5. Conclusion

Problems with workers, machinery, physical health and family size are the most stressful variables associated with poor quality of life in rural communities in Nigeria. Gender differences were not observed in quality of life. Increasing family size and longer stay at a rural area were associated with poor quality of life. This is an indication that the various interventions and developmental approaches to solving rural problems have largely not had the desired impact. For mental health practitioners there is need for advocating for the inculcation of free mental health counseling services for rural dwellers as they are less likely to seek help and have lesser resources to take up counseling services in the urban centres. There is need for urgent intervention in the rural areas of Nigeria in the area of provision of health and economic infrastructures to help farmers cope with stress associated with farming. Government should provide financial assistance to farmers in order to improve their quality of life. Further studies should endeavor to investigate the coping resources available to rural dwellers to provide further insight to the level of quality of life among the rural populace.

Implication of study for social work practice: This study has implications for rural social work practice. Rural social work is about ensuring the well-being of rural dwellers, with the aim of meeting their needs at individual and community levels through intervention programs. The study provides information for the rural social worker on the challenges of rural dwellers in Nigeria and how these people can be supported with informed policy to address their problems. Advocacy is highly needed to articulate and present the needs of rural dwellers to those who can effectively address these problems. To ensure the well-being of rural people through a quality life, rural social workers need to engage them in ways that inform on how to reduce their stress levels induced by farming activities and other stressors that are peculiar to the rural environment through periodic enlightenment programs and other means such as mental health counseling, which can ensure good quality of life. The need for enlightenment programs cannot be overemphasized.

Recommendations: In light of the findings of the study discussed and the conclusions arrived at, this study recommends the following:

- There is need for urgent intervention in the rural areas of Nigeria to provide infrastructural facilities to help farmers cope with the stress associated with farming.
- Government, at all levels, must show genuine interest in agriculture by providing financial assistance to farmers in order to improve their quality of life.
- Further study should endeavor to include physical health and environmental stressors to provide further insight the quality of life among the rural populace.

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Framework for Advancement of Women Working in Selected Regulatory Organizations in South Africa

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Abstract: The purpose of this study was to develop a framework that would be used as a guideline for managers to create a conducive environment for women to advance into management positions in selected regulatory organizations operating in the maritime and aviation industries. The literature reviewed revealed that mentoring, employment equity legislation, and not confirming to stereotypes were some of the factors leading to women's advancement into management positions. Feminism and equity theory were used to give the study theoretical grounding. The research approach was qualitative, the population size was twenty (N=20) and the sample size was fifteen (n=15). The latter was attained after the saturation point had been reached. The research protocol was developed from the literature reviewed. Face-to-face interviews were conducted and qualitative content analysis was used to develop study themes manually. The major findings of the study were that these factors enhanced women's advancement into management positions: qualification and industry-related experience, fair recruitment and selection practices, proper handover, mastering work–life balance, and leadership and management development. It is envisaged that the results will empower managers and policy-makers dealing with employment equity, given the fact that women advancement into management positions is moving at a slow pace. In future a study can be conducted where a bigger sample size is used and the researchers could use the mixed-method approach. Furthermore, a follow-up study could be conducted using the same participants to establish whether they have advanced or not.

Keywords: *Equity theory; feminism; management positions; regulatory organizations; women*

1. Introduction

According to Kitada, Williams and Froholdt (2015), global research shows that female representation in management positions is not high. For example, Kitada et al. (2015) opine that 29% women in the Asian Pacific, 25% in the European Union, 23% in Latin America, and 21% in the United States of America (USA) occupy management positions. Internationally, there are initiatives like Women's Empowerment Principles (see McWha-Hermann, Maynard & Berry, 2016) and feminists groups who challenged the under-representation in top management positions (Gill, 2014). There are factors that prevent women from advancing into management positions. International literature revealed that not having relevant qualifications and experience (Alvesson & Due Billing, 2009; Knight, 2016) and unfair and biased recruitment practices (Bratton, Callinan, Forshaw & Sawchuk, 2007; O'Neil, Hopkins & Sullivan, 2011) are some of the factors that hamper women's advancement into management positions. At the time of writing this article, there were frameworks of women advancement (see Chinyamuridi, 2016) however there was no framework with themes like leadership and management as factors leading to the advancement of women into management positions). Furthermore, there was no study that has been conducted before in the South African context, where data were collected from the "understudied" sample of women in management positions (Chinyamuridi, 2016: 9). Women are not advancing into management positions because they are accused of lacking masculine traits like being hard and autocratic (Griffin, Phillips & Gully, 2014) and aggressive (Syed & Murray, 2008). According to Kitada et al. (2015), women who work in male-dominated occupations tend to face challenges that differ from those who work in more gender-balanced and female-dominated occupations.

Problem statement: In the selected regulatory organizations in South Africa, where the present study was conducted, women in management position were expected to work long hours and they were invisible as female managers within the organization. Sometimes women had to be on standby (Kitada et al., 2015). The data showed that in 2013, in the industry where selected regulatory organizations operate, the gender representation was as follows: 80% males and 20% women (Anno-Frempong, 2014). The data show that the vestiges of the past in South Africa created by draconian and brutal systems (i.e. colonialism and apartheid) of relegating women in low positions (Slutskaya, Simpson, Hughes, Simpson & Uygur, 2016) and not being appointed in management positions still exist (Du Toit et al., 2015). Whereas research has been conducted

internationally and in South Africa about women's under-representation in workplaces, thus far in South Africa, no study has been conducted to develop a framework of women's advancement into management positions in the selected regulatory organizations (i.e. maritime and aviation).This was the gap that this study wanted to address, with the following research objectives:

- to identify how qualifications and experience influence the advancement of women into management positions;
- to identify which human resource management (HRM) practices influence women in advancing into management positions;
- to identify labour relations (LR) practices that influence the advancement of women into management positions; and
- to identify how individual factors influence the advancement of women into management positions.

By addressing the above-mentioned objectives, the researchers envisaged that by using the framework that they had developed (refer to Figure 1):

- they would empower women managers working within the selected organizations with knowledge that would assist them to mitigate the factors that stymie women's advancement; and
- this would contribute to the theoretical literature on women's advancement.

In the sections below, the theoretical framework, the research methodology, the results and discussion are discussed.

2. Theoretical framework

Women's advancement can be defined as vertical and horizontal career progression influenced by factors such as education and experience, fair recruitment and selection policies, organizational culture, self-esteem, external factors (i.e. family support),and networking and/or attending informal meetings. This could be impeded by work–life balance, a lack of mentors, and stereotyping (Chinyamurindi, 2016). In order to give the study a theoretical grounding of women's advancement, feminist theory was used as theoretical framework. The primary goal of feminism is to champion women's rights against unequal treatment and organizational injustice (Gouws, 2012).Feminist theory was developed in the 1960s in the United States of America in order to advance the agenda of gender equality and women's advancement in organizations (Zippel, 2006). Some literature shows how in Africa, feminism gained prominence due to unfair labour practices of using women as cheap labour (Denzin & Lincoln, 2011). In South Africa, not much has been written about feminism in industrial relations or HRM literature; hence, Nel, Kirsten, Swanepoel, Erasmus and Jordaan (2016) question its relevance as a theoretical framework.

A theoretical framework for women's advancement that has been cited in South African HRM literature is equity theory (Coetzee & Schreuder, 2010). This theory states that employees, irrespective of whether they are men or women, should be treated equally (Robbins & Judge, 2015). It can be argued that equity theory has some similarity with feminism theory, as both are also against unequal treatment of employees. Research in South Africa revealed that a lack of self-confidence (Booysen, 2007), as well as stereotypes (Choi & Park, 2014) were some of the issues that stymie women's advancement into management positions. It had been found that the quality of work-life balance (i.e. the balance between work and family life), a lack of respect and being treated with dignity, 'old boys practice', and education and proper management training (Lewis-Enright, Crafford & Crous, 2009) were some of the factors that worked against the advancement of women in management positions. Recent literature has shown that women who do not conform to gender stereotypes are likely to succeed as leaders (Cukier, Jackson, Elmi, Roach & Cyr, 2015).

In South Africa, various legislation, policy, and gender commissions have been established to create opportunities for advancement of women into management positions. In terms of the latter, section 9(2) of the Constitution of South Africa and the Employment Equity Act (EEA), No. 55 of 1998, section 6(1), prohibit unequal treatment of employees based on their gender (Republic of South Africa, 1998). The EEA aims to ensure that the legacies of apartheid in the South African workplace are addressed and that equal opportunities and fair treatment are promoted through the elimination of unfair discrimination and the

implementation of affirmative action measures to advance black people, women, and people with disabilities (Republic of South Africa, 1998). A Commission for Gender Equality was established in 1991and a gender policy framework was developed in 1996 (Gender Policy Framework, 2003). Despite these efforts, the Commission of Employment Equity (2016) shows that women are not equally represented in top management: 20% in private sector and 30.6% in the public sector.

Women do not progress because they do not have mentors (Bosch, 2011). It had been found that women who did not have mentors do not progress in their careers and they struggle to cope with work and family challenges and their well-being or health was affected in a negative way (Burke & El-Kot, 2011:56). On the other hand, women who had mentors were empowered to cope with pressure and the masculine or male-dominated organizational culture (Annis & Gray, 2013). Based on the above discussion, it can be surmised that under-representativeness of women is a global phenomenon**.** It can be observed that in the selected regulatory organizations, there are human resources factors that influence the advancement of women in management positions. No theoretical framework could be found in South African literature that can be used by selected regulatory organizations to advance the careers of women in management positions. Therefore, the purpose of this study was to develop a framework that would assist managers to create a conducive environment for women to advance into management positions.

3. Methodology

In this section, the research design, population and sample, measuring instrument, research process, data analysis, trustworthiness, and ethical consideration are discussed.

Research design: In order to address the study objectives, a qualitative research approach was deemed appropriate. The research design was cross-sectional feminism research. The latter was selected because the researchers intended to solicit "experiences and viewpoints of women" (Kumar, 2014:160). Since the research approach was qualitative, the research epistemology was interpretivist because the researchers wanted to bring about a thorough understanding of women's experiences about what they perceived as factors leading to their advancement into management positions. The researchers also opted for a qualitative approach in order to solicit "multiple realities" (ontology) (Struwig & Stead, 2013:15) of women.

Population and sample: The target population for this present study comprised twenty women managers at management level 1 to 4 (i.e. junior, middle, senior, and top management level) in two regulatory organizations in South Africa. A purposive sample was used to select participants, and the inclusion criteria to select participants were as follows:

- participants had to be women; and
- they had to be in management positions.

Out of the population of twenty women (N=20) managers, only fifteen (n=15) women managers were interviewed for this study. The rationale of interviewing fifteen women managers was that between interviewees twelve and fifteen, no new information emerged – meaning that a point of data saturation was reached (De Vos, Strydom, Fouché & Delport, 2011).The sample size was within 5 to 25 range as suggested by Saunders, Lewis and Thornhill (2012). In Table 1, the biographical information of the participants is displayed.

Table1: Biographical information of participants

Qualification	Occupational level	Period of employment	Field of specialization (relevant/irrelevant)	Gender of mentor
Diploma	Middle manager	5 years	Relevant	Did not have mentor
Diploma	Middle manager	6 years	Relevant	Did not have mentor
Diploma	Middle manager	13 years	Relevant	Did not have mentor
Diploma	Middle manager	14 years	Relevant	Did not have

Qualification	Occupational level	Period of employment	Field of specialization (relevant/irrelevant)	Gender of mentor
				mentor
Diploma	Senior manager	16 years	Relevant	Did not have mentor
Diploma	Junior manager	17 years	Relevant	Did not have mentor
Honours	Middle manager	6 months	Relevant	Man
Honours	Junior manager	5 years	Relevant	Woman
Honours	Junior manager	8 years	Relevant	Man
Honours	Junior manager	8 years	Relevant	Man
Master's	Executive manager	2 months	Relevant	Male
Master's	Senior manager	3 years	Relevant	Did not have mentor
Master's	Senior manger	3 years	Relevant	Did not have mentor
Master's	Executive manager	4 years	Relevant	Did not have mentor
Honours	Executive manager	10 years	Relevant	Did not have mentor

Source: Study results

From Table 1, it is clear that 27% of the participants were junior managers, 40% were middle managers, 20% were senior managers, and 13% were executive managers. The average working experience of the participants was 7.52 years.

Measuring instrument: An open-ended semi-structured interview protocol was designed and developed from the literature reviewed, and was aligned with the objectives of the study. The interview protocol consisted of two sections: Section A comprised questions relating to logistical information and the biographical details of participants. Section B covered broad areas of inquiry related to recruitment practices, mentoring, qualifications, and experience. The questions were structured in such a way that they addressed the research problem in question. Some of the research questions asked in Section B were as follows:

- How would you describe the recruitment process in the organization?
- How would you describe the recruitment practices in the organization?
- Which kind of strategies do you use to achieve work-life balance?
- How would you describe the career opportunities in the organization?
- What are the barriers for women's advancement in the organization?

Research process: Before the actual interviews, the researchers conducted a pilot study with two participants (n=2) to ensure that the questions were clear and that the objective**s** of each section were understood. After the pilot study had been conducted, the researchers refined some of the questions (Saunders et al., 2012).Once the pilot had been conducted, the researchers agreed that one researcher would collect the data. Face-to-face interviews were conducted and these enabled the researcher to probe for further clarity when participants were not giving clear responses (Babbie & Mouton, 2008).

Data analysis: In order to analyze data, the researchers followed five steps of analyzing data as suggested by Creswell (2014:197):

- organising and preparing data;
- reading through the data;
- coding the data;
- linking themes/descriptions; and
- interpreting the meaning of themes.

Coding of data was conducted separately and the researchers met and agreed on themes. The researchers separately analyzed the data manually and met to agree on the codes – this is known as inter-coder agreement (Bless, Higson & Sithole, 2013).

Trustworthiness: Below is a description of how the researchers achieved trustworthiness as suggested by Maree (2012:140-141):

- **True value (credibility):** member checking was not done as female managers could not be reached because of their busy schedule. Transcripts (i.e. primary data) were fused with secondary data during interpretation and analysis of the results to enhance triangulation. Prior to submission of the manuscript, the manuscript was given to a peer (i.e. an academic) to review. The feedback from the academic was important, and the changes were incorporated into the manuscript. In addition, the data were reported verbatim.
- **Applicability (transferability):** even though the researchers' aim was not to generalize the results to the population, the researchers were confident that the results of the study, which led to the framework of women's advancement, could be generalized other contexts. Yin (2015) argues that analytical generalisation is generalisation to theoretical proposition and not population.
- **Consistency (dependability):** the researchers explained the research procedure in detail, in anticipation that other researchers who follow the same steps would find similar results. To enhance the quality of the data collected, the data were recorded by audio recorder, which assisted the researchers in transcribing the data verbatim. Data were collected in the participants' offices where there were no disturbances.
- **Neutrality (confirmability):** transcripts were given to an independent academic, who did an 'audit trial' or verification that results were presented in a neutral manner. The researchers stored the results on compact disc, so that if other researchers want to view the transcripts, recordings, and other documents (i.e. interview protocol, ethical clearance letter, and informed consent), they can be made available.

Ethical considerations: No participant was coerced to participate and to enhance participants' anonymity**,** they were given pseudonyms during data collection. Prior to data collection, the interview protocol and informed consent form were submitted to the university's Central Ethics Committee for ethical approval, which was granted. Participants were also informed prior to the face-to-face interviews that they had the right to withdraw their participation during interviews and they had the right to not answer questions that made them uneasy.

4. Results and Discussion

The themes that emerged from the data were an entry to management positions, HRM and LR practices, and individual factors.

- **Entry into management position:** Qualification and experience: As can be observed from Table 1, the qualification of participants ranged from a national diploma to a master's degree. Furthermore, all participants had relevant qualifications related to the selected regulatory organizations. In terms of the relevance of the qualifications, during face-to-face interviews a participant said, "I've got an operational qualification that is the pilot licensing as well as the certificate of competence."

It also emerged from the data that the experience of participants ranged from two months to seventeen years. When interviewed, a participant made this assertion about working experience, "I think the qualification with the years of experience almost elevate you to an area of specialization so you are almost a specialist as expected in your area, that you would know the dynamics or you would have a better understanding of all the dynamics and new trends in the area." The findings of the present study are similar to what Alvesson and Due Billing (2009) and Knight (2016) found, namely that qualifications and relevant industry are key and rudimentary drivers to enter into management positions.

HRM practices: Discussed in this section are recruitment and selection, mentorship, recognition and informal meeting, and leadership and management.

- **Recruitment and selection:** Participants mentioned that the recruitment and selection processes were transparent and fair. One participant said, "I would say that they are fair obviously we are looking at equity and we do look at gender so as far as that is concerned I would say that the recruitment process itself is very fair from HR [human resources] side."

On the other hand, men were preferred over women, and a participant mentioned, "It is about who you know mostly." This selection criterion perpetuated what is known as the "old boy network" (Wroblewski, 2014:296) and it stymies women's advancement into management positions.

- **Mentorship:** As can be observed from Table 1, most participants did not have mentors and there was a paucity of women mentors. Maleka's (2012) study revealed that mentorship was salient to the advancement of women managers. A participant responded that mentorship is salient, but mentioned that women were sometimes their own worst enemies: "I have mentored throughout my career several women. One of the women said I am shy."

A participant mentioned that mentorship played a critical role in her professional development and not advancement. She said,
"It [mentorship] plays a huge role but I wouldn't say in advancing me as a woman but advancing me in my professional development."

- **Recognition and informal meeting:** In order for women to advance, they have to work harder than men and without recognition. A participant mentioned, "As a woman have to work three times more than my male colleagues for me to be able to be recognised and for me to be able to achieve, not because you are a less achiever, sometimes people don't even take recognition of you unless you put the light on the mountain and shine."

This finding is similar to findings from a study by Evans (2011). Attending informal meetings is also essential for women's recognition and being part of decision-making in the maritime organization:
"I work with men that smoke… even though I don't smoke I have now learned to take my cup of tea and join them… a lot because those people, they are very informal yet they make constructive decisions.''

Choi and Park (2014) also found that major decisions are taken in informal settings, and males endorsed those decisions in formal meetings.

- **Leadership and management development:** In order to equip women in decision-making, one participant mentioned that she was selected to attend a leadership and management development course: "You will find there was a programme of women in aviation and there were certain people that were selected and there was another one … it was about women leadership."

Similarly, another participant said,
"There is this personal development programme that has been placed from our skills development unit with our HR. At the beginning of a financial year you draw up your business plan for the year and in that you also have to identify personal development programmes that you think that can help you to advance in your line of duties or functions."

Robbins, Odendaal and Roodt (2007) argue that leadership and management development capacitate both male and female managers to advance because they empower them to learn skills that would make them competent. In terms of HRM practices, the data disconfirmed what is written in the literature, namely that mentorship affects women's advancement. Instead, it emerged from the data that mentorship assisted with professional development. It also emerged that women's lack of confidence caused them not to advance and demoralised the mentor. Interestingly, five out fifteen participants were advancing without having mentors.

LR practices: Discussed in this section are employment equity and discrimination.

- **Employment equity:** Section 6 of the Employment Equity Act (EEA) No. 55 of 1998 and section 9 of the Constitution of the Republic of South Africa guide HR departments to appoint and promote women into management positions. In terms of the former, HR must submit an employment equity plan to the Department of Labour to show it is compliant with race and gender equity. In terms of the latter, a participant said, "On the EXCO level, you still get a lot of males; I think we have two or three women if I am not mistaken. In this of 21 years of democracy you will think organizations will have a balance…"

This response reinforces what was discussed in the introduction section, namely that women are not equally represented in South African and global organizations (Du Toit et al., 2015; Slutskaya et al., 2016). A participant said the following about handover,
"Starting of it was quit hectic for me because what we decided is that the previous gentleman (he is still around) will do a handover over a period of three months."

However, Sanderson and Whitehead (2016) found that males were barriers to women's advancement.

- **Discrimination:** not only are women under-represented; in order to advance, they have to deal with and overcome discriminatory practices. The data revealed that there were no advancement policies; hence, few women were advancing into executive positions: "There are no policies. Even if you go check on our executive level there is only two women and the second women was just hired three months ago, while the other time there was only one woman executive so there is really no programme or policies that is helping with the advancement of women."

It also emerged that the discriminatory and stringent criteria stymies women to advance in other careers,
"I am not going to be a senior manager in flight operations because I need 7500 flying hours… Any women today … whether they are white or black, not anyone of them can actually meet those requirements that they have set."

This finding is not consistent with section 6 of EEA, No. 55 of 1998, and section 2(2), schedule 7 of the Labour Relations Act, No. 66 of 1997, which stipulate that there must be equal opportunity, fair treatment, no discriminatory practices, and advancement of women (Horwitz & Jain, 2011). It also emerged that the criteria "are unrealistic "and only suited "very old white males that have been in the industry for a very long time."

Individual factors: Discussed in this section are work-life balance, masculinity or assertiveness, self-confidence, and career advancement.

- **Work-life balance:** Women use different strategies in order to balance between work and family responsibilities. Some participants responded by saying, "I work very late hours. Also when it is time to write tests, I sleep late, get up at 02:00, sleep an hour and I still need to be [at work];" and

"When the kids go to bed at about 20:00, then I continue to study, then I will sleep for two hours, then I will wake up at 01:00 and I study until I get to work. My husband wasn't very happy about that."

Zinn (2016) cautions that women in management have to be flexible and able to balance between their family responsibilities and at the same time they have to be able to rest so that they perform optimally in the workplace. A participant eloquently said, "There is no formula. "This finding is in line with the narrative that says that there is no "one size-fits all approach" (Urban, 2010:1) in achieving work-life balance.

- **Masculinity or assertiveness:** women who were in management positions were undermined in management rendezvous and some instances males "will look at you as [a woman] to take notes."

The same participant mentioned that it frustrated her and she had to change her personality and be masculine or assertive,

"So you have to become a different person in order to survive in this environment. You have to harden yourself."

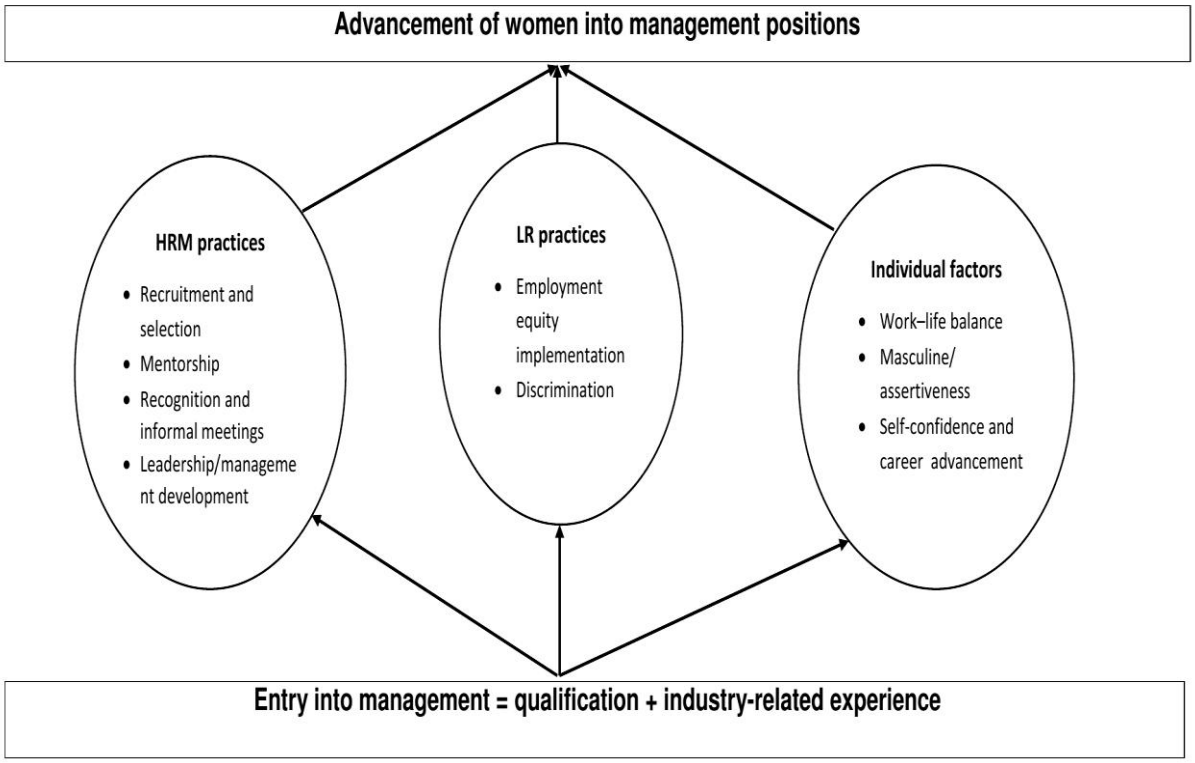
When lamenting about the masculine culture dominant in the organization, she poignantly said,
"I think the biggest problem we have is the fact that there is still that very traditional view of a woman being at home raising her children."

- **Self-confidence and career advancement:** women who are confident look for opportunities to advance themselves. It was found that in both organizations there were career advancement opportunities, and a confident participant said the following, "If they advertise a position that will interest me obviously I will put my CV [curriculum vitae] forward and make myself available for that."

Another participant was confident that her exposure would lead to her career advancement,
"I think I am exposed in a way with different stakeholders and different environments (nationally, internationally and regionally). So the career opportunities for me should not be a problem. It depends on how I carry myself in those forums."

Research revealed that employees, irrespective of their gender, who were confident, were more likely to advance in their careers than those who were not confident (Potgieter, 2012). Based on the data of the study, Figure 1 presents a framework for women'sadvancement.

Figure 1: Framework for advancement of women into management positions



Source**:** Study results

5. Conclusion and Recommendations

Based on the study findings, it can be concluded that even though there were few women managers in the selected organizations, the ones who were in management were in a better position to advance to senior management positions. The data revealed that there were fair HR recruitment and selection practices, and

there were leadership and management development opportunities. In some instances, a male was willing to do proper handover, women mastered balancing work and life, and they were assertive and there were career opportunities for advancement. The present study used a small population size because there were few women in management positions in the selected regulatory organizations. The findings can therefore not be generalized to the population in other industries; however, they can be applied to similar situations or beyond the actual study (Yin, 2015). A further limitation was that, due to a lack of trust, the participants were not free to express their experiences and perceptions of factors thwarting the progression of women. In future, a study can be conducted where a bigger sample size is used and the researchers could use the mixed-method approach. Furthermore, a follow-up study could be conducted using the same participants to establish whether they have advanced or not. In terms of the managers of selected organizations, the following recommendations are made in order to advance more women:

- mechanisms should be made available by organizations to give women more exposure so that they can meet the long hours of being trained as pilots;
- organizations should appoint more mentors to assist women with professional and career development opportunities;
- organizations should build facilities (i.e. crèches) within their premises for children so that women should not have to worry about the children at home whilst they are working long hours; and
- flexible working hours should be introduced to HRM policies to retain skilled and educated women in management.

Furthermore, it is recommended that managers in selected organizations should use the framework suggested in Figure to attract and retain women in management positions.

Policy implication: The data revealed that there was a disjuncture in terms of EAA policy and appointment requirements that excluded women in certain professions. This finding shows that policy makers have the mammoth task of ensuring that these demographics (i.e. women) are not ostracized in the regulatory workplaces, by employers who create barriers that make them not to be appointed and selected into management positions. Since it emerged from the data that there no policies to women appointment and selection into management positions, policy makers have the responsibility to enforce that such a policy is developed and implemented. The policy makers should also deploy officials to closely monitor the implementation of such a policy. Lastly, policy-makers should create avenues or opportunities for women to be capacitated so that they can meet this criterion as an entry into senior management: "I am not going to be a senior manager in flight operations because I need 7 500 flying hours."

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Savings Mobilization and Financial Development during the Multicurrency Regime Period in Zimbabwe

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Abstract: This paper seeks to investigate the relationship between savings and financial development in Zimbabwe using both autoregressive distributive lag (ARDL) and vector error correction model (VECM) approaches for comparison purposes with monthly time series data from January 2009 to August 2015. Four distinct hypotheses emerged from the literature and these are the savings-led financial development, financial development-led savings, feedback effect and the insignificant/no relationship hypothesis. The existence of diverging and contradicting views in empirical literature on the subject matter is evidence that the linkage between savings and financial development is still far from being concluded. Both F-Bounds and Johansen co-integration tests observed that there is a long run relationship between savings and financial development in Zimbabwe. What is even more unique about this study is that both ARDL and VECM noted the presence of a bi-directional causality relationship between savings and financial development in the short and long run in Zimbabwe. The implication of this study is that in order to increase economic growth, Zimbabwe authorities should increase savings mobilization efforts in order to boost financial development, which in turn attracts more savings inflow into the formal financial system.

Keywords: *Savings; Financial Development; ARDL; VECM; Zimbabwe*

1. Introduction

Theory states that savings contribute towards economic through its stimulating effect on investment activities and financial sector development (Lucas, 1988; Romer, 1986). On the other hand, the supply-leading hypothesis founded by Schumpeter (1911) and supported by Goldsmith (1969) and McKinnon (1973) argued that a financial sector mobilize savings, diversify risk and efficiently allocates capital, among other functions. In a bid to approve or disapprove this theory, several empirical studies which investigated a direct relationship between savings and financial development then followed. Their findings fell under four distinct categories, namely the savings-led financial development, financial development-inspired savings mobilization, bi-directional causality and no/insignificant relationship between financial development and savings. The empirical work on the savings-financial development hypothesis is still an unsettled matter considering the diverging and contradicting findings emanating from such studies. Besides, previous time series studies on savings and financial development linkages have mainly used data whose number of observations is just above the minimum required, used at most one econometric estimation technique, either used quarterly or annual time series data, avoided economic and political volatile countries such as Zimbabwe. It is against this backdrop that this paper carried out an empirical investigation of the interlinkages between savings and financial development in the case of Zimbabwe. This study adds value to the literature as this is the first study the author is aware of to examine the linkage between savings and financial development using monthly time series data. The comparison of results from two different econometric estimation techniques (ARDL and VECM) in a single study makes this paper a worthwhile contribution to the literature. This is the first study the author is aware of, done in a country: (1) still reeling from a period of hyperinflation during which time the people's savings in financial institutions had been completely wiped out and (2) which had adopted dollarization as a currency policy or in a multicurrency regime. The findings from this study will help Zimbabwean authorities to develop a raft of savings mobilization or financial development measures aimed at boosting future economic growth of the country. The paper is structured as follows: The second section focuses on the theoretical perspective, section three reviews empirical literature whereas section four shows and discusses the trends on savings and financial development developments in Zimbabwe. The fifth section explains the research methodological framework, results and interpretation whereas the sixth section concludes and suggests areas for future research.

2. Literature Review

The endogenous growth model developed by Pagano (1993) which was expanded by Bailliu (2000) argued that banks increase their efficiency as they provide more financial intermediation services. This increased efficiency leads to the fall in the service costs that they charge for their services thus pushing up the portion of savings directed towards investment and economic growth. Schumpeter (1911) who is the founder of the finance-led growth hypothesis (supply-leading hypothesis) noted that a developed financial sector provides financial services such as savings mobilization, risk diversification and the allocation of capital in an efficient manner that accelerate economic growth. In support of the Schumpeter view, Goldsmith (1969), McKinnon (1973), Shaw (1973) and King and Levine (1993) showed that financial sector spur economic growth through mobilizing savings and allocating them towards production, reducing information and transactions costs. Grossman (1976) argued that a stock market is an avenue through which savings are pooled together and then efficiently allocated to competing productive sectors of an economy. Edo (1995) referred an investment in financial securities as a way of channeling savings to the productive but deficit sectors of the economy. On the other hand, endogenous growth theorists such as Lucas (1988) and Romer (1986) noted that savings stimulate investment activities through the financial sector hence positively influencing economic growth.

Empirical Literature: Previous researchers' findings on the linkage between savings and financial development falls into four distinct categories, namely the savings-led financial development, financial development-led savings, feedback effect and insignificant/no relationship hypothesis as discussed next. The savings led financial development hypothesis resonates with findings from studies done by Bonser-Neal and Dewenter (1999), Fry (1980) and Odhiambo (2008), among others. Using panel data analysis with data from 1982 to 1993, Bonser-Neal and Dewenter (1999) studied the relationship between financial development and savings mobilization in 16 countries. Stock market development was positively but non-significantly affected by higher savings level when countries which were characterized by extreme stock market values were excluded from the study (Bonser-Neal and Dewenter, 1999:376). The same study observed that savings were found to have positively and significantly impacted on stock market development across all the 16 countries. According to Fry (1980), higher savings improve the quantity of real money demand and real supply of credit, which in turn boost economic growth. The same study noted that increased savings which pushes up levels of investment result two outcomes: (1) increased efficiency of the financial sector through lowering of interest rates and (2) higher investment and financial intermediation activities which also spur economic growth. Odhiambo (2008) examined the relationship between savings, financial depth and economic growth in Kenya using the co-integration and error correction frameworks. The findings are threefold: (1) savings improved financial development, (2) savings mobilization was positively influenced by the higher levels of economic growth and (3) economic growth positively affected financial development in Kenya.

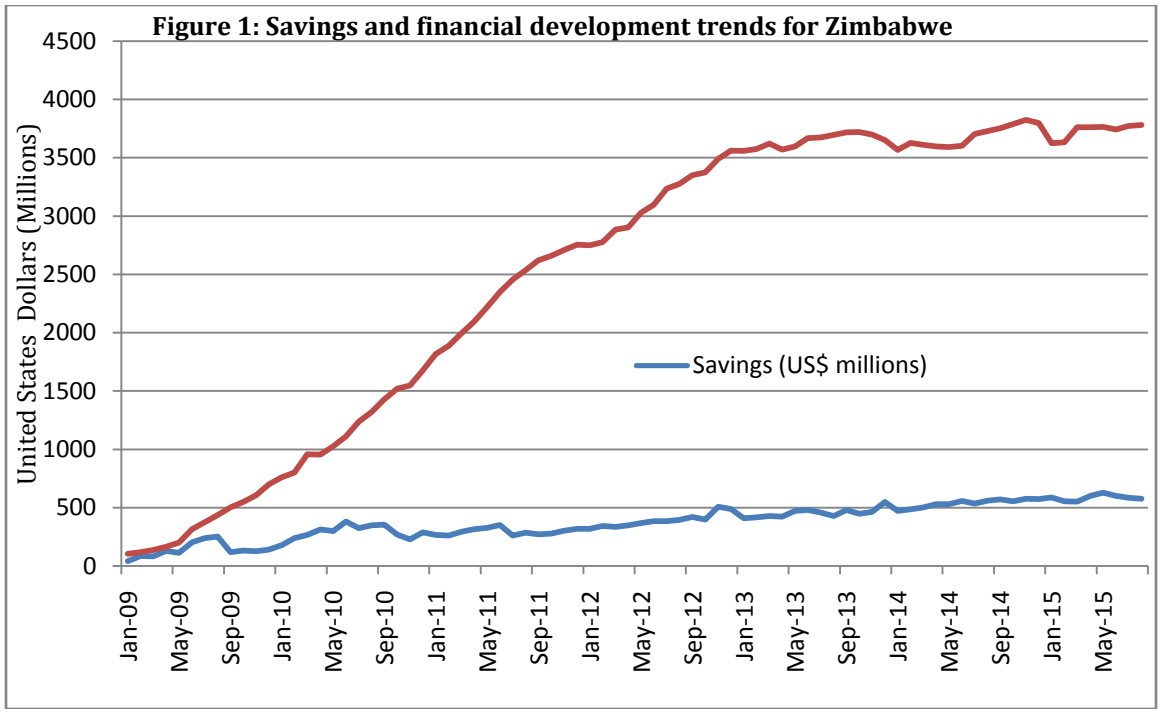
Empirical studies which supported the financial development-led savings perspective were done by a number of researchers. In a study of the impact of financial reforms on savings, investment and GDP in Ghana using ordinary least squares (OLS), Asamoah et al. (2008) found out that savings were positively and significantly affected by financial sector reforms. Using ARDL, with annual time series data (1970-2008), Gungor et al. (2014) investigated the impact of financial development on savings in Turkey. Their study revealed that savings were positively Granger caused by financial development in Turkey during the period under study. Sahoo and Dash (2013) compared the influence of financial development on savings between pre and post reforms period in South Asia using panel data analysis with data ranging from 1975 to 2010. Their study found out that financial development positively and significantly influenced private savings, foreign savings, agriculture and per capita income in South Asia during both pre and post reform periods. Ewetan et al. (2015) studied the long run linkage between financial development and domestic savings in Nigeria using the ARDL approach with annual time series data ranging from 1980 to 2012.The two variables were found to be co-integrated and that financial development played a significant positive role in influencing domestic savings mobilization in Nigeria. Using panel co-integration analysis, Kelly and Mavrotas (2008) observed that financial sector development had a positive influence on savings in majority of African countries that formed part of the study. Financial development was an important factor in that positively influenced savings mobilization in Pakistan (Khan and Hasan, 1988:706).

Using primary data gathered using questionnaires and interviews; Oloyede (2008) studied the interlinkages between savings, informal financial development and rural development in the Ekiti state of Nigeria. Informal financial development played a bigger role in comparison to the formal financial sector in mobilizing savings for rural development in the Ekiti state of Nigeria. However, Husien (2007) explored the relationship between savings, financial development and economic growth in Libya using quantitative data analysis with time series data. Financial development as proxied by credit to the private sector either negligibly affected savings mobilization or non-significantly influenced savings in the long run in Lybia. The same study showed that economic growth boosted savings levels and financial sector development in Lybia. Whilst higher income levels and real interest rates were found to have had a positive influence on savings mobilization, the implementation of financial sector reforms negatively affected savings in Bangladesh (Chowdhury, 2001:4). Quartey (2005) studied the relationship between savings mobilization, financial development and poverty reduction using time series data analysis with data from 1970 to 2001. There are two findings to this study: (1) a negligible impact of financial development on savings mobilization and (2) financial development decreased poverty levels in a non-significant manner.

Baya (2014) studied the linkage between savings and financial development in emerging Asian countries using panel regression analysis with data from 1992 to 2011. Financial development, real interest rate and economic growth were found to have had an independent positive and significant impact on domestic savings in emerging Asian countries. In a study of the determinants of savings, Ang (2011) found out that financial depth and increased banking sector density were the two key factors that encouraged savings mobilization in Malaysia. Hussein et al. (2017) examined the relationship between real interest rate, financial development and private savings in Egypt using vector error correction model (VECM) with quarterly data ranging from 1991 to 2010. Their study observed that private savings were positively and significantly influenced by financial development and real interest rates in the long run in Egypt. Using the Generalized Methods of Moments (GMM) and data from 1999 to 2010, Raheem and Oyinlola (2016) studied the interlinkages between financial development, savings and investment in 37 Sub-Saharan African (SSA) countries. The finding was that improved financial development helped in the mobilization of more savings, which in turn accelerated the investment capacity of SSA countries. The finding resonates with Adeniyi and Egwaikhide (2013) whose study showed that financial development as proxied by credit to the private sector helped in mobilizing savings for investment purposes in 20 SSA countries. Other recent work which supported the financial development-led savings mobilization hypothesis was carried out by Adenutsi (2011).

The feedback effect hypothesis was supported by Rezaei et al. (2014). The latter explored the interrelationships between economic growth, savings and financial development in Iran using the ARDL approach with annual time series data from 1973 to 2012. They noted that a bi-directional relationship existed between (1) financial development and savings, (2) financial development and economic growth and (3) savings and economic growth in Iran both in the long and short run. Empirical studies which resonate with the no relationship hypothesis include those which were done by Rehman et al. (2015). Their study examined the interlinkages between savings, economic growth and financial development in Bahrain using Vector Autoregression (VAR) approach with time series data between 1981 and 2013. Using Johansen co-integration test, the study failed to establish any kind of long run relationship between savings, financial development and economic growth in Bahrain during the period under study.

Savings and Financial Development Trends for Zimbabwe: According to Reserve Bank of Zimbabwe (2017) database, both savings and credit to the private sector in Zimbabwe showed a consistently upward trend between January 2009 and August 2015 (see Figure 1 and 2).Savings went up from US$41.06 million in January 2009 to US$140.97 million in December 2009, representing a massive 243.06% increase whilst credit to the private sector surged by 569.58%, from US$104.59 million in January 2009 to US$700.31 million in December 2009. Savings and credit to private sector for Zimbabwe increased by 104.58% and 139.49% respectively during the period between December 2009 and December 2010 before savings recorded another increase from US$288.40 million in December 2010 to US$318.37 billion in December 2011 and credit to private sector gaining from US$1 677.20 million in December 2010 to US$2 755.04 in December 2011.

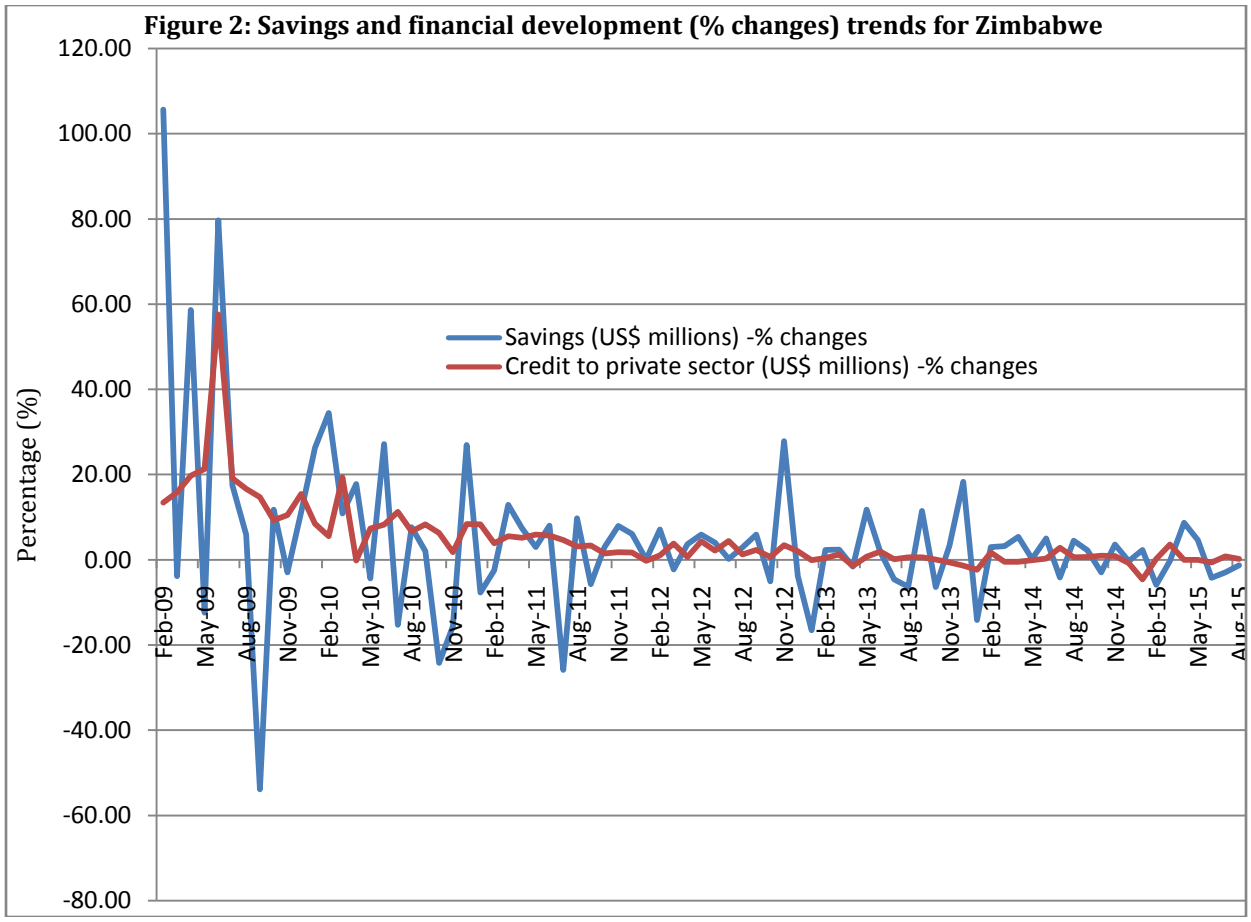


Source: Data from Reserve Bank of Zimbabwe website (www.rbz.co.zw)

Savings went up from US$318.37 million in December 2011 to US$488.52 million in December 2012, increased by 12.18% during the subsequent 12-month period before further marginally going up by 4.59%, from US$548.03 million in December 2013 to US$573.20 million in December 2014. On the other hand, credit to the private sector in Zimbabwe went up from US$2 755.04 million in December 2011 to US$3 560.69 million in December 2012, representing a 29.24% surge, marginally increased by 2.51% during the 12-month period from December 2012 to December 2013 and then further went up by a 4.01%, from US$3 650.06 million in December 2013 to US$3 796.27 million in December 2014. Lastly, the 8-month period between December 2014 and August 2015 saw savings going up by 0.55% to end at US$576.36 million whilst credit to the private sector plummeted by 0.41%, from US$3 796.27 million in December 2014 to US$3 780.59 million in August 2015. The general trend observed from Figure 1 and 2 is that both savings and credit to the private sector developments in Zimbabwe moved in tandem with each other during the period under study. The weakness of trend analysis is that although it shows the direction of movement of the variables under study, it cannot tell whether there is a long run relationship or the direction of causality between the variables. The weakness is comprehensively addressed by the use of econometric techniques (see section 5).

3. Methodology

Data description, variables definition and a priori expectation: Using monthly time series data (from January 2009 to August 2015) obtained from the Reserve Bank of Zimbabwe website (www.rbz.co.zw), this study examined the relationship between savings and financial development in Zimbabwe during the multicurrency regime period. Savings (US$ millions) and credit to the private sector (US$ millions) data were used to represent savings and financial development respectively. Since the data for both savings and credit to the private sector was in millions of United States dollars, this study first converted it to natural logarithms before analysis in order to remove any high standard deviations, outliers and abnormal values which could cause inconsistency and auto-correlation bias, consistent with Hair et al. (2014:80). A priori, financial development is expected to have an influence on savings in line with Schumpeter (1911), McKinnon (1973), Shaw (1973), among others. Following Romer (1986) and Lucas (1988), savings can also positively influence financial sector development. On data cleaning, the autocorrelation which characterized the data at level was addressed at first difference.



Source: Data from Reserve Bank of Zimbabwe website (www.rbz.co.zw)

Unit root testing: In line with Odhiambo (2008), unit root tests were done in order to establish the characteristics of time series data before the existence of a long run relationship between savings and financial development was estimated. Consistent with Kapingura and Alagidede (2016), this paper used Augmented Dickey Fuller (ADF) and Philips-Perron (PP) to check the stationarity of savings and financial development data and to find out the order of integration of the variables.

Table 1: Stationary Tests of savings and credit to the private sector data at level

Variable	Test Statistic – None		Critical Values		
Stationarity Tests of Variables on levels - Augmented Dickey-Fuller - Test					
LSAVINGS	1.2987		-2.5946*	-1.9450**	-1.6141***
LCREDIT		0.5214	-2.5962*	-1.9452**	-1.6139***
Stationarity Tests of Variables on levels – Phillips-Perron (PP) Test					
LSAVINGS		1.3572	-2.5946*	-1.9450**	-1.6141***
LCREDIT		2.0119	-2.5946*	-1.9450**	-1.6141***

Note: *, ** and *** denote 1%, 5% and 10% levels of significance, respectively.

Table 1 results show that both savings and credit to the private sector data sets were not stationary at level thus making it necessary to check for stationarity at first difference (see Table 2).

Table 2: Stationary Tests of savings and credit to the private sector data at first difference

Variable	Test Statistic – None	Critical Values		
Stationarity Tests of Variables on first Difference - Augmented Dickey-Fuller - Test				
DLSAVINGS	-10.9223	-2.5949*	-1.9450**	-1.6141***
DLCREDIT	-2.4902	-2.5962*	-1.9452**	-1.6139***
Stationarity Tests of Variables on first Difference – Phillips-Perron (PP) Test				
DLSAVINGS	-10.8068	-2.5949*	-1.9450**	-1.6141***
DLCREDIT	-2.9017	-2.5949*	-1.9450**	-1.6141***

Note: *, ** and *** denote 1%, 5% and 10% levels of significance, respectively.

The fact that the test statistic value was smaller than critical values in Table 2 shows that savings and credit to the private sector data was stationary at first difference and therefore integrated of order 1. This condition satisfied (not integrated of an order above 1) by the data paved way for further econometric analysis as all what was needed was to difference the data series once in order to make them stationary.

Determination of the optimum lag length: The next step was to determinate the optimum lag length since the data series had satisfied the stationary requirements (at most integrated of order 1). The fact that the lag length impact on the power of accepting or rejection of the results makes its determination very important before any further analysis is done, in line with Kapingura (2014:49). Table 3 results show that the lag length of 5 was found as the optimum.

Table 3: Lag length selection criteria

Number of lags	AIC	SC	HQ
6	-4.6300	-4.1594	-4.4424
5	-4.6747*	-4.2699*	-4.5132*
4	-3.8659	-3.5260	-3.7302
3	-3.6803	-3.4043	-3.5699
2	-3.6227	-3.4097	-3.5375
1	-3.6085	-3.4574	-3.5480

Notes:
AIC: Akaike information criteria
SC: Schwarz information criteria
HQ: Hanna-Quinn information criteria
FPE: Final prediction error
LR: Sequential modified LR test statistic
*Shows lag length chosen by the criteria

ARDL-bounds Co-Integration Tests: The ARDL framework employed for the purposes of this study is as follows, following Tsaurai and Odhiambo (2013), Odhiambo (2010); Narayan and Smyth (2008).

$$\Delta InCREDIT_t = a_0 + \sum_{i=1}^{n} a_{1i}\Delta InCREDIT_{t-i} + \sum_{i=0}^{n} a_{2i}\Delta InSAVINGS_{t-i} + a_3 InCREDIT_{t-1} + a_4 InSAVINGS_{t-1} + \mu_t \ldots (1)$$

$$\Delta InSAVINGS_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta InSAVINGS_{t-i} + \sum_{i=0}^{n} \beta_{2i} InCREDIT_{t-i} + \beta_3 InCREDIT_{t-1} + \beta_4 InSAVINGS_{t-1} + \mu_t \ldots\ldots\ldots\ldots (2)$$

Where: In CREDIT = Log of CREDIT variable; In SAVINGS= Log of Gross Domestic Savings; Δ = first difference operator.

The F-Bounds test was applied on equation 1 and 2 (see results in Table 4).

4. Results

Table 4: F-Bounds Test for co-integration results

Dependent variable	Function		F-test statistic			
CREDIT	CREDIT(SAVINGS)		12.9549***			
SAVINGS	SAVINGS(CREDIT)		10.4742***			
Asymptotic Critical Values						
	1 %		5%		10%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Pesaran et al. (2001), p. 300, Table CI(i) Case I	2.82	4.21	2.14	3.34	1.81	2.93

Note: *** denotes statistical significance at the 1% level.

Both credit and savings functions in Table 4 show that the two variables are co-integrated. In other words, there exist a long run relationship between savings and financial development in Zimbabwe, consistent with recent literature (Ewetan et al., 2015; Husien, 2007; Baya, 2014; Ang, 2011; Adenutsi, 2011).

Johansen and Juselius Co-Integration Test: Johansen & Juselius (1990) framework uses both the Maximum Eigenvalue and the Trace test to determine the existence and the number of co-integration vectors. The Johansen and Juselius's co-integration results are contained in Table 5.

Table 5: Johansen co-integration test

Unrestricted co-integration rank test (Trace) results				
Hypothesized number of co-integrated equations	**Eigenvalue**	**Trace statistic**	**5% critical value**	**Probability**
None	0.4110	42.0045*	15.4947	0.0000
At most 1	0.0376	2.8346	3.8415	0.0922
Unrestricted co-integration rank test (Max-Eigen statistic) results				
Hypothesized number of co-integrated equations	Eigenvalue	Max-Eigen statistic	5% critical value	Probability
None	0.4110	39.1699*	14.2646	0.0000
At most 1	0.0376	2.8346	3.8415	0.0922

Notes * refers to the rejection of null hypothesis at, 5% significance level.

Both trace and max-eigen statistics cannot reject the null hypothesis that says there is at most 1 co-integrating vector in the relationship between savings and financial development for Zimbabwe. In summary, the results from F-Bounds and Johansen co-integration tests concur that there exists a long run relationship between savings and financial development in Zimbabwe during the multicurrency regime period, in support of the theoretical predictions (Schumpeter, 1911; Grossman, 1976; Romer, 1986; Pagano, 1993; Bailliu, 2000; Lucas, 1988).

ARDL Granger causality tests: Following Narayan and Smyth (2008), the following equations provide a framework for Granger causality tests.

$$\Delta InCREDIT_t = \delta_0 + \sum_{i=1}^{n} \delta_{1i} \Delta InCREDIT_{t-i} + \sum_{i=0}^{n} \delta_{2i} \Delta InSAVINGS_{t-i} + ECT_{t-1} + \mu_t \quad \text{.....(3)}$$

$$\Delta InSAVINGS_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta InSAVINGS_{t-i} + \sum_{i=0}^{n} \phi_{2i} \Delta InCREDIT_{t-i} + ECT_{t-1} + \mu_t \quad \text{.....(4)}$$

ECT_{t-1} = the lagged error-correction term.

Absence of serial correlation in equations 3 and 4 was confirmed by the Breusch-Godfrey Serial Correlation LM Test (results not shown here). The ECT(-1) and F-statistics measure long and short run relationships respectively (see Table 6 for Granger causality results).

Table 6: Causality between savings and financial development using ARDL

Dependent variable	Direction of flow	ECT(-1) statistic	F-statistic
CREDIT	SAVINGS→ CREDIT	-0.8287***	2.0749*
SAVINGS	CREDIT→ SAVINGS	-2.8601**	3.4720*

Note: ***/**/* denotes statistical significance at the 1%/5%/10% level respectively.

From Table 6, it shows that feedback effect between savings and financial development occurred both in the long and short run. However, the bi-directional relationship was more significant in the short run than in the long run. The finding is in line with results found by Rezaei et al. (2014) in the case of Iran.

VECM causality analysis: Both long and short run causality VECM tests were performed (see results in Table 7 and 8).

Table 7: Relationship between savings and credit in Zimbabwe using VECM

	Dependent variables		Lag length =5
Independent variables	DLCREDIT	DLSAVINGS	
DLCREDIT (-1)		0.5146(0.1609)	
DLCREDIT(-2)		-0.3281(0.3311)	
DLCREDIT(-3)		-1.7671(0.0000)	
DLCREDIT(-4)		-1.2940(0.0011)	
DLCREDIT(-5)		-0.5243(0.1884)	
DLSAVINGS (-1)	0.0401(0.0658)		
DLSAVINGS(-2)	-0.0139(0.5185)		
DLSAVINGS(-3)	-0.0136(0.4546)		
DLSAVINGS(-4)	0.0215(0.2276)		
DLSAVINGS(-5)	0.0429(0.0132)		
Joint causality [Error correction tem]	-0.0608(0.0000)	-0.2641(0.0000)	

Source: Author's compilation from E-Views analysis

The model in which credit is a dependent variable shows a negative error correction term of -0.0608 which is statistically significant at 1% level. This means that savings positively and significantly influenced credit in the long run in Zimbabwe. The error correction term is also negative and significant at 1% level in a model whose dependent variable is savings and credit as an independent variable. This shows that credit significantly Granger caused savings in the long run in Zimbabwe. VECM approach noted the existence of a bi-directional causality relationship between savings and financial development in the long run in Zimbabwe, result which is similar to the ARDL framework finding (see Table 6). Using Wald tests, the study then examined the relationship between savings and credit in the short run, results of which are presented in Table 8.

Table 8: Short run causality between the variables using VECM

Dependent variable	Direction of flow	F-statistic
CREDIT	SAVINGS→ CREDIT	2.7872**
SAVINGS	CREDIT→ SAVINGS	9.0823***

Note: ***/**/* denotes statistical significance at the 1%/5%/10% level respectively.

From Table 8, there exist a bi-directional causality relationship between savings and financial development in the short run in Zimbabwe. These results are in line with those produced by the ARDL approach and shown in Table 6.In summary, savings and financial development affected each other in both short and long run in Zimbabwe. The results are consistent with Rezaei et al. (2014) whose study observed that savings and financial development followed a bi-directional relationship in Iran both in the long and short run.

Diagnostic tests of the VECM models: Table 9 presents the robustness tests results. A model in which credit is a dependent variable and savings is an independent variable shows that there is no serial correlation, data

is normally distributed, 81.20% of the data is explained by the model and the data fitted well in the model although there is heteroscedasticity. A model in which savings is a dependent variable whilst credit is an independent variable shows that there is no serial correlation, there is no heteroscedasticity, 61.85% of the data is explained by the model and the data fitted well in the model. The only weakness of the model is that data is not normally distributed. Given these diagnostic statistics, the paper concludes that the results that were produced from the VECM models are quite robust.

Table 9: Diagnostic tests

Dependent variable	Test	H0	Test statistic	P-value	Summary
Credit	Serial correlation	There is no serial correlation in the residuals	1.2099	0.3163	No serial correlation
Credit	Heteroscedasticity	There is no heteroscedasticity in the residuals	2.1260	0.0396	There is heteroscedasticity, which is not good.
Credit	Jarque-Bera	Residuals follow a normal distribution	14.6183	0.1893	The errors are normally distributed
Credit	R-squared		81.20%	N/A	The model is right
Credit	F-statistic		24.34	0.0000	The data has fitted well in the model
Savings	Serial correlation	There is no serial correlation in the residuals	2.7457	0.1352	No serial correlation
Savings	Heteroscedasticity	There is no heteroscedasticity in the residuals	0.7645	0.6835	There is no heteroscedasticity.
Savings	Jarque-Bera	Residuals follow a normal distribution	19.0937	0.0067	The errors are not normally distributed
Savings	R-squared		61.85%	N/A	The model is right
Savings	F-statistic		6.0946	0.0000	The data has fitted well in the model

Source: Compiled by author

5. Conclusion

This paper examined the relationship between savings and financial development in Zimbabwe using both ARDL and VECM approaches for comparison purposes with monthly time series data from January 2009 to August 2015. Four distinct hypotheses emerged from the literature and these are the savings-led financial development, financial development-led savings, feedback effect and the insignificant/no relationship hypothesis. The existence of diverging and contradicting views in empirical literature on the subject matter is evidence that the linkage between savings and financial development is still far from being concluded. Both F-Bounds and Johansen co-integration tests observed that there is a long run relationship between savings and financial development in Zimbabwe. What is even more unique about this study is that both ARDL and VECM noted the presence of a bi-directional causality relationship between savings and financial development in the short and long run in Zimbabwe. These findings confirmed theoretical predictions. The study therefore urges the Zimbabwe authorities to increase savings mobilisation efforts in order to boost financial development, which in turn is instrumental in spearheading economic growth. Zimbabwe should also implement financial sector development enhancement policies in order to mop up savings and channel them towards the productive sectors of the economy. The weakness of this study is that it only focused on Zimbabwe. It would have been more informative had the study compared Zimbabwe against its Southern African counterparts in as far as savings-financial development nexus is concerned. Such a study can be a subject for future research.

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Threshold Cointegration and Nonlinear Causality test between Inflation Rate and Repo Rate

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Abstract: The current study investigated a cointegration and nonlinear causality relationships between inflation and repo rates of South Africa using the data spanning the period of January 2002 to March 2016. We used a threshold vector error correction model (TVECM) and nonlinear Granger frameworks causality to carry out the analysis. Preliminary analysis of data revealed the expected properties of the data such as nonlinearity, non-stationarity and co-movement of the variables. The two variables confirmed to be moving together in the long-run according to the observed supWald test statistic. Finally, the Diks-Panchenko nonlinear Causality test revealed a strong bidirectional nonlinear causal relationship between repo rate and inflation rate. The results imply that the use of repo rate to target the inflation rate during the target period did not address the financial problem in South Africa. Consequently, the study concluded that repo rate may not be a good measure to use for controlling inflation rates of South Africa.

Keywords: *Threshold Cointegration, nonlinear causality test, financial data*

1. Introduction

There is a general impression about the presence of a linear relationship between macroeconomic variables and as such most of the empirical studies base their analysis disregarding the fact that these variables may be nonlinear (Enders and Siklos, 2001; Iyke, 2015). Empirical Studies by among others Granger and Lee (1989) and Balke and Fomby (1997) found that most of the macroeconomic variables correlate asymmetrically towards equilibrium. As such, it is noteworthy to pay attention when subjecting these variables, specifically those of financial sector to the analysis to avoid reporting misleading findings that will influence policy decisions negatively. The current study proposes the application of asymmetric cointegration and nonlinear causality to inflation and repo rates of South Africa. This study explores the threshold vector error correction method (TVECM) Johansen cointegration and follows up with a Diks and Panchenko (2006) nonparametric nonlinear causality test. The Diks and Panchenko (2006)causality method lessens the biasness and hampers the risk of over-rejection of the null hypothesis according to (Karagianni et al., 2013). The study contributes to academic paradigm by filling a void in practical literature by instantaneously navigating error correction modelling and causality tests focusing on an asymmetric viewpoint. Such studies are very scares in literature as far as South Africa is concerned. There is evidence of studies that used other cointegration methods on inflation rates and other macroeconomic variablesespecially linear methods but evidence of studies on this sector and repo rate with the application of nonlinear methods has not been recorded. For more readings on nonlinear causality also see Nazlioglu et al. (2014), Bal and Rath (2015) and Phiri (2016).

The South African Reserve Bank has in February 2002 grasped a landmark as far as monetary policy conduct is concerned about becoming the first Bank in Central Africa to implement an inflation targeting regime. The bank set an inflation targets between 3% to 6% percent. This formed the spine of monetary policy conduct in South Africa. The objective of this policy was re-enforced by the constitution act of 1996 (Act No. 108) and was further enforced by the SARB Act No. 90 of 1989 (Iyke, 2015). The bank hoped to attain lower and stable inflation rates when implementing this strategy. This was also to avoid high prices resulting from high inflation rates and to ensure that resources are allocated accordingly (Hodge, 2009). High rates of inflation are also associated with issues such as reduced international competitiveness resulting in expensive exports (Gokal and Hanif, 2004; interference on the tax system which falsifies borrowing and lending decisions within the economy (Papepetrou, 2001). Eita and Jordan (2010) are of a view that “a financial sector is an important tool as far as transfer of deposits into financial assets and directing funds from surplus units to deficits is concerned”. This consequently helps in facilitating and creating wealth trade and capital formation. The current study approach deviates from the norm of earlier studies directed to the South African economy. Most studies rely on linear relationship assumption between financial expansion and other macroeconomic variables. Some of the previous studies that estimated the South African inflation thresholds were conducted by Leshoro (2012) and Adusei (2012) respectively.

2. Literature Review

The concept of cointegration was introduced by Granger and Lee (1989). This concept turned into a fundamental stride in the analysis of nonstationary time series. Regardless of the assumption that two or more variables are nonstationary, there exist a possibility that their combination is stationary(Esso, 2010).This definition prompts intriguing translations as the variables can then be interpreted to have a stable relationship (a long-run relationship), i.e. can be represented in a VECM, and share a typical stochastic pattern. Due to some adjustment costs, the conventional linear cointegration model and linear vector error correction model (VECM) might be inappropriate for testing the present-value model in the long run. To resolve this mystery, several financial and macroeconomic analysts introduced nonlinear models. Stigler (2010)among others recommended TVECM framework as it caters for nonlinear financial data. This cointegration method was first introduced by Balke and Fomby (1997) as a feasible approach to address nonlinearity. The method further captures asymmetries in the adjustment, where positive or negative deviations will not be corrected in the same manner. According to Hansen and Seo (2002), the model has produced remarkable associated enthusiasm, including the accompanying applications (Baum et al., 2001; Lo and Zivot, 2001; Taylor, 2001). In exploring nonlinear cointegration between the price of the international crude oil and stock market of India, Ghosh and Kanjilal (2016) employed a TVECM cointegration method. Along-run equilibrium relationship among the variables for the entire data was rejected. Surprisingly, Toda–Yamamoto Granger causality test revealed an impact of the international crude oil price movement on the Indian stock market with no feedback effect.

Ghassan and Banerjee (2015), analyzed the organization of petroleum exporting countries (OPEC) and non-OPEC crude oil dynamics using threshold cointegration method. While capturing the asymmetry of the long run, the authors developed an error correction model within a threshold cointegration and component generalized autoregressive conditional heteroscedasticity (CGARCH) framework.The study recorded cointegrating relations between OPEC price and non-OPEC prices. Also exhibited was the conditional volatility of variance with long run memory feature. The shocks on the long run component did not adjust quickly. In examining the causal relationship between energy consumption and economic growth for a sample of Asian newly industrialized countries as well as the United States (US), Chiou-Wei et al. (2008) applied both linear and nonlinear Granger causality tests. The study revealed an evidence supporting a neutrality hypothesis for the US, Thailand and South Korea. Nevertheless, empirical evidence on Philippines and Singapore disclosed unidirectional causality running from economic growth to energy consumption while energy consumption may have affected economic growth for Taiwan.

Diks and Wolski (2015), opined that Diks and Panchenko (2006) nonlinear Granger causality testing, which aims to correct for the over-rejection problem observed in the original methodology developed by Hiemstra and Jones (1994) has the problem with data sharpening. To correct that, Diks and Wolski replaced the correlation integral by the Gaussian kernel density estimator in assuring the performance of the Gaussian estimator.The authors first checked the behavior in the standard bivariate case and later extended the analysis into the multivariate setting by providing the asymptotic theory for Diks and Panchenko (2006) test. Ajmi et al. (2015), investigated the dynamics of causal link between exports and economic growth by utilizing both linear and nonlinear Granger causality tests. With the linear Granger causality, their study revealed no significant evidence of the causal relationship between exports and GDP. By using Hiemstra and Jones (1994) and Diks and Panchenko (2006), both tests led to misleading conclusions based on the standard linear Granger causality tests which neither accounts for structural breaks nor uncover nonlinearities in the dynamic relationship between the variables.With Hiemstra and Jones test, a unidirectional causality relationship was recorded while Diks and Panchenko revealed a significant bi-directional causality. For more reading causality also see Nazlioglu et al (2014), Bal and Rath (2015) and Phiri (2016).

3. Methodology

This study integrates two methods which include testing no cointegration null hypothesis against the threshold cointegration through TEVM model and nonlinear causal relationship.

Preliminary analysis: Discussed in this section are the methods for preparing the data for empirical analyses. The results obtained here aremeant to give guidance about the nature of the data and the type of models to estimate.

Nonlinearity test: Prior estimation of the models, the nonlinear test which includes the Ramsey RESET test is established. The RESET test is a detailed test for linear regression analysis. With regards to the study, the normally utilized linear regression model is the univariate autoregressive model of order p, denoted by AR (p).The RESETtest was derived by Ramsey (1969) as follows:

$$Y_t = \beta_0 + \sum_{j=1}^{p} \beta_j Y_{t-p} + \varepsilon_t, \quad (1)$$

where $\beta_0, \beta_1, \dots, \beta_p$ are the estimated parameters of the regression model and $\varepsilon_t \sim i.i.d(\mu, \sigma_\varepsilon^2)$. In order to practically achieve a minimum error, Franses and Van Dijk (2000)stated that the value of p must be selected in such a way that it minimizes information criterions.

If $Y_t = \left(Y_{t-1}, Y_{t-2}, \dots, Y_{t-p}\right)`$ then (1) becomes:

$$Y_t = Y_t`\beta + \varepsilon_t. \quad (2)$$

Moreover, (2) can be generalizedin the following manner as Shumway and Stoffer (2010) has suggested:

$$Y_t = \Phi(\Phi T_{t-2} + \varepsilon_{t-1}) + \varepsilon_t. \quad (3)$$

This simplifies to:

$$Y_t = \varepsilon_t + \Phi\varepsilon_{t-1}\Phi^2 Y_{t-2}, \quad (4)$$

Which when repeated $k-1$times, (4) becomes:

$$Y_t = \varepsilon_t + \Phi\varepsilon_{t-1} + \Phi^2\varepsilon_{t-2} + \cdots + \Phi^{k-1}\varepsilon_{t-k+1} + \Phi^k Y_{t-k} \quad (5)$$

Instead of modelling the errors as heavily tailed, it is possible to use a continuous mixture such as t-distribution. The RESET test involves, first, obtaining the OLS estimate,β in equation (5), the residual$\hat{\varepsilon}_t = Y_t - \hat{Y}_t$, and the sum of squared residuals:

$$SSR_0 = \sum_{t=p+1}^{n} \hat{\varepsilon}_t^2. \quad (6)$$

The second step is estimating the following regression:

$$\hat{\varepsilon}_t = Y_{t-1}^{'}\lambda_1 + M_{t-1}^{'}\lambda_2 + e_t, \quad (7)$$

Where $M_{t-1}^{'} = \left(\hat{Y}_t^2 Y_t^3 \dots Y_t^{s+1}\right)$ for $s > 1$, $e_t \sim i.i.d(\mu, \sigma_e^2)$. The sum of squared residuals from the estimated residuals of $\hat{\varepsilon}_t = \hat{\varepsilon}_t - \hat{\hat{\varepsilon}}_t$ is computed as:

$$SSR_1 = \sum_{t=p+1}^{n} \hat{e}_t^2. \quad (8)$$

Note that if the underlying AR(p) is adequate, the RESET test asserts that $\lambda_1$andλ_2 are zero hence, the following hypothesis is tested:

$$H_0: \lambda_{ij} = 0$$
$$H_a: \lambda_{ij} \neq 0$$

The test statistic used for testing the hypothesis is the usual regression F statistic given as:

$$F = \frac{SSR/_{p-1}}{SSE/_{n-p}} \sim F_{\alpha,p-1,n-p}. \quad (9)$$

In this case, the null hypothesis of linearity is rejected if the calculated probability value of F statistic is less than the observed probability value. This implies that the true model specification is nonlinear, allowing the implementation of the proposed methods for the current study.

Testing the linear no cointegration null in a TVECM: This study uses methods that conform to the analysis of time series data.Time series analysis contains procedures for analyzing time series data keeping in mind the end goal to separate important measurements and different attributes of the data. As per Jonathan and Kung-Sik (2008), the motivation behind time series analysis is by and large twofold: (1) to comprehend the stochastic mechanism that offers ascend to an observed series and (2) to forecast the future values of a series in light of the historical backdrop of that series and perhaps, other related series. The review of TVECM in this section is motivated by Lo and Zivot (2001) who suggested the following equation:

$$\Phi(L)\Delta x_t = \alpha_1 z_{t-1} 1\{z_{t-1} \leq \gamma_1\} + \alpha_2 z_{t-1} 1\{z_{t-1} > \gamma_2\} + \mu + \varepsilon_t \quad (10)$$

where $t = 1,2,3, \dots, n$ and q^{th} order polynomial in the lag operator is denoted by $\Phi(L)$ which can be extended to be $\Phi(L) = I - \Phi_1 L^1 - \cdots - \Phi_q L^q$.The error correction term is defined as $z_t = x_t^{'}\beta$ for a known cointegrating vector β. The threshold parameter $\gamma = \left(\gamma_1, \gamma_2\right)$ which satisfy the following condition $\gamma_1 \leq \gamma_2$ and takes values on a compact set $\Gamma$is estimated. Equation (10) does not allow any adjustment region in between $\gamma_1 < z_{t-1} \leq$

$\gamma_2$which arises due to the presence of transaction barriers or policy interventions. We employ this model because it has been used in most empirical studies often with restrictions, such as $\alpha_1 = \alpha_2$ and or $\gamma_1 = a\gamma_2$ imposed. The testing approach developed in this paper can be applied to restricted models with little modification. There are four possible hypotheses as Seo (2006) has indicated.Hansen and Seo (2002) developed a test for the linear cointegration null hypothesis in a two-regime TVECM. In other words, they test the hypothesis $\alpha_1 = \alpha_2$ under the restriction that both are nonzero, and that $\gamma_1 = \gamma_2$.Following the convention in the literature, it is assumed throughout this paper that there is no such case as threshold no cointegration. Nevertheless, Seo (2006)suggested that future studies should develop a test for the threshold no cointegration null hypothesis as the parameter space for the threshold no cointegration hypothesis is quite complicated i.e a subset of $\{\alpha_1 = 0 \text{ and } \alpha_2 = 0\}$ or $\{\alpha_1 \neq 0 \text{ and } \alpha_2 = 0\}$,since the intercept μalso plays a role in determining the stationarity of the error correction term z_t.

Estimation of a Threshold parameter: Since the stationary distribution of a TVECM model does not have a closed form solution, Jonathan and Kung-Sik (2008) revealed that the estimation is often carried out conditional on the max(p,d) initial values where p is the order process and d is the delay parameter. According to Chan and Kutoyants (2012), the threshold parameter denoted by $\gamma \in \Theta = (\alpha, \beta)$ which is unknown threshold parameter. The goal is to estimate γ from observations $X^n = (X_0, X_1, \dots, X_n)$. Therefore, using the maximum likelihood estimator to estimate the threshold parameter, the likelihood function according to Chan and Kutoyants (2012) is as follows:

$$L(Y, X^n) = F_0(X_0)\left(\frac{1}{\sqrt{2\sigma^2\pi}}\right)^n e^{\left\{-\frac{1}{2\sigma^2}(\sum_{j=0}^{n-1} X_{j+1} - \rho_1 X_j \mathbb{I}_{\{|X_j| \leq Y\}} - \rho_2 X_j \mathbb{I}_{\{|X_j| > Y\}})^2\right\}}, \quad (12)$$

and the maximum likelihood estimator (MLE) $\hat{Y}$ is defined by the equation:

$$\frac{SUPL}{Y, X^n}(\gamma, X^n) = \text{Max}\left[L(\hat{\gamma}_n + X^n), \hat{\gamma}_n - X^n\right] \quad (13)$$

If this equation has many solutions, we can, for example, call the MLE to be the value which is at the center of the gravity.

The Nonparametric Diks-Panchenko Causality Test: Granger proposed a causality test to portray the reliance relations between economic time series. As per this, if two variables$\{X_t, Y_t \geq 1\}$are strictly stationary,$\{Y_t\}$ Granger causes $\{X_t\}$if past and current values of X_t contain additional information on future values of Y_t. SupposeF_{Xt} and F_{Yt} denote the information sets consisting of past observations of X_t and $Y_t$for time t, then, $\{Y_t\}$ Granger causes $\{X_t\}$ if:

$$(Y_{t+1}, \dots, Y_{t+k}) | (F_{X,t}, F_{Y,t}) \sim Y_{t+1}, \dots, Y_{t+k} | F_{X,t}, \quad (14)$$

$k \geq 1$ in this case. However, in practice $k = 1$ is more often than used. Nevertheless, Granger non-causality can be tested by comparing the one-step-ahead conditional distribution of $\{Y_t\}$with and without past and current observed values of$\{X_t\}$. To test for Granger causality, we consider a two stationary time series with a meanmodel$E\left(Y_{t+1} | (F_{X,t}, F_{Y,t})\right)$. We compute the residuals of a fitted TVECM. Suppose that $X_t^{\ell X} = (X_{t-\ell X+1}, \dots, X_t)$ and $Y_t^{\ell Y} = (Y_{t-\ell Y+1}, \dots, Y_t)$are the delay vectors where $\ell_x, \ell_Y \geq 1$. The null hypothesis to be tested is:

$$H_0: Y_{t+1} | (X_t^{\ell_x}; Y_t^{\ell_Y}) \sim Y_{t+1} | Y_t^{\ell_Y}. \quad (15)$$

The null hypothesis becomes a statement about the invariant distribution of the$(\ell_X + \ell_Y + 1)$-dimensional vector $W_t = (X_t^{\ell_x}, Y_t^{\ell_x}, Z_t)$. Ignoring the time index and if $\ell_X = \ell_Y = 1$, the t distribution of Z given that $(X, Y) = (x, y)$ is the same as of Z given $Y = y$ respectively. Nonetheless, in order to take account of the ratios of the joint distributions, [15] is restructured (Karagianni et al., 2013). In that sense, the joint probability density function$F_{X,Y,Z}(x, y, z)$and its marginals should satisfy the following relationship:

$$\frac{F_{X,Y,Z}(x,y,z)}{F_Y(y)} = \frac{F,X,Y(x,y)}{F_Y(y)} * \frac{F,X,Z(y,z)}{F_Y(y)} \quad (16)$$

As per Diks and Panchenko (2006), the null hypothesis simplifies to:

$$q \equiv E\left[F_{X,Y,Z}(X, Y, Z)F_Y(Y) - F_{X,Y}(X, Y)F_{Y,Z}(Y, Z)\right] = 0. \quad (17)$$

Then, the test statistic is a scaled sample version of q in equation (17):

$$T_n(\varepsilon_n) = \frac{n-1}{n(n-2)} * \sum_i \left(\hat{f}_{X,Y,Z}(X_i, Y_i, Z_i)\hat{f}_Y(Y_i) - \hat{f}_{X,Y}(X_i, Y_i)\hat{f}_{Y,Z}(Y_i, Z_i)\right) \quad (18)$$

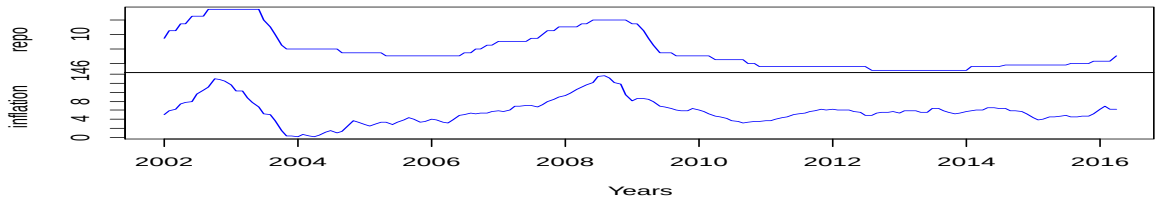
for $\ell_X = \ell_Y = 1$, and if $\varepsilon_n = C_n^{-\beta}\left(C > 0, \frac{1}{4} < \beta < \frac{1}{3}\right)$,therefore Diks and Panchenko (2006)attested that the test statistic in [18] satisfies the following condition:

$$\sqrt{n}\frac{(T_n(\varepsilon_n)-q)\xrightarrow{D}N(0,1)}{S_n} \quad (19)$$

$\xrightarrow{D}$denotes convergence in distribution and S_ns an estimator of the asymptotic variance of $T_n(.)$(Karagianni et al., 2013).In this study, the Karagianni's suggestion, to implement a one-tailed version of the test, has been employed. The null hypothesis is rejected if the observed probability value is greater than the critical probability value.

Empirical Analysis: Data for the period of January 2002 to March 2016 accessed from the South African Reserve bank(SARB) database is used.The intention of the study is to confirm the relationship between inflation rates and repo rates using the novel TVECM and nonlinear causality test. Makatjane and Moroke (2016) has emphasized the significance of assessing data behavior patterns prior model data analysis. This helps in identifying the properties associated with the data at hand and to help decide on the type of model to estimate.

Figure 1: South Africa Inflation Rate and Repo Rate



The co-movement between the inflation rate and repo rate is depicted in Figure 1. This serves as a strong motivation to use these variables with the proposed methods. Since the movements of the series from the year 2002 suggest the possibility of cointegration prior to imposing the transformation to the data. The up and down movement is an indication of volatility and this is expected for financial and macroeconomic time series. These series are as a result perfectly suitable to serve as experimental units for this study.They perfectly fit the proposed frameworks.

4. Results

Prior TVECM estimation, we used Ramsey reset test to confirm the null hypothesis of linearity against nonlinearity in the variables. The results of a RESET test are presented in Table 1.

Table 1: Estimated AR(1) models with nonlinear test

Repo Rate				
Parameter	Coefficient	Std. Error	Test Statistic	Prob
C	65.676	0.5271	14.532	0.00000
Φ_2	3.229	0.0803	0.109	0.00000
Reset Test	208.53			0.00000
Inflation Rate				
C	6.6025	0.4549	14.512	0.00000
Φ_2	-0.0065	0.0598	-0.109	0.00000
Reset Test	25.509			0.00000

It is evident in Table 1 that both the inflation and repo rate are nonlinear. The RESET test statistic is significant at 1%, 5% and even 10%. This implies that the data is suitable for implementation of the nonlinear models.

TVECM model and Threshold cointegration test: This section presents the results for a threshold cointegration method as summarized in Table 2. TVECM serves as the build on the Johansen cointegration framework. Ghassan and Banerjee (2015) opined that the Johansen procedure only assumes that the cointegrating vector remains constant during the sample period. This could be misleading owing to the scientific progress, transformation in people's preference, economic crisis, policy or regime alteration and institutional development. Such limitations are also valid for the Engel Granger method. Therefore, an enhanced Johansen cointegration framework is more appropriate for the current study as it also accommodates data with structural breaks. Table 2 reports the results from the TVECM.

Table 2: TVECM (1) model

Lower Regime	
Parameter	**Estimate**
δ_1	-0.0117(0.0100)*
μ_1	0.0089(0.6860)
Φ_{11}	0.2150(0.0079)**
Φ_{21}	0.4317(0.000)***
Upper Regime	
δ_2	-0.5463(0.0005)***
μ_2	-3.7823(0.0006)***
Φ_{12}	-0.4156(0.0456)*
Φ_{22}	0.4804(0.0001)***

Notes **** significant @ 1% ** significant at 5%, *significant at 10%; Numbers in () are standard errors*

Applying equation 16-17, the procedure yields a threshold parameter of $\gamma = 0.119$.Based on this parameter the TVECM (1) is divided into two regimes. Regime 1 is defined by those monthly inflation rates were the absolute deviation from the long-term equilibrium is below 11.9%. For every observation in regime 2, the absolute deviation from the long-term equilibrium is above 11.9%.UsingSeo (2006)'s supremum Wald statistic (herein referred to as *supW* in Table 3)bootstrapping50 replications, we find the critical threshold to be significant at 5%. The test statistic is greater than the critical value 99.072. We conclude that there is a threshold cointegration between the inflation rate and repo rate.

Table 3: Seo SupW bootstrap Test

Seo's threshold test	**Test Statistic**	**Critical Value**
supW test	104.0395	99.07157

Diks-Panchenko Causality Test: Since the estimated TVECM(1) confirmed the presence of threshold cointegration between the variables, this also is an indication of the presence of short-run nonlinear relationship. A follow-up nonlinear causality test results are presented in Table 4.

Table 4: Diks-Panchenko nonparametric causality test

Group	**Diks-Panchenko -test**
Inflation	[4.826]***
Repo	[6.4918]***

Notes **** significant @ 1% ** significant at 5%, *significant at 10%; Numbers in [] are nonparametric t statistic*

The results obtained from the test indicate a bidirectional causality between inflation rate and the repo rate inflation rate and the repo rate. The results imply that the use of repo rate to target the inflation rate during the target period did not address the problem in South Africa. The same findings were reported by Bonga-Bonga and Kabundi (2015) in their study of monetary policy instrument and inflation in South Africa(Rossouw et al., 2014).Any change to the monetary sector affects short-term liquidity in the monetary

system, which suddenly has an effect on other rates.Mboweni et al. (2008)and Gupta and Komen (2009)reported that a positive shock in the repo rate increase prices for more than 18 months giving no hope for prices to decrease after a positive monetary shock.

5. Conclusion and Recommendations

The current study aims to empirically investigate the threshold cointegration and nonlinear Granger causal relationships between inflation rate and repo rate of South Africa. Threshold cointegration was estimated through the TVECM. According to Ghassan and Banerjee (2015), TVECM serves as the extension of the Johansen cointegration framework which assumes that the cointegration vector is constant over a sampled period. The Johansen framework is unfounded in this instance due to structural changes in the economy. An estimated TVEM (1) was found to be a good framework for inflation and repo rates nexus. This was confirmed with an observed SupW test which was significant at all conventional levels of significance. Yau and Nieh (2009)reported similar studies in the context of Japan and Taiwan. Additionally, Diks-Panchenko Causality test confirmed a nonlinear a bidirectional causal relationship between the two variables. This implies that the nonlinear Granger causality test does not support the neutrality hypothesis of unidirectional relationship between inflation rate and repo rate of South Africa.This implies that repo rate may not to be a good instrument to control the inflation rates. Changes in the repo rate tend to have similar effects the inflation rate. See studies by Mboweni et al. (2008); Gupta and Komen (2009); and Bonga-Bonga and Kabundi (2015). This study provides some practical information to the SARB and decision makers for the use of repo rate and consumer consumption behavior policies. In this regard, decision makers would benefit from the findings for their policy implementations and in the economic planning process. For instance, they may take electricity consumption into account in policy designs by considering no aftermath effect of repo rate on inflation rate in South Africa. Furthermore, the monetary committee may implement the policies that aim at protecting the economy by considering other measures of the inflation as to target the inflation in the specified interval of 3%-6%.

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Evaluating Entrepreneurial Features of Firm's Growth Using Confirmatory Factor Analysis

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Abstract: The growth of Small and medium-size firms cannot ensue without the entrepreneurial features and the environment that the firm operates. The entrepreneurial characteristics, therefore, are vital due to the unique individualism of firm owners or sponsors. Construction SME growth-oriented firms are a significant contributor to Ghana's economic gain. Conversely, the concept of growth varies from one entrepreneur to the others depending on the exhibited skills by the entrepreneurs, hence entrepreneurial features. Numerous factors influence the entrepreneurial features as a factor of firm's growth. Some are of the factors are established and categorised as having strong influence while others are classified weak. This study, therefore, adopted the confirmatory factor analytical technique to justify the factors after exploring. To achieve the goal of the study, respondents such as firm owners, SME managers and construction professionals engaged by SMEs as the population were administered with questionnaires. In all, 315 questionnaires were given out in the form of semi-structured structured, but only 228 were retrieved for analysis representing a responds rate of 72 percent. The study established Cronbach alpha and composite reliability values that predicted the entrepreneurial feature as a subsequent determinant of firm's growth. Additionally, the hypothesis was supported statistically suggesting that there is a direct relationship between entrepreneurial features and firm growth.

Keywords: *Confirmatory Factor Analysis, entrepreneurial features, firm, growth*

1. Introduction

Small and medium-size firms grow either by integration or organically (Miriam, 2006). Both of these growth conduits can ensue without the entrepreneurial features and the environment that the firm operates. These environments are categorised as internal and external. According to Islam et al. (2011), the internal environment factors comprise entrepreneurial management which consists of a level of emphasis placed on strategic direction, resources orientation, management structure entrepreneurial culture development, reward philosophy, and the entrepreneurial orientation is related to personal characteristics of the entrepreneurs. Entrepreneurial features depend on the characteristics of the person or persons that provide the key resources used in establishing the business. Zhou and Wit (2009) supported that the readiness and capability of the owner together with growth motivation suggest a significant role in entrepreneurial ventures. Similarly, Kritikos (2014) stressed that entrepreneurial features do not only manipulate the internal growth of a firm but also the economic growth of a country, suggesting that entrepreneurs usually develop new products, create new technologies, and open new markets that bring about growth in their firms and the entire economy. In the context of Ghana as the study area, entrepreneurial features which influence the growth of SMEs are not different from other Saharan African economies. In Ghana, most construction SMEs are branded of folding-up soon after the execution of major projects. Further, these SMEs are easily sprang-up leveraging on a single or one man ownership without any proper managerial structures and strategies that bring about growth. The small and medium-size construction (SMEs) in the Ghanaian construction sector are described as prolific job creators with the lack of growth traits. Also, construction SMEs in Ghana are also notable of been profit oriented without any model that will promote firm's growth.

Despite the significant constraints faced by the entire SME sector within the Ghanaian economy, the extreme and overwhelming benefits associated with the construction SMEs makes them unique. The SME sector in Ghana is thus a major employer in the economy coupled with their impact in the social and economic development which makes them indisputable. As a result, the activities of SMEs that proliferates growth both at the micro and macro-levels of the economy are considered vital. According to Keskin and Senturk (2010) recent empirical studies reveal that Small and medium-size firms contribute to the Gross Domestic Product (GDP) to over 55 percent and over 65 percent of the total employment in high-income countries. While in the middle-income economies, the contribution of SMEs is over 95 percent of total employment and about 70 percent of GDP. To continue achieving and contributing to this significant Key Performance Indicator (KPI) by

the firms, the SMEs need support. Entrepreneurial features revolve on the input of the person or persons that provide the key resources used in setting up the company. These features are typically identifiable before developing the business and include a range of personal and behavioural uniqueness. Diverse factors influence the entrepreneurial features as a factor of firm's growth. However, some are of the factors are established and categorised as having strong influence while others are characterised as slightly weak. An in-depth study that gives insight into factors that influence entrepreneurial features as determinants of firm's growth is therefore essential. This study, therefore, sought to confirm the explored factors of as a factor of growth amongst construction SMEs in Ghana. Further, the confirmed factors can act as a benchmark to provide a comprehensive understanding on how to firm's growth will be initiated during the start-up of businesses via entrepreneurial activities of in a firm. This study was also driven throughout by the assumption statement that there is a significant relationship between entrepreneurial features and growth of firm.

2. Literature Review

Determinates of SMEs growth: A study by Hashi and Kransnigi (2011), emphasised that determinants of SMEs growth are clustered into three separate categories including those related to the characteristics of the firm, the business environment that the firm operates and lastly those related to entrepreneurial features of the firm. These entrepreneurial features include strong ambition of owner to growth, owner's strong entrepreneurial personality, strong desire to produce high standards, good development of internal ideas, strong human factor capital amongst others. Growth and expansion of SMEs depend utterly on the motivation and aspiration of the owner of the firm personality behavior. Delmar and Wiklund (2008) pointed that the character trait of entrepreneurs is a key factor that affects motivation Zhou and Wit (2009) supported that preparedness and capacity of the owner with the addition of growth motivation play a substantial role in entrepreneurial ventures. According to (Wiklund et al., 2003), approach to growth depends on the expected consequences of growth and what the entrepreneur is contented managing (Cliff, 1998). Also, Cassar (2007) supported that financial gain has not been found to a wholly determinant of attitudes toward growth but other important non-economic outcomes exist, such as those around keeping control and independence, and the effect on employee well-being Wiklund et al., 2003). The presence of an entrepreneurial team has also been shown to influence positively firm growth (Ensley et al., 2002; Ruef et al., 2003). An important function of SME's entrepreneurial is their ability to innovate and challenge incumbents firms with their creative products service offerings (Shane, 2003).

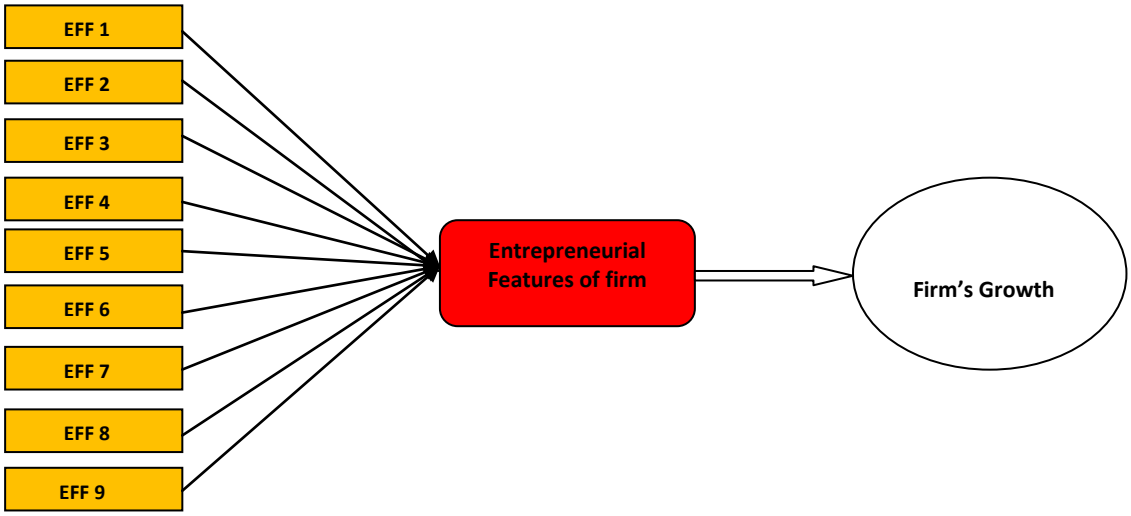
Table 1: **Entrepreneurial Features as a factor of firm's growth with its sub-constructs influencing the factor**

Item	Factor driving Firm's growth	Code	Sub-constructs influencing factor of firm's growth
	Entrepreneurial Features of firm (EFF)	EFF 1	Strong ambition of owner to growth
		EFF 2	Owner's strong entrepreneurial personality
		EFF 3	Strong desire to produce high standards
		EFF 4	Good development of internal ideas
		EFF 5	Strong human factor capital
		EFF 6	High level of skill amongst employees
		EFF 7	High worker motivation
		EFF 8	High level of managers competencies
		EFF 9	Exceptional level of education of entrepreneurs

Goedhuys and Veugelers (2012) stress that combining product and process innovation is vital for significantly improving the success and growth of SMEs. Accordingly, businesses owned by entrepreneurial teams have a more diversified and skilled resource base and a wider network of contacts, leading them to exploit business opportunities more efficiently hence better performance. Although general economic conditions are favourable, and firm may be able to exploit the growth in the market for the use of its resource capabilities, manager's ability and managerial ambition plays a reinforcing effect on the firm growth (Gopinath, 2012). Pajarinen et al. (2006) stressed that entrepreneurs with the higher academic profile are more innovative and will employ modern techniques and models to do business. Barringer and Bluedorn

(1999) also described entrepreneurs as individuals who can explore the environment, discover the opportunities, and exploit them after proper evaluation. Literature has also acknowledged that individuals from families owning a business are more inclined to start an entrepreneurial venture by developing knowledge of how to run a business. Empirical evidence suggests that firms belonging to an entrepreneurial family augment the probability of survival (Cooper et al., 1994, Papadaki et al., 2000). However, firm's performance is found to be positively affected by the prior entrepreneurial experience Table (1).

Figure 1: Conceptual Framework for firm's growth



3. Methodology

This study used quantitative methodological approach, where survey questionnaires in a semi-structure format were administered to a targeted population comprising of firm owners, managers and construction professionals engaged by the construction SMEs. A total of 315 questionnaires were administered to construction SMEs throughout the entire regional capitals of Ghana, but only 228 was retrieved for analysis representing a response rate of 72 percent. The questionnaire adopted 5 points Likert-scale comprising a range of strongly influential to not at all influential. To ease the analysis of the collated data and further aid in addressing the goal of the study, sequential process including coding the responses, cleaning, screening the data and selecting the suitable data analysis technique, etc. was done. The selection of the suitable statistical analysis technique for this study was done considering the research objectives, and problem, the characteristics of the data and the underlying properties of the statistical technique as recommended by Malhotra (1999). To address the primary aim of the study, inferential analysis SPSS version 23 was accordingly used. The method commenced with Exploratory Factor Analysis (EFA) which first explored the factors which influenced entrepreneurial features as a driver of firm's growth. This was followed by the Confirmatory Factor Analysis (CFA) using the response of the questionnaires from the factors of firm's growth as depicted on Table (1). Prior the CFA test and the hypothesis for the study, the reliability and the validity of the study's construct were as well carried out.

4. Analysis and Results

Exploratory Factor Analysis: Before the used of the Confirmatory Factor Analysis, Exploratory factor analysis techniques were utilized to check the interrelationships among a set of variables which constituted and further influence entrepreneurial features a factor of firm's growth for the study. The statistical package for social sciences (SPSS) version 23 was used to evaluate the Kaiser-Mayor Olkine and Bartlett's test. Factor analysis is deemed appropriate when the Kaiser-Meyer-Olkin (KMO) the measure of sampling adequacy test index is higher than the satisfactory minimum limit of 0.5 and a desirable limit as 0.8 or greater (Kaiser, 1970). Hair et al. (2010) also suggested a cut-off value KMO greater than or equal to 0.07. According to Hair et al. (2010), Bartlett's test with a significance level of less than 0.0001 substantiates the appropriateness of the

factor model. Also, Eigenvalues were also used to confirm the factors within the proposed items. The eigenvalues greater than one were considered significant and it explained the variance obtained by a factor. This was, however, in-line with Hair et al. (2010) assertion that, eigenvalues of less than one are considered insignificant, these were excluded accordingly in the current study. Following the subjection of the factors through the EFA analytical test, the respective KOM values and the significance level are summarised in Table 2. The significant level was less than 0.05, representing that the correlation matrix is significantly dissimilar from an identity matrix in which the correlations between variables are all zero. Also, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was greater than 0.70 which indicates sufficient items for each factor.

Table 2: Factors of firm's growth with KMO and Significance Level

Construct	CODE	Number of Items extracted	KMO	Significance level
	EFF 2			
	EFF 3			
Entrepreneurship Features (EFF)	EFF 5	3	0.791	0.000

Source: Author's Compilation

Entrepreneurial features (EFF) of a firm as an independent variable were subjected to an exploratory analytical test. Nine items were measuring entrepreneurial features as a determinant factor of growth for construction SMEs. The results revealed that the KMO of sampling adequacy as 0.791 suggesting that the sample size is indeed satisfactory for factor analysis. Conversely, Bartlett's Test of Sphericity undertaken established a high significance level of 0.00 as illustrated in Table 3. Also, the total initial eigenvalues greater than one were determined from the selected factor as depicted in the pattern matrix in Table 1.2.3.

Table 3: Entrepreneurial features of firm (EFF)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.791
Bartlett's Test of Sphericity	Approx. Chi-Square	740.762
	Df	36
	Sig.	.000

Source: Author's Compilation

Confirmatory Factor Analysis: A Confirmatory Factor Analysis (CFA) was employed carried out to determine the validity of the extracted factors regarding the convergent and discriminant validity of the construct in the study. Also, in contrast to the exploratory factor analysis (EFA), the Confirmatory factor analysis (CFA), is a more multifaceted and sophisticated set of techniques used in the study process to test (confirm) specific hypotheses or theories regarding the structure underlying a set of variables. Tabachnick and Fidell (2007) demonstrated that CFA is primarily pedestaled on sound empirical foundation or theories that permit an advance specification of the exact structure. Further, in CFA technique every observed variable has residual or errors associated the highlights the proportion of variance in the variable that is portrayed by the factors. Confirmatory factor analysis was, therefore, prudent and was adopted for assessing the factorial validity of this study. The CFA technique tested for reliability (Cronbach alpha and composite). Also evaluated was the reliability (Cronbach alpha and composite) and the validity (convergent and discriminate) using correlation matrix and the average variance extracted values in this study as represented in Tables (4) and (5).

Cronbach alpha and Composite Reliability: Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability Hair et al. (2010) stressed that values higher than 0.7 were considered as being reliable. Kipkebut (2010) also maintained that the values for Cronbach alpha range between 0 and 1. In the context of this current study, the Cronbach Alpha value was 0.812 as shown in Table 4. Gliem and Gliem (2003: 87) supported that the closer Cronbach alpha is to 1.0, the more the internal consistency of the items in the scale. This also clarifies that the higher the alpha coefficient, the more reliable the test (Yu, 2001: 3). Similarly, a Composite Reliability analysis

was carried out using SMART PLs software application. The test also examined the reliability of the construct and value of 0.857 was estimated as shown in Table 4.

Table 4: Reliability Analysis using Cronbach alpha and Composite Reliability

Construct		Code	Factor Loadings	Number of Items extracted	Cronbach alpha	Composite Reliability
Entrepreneurship (EFF)	Features	EFF 2	0.889	3	0.812	0.857
		EFF 3	0.842			
		EFF 5	0.840			

Source: Author's Compilation

Testing for Validity: In this study, the validity of the instrument was tested using the correlation matrix. The test was done using the factor loadings and the average value extracted. In measuring the Correlation matrix, the Average Value Extracted (AVE) as the Shared value, the convergent validity and the discriminant validity used in estimating the measurement validity. The discriminant validity of the study observed a comparison of the square root of the AVE for each construct and its relationship with other constructs. Fornell and Larcker (1981) stressed that for discriminant validity is be ascertained, the square root of the AVE for a construct must be greater than the correlation with the other constructs. Table (5) illustrates that the square root of all the AVE for each construct is greater than their correlations with other constructs showing that discriminant validity has been achieved. Further, the average variance extracted approximate reflects the total elements of variance in the indicators which accounted for by a latent construct. Fraering and Minor (2006), informs that an AVE value of 0.4 is seen as satisfactory. Hair et al. (2010) observed that a threshold value of 0.30 qualifies to be used as a minimum threshold in social sciences while in marketing discipline, an acknowledged threshold of 0.5 was comparatively acceptable. In the context of this study, limits ranging from 0.539 to 0.755, which is consistent with that of Fraering and Minor (2006) and Hair et al. (2010) and are presented in Table (5).

Convergent validity: Hair et al. (2010) hypothesized that convergent validity is the extent at which indicators of a particular variable converge a high proportion of variance in common. This clarifies the extent at which a scale correlates with other measures of the same construct in the same direction. Carlsman and Herdman (2012) similarly supported that a weaker convergent validity is evident using values deviating from one while values closer to one is usually accepted. Table (5) presents the estimates of the factor loadings of Entrepreneurship features (EFF).

Table 5: Assessment of Average Variance Extracted (AVE)

Research Construct		Factor Loadings	AVE Value
Entrepreneurship features (EFF)	EFF2	0.889	0.750
	EFF3	0.842	
	EFF5	0.840	

Source: Author's Compilation

Average value extracted (AVE): The Average Variance Extracted (AVE) approximately reflects on the total elements of variance in the indicators which accounted for a latent construct. Dillon and Goldstein (1984) suggested that an AVE value greater than 0.50 demonstrates that the convergent validity of the variable is satisfactory to be considered. According to Fraering and Minor (2006), an AVE value of 0.4 is realized as satisfactory. Hair et al. (2010) also observed that a threshold value of 0.30 qualifies to be used as a minimum threshold in social sciences while in the marketing field; an accepted threshold of 0.5 was comparatively acceptable. The study has a threshold of 0.750, which is consistent with that of Fraering and Minor (2006) and Hair et al. (2010) as presented in Table 5.

Measurement models for Entrepreneurial Features (EFF): Entrepreneurship features of a firm (EFF) as a construct to the growth of the firm in this current study demonstrated sufficient evidence regarding the measurement and reliability using the exploratory factor analysis (EFA). In ascertaining the construct's validity for the measurement models, a Confirmatory Factor Analysis (CFA) was carried out. Table (5) shows

the Cutoff criteria for fit indices and the acceptable parameters. The study employed additional fit indices in assessing the viability of the current CFA model. These include CMIN or the Chi-square (x^2/df), Normed Fit Index (NFI), Goodness-Of-Fit Index (GFI), the Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI) as supported Incremental Fit Index as shown in Table (6). The chi-square index was checked as part of the CFA in determining the model fit of the study. The CMIN/DF recorded value of 2.094 as an acceptable value appropriate for the model. The value is consistent with Bentler and Bonet (1980:559) study, which suggested a chi-square value of less than 5 (< 5) for good model fit. The baseline comparison index was computed using the Normed Fit Index (NFI), Random fit index, the Tucker-Lewis Index (TLI), the Incremental Fit Index (IFI) as well as the Comparative Fit Index (CFI). Hair et al. (2010:672), a report on the chi-square value, either the CFI or the TLI and the RMSEA are expected to provide sufficient results for the model fit. In this study, all the indices were above 0.9, which were strong enough to be accepted in the model fit. The Root Mean Square Error of Approximation was examined as part of the model fit, and it indicated a value of 0.058 as depicted in Table 6.

Table 6: Summary of Fit Indices of the Measurement Model

Model Fit Indices	Acceptable Threshold	Study Threshold	Acceptable / Unacceptable
Chi-Square Value:χ2/(df)	<3	2.094	Acceptable
Comparative Fit Index (CFI)	> 0.900	0.932	Acceptable
Incremental Fit Index (IFI)	> 0.900	0.911	Acceptable
Normed Fit Index (NFI)	> 0.900	0.906	Acceptable
Tucker Lewis Index (TLI)	> 0.900	0.901	Acceptable
Random Measure of Standard Error Approximation (RMSEA)	< 0.08	0.058	Acceptable

Source: Author's Compilation

The outcome of the fit indices of the initial assessment of the CFA of the variables and their indicators were all acceptable as shown in Table 6. The findings from the CFA exemplifies that the conceptual model was a representation of the collected data. Accordingly, once a good fit is obtained for a hypothesized model, the path significance of each relationship in the research model and the variance ought to be estimated, given that, the path modeling and its hypothesis test.

Testing of Hypothesis

Testing of the direct influence of Entrepreneurial Features on overall firm's growth: In testing the model hypothesis, the structural model is not its goodness of fit but also the achievability of the model. The statistical assessment of the values of factor loading and P-value for the indicator Entrepreneurial Features of Firm (EFF) revealed 3.046 and 0.002 respectively. The three values of the variables measuring the entrepreneurial features which further predict the endogenous variable firm growth was strong in predicting the endogenous variable (Table 5). This advocates that the relationship of these variables or indicators in determining the overall or integrated growth construction SME firms is major. Additional assessment of the variables of EFF indicated a significance level of 5 percent suggesting that the influence of the factor on the endogenous variable is direct and significant hence the proposition of the hypothesis was supported.

Table 6: Outcome from the Structural Model Testing

Study's Hypothesis	Hypothesis Outcome	Loadings	P-Value	Remarks
EFF ⟹ FGS	H1	3.046	0.002***	Supported

Note: EFF: Entrepreneurial Features of Firm, FSG: Firm Growth, *** P < 0.01 – 0.05
Source: Author's Compilation

Findings and Discussions: Small and medium-size firms growth either by integration or organically as classified by Miriam (2006) is influenced by the entrepreneurial features and the environment where the firm operates. The entrepreneurial feature however of a firm is fundamental to firm's growth (Hashi and Kransnigi (2011). The features include personal entrepreneurial attributes of individual managing the firm, the level of knowledge on the business, the inherent culture within the firm. It has been argued that the entrepreneurial features of a firm which affect growth depend on the characteristics of the persons or the key persons providing the business capital. This is because the sponsors are the main risk takers and as a result have full control over their firm's operation. Zhou and Wit (2009) supported that owners will regarding sponsorship funding coupled with personal motivation influence growth of the firm. The activities SMEs globally are similar to the construction SMEs in Ghana. The characterized feature of this construction SMEs such as improper managerial structures, lack of succession plans, profit oriented, early liquidation soon after the execution of projects and low barriers to early which lead to the formation of inexperienced firms without any growth strategy. Despite the challenges of SMEs, firms categorised as SMEs are remarkably of impact equally on macro and the micro levels of an economy. Keskin and Senturk (2010) opined that SMEs contribute over 55 percent GPD in high-income economies and 70 percent in middle-level income nations while fulfilling employment, social, economic infrastructure development, and poverty reduction. Therefore, this implies that the sustainable growth of SMEs within a country is significant.

Firm's growth as defined by Miriam (2006) is influenced by internally or by integration. The internal or organic growth of a firm is largely influenced by the entrepreneurial features of the firm. A more vigorous analysis on the constructs that influence entrepreneurial features as a factor of growth of firm was embarked via EFA. Out of the nine constructs that were subjected to the analytical test only three constructs were found suitable for the next stage CFA. The explored constructs were justified by their reliability and validity values before the confirmatory analytical test. The established Cronbach alpha and composite reliability values were suitable, implying the constructs were reliable scales to predict the entrepreneurial feature as a subsequent determinant of firm growth. The validity of the explored constructs was tested using correlation matrix through the factor loadings. The discriminant validity of the constructs using their respective factor loadings fell within the certified values proposed by Fornell and Lacker (1981); this confirmed there was validity but discriminant. Convergent validity equally met the necessary thresholds which were inconsistent in the study of (Hiar et al., 2010). Before the measurement model of constructs for EFF, the validity of the constructs supported by the reliability was carried out. Also, to enable a viable model for the CFA several fit indices were made with their own cut off critical as depicted in Table (6). All the thresholds such as chi-square, normed fit index, GFI, RMSEA, TLI, and the CFI were found to be acceptable. The statistically tested hypothesis supported that there is a direct relationship between entrepreneurial features and firm growth. This further implies that, when adequate policies are established such as individual skills identification and development within the firm, it encourages intrinsic entrepreneurial ideas and foster firm's growth.

Implications of the study: The inference of this study to the construction SMEs is that entrepreneurial features as a determinant of firm's growth emanate from small individual skills which need to be developed. These skills must not essentially have to be that exhibited by the owner or sponsors of the firm. However, stakeholders (internal and external) skills must be explored in-line with the strategic goals and needs of the firm to help drive growth within the company.

5. Conclusion

This study established the explored constructs that influence entrepreneurial feature as a determinant of firm's growth among construction SMEs in Ghana. Despite the various identified challenges the construction SMEs sector in Ghana is faced, there are still important attributes from the sector that impact the entire Ghanaian economy. For instance, it was ascertained in the study by Keskin and Senturk (2010) that SMEs contributes over 55 percent GPD in high-income economies and 70 percent in middle-level income nations while fulfilling employment, social, economic infrastructure development, and poverty reduction. This therefore, affirms the imperative need of the SMEs. Extensive data of construction SMEs currently operating within the entire regional capital of Ghana was employed to estimate the influence of a variety of factors affecting SME growth. The statistical overview shows that there is a significant relation between entrepreneurial feature and firm's growth. The study justified this assertion by first exploring the various

constructs using EFA. This followed by a CFA test which assessed both the reliability and validity of the constructs. The results of the reliability and validity assessment established that the constructs were suitable and in conformity with Hair et al. (2010). The CFA was also carried out to establish the construct's validity of the measurement models. The study as well adopted the acceptable parameters Cut-off criteria for fit indices including CMIN or the Chi-square (x^2/df), Normed Fit Index (NFI), Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), Incremental Fit Index. Goodness-Of-Fit Index (GFI) as well as the Comparative Fit Index (CFI). These indices additionally made it more vigorous for the validity of the current CFA model to be assessed. The hypothesis was supported statistically that there is a direct relationship between entrepreneurial features and firm growth. The acceptance of the hypothesis was also supplemented by the three measurement variables namely: owner's strong entrepreneurial personality, (EEF2), strong desire to produce high standards (EFF3), strong human factor capital (EFF4) which indicated a high internal consistency measured the independent variable entrepreneurial features of the firm. The conclusion to this study further states that, when adequate policies are established such as individual skills identification and development within the firm, it encourages intrinsic entrepreneurial ideas and foster firm's growth. Entrepreneurial features of a firm how

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The use of Postponement Decisions in Determining Supply Chain Strategies of Light Vehicle Manufacturers in South Africa

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Abstract: This article investigates the use of postponement decisions in determining the supply chain strategies of light vehicle manufacturers in South Africa. The article is exploratory and descriptive in nature. A survey was conducted among light vehicle manufacturers and the findings analysed by means of descriptive statistics. The results revealed that postponement decisions could be used to determine the supply chain architecture used by light vehicle manufacturers in South Africa. With regard to postponement decisions, the study found that all the light vehicle manufacturers made use of a lean supply chain strategy, while a few made use of an agile supply chain strategy. The results also revealed that all the production lines engaged in full speculation based on projected forecasting, and therefore employed a lean supply chain strategy. In terms of the postponement decisions made in line with the parent company of origin, European manufacturers 1 and 2 kept a work-in-progress inventory of stock to be customised for a particular customer. These manufacturers thus employed a lean and agile supply chain strategy, while most of the manufacturers adopted a lean supply chain strategy. All the manufacturers, except Asian manufacturer 1 and the American manufacturer, employed both lean and agile supply chain strategies. Therefore, the majority of the light vehicle manufacturers employed lean supply chain strategies in their inbound and outbound supply chain, while a few employed an agile supply chain strategy in their outbound supply chain, there by indicating leaglity. The article provides evidence of some form of postponement practice being followed by light vehicle manufacturers.

Keywords: *Postponement, supply chain, decisions, strategies, automotive environment*

1. Introduction

Postponement is one of the most popular and widely used concepts in contemporary supply chains. Postponement, generally known as late customisation or delayed product differentiation, involves delaying supply chain activities purposefully until the customer order is known. Postponement centres around delaying activities in the supply chain until real information about the markets is available. The viability of postponement is determined by the structure of the supply chain characteristics (Battezzati & Magnani, 2000). A postponement strategy brings benefits to an enterprise, such as a reduced inventory, pooling risk, and accurate forecasts. However, the postponement is not suitable for all situations, and there is a wide range of delay, determined by the appropriateness of the location of the materials' decoupling point, which is reflected in the most popular classification of manufacturing types (Zheng & Mesghouni, 2011). Therefore, moving one or more activities forward through postponement increases the agility of the supply chain.

One of the most important links in supply chains is manufacturers who have developed many supply chain strategies to address the problems of product proliferation and meeting customers' exact needs. Huang and Li (2009:363) asserted that postponement has been identified as one of the important characteristics of modern and competitive supply chains, and the implementation of postponement decisions may require significant reconfiguration of the supply chain. According to Feitzinger and Lee (1997), postponement has been increasingly used as an important supply chain decision. However, the choice of a supply chain strategy is intimately related to the positioning of the decoupling point (Wikner & Rudberg, 2005:624). Postponement is used to move the decoupling point closer to the end user and increase the efficiency and effectiveness of the supply chain (Yang & Burns, 2003:2078). Having postponement in the supply chain allows suppliers to adjust their production schedules and plan ahead for the components that are needed for production. Therefore, postponement partially mediates the relationship in supply chain strategies (Gunasekaran et al., 2008). There are several factors that should be taken into account in determining supply chain strategies, such as product characteristics (Mason-Jones, Naylor & Towill, 2000; Christopher, 2005),manufacturing techniques (Hull, 2005), decision drivers of the supply chain, as well as postponement characteristics (Vinodh, Sundararaj & Devadasan, 2009).

Despite the well-known importance of postponement as a strategic supply chain decision tool, it has not been empirically used to determine supply chain strategies in developing economies (Chaudhry, 2010; Yang et al., 2005; Boone et al., 2007; Yeung et al., 2007). Most of the studies on postponement are based in Western and highly developed countries (Qi, Boyer and Zhao, 2009:668; Huang & Li, 2009:363). While these studies have opened up debate and discussion on postponement decisions, generating new insights into how it could be used in different supply chain strategies, there remains a need to provide empirical evidence in the context of South Africa. This article extends studies on the application of postponement decisions within the supply chain environment. It investigates the use of postponement decisions in determining supply chain strategies of light vehicle manufacturers in South Africa. The remainder of the article presents a conceptual review of the relevant literature, the research methodology used, as well as the findings and discussion, followed by the conclusion.

2. Literature Review

This section presents a review of the literature on supply chain strategies, as well as postponement decisions in supply chains.

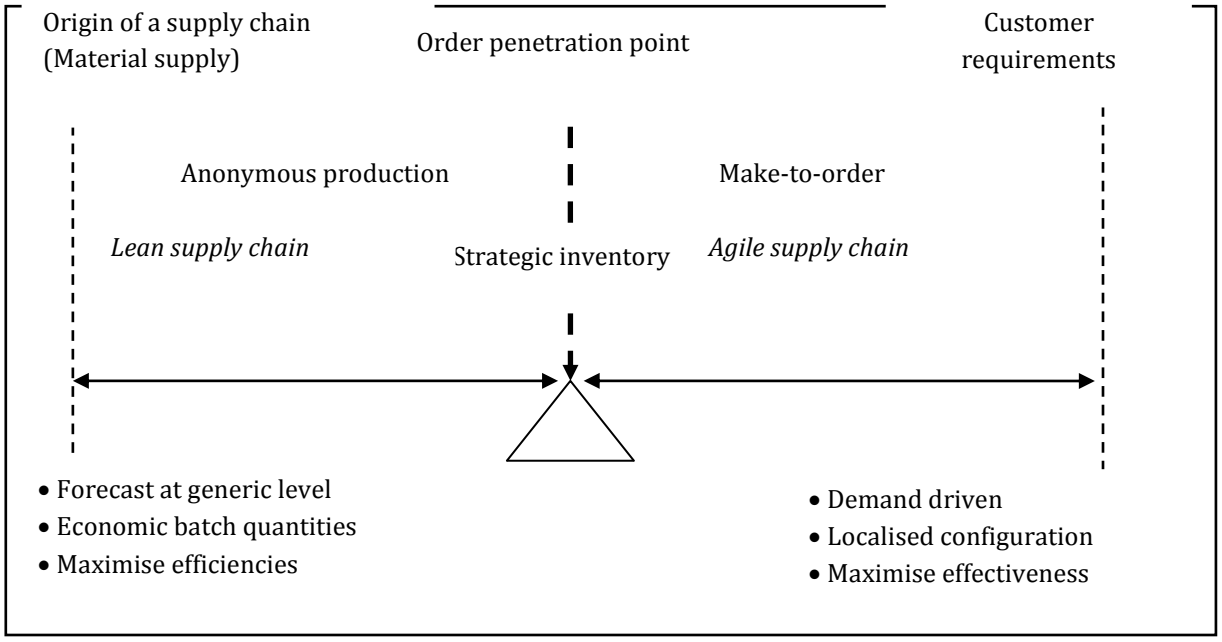
Supply chain strategies: Supply chain strategy utilises inter-firm coordination to facilitate the achievement of objectives focused on revenue growth, operating cost reduction, working capital and fixed capital efficiency, in order to maximise shareholder value (Hallgren & Olhager, 2009). Fisher (1997) developed a model that helps managers to understand the nature of their product, and to devise a supply chain strategy that can best satisfy the specific demands (Jacobs, Chase & Aquilano, 2009:362). However, there are several factors (some of which were mentioned above) that should be taken into account when determining supply chain strategies, such as product characteristics (Mason-Jones, Naylor & Towill, 2000; Christopher, 2005); manufacturing techniques (Hull, 2005); decision drivers of supply chains; and postponement characteristics (Vinodh, Sundararaj & Devadasan, 2009). There are two generic strategies in supply chain management (Hallgren & Olhager, 2009). These strategies include "leanness" and "agility". Identifying the types of supply chain strategies (lean or agile) may be appropriate in different circumstances, in order to position the product in an organisation's portfolio according to its supply and demand characteristics.

Supply chain scholars have indicated that lean and agility approaches can be integrated in a variety of ways (Faisal, Banwet & Shankar, 2006:884). This is because they complement one another, and can be combined to create a new manufacturing paradigm under the name leagile (Vinodh et al., 2009: 573). Krishnamurthy and Yauch (2007: 591) define leagility as "a system in which the advantages of leanness and agility are combined". The aim of leagile supply chains is to infuse competitiveness into an organisation in a cost-effective manner. In the leagile supply chain paradigm, lean and agile approaches are combined within a total supply chain strategy, by positioning the decoupling point (DP) in order to best suit the need for responding to a volatile demand downstream, while providing level scheduling upstream from the DP. Postponement is used to move the DP closer to the end user and increase the efficiency and effectiveness of the supply chain (Yang & Burns, 2003:2078).

The decoupling point: The decoupling point is the most cited of the three hybrid strategies (Wikner & Rudberg, 2005). It separates the lean and agile paradigms. According to Hull (2005:230), this is the point where the product characteristics, based on which customers place their orders, penetrate (Rahiminia et al., 2009:802). It is the point where the order-driven and forecastable meet. Krishnamurthy and Yauch (2007:592) assert that lean and agile systems do not co-exist, but have a demarcation between them. Figure 1below illustrates the decoupling point of the lean and agile paradigms. The decoupling point approach employs the concept of postponement, which is now increasingly and more widely used by organisations in a range of industries (Hull, 2005; Wikner & Rudberg, 2005). The concept of postponement dates back to 1920. It can be defined as "the delaying of operational activities in a system until customer orders are received rather than completing activities in advance and then waiting for orders" (Krishnamurthy & Yauch, 2007:592). The basic idea is to hold inventory in some generic or modular form, and only complete the final assembly or configuration when the precise customer order is received (Christopher, 2005:120). A company may delay the forward movement (distribution) of products as long as possible in the chain of operations, keeping these product(s) in storage at central locations in the distribution chain (Hilletofth, 2009:22). This

can be done through assembly (assembly-to-order), production (make-to-order) and sourcing, or even design (engineer-to-order).

Figure 1: The decoupling point



Source: Adapted from Christopher (2005:121)

Thus, the choice of a supply chain strategy is intimately related to the positioning of the decoupling point (Wikner & Rudberg, 2005:624). The types of manufacturing strategies in which to place the decoupling point in order to determine supply chain paradigms have been well documented. The four most common manufacturing activities based on speculation and customer order commitments are make-to-stock, make-to-order, configure-to-order and engineer-to-order (Taylor, 2004:28; Cohen & Rousell, 2005:12; Webster, 2008:218; Bowersox et al., 2010:87).Therefore, the determination of postponement strategies is based on identifying four representative supply chains that are appropriate for different manufacturing environments (Bowersox, Closs & Cooper, 2010:87). These include make-to-stock (MTS); assemble-to-order (ATO); configure-to-order (CTO); make-to-order (MTO); design-to-order (DTO); and engineer-to-order (ETO). In a MTS supply chain, the end consumer has no individual inputs in the configuration of the product, and typically purchases the product 'as is' from a retailer. The supply chains are extremely common, because they are appropriate for high-volume, low-profit margin, commodity products (Jonsson, 2008:153; Stavrulaki & Davis, 2010:134). In a CTO, customers have a limited number of choices in the configuration of the final product (Jonsson, 2008:153). The MTO supply chain affords consumers the opportunity to have at least some part of the product uniquely built into their individual specifications (Stavrulaki & Davis, 2010:138). Products made with the ETO supply chain represent the ultimate in customisation, because there are virtually no constraints on customers with respect to incorporating their individual preferences and requirements into the final design of the product. Therefore, products from an ETO supply chain are by definition low volume (often volumes of one), with highly variable characteristics, as well as high prices. Table 1below shows that there are characteristics of postponement decisions in supply chains.

Postponement as a Supply Chain Strategy: Postponement refers to a concept whereby activities in the supply chain are delayed until a demand is realised (Boone, Craighead & Hanna, 2007:594). This involves intentionally delaying the execution of a task, instead of starting it with incomplete or unreliable information inputs (Yeung, Selen, Deming & Min, 2007:332). Therefore, postponement, or 'delayed configuration' as it is called, is based on the principle of seeking to design products by using common platforms, components or modules, but postponing the final assembly or customisation until the precise market destination or customer requirement is known (Christopher, 2003:288, 289). Basically, postponement encompasses holding

inventory in a generic form, in the fewest locations, and only completing or finally configuring the product once real demand is known (Christopher, 2003:286). As indicated by Taylor (2004), postponement is used to manage uncertainties, and the final operations that result in a customised product for the end customer are performed when the uncertainty is removed (Waters, 2007:206). It allows organisations to be flexible in developing different versions of a product as needed. It has the potential to improve responsiveness while reducing costs, such as inventory, transport, storage and obsolescence costs (Boone et al., 2007:594).

Table 1: Manufacturing characteristics in supply chains

Postponement characteristics	Lean supply chain	Agile supply chain
Manufacturing strategies	MTS	CTO, MTO, ETO
Manufacturing cost	Low cost manufacturing strategy	Cost is demand-driven (flexibility)
Inventory holding	Minimum inventory in the production process	Hold inventory based on demand specifications (pull by orders)
Changes in manufacturing	Little or no changes (based on projected forecasting)	Make provision for changes in customer demand
Manufacturing process	Push supply	Pull supply

Postponement is an excellent example of a push-pull strategy (Simchi-Levi, Kaminsky & Simchi-Levi, 2008:190). Before end customer demand is known, a push-based strategy is used to produce generic products based on a forecast. The demand for generic products is an aggregation of demand for all the organisation's corresponding end products, hence forecasts are more accurate. By contrast, customer demand for a specific end product typically has a high level of uncertainty, and product differentiation therefore occurs only in response to individual demand. The portion of the supply chain starting from the time of differentiation is pull-based (Simchi-Levi et al., 2008:191). Earlier in this article, the decoupling point was defined as the point at which real demand penetrates upstream in a supply chain (Christopher, 2003:28). From this, it can also be deduced that the push-pull boundary is the same point as the decoupling point. Postponement takes place at the decoupling point or the push-pull boundary, and the decoupling point determines the form in which inventories are held. Therefore, once the decoupling point is determined, organisations must support push-pull decisions to meet customers' expectations (Goldsby, Griffis and Roath, 2006:60).

The various forms of postponement include full postponement, assembly/logistics postponement, manufacturing postponement and full speculation. Full postponement refers *to* "making the decoupling point earlier in the process", which means that a few steps in the design process will be performed under conditions of uncertainty and forecasting (Świerczek, 2010:35). At the same time, it decreases the necessary stock of semi-finished goods. For this postponement strategy to be successful, processes have to be designed in such a manner that less differentiating steps can be performed prior to the decoupling point (Balland & Lindholm, 2012:7). According to Yang, Burns and Backhouse (2004), assembly or logistics postponement refers to the movement of finished goods (It is also referred to as semi-finished goods (Gattorna, 1998), where the last differentiating stages are performed at the warehouse/distribution centre (DC). Gattorna (1998) refers to stages such as labelling, packaging and assembly. These delayed processes allow a product to be centrally stored and customised according to local market specificities when a customer order is received. Manufacturing processes are based on speculation and logistics processes are customer order-initiated (Balland & Lindholm, 2012:8).

Manufacturing postponement focuses on designing products so that they are kept undifferentiated for as long as possible (Yang et al., 2004). This decreases inventory, since components can be used for multiple products. Relevant processes in this regard are labelling, packaging, assembly and manufacturing (Świerczek, 2010:35). The manufacturing process is redesigned in order to allow processes that do not differentiate the product and are based on forecasts to be completed prior to the customer order decoupling point (CODP). The processes that differentiate the product are placed after the CODP and are customer order-initiated. For instance, Benetton places the dying process of its clothes after the knitting process, thereby allowing for a more accurate demand of colours (Gattorna, 1998). The following three formalised approaches are used in

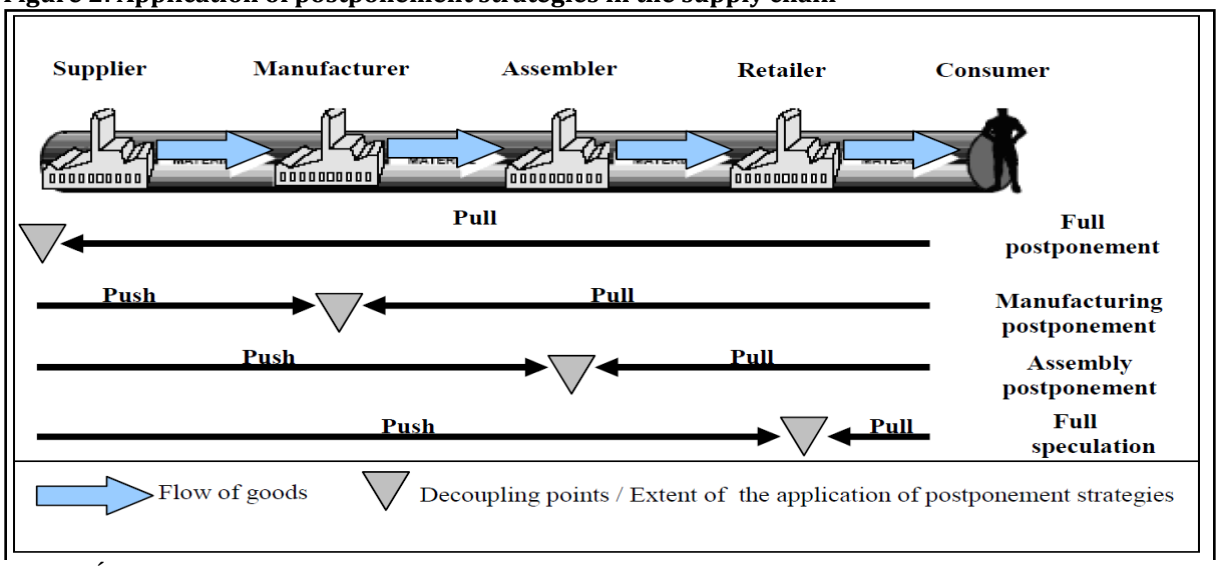
manufacturing postponement: (1) standardisation; (2) modular design; and (3) process restructuring (Balland & Lindholm, 2012:9).Full speculation is the opposite of postponement in any form (full, logistics or manufacturing). The full speculation strategy can, in one way, be compared to a MTS production strategy. In this strategy, all manufacturing operations are performed without the involvement of the customer (Balland & Lindholm, 2012:7). The product is distributed in a decentralised way, often in large volumes. These large volumes allow for the use of economies of scale at several points in the supply chain (Świerczek, 2010:35). Table 2below indicates the various forms of postponement.

Table 2: Types of postponement strategies

Types of postponement	Authors
Full postponement	Lee (1998); Świerczek (2010); Balland & Lindholm (2012).
Assembly/logistics postponement	Gattorna (1998); Yang et al. (2004); Balland & Lindholm (2012).
Manufacturing postponement	Gattorna (1998); Yang et al. (2004); Świerczek (2010); Balland & Lindholm (2012).
Full speculation	Balland & Lindholm (2012); Świerczek (2010).

These four postponement strategies can be applicable to different phases of the supply chain, as indicated in Figure 2 (Świerczek, 2010:35). For example, make-to-stock (MTS) is typical of a full speculation strategy, configure-to-order (CTO) refers to assembly/logistics postponement, make-to-order (MTO) is linked to manufacturing postponement, and engineer-to-order (ETO) corresponds to full postponement.

Figure 2: Application of postponement strategies in the supply chain



Source: Świerczek (2010:35); Balland & Lindholm (2012:11)

These points indicate different degrees of application of postponement strategies in supply chains. Therefore, the location of the material decoupling point is often perceived as a primary tool to indicate the extent of the application of postponement strategies in supply chains. Postponement is an excellent example of a push-pull strategy (Simchi-Levi, Kaminsky & Simchi-Levi, 2008:190).

3. Methodology

This study was exploratory and descriptive in nature, based on a survey of light vehicle manufacturers in South Africa. The target population was light vehicle manufacturers [original equipment manufacturers (OEMs)] in the South African automobile industry (total target population: 7 OEMs). The study made use of the total target population (all light vehicle manufacturers in South Africa), because the study sought to obtain an in-depth understanding of the implications of postponement decisions on supply chain strategies. In South Africa, the automotive industry is the leading industry in supply chain practices (Supply chain

foresight, 2010). The industry is often referred to as a barometer for the health of the country's economy [7% of GDP for 2012 (Automotive Industry Export Council [AIEC], 2013)]. Vehicle manufacturers face enormous supply chain challenges, which include the adoption of cost reduction measures and service improvement (Supply chain foresight, 2007). The majority of companies in the industry do not only operate with low levels of collaboration, but are also not very market-sensitive or reactive to the changing market (Supply Chain Intelligence Report [CSIR], 2009). Therefore, an efficient and responsive supply chain strategy is required for South African automotive industry manufacturers who assemble different types of vehicles for local and international markets, in order to produce at a competitive cost and respond quickly and reliably to first-world market demands.

South Africa houses major international assemblers and manufacturers, including OEMs, from traditional manufacturing powerhouses in the USA, Japan and Europe, where key decisions about their manufacturing are made. Most of the global motor vehicle brand manufacturers are represented in South Africa. These include Toyota, BMW, Volkswagen, DaimlerChrysler, Nissan, General Motors, Ford (incorporating Mazda, Land Rover and Volvo) and Fiat. Some of the OEMs manufacture certain models locally for the local market, as well as exporting some of their production outputs. The South African automotive industry produces two broad categories of vehicles, namely passenger vehicles and commercial vehicles. Passenger vehicles are classified as A to D class, premium and SUVs, while commercial vehicles are classified as light commercial, medium commercial and heavy commercial. Passenger vehicles and light commercial vehicles are referred to as light vehicles.

One manufacturer may have various production lines, with different supply chain strategies for each. This is because supply chain strategies are unique to a production line and not the supply chain in general, as indicated by Fisher (1997). This study focused on one production line (models) for each of the manufacturers. In this regard, postponement decisions along the product line, manufacturing and decision drivers were investigated. The population for the study therefore constituted light vehicle manufacturers (passenger and light commercial vehicles), which were chosen, firstly, because this would incorporate all the automotive manufacturers in South Africa. Secondly, both categories of vehicle are used for personal purposes and therefore require distinctive features and characteristics.Purposive sampling was used in this study, with a focus on supply chain experts with competent knowledge of the supply chain processes in their organizations (senior supply chain managers). The basic criteria for selecting the respondents were, firstly, that the company was a local manufacturer of light vehicles in South Africa, and secondly, that the respondent was an employee in a senior SCM position in that company. In some companies, more than one respondent had to participate in the interview process, in order to complete the different parts of the interview questionnaire.

A total of twelve (N=12) in-depth interviews were conducted with six of the seven light vehicle manufacturers in South Africa. A semi-structured interview questionnaire was used to elicit the opinions of the respondents. The interviews were conducted at different manufacturers for a particular locally manufactured car (model). As indicated by Fisher (1997), a supply chain strategy is dependent not on a supply chain, but on a product (or in this case a model). Therefore, in this study, the interviewees who were senior supply chain managers had to identify a locally manufactured model (production line) on which the interview would be based. In this article, only the structured responses were analysed. The constructs in the structured questions were measured using a five-point Likert-type scale, where (1) is "strongly disagree" and (5) is "strongly agree". The data was analysed descriptively using the Statistical Package for Social Sciences (SPSS). Descriptive statistics were used to describe the main features of the data in quantitative terms (Gray, Williamson, Dalphin, 2007:44), and the results were presented in the form of mean value scores.

4. Findings and Discussion

This section of the article discusses the results of the study. As indicated in the literature review, supply chain strategies are based on a particular locally manufactured vehicle model or production line. The findings relating to strategies based on postponement decisions are interpreted for a particular model, and are not necessarily applicable to other models manufactured by the same company. The results of the study are firstly discussed based on the responses in relation to the postponement characteristics of the product as a

whole, and thereafter according to the various manufacturers. In addition, the findings are mapped to determine the alignment of postponement decisions to supply chain strategies.

Responses regarding postponement characteristics of the product: Statements relating to postponement were used to establish the relationship between manufacturing characteristics and supply chain strategies. A postponement strategy shows the position (decision point) where a strategy changes from one to another (from a lean to an agile supply chain). The respondents were asked to indicate their level of agreement with regard to the application of postponement by means of six statements, using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). For purposes of analysis, the following abbreviations were used: *SD* for strongly disagree; *D* for disagree; *N* for neither agree nor disagree; *A* for agree; and *SA* for strongly disagree. Table 1 below indicates the frequency distribution (in %) per statement.

Table 1: Responses regarding postponement characteristics

Statements	Percentage				
	SD	D	N	A	SA
Our strategic suppliers keep inventory in the form of modules, components and materials	0.0%	0.0%	0.0%	83.3%	16.7%
We keep fully assembled vehicles in stock (assembled vehicles)	8.3%	0.0%	8.3%	75.0%	8.3%
Our dealers keep fully assembled vehicles in stock	0.0%	0.0%	0.0%	66.7%	33.3%
We keep work-in-progress inventory to be customised for specific customer orders	16.7%	41.7%	16.7%	25.0%	0.0%
We only order modules, components and materials from our strategic suppliers when the customer specifications are known	16.7%	8.3%	0.0%	50.0%	25.0%
We make provision for the finalisation of some features to our vehicles at the dealership, based on final customer requests	33.3%	0.0%	8.3%	8.3%	50.0%

Table 1 reveals that all the respondents (100%) agreed that their strategic suppliers kept inventory in the form of modules, components and materials. Furthermore, the majority of the respondents (83.3%) agreed that fully assembled models of the vehicles were kept in stock. All the respondents (100.0%) agreed that their strategic customers (dealers) kept fully assembled vehicles in stock. More than half (58.4%) of the respondents disagreed that they kept work-in-progress inventory to be customised for specific customer orders, while only a quarter (25.0%) agreed. Three-quarters of the respondents (75.0%) agreed that modules, components and materials were only ordered from strategic suppliers when the customer specifications were known. More than half (58.3%) of the respondents agreed that they made provision for the finalisation of some features to their vehicles at the dealership based on final customer requests, while a third (33.3%) strongly disagreed. It is thus clear that strategic suppliers keep inventory in the form of modules, components and materials, and most manufacturers keep fully assembled vehicles in stock (83.3% agreement). Work-in-progress inventory is kept by most manufacturers, which indicates that a decision about final assembly is made at the manufacturer (decoupling point) based on final customer requirements. This implies the use of a lean and agile (leagile) supply chain strategy. Overall, the findings suggest that the majority of the respondents used some form of postponement, which indicates an element of agility, hence the use of a leagile supply chain.

Table 2: Responses regarding postponements by manufacturers

Statements	Mean level of agreement					
	E1	AM	E2	A1	A2	E3
Our strategic suppliers keep inventory in the form of modules, components and materials	4.00	4.50	4.00	4.00	4.00	4.50
We keep fully assembled vehicles in stock (assembled vehicles)	2.50	4.50	4.00	3.75	4.00	4.00
Our dealers keep fully assembled vehicles in stock	4.50	4.50	4.00	4.25	5.00	4.00
We keep work-in-progress inventory to be customised for specific customer orders	3.50	1.50	4.00	2.75	1.00	2.00
We only order modules, components and materials from our strategic suppliers when the customer specifications are known	4.50	3.00	4.00	2.75	4.00	4.50
We add some features to our vehicles at the dealership, based on final customer requests	1.00	3.00	5.00	4.25	5.00	3.00

Postponement decisions by manufacturers: To gain a further understanding of how different manufacturers apply postponement practices, the responses were analysed according to the mean level of agreement per manufacturer. Table 2 below presents the responses in this regard. For purposes of analysis, the following abbreviations were used: *E1* for European manufacturer 1; *E2* for European manufacturer 2; *E3* for European manufacturer 3; *AM* for American manufacturer; *A1* for Asian manufacturer 1; and *A2* for Asian manufacturer 2. As indicated in Table 2, all the manufacturers, in general, agreed that their strategic suppliers kept inventory in the form of modules, components and material (means of 4.00 to 4.50). European manufacturers 2 and 3, Asian manufacturer 2 and the American manufacturer agreed that they kept fully assembled vehicles in stock (assembled vehicles) (means of 4.00 to 4.50), while European manufacturer 1 disagreed (a mean of 2.50). All the manufacturers agreed that their dealers kept fully assembled vehicles in stock, thereby indicating a lean supply chain. European manufacturers 1 and 2 were the only manufacturers that kept work-in-progress inventory to be customised for specific customer orders (means of 3.50 and 4.00 respectively), while the other manufacturers disagreed in this regard (means of 1.00 to 2.75). Only the American manufacturer disagreed that it only ordered modules, components and materials from its strategic suppliers when the customer specifications were known (a mean of 2.75), while four of the other five manufacturers agreed (means of 4.00 to 4.50). Three of the manufacturers (European manufacturer 2, Asian manufacturers 1 and 2) agreed that they made provision for additional features for vehicles at the dealership based on customer requests (means of 4.25 to 5.00), while European manufacturer 1 disagreed in this regard (a mean of 1.00).

The results show that European manufacturer 1 did not keep fully assembled vehicles in stock, thereby indicating a MTO strategy (agile supply chain). Only European manufacturers 1 and 2 tended to keep work-in-progress inventory, which indicates the point where a lean supply chain changes to an agile supply chain. The results provide evidence of some form of postponement practice being adopted by the manufacturers. Therefore, although some supply chains were mainly lean, they may have applied some agile elements at different points in the supply chain. However, to determine the exact positions (side of the supply chain) of lean and agile (or leagile) supply chain strategies, the concept of postponement needs to be employed. In the leagile supply chain paradigm, lean and agile are combined within a total supply chain strategy, by positioning the decoupling point (DP) in order to best suit the need for responding to a volatile demand downstream, while providing level scheduling upstream from the DP. Postponement is used to move the DP closer to the end user and increase the efficiency and effectiveness of the supply chain. To determine the supply chain strategy on different sides of the supply chain for each of the models (production lines), the study also sought responses to questions relating to postponement. The four forms of postponement are full postponement (CTO), manufacturing postponement (MTO) and assembly postponement (ETO), which are all associated with an agile supply chain strategy; and full speculation (MTS), which is associated with a lean supply chain strategy.

The results relating to postponement revealed that, for all manufacturers, their strategic suppliers kept inventory in the form of modules, components and materials (100.0%). In addition, fully assembled vehicles were kept in stock by the majority (83.3%) and with their dealers by all respondents (100.0%). This shows that all the production lines engaged in full speculation based on projected forecasting, and therefore at least employed a lean supply chain strategy. European manufacturers 1 and 2 agreed that they kept work-in-progress inventory in stock to be customised for a particular customer, thereby indicating the decision-making or decoupling point (means of 3.50 and 4.00 respectively). These manufacturers thus employed a lean and agile supply chain strategy (leagile supply chain strategy), while most of the manufacturers followed a lean supply chain strategy. In general, all the manufacturers, except Asian manufacturer 1 and the American manufacturer (means of 2.75 and 3.00), agreed that modules, components and materials were only ordered when the customer specifications were known, which means that both lean and agile supply chains should be employed. European manufacturer 1 did not add some features to the vehicle at the dealership, based on customer requests (mean of 1.00), while European manufacturer 2 did this (mean of 5.00). The results indicate that, based on the postponement characteristics, both lean and agile (leagile) supply chain strategies should be implemented.

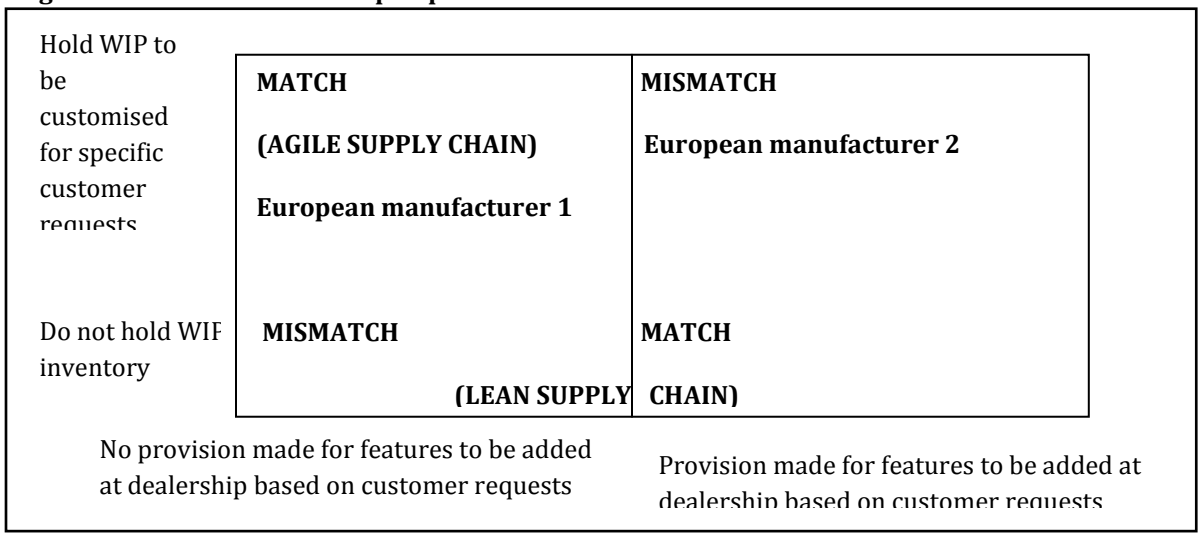
To determine the position in the supply chain where inventory is held (postponement exists) for each of the models, two characteristics, namely holding *WIP inventory* (MTO), and adding *some features at the dealership, based on customer requests,,* were used, as they depict different postponement points in the supply chain. Table 3below shows the alignment of postponement characteristics to supply chain strategies. For purposes of analysis, the following abbreviations were used: E1 for European manufacturer 1; E2 for European manufacturer 2; E3 for European manufacturer 3; AM for American manufacturer; A1 for Asian manufacturer 1; and A2 for Asian manufacturer 2.

Table 3: Aligning postponement decisions to supply chain strategy

Light Vehicle	Postponement characteristics	Mean	Forms of postponement based on manufacturing characteristics	Supply chain strategy based on forms of postponement
E1	WIP is kept to be customised for specific orders	3.50	Manufacturing postponement	Agile supply chain
	Some features are added to the vehicle at the dealership based on the final customer request	1.00	Full speculation	Lean supply chain
AM	WIP is kept to be customised for specific orders	1.50	Full speculation	Lean supply chain
	Some features are added to the vehicle at the dealership based on the final customer request	3.00	Full speculation	Lean supply chain
E2	WIP is kept to be customised for specific orders	4.00	Manufacturing postponement	Agile supply chain
	Some features are added to the vehicle at the dealership based on the final customer request	5.00	Full speculation	Lean supply chain
A1	WIP is kept to be customised for specific orders	2.75	Full speculation	Lean supply chain
	Some features are added to the vehicle at the dealership based on final customer request	4.25	Full speculation	Lean supply chain
A2	WIP is kept to be customised for specific orders	1.00	Full speculation	Lean supply chain
	Some features are added to the vehicle at the dealership based on the final customer request	5.00	Full speculation	Lean supply chain
E3	WIP is kept to be customised for specific orders	2.00	Full speculation	Lean supply chain
	Some features are added to the vehicle at the dealership based on the final customer request	3.00	Full speculation	Lean supply chain

As indicated in Table 3, the form of postponement for each model was determined from the characteristics and their mean scores. Thereafter, the supply chain strategy was identified based on the forms of postponement. It is clear from Table 3 that most of the models had the full speculative form of postponement, thereby indicating a lean supply chain strategy. On the other hand, European manufacturers 1 and 2 had manufacturing postponement, thereby indicating a leagile supply chain strategy. To further determine whether their responses were in line with practices, a portfolio matrix was developed. Figure 1below presents the portfolio matrix for postponement.

Figure 1: Portfolio matrix for postponement



If the WIP inventory has been customized at the time of manufacturing, there is little or no chance of features being added to the model, because it was done based on the customer's request. As indicated in Figure 1, all the manufacturers were correctly positioned, except for European manufacturer 2.This indicates that they kept WIP inventory to be customized for specific customer needs, and that some features were added at the dealership, based on customers' requests.

5. Conclusion

The purpose of this article was to determine the supply chain strategies of light vehicle manufacturers in South Africa based on postponement decisions. There are four major forms of postponement: full postponement (CTO); manufacturing postponement (MTO); assembly postponement (ETO), which are all associated with an agile supply chain strategy; and full speculation (MTS), which is associated with a lean supply chain strategy. Postponement decisions can be used to determine the exact positions (side of the supply chain) of lean and agile (or leagile) supply chain strategies through the decoupling point. Based on a survey of light vehicle manufacturers in South Africa, it is clear that strategic suppliers keep inventory in the form of modules, components and materials, and that most manufacturers keep fully assembled vehicles in stock. Overall, the findings suggest that the majority of light vehicle manufacturers used some form of postponement, which indicates an element of agility, hence the use of a leagile supply chain. The results also show that all the production lines engaged in full speculation based on projected forecasting, and therefore at least employed a lean supply chain strategy.

With regard to the specific light vehicle manufacturers used in this study, European manufacturers 1 and 2 kept work-in-progress inventory in stock to be customised for a particular customer (indicating the decision-making point or decoupling point). These manufacturers thus employed a lean and agile supply chain strategy (leagile supply chain strategy), while most of the manufacturers followed a lean supply chain strategy. All the manufacturers, except Asian manufacturer 1 and the American manufacturer, employed both lean and agile supply chain strategies. The article further suggests that if work-in-progress inventory has been customized at the time of manufacturing, there is little or no chance for features to be added to a model, as it was done

based on customers' requests, hence using a lean supply chain strategy.Based on the findings, it is therefore evident that postponement decisions drive the implementation of a supply chain strategy.

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The Role of E-Banking on the Switching Behaviour of Retail Clients of Commercial Banks in Polokwane, South Africa

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Abstract: This study focused on investigating the role of E-banking on the switching behaviour of retail bank clients in Polokwane, South Africa. Recently, studies have shown that people are switching banks more often than in the past. Circumstances that are beyond control cause people to switch. This has become a challenge in the banking industry as many banks lose their clients. However, newly developed technologies have brought many changes in the operation of banks. The new E-banking services have enabled bank clients to have access to their bank account for 24 hours without visiting the physical branch. A sample of 98 respondents was surveyed in Polokwane, South Africa using the convenience sampling technique. The cronbach alpha test was used to ascertain reliability of the findings. The findings reveal that demographic characteristics have much impact on the switching behaviour of commercial bank clients and acceptance of e-banking services. Switching factors such as bank charges, low interest rates on savings, promotion activities, location and switching costs were the major reasons for bank customers to switch banks.

Keywords: *E-banking, Customer Switching behaviour, Switching Barriers, South Africa's banking industry*

1. Introduction

Within the contemporary business environment, the propensity of financial service consumers switching service providers has significantly increased - buoyed by the competitive pressures arising from the deregulation of the banking sector by individual economies from the early 1980's to present day, economic integration associated with globalisation and more pertinently, advances in information and communication technology - ICT (Clemes, Gan & Zheng, 2007; Kura, Mat, Gorondutse, Magaji & Yusuf, 2012; Wu, 2005). The proliferation of electronic banking (E-banking) in the South African banking services sector has, since its introduction in 1996, become a major component of banking services and product delivery - debunking the traditional bank-branch oriented services (Addae-Koranye, 2014; Chavan, 2013; Wu, 2005). The utilisation of internet-based services and products within the South African banking sector is extensive and has been found to have a critical impact on the consumer behaviour of bank clients (Gouws, 2012; Redelinghuis & Rensleigh, 2010; Wu, 2005). This shift in consumer behaviour includes the subject matter of this paper, customer switching behaviour.

Customer switching is the undesirable effect of an increasingly innovative and competitive market in any service oriented industry, more-so in the South African financial services sector. The literature (Khan, Ghouri, Siddaqui, Shaikh & Alam, 2010; Pirzada, Nawaz, Javed & Asab, 2014) intrinsically links customer retention with the profitability of banking institutions. Khan et al. (2010) and Gouws (2012) consider customer switching to have a discernible antipodal relationship with the operating costs of organisations, as increased customer switching ultimately results in increased marketing and customer retention costs. To this end, Onditi (2013) argues that there is a golden thread between service features and customer loyalty, in relation to customer retention and organisational performance, respectively. The South African banking sector is highly competitive and is characterised as saturated by Chigamba and Fatoki (2011), who go on to ascertain that consumers are privy to unlimited switching options. The extent of technological innovation in the South African banking sector through e-banking and the subsequent impact on customer switching behaviour is a relatively novel discourse. This is so especially within a predominantly rural region such as Limpopo Province, South Africa. This study therefore, contributes to an improved understanding of e-banking as an antecedent of switching behaviour within the surveyed population. It is with this in mind that this study was conducted, particularly to establish the impact of e-banking on the switching behaviour of retail banking clients of commercial banks within the Polokwane City locale, which is the provincial capital of Limpopo Province, South Africa.

Aim, Objectives and Hypotheses: The aim of this research was to interrogate the role played by E-banking on the switching behaviour of commercial bank clients in the Polokwane City. The following were the objectives of the study:

- To examine the contribution of e-banking in customers' bank switching behaviour in Polokwane banking sector.
- To determine the extent to which bank customers are being affected by switching factors in Polokwane.
- To determine the extent to which e-banking provides switching costs.
- To determine the impact of the demographic characteristics on the customers' switching behaviour on e-banking.

In order to realise the aforementioned objectives, the following research hypotheses were tested:

Primary hypothesis

H_0: E-banking does not play a significant role on customers' bank switching behaviour.
H_1: E-banking does play a significant role on customers' bank switching behaviour.

Secondary hypotheses

H_o: The extent to which bank customers are being affected in by switching factors cannot be determined.
H_2: The extent to which bank customers are being affected by switching factors can be determined.
H_0: Switching costs on e-banking services are the barriers that retain customers from switching banks.
H_3: Switching costs on e-banking services are not a barrier in retaining customers from switching bank as e-banking providing low switching costs.
H_0: Demographic characteristics have no impact in the customers' bank switching behaviour and acceptance of e-banking.
H_4: Demographic characteristics have much impact in the customers' bank switching behaviour and acceptance e-banking.

2. Literature Review

Overview of E-banking in South Africa: The internet have revolutionised the contemporary global financial services market. In the case of the banking industry, the internet and its associated new technologies have resulted in the introduction of new web-based financial services products. This has increased innovation-based competition between financial services providers as consumers become more circumspect in their banking service choice (Clemes et al., 2007). E-banking is essentially the provision of financial services and products via electronic platforms (Addae-Koranye, 2014; Chavan, 2013; Chibueze, Maxwell & Osondu, 2013; Wu, 2005) – and these include automated teller machines (ATMs), internet banking and cell-phone banking. The benefits of which include: reduced transaction costs associated with banking; customer convenience; better financial management and; improved access to information for both clients and bankers (ibid). In the case of South Africa, one major banking group provides the following e-banking services:

Table 1: E-banking services provided by a major South African bank

Features	Telephone banking	ATM	Internet banking
Withdrawals			
Deposits			
Balance enquiries			
Interim statements			
Transfer of funds			
Cheque payments			
Stop orders			
Rates			

Source: Wu (2005)

It is important to note that before the advent of e-banking, the services outlined above required physical interaction between the bank and its clients. Therefore, probably the more important attribute of e-banking is that it made banking more convenient, more accessible and more importantly, significantly reduced the cost of doing business for banks and transaction costs for the consumer. This view is similarly expressed by Wu (2005). E-banking has to a larger extent been considered as a revolutionary force in South Africa's banking sector, expediting customer service and ensuring the efficiency for the financial services sector (Redelinghuis & Rensleigh, 2010). A South African banking industry survey by Price water house Coppers – PwC (2013) found that along with traditional retail and personal banking, e-banking is still a very important and competitive retail banking segment – with many banks realising significant revenue growth and profitability from e-banking products and transactions. Additionally, technology is considered to be a key catalyst in the innovation of the South Africa's banking sector, with the four largest banks in South Africa investing an estimated R3-R5 billion into electronic channels (PwC, 2013).

Customer switching behaviour: Khan et al. (2010) pointedly refer to customer switching as customer *defection or exit*. While, Pirzada et al. (2014) simply define switching behaviour by viewing the concept from two perspectives – switching which refers to making a shift, change or exchange, and behaviour which refers to taking proactive or reactive action to something. Gouws (2012) views customer switching behaviour as a form of customer attrition, which impinges on the competitiveness and profitability of South African retail banks in particular. From this simplified viewpoint, for the purposes of this paper bank customer switching behaviour may be characterised as the propensity of bank customers to change their banking service provider in reaction to or in anticipation of certain factors. The prevention of customer switching (customer retention) has increasingly become a significant competitive strategy within the banking industry as it costs significantly less to retain a customer than it is to recruit new customers (Clemes et al., 2007; Subramaniam & Ramachandran, 2012).

Empirical evidence on customer switching behaviour in the banking sector: According to Manrai and Manrai (2007), customer switching behaviour may be explained across four broad categories, personnel, environmental, convenience and/or financial. Relatedly, a review of literature on service switching by Clemes et al. (2007) found more in-depth evidence that certain industry specific factors contributed to customer switching behaviour: dissatisfaction; poor service and perception of quality were significant influencers in customer switching in the insurance, retail and banking sectors respectively. With specific reference to the banking sector the following salient factors are identified:

Table 2: Salient factors influencing customer switching in the banking sector

Authors	Factors influencing bank customer switching behaviour
Colgate and Hedge (2001)	Pricing issues (fee, charges, interest rate), service failures (mistake, inflexible, inaccessible, unprofessional), and denied services (denied loan, no advice)
Gerrard and Cunningham (2000)	Inconvenience, service failures, pricing, unacceptable behaviour, attitude or knowledge of staff, involuntary/seldom mentioned incidents, and attraction by competitors
Keaveney (1995)	Pricing, inconvenience, core service failure, service encounter failure, response to service failure, ethics, competition, and involuntary switching
Stewart (1998)	Facilities, provision of information and confidentiality, and services issues

Adapted from: Clemes et al. (2007)

As illustrated in Table 2 there are some common salient factors that may be considered to be generic in influencing banking customers to switch banks and these include: pricing of banking products and services (including switching costs); service quality (including turnaround time in services and products); banking facilities (convenient access to products and services) and; competition from other financial services providers (intensity of advertising, pricing and innovativeness). In their analysis of the determinants of customer switching amongst bank clients in Pakistan, Khan et al. (2010:105) from a convenient sample of n=302 customers from 20 major private banks found that there was a positive relationship between customer switching and an unfavourable perception of pricing, unfavourable bank reputation, unfavourable service quality, unfavourable perception of distance and, effective advertising competition. A negative relationship was found between switching costs and customer switching. Relatedly, Pirzada et al. (2014) in

their empirical study on the factors influencing the switching behaviour of Pakistani banking consumers found, based on data from a convenient sample of *n*=200 banking clients, a statistically positive relationship between customer switching behaviour and the following independent variables: bank branches (convenience of location & access); service quality and; profit and interest rates. In a study on customer switching behaviour in New Zealand's banking industry, Clemes et al. (2007) applied a Qualitative Choice Model of customer switching behaviour on a final sample of *n*=454 households - found that customer commitment had the strongest impact on the switching intention of banking consumers in New Zealand, followed by service quality, reputation and customer satisfaction respectively.

The impact of E-banking on customer behaviour: The literature reviewed (Chavan, 2013; Masocha, Chiliya & Zindiye, 2011), suggests that e-banking improves the overall customer satisfaction of banking clients over a wider geographical area including previously disadvantaged rural communities. Gouws (2012) identifies: regulatory changes (introduction of Basel III); technology shifts (increased investment in ICT platforms and processes); innovation (cost reduction driven e-banking channel modernisation) and; changing market dynamics (increasingly competitive retail banking sector) as the factors influencing the contemporary South African retail banking sector. With particular reference technology and innovation, in the South African context e-banking, according to a PwC (2013) survey, offers customers significant benefits which include: added convenience; transaction cost reduction; seamlessness, increased functionality and confidentiality, as well as; simplicity in banking. These benefits may be expected to positively impact on consumers and mitigate switching intention. Similarly, in the case of Nigeria, Chibueze, Maxwell and Osondu (2013) found that e-banking has expanded the country's banking sector, opening new distribution channels for banking services and products. To the best of our knowledge no empirical study has been conducted to examine the impact of e-banking on customer switching behaviour in the South African context.

3. Methodology

A quantitative study was conducted with the aim of generating computable data that would empirically address the aim of the study (Blumberg, Cooper & Schindler, 2008). However, the study employed the non-probability sampling approach to establish its study population. Non-probability sampling is increasingly being adopted by marketing oriented studies that are quantitative in nature (Mathers, Fox & Hunn, 2007). Although convenience sampling did not afford all bank account holders in the province an opportunity to participate in the study, the sampling technique is widely recommended for studies whose total population cannot be determined at the start of the study (Cooper & Greenaway, 2015:3). Convenience sampling, which focuses on accessing the easiest to reach population elements for the purposes of the study, was employed to solicit participation in the study (Mugera, 2013). As a result, 98 respondents were interviewed through the use of survey questionnaires at two popular shopping malls, namely Mall of the North and Savanna Mall located in the Polokwane Province of South Africa. The data generation instrument (questionnaire) used in this study was structured in three sections.

- Section A captured basic banking information and the usage of e-banking services;
- Section B captured information about the customers' bank switching behaviour and;
- Section C captured information about demographics.

Multiple choice, Likert scale, dichotomous, open and closed ended questions were used. A chi-square test of association was used with 95% confidence level. The Cronbach alpha test was used to test for the reliability of the research questions. In order to conclude on the reliability of the research questions, the Cronbach alpha had to be the value greater than 0.53.

4. Results

This section of the paper presents the findings of the study.

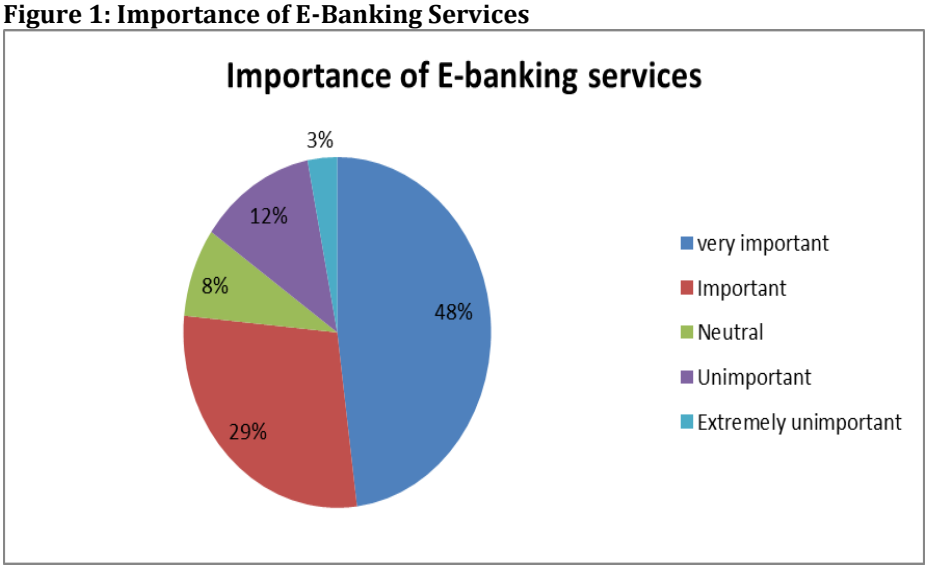
Demographic profile: The data on gender reveals that out of the total number of respondents, 51% were males and 49% were females. The majority of the respondents were younger than 30 years. The modal marital status was for single people with 71% of respondents whereas 20% were married, 5% divorced and 3% were widowed. The researchers strived to distribute the questionnaires in all racial groups as South

Africa's population is very diverse; however, the area where the data was collected is much dominated by Black Africans. Thus, 76% were Blacks, 10% Coloureds, 8% Whites and 6% Indians. The research established that 74% of the respondents were in possession of a tertiary education, while 9% and 17% had only acquired the primary or high school education, respectively. The majority of respondents were earning less than R10 000 per month. The income modal group was 0-R5 000.

Banking Profile of respondents: The findings on respondents' duration of banking, 1 year and 35 years represent the minimum and maximum period, respectively. Most respondents had been with their banks for 4 years. The average of banking patronage by the respondent was 8.55 years. Respondents were asked to select their bank of first choice and they were also asked to indicate whether or not they had accounts with other banks. The findings showed that Standard bank is the most utilised bank with 41% of respondents and followed by FNB 24%. The remaining 35% has been shared amongst by Absa, Capitec, Nedbank and Post bank with 12%, 13%, 8% and 2%, respectively. However, there were no respondents who banked with Investec bank. The majority of the respondents are holding accounts only with the bank of their first choice.

Usage of E-Banking Services: Figure 1 below reflects the findings when respondents were asked about the importance of e-banking in conducting their personal banking.

Figure 1: Importance of E-Banking Services



The study indicates that 77% of the respondents highlighted that e-banking was important in conducting their personal banking, 48% of them specifically considered it as very important. Only 15% of the respondents who highlighted that e-banking is unimportant, of which 3% of them considered it as extremely unimportant and 8% were neutral.

Table 3: E-banking Benefits

	Valid percentages %				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Reduces switching costs	13.3	28.6	41.8	15.3	1.0
Improves bank service quality	39.8	34.7	16.3	7.1	2.0
Increase bank information	26.5	38.8	21.4	10.2	3.1
Removes switching barriers	6.1	28.6	57.1	8.2	0
Provide cost effectiveness	22.4	40.8	22.4	13.3	1.0
Are secure and trustworthy	18.4	33.7	25.5	15.3	7.1
Minimize switching time	9.2	26.5	55.1	6.1	3.1
Ease account accessibility	40.8	16.3	32.7	9.2	1.0

Effective communication	32.7	29.6	26.5	8.2	3.1
Better self-management of finance	30.6	36.7	23.5	8.2	1.0
Easy and simple to use	48.0	38.8	10.2	3.1	0
Life-style compatibility	29.6	40.8	25.5	3.1	1.0
Ease use of ATMs of any bank	52	32.7	12.2	2.0	1.0
quick response to complaints	12.2	21.4	54.1	10.2	2.0

Impact of E-banking on Customers Switching Behaviour: The majority of the respondents agreed with the assertions that e-banking services reduced the cost of switching, improves bank service quality, increase information about the bank, are cost effective to them, are secure and trustworthy, allows bank clients to have an access in their account at any location with internet connection, makes them more comfortable to communicate with the bank, allows them to manage their finance, easy and simple to use, makes their lifestyle more convenient and enables them to use ATMs of any bank. However, the majority of respondents were not certain that e-banking removes the barriers for them to switch their banks and save time when switching to a new bank. The response of those who disagree with these perceptions was very low. This implies that e-banking services have the significant impact in the switching behaviour of retail clients of commercial banks. The diagram below (Table 3) indicates to what extent respondents agreed that e-banking services offered various benefits as outlined in the diagram.

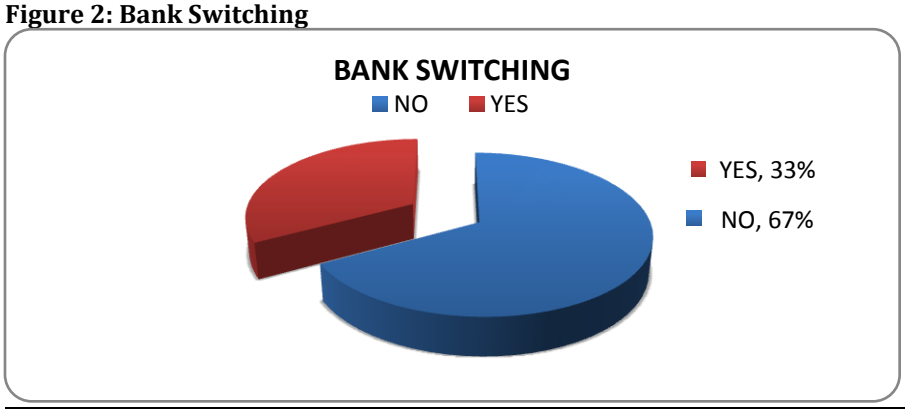
Table 4: Chi-square test results-Objective 1

	X^2-value	p-value
Removes the barriers for me to switch from one bank to another	66.0816	0
Save time when switching to a new bank	91.6939	0
Enables me to use ATMs of any bank	94.5510	0

The first null hypothesis stated that: E-banking does not play a significant role on customers' bank switching behavior. From the results shown above, each statement on what e-banking does for retail commercial bank clients has a p-value< 0.05 meaning H_0 is rejected and it can be concluded that e-banking does play a significant role on customers' bank switching behavior.

Switching Behaviour: Also respondents were quizzed if they switched their principal banks in the last 3 years and the following was found (see Fig. 2).

Figure 2: Bank Switching



The findings show that 33% of the respondents had switched their principal banks while 67% have not switched banks. The findings showed that males have switch banks than females. The findings also show that 67% of the respondents were non-switchers. However, 33% of respondents were switchers and were answering questions on why they have switched. However, in the 33% of the respondents who had switched banks, 20% were uncertain, 9% disagree, 2% agree, and 2% strongly disagree that their bank's online system was unreliable. However, the 67% of respondents who have not switched banks, 35% were uncertain, 11%

disagree, 6% strongly disagree, 10% agree and 5% strongly agree that their bank's online system was reliable.

Impact of bank charges and interest rates on customer switching: The responses of those who have not switched their banks showed that the majority of them have not switched banks because of low bank charges. However, the majority of respondents were not sure about the interest rates on savings account. The results indicated that 46% agreed, 8% were uncertain, 11% disagreed that their banks charged low fees while 4% strongly agreed, 21% agreed, 30% were uncertain, 10% disagreed and 2% strongly disagreed that their banks provided high interest rates on savings account. The results indicated that 20% agree that promotion activities from other banks had not influenced them to switch banks, of which 16% of them strongly agree. However, 15% were uncertain, 15% disagree and only 1% strongly disagree that they have not been influenced by the promotion activities from other banks.

The extent of switching and availability of bank branches: The majority of respondents agreed that availability of bank branches in their area is one of the factors that make them not to consider switching as a best option. In the case of relocation, those who have not switched disagree that it has an impact in changing banks. This means that though they have relocated but their banks are available in their immediate area.

Uncertainty about Benefits when switching to a new bank: The majority of respondents agreed that they had not switched to new banks because they were not sure that there are benefits they can receive. The results indicate that 9% strongly agreed, 17% agreed, 22% uncertain while 18% disagreed and 1% strongly disagreed that they were not sure about the benefits they will receive when switching.

Perception of switchers about switching costs: The majority of respondents were uncertain and some agree that they had switched banks because it would not cost them too much when switching to a new bank. The results indicated that 5% strongly agree, 10% agree, 15% were uncertain and 3% disagree.

Perception of non-switchers about switching costs: The secondary objective aimed at investigating about the extent to which e-banking services such as internet banking, Cellphone banking, ATM's, provide switching costs. The researcher was interested in investigated on whether e-banking services reduce or increase the costs of switching. The majority of the respondents were uncertain and some agree that they had not switched because of high switching costs to a new bank e-banking platform. The results indicated that 8% strongly agree, 12% agree, 29% were uncertain, 14% disagree and 4% strongly disagree.

Table 5: Chi-square test of results-Objective 1

	X^2-value	p-value
The bank's online system was unreliable	147.2041	0
The bank did not offer a wide range of service products	184.0000	0
The service products offered did not satisfy my specific needs	187.0612	0
The bank's online system is reliable	52.7347	0
The bank provides a wide range of service products	51.8980	0
The service products satisfy my specific needs	41.4898	0

The null hypothesis formulated in line with objective 1 states that: e-banking does not play a significant role on customers' bank switching behavior. From the results shown above, each statement on what banks provide through e-banking services for retail commercial bank clients has a p-value< 0.05 meaning H_0 is rejected and it can be concluded that e-banking does play a significant role on customers' bank switching behavior.

Table 6: Chi-square test of results-Objective 2

	X^2-value	p-value
The bank charged high fees	202.9796	0
The bank provided low interest rates on savings accounts	188.7755	0
The promotion activity of the competing bank influenced my decision to switch banks	188.4082	0

The principal bank branches in my area are closed	187.6735	0
I moved to a new geographic location and my principal bank is not in the area	186.0816	0
I am sure that I can receive additional benefits if I switch to a new bank	188.0408	0
The bank charges low fees	36.8163	0.000001
The bank provides high interest rates on savings accounts	50.5306	0
The promotion activity of the competing bank do not influenced my decision to switch banks	30.0816	0.000014
There are bank branches in my immediate area	52.2449	0
I have not moved to a new geographic location	29.1020	0.000022

The null hypothesis stated that: the extent to which bank customers are being affected by switching factors cannot be determined. From the results shown above, those who have switched together with those who have not switched their banks has a p-value< 0.05 meaning H_0 is rejected and it can be concluded that the extent to which customers are being affected by switching factors can be determined.

Table 7: Chi-square test of results-Objective 3

	X^2-value	**p-value**
It will not cost me too much to switch to a new bank	141.0816	0
It will cost me too much to switch to a new bank	38.4082	0

The null hypothesis state that: switching costs are the barriers that retain customers from switching banks. From the results shown above, statement of switching costs has a p-value< 0.05 meaning H_0 is rejected and it can be concluded that switching costs are no longer an effective strategy in retaining customers from switching bank as e-banking provides low switching costs.

Table 8: Chi-square test of association results-Objective 4

	X^2-value	**p-value**
Switching banks and gender	2.506	0.113
Switching banks and age group	13.697	0.008
Switching banks and marital status	6.656	0.155
Switching banks and race	8.404	0.038
Switching banks and level of education	2.539	0.468
Switching banks and income group	7.905	0.048

The null hypothesis states that: demographic characteristics have no impact in the customers' bank switching behavior and acceptance of e-banking. From the results shown above, gender, marital status and educational level in relation to banks switching have a p-value> 0.05 meaning they are insignificant. Thus, H_0 is not rejected and it can be concluded that demographic characteristic have no impact in the customers' bank switching behavior. However, income group, race, and age group have p-values <0.05 meaning that in this case H_0 is rejected and it can be concluded that demographic characteristic have much impact in the customers' bank switching behavior and acceptance of e-banking.

5. Discussion and Conclusion

Based on the analysed data, gender inequality among males and female with bank account exist although this gap promises to disappear as more women get educated and employed in high position. The tradition that females are expected to stay at home caring for the children whilst men go to work seems to falling apart. Young age groups dominate the banking industry and seemingly are more equipped on the usage of e-banking services. This primarily owes to the fact that many young people are educated and education has shown to be a contributing factor in the acceptance and adoption of e-banking. Thus, more educated people are; the more likely they utilise e-banking. Also income and the level of education have a positive correlation, meaning that people with higher education are likely to earn higher incomes. This contributes towards high

e-banking adoption levels. The data analysed highlights that the majority of respondents were those who have not changed their banks. However, this does not mean that these customers are still satisfied with their banks. Some continue to be loyal even though they are unsatisfied with their banks. This might be caused by the fact that they have been using these banks for a long time and are afraid to change after so long. The findings on the importance of e-banking are consistent with the research results of Masocha et al. (2011). This study found that the majority of people considered e-banking services as an important way of conducting their personal banking. The study also indicates that, responses on the banking methods such as internet banking and telephone banking showed that in a normal week the majority of respondents do not use these e-banking methods, respectively.

The demographics of this research are also consistent with some of the research results of Zhang (2009) conducted in New Zealand banks. In his study, he found that switching behaviour was most common with younger-aged and high educated bank customers. However, the results differ from some of the findings of Zhang (2009) who determined that higher income earners were the most likely to switch banks than low income earners. The findings about the impact of high price (e.g., bank charges, interest charges on loan) and low interest rates on savings accounts on customer switching behaviour are consistent with the research results of Keaveney, (1995); Colgate and Hedge, (2001); Dawes, (2004). However, the results on interest charges on loan differ from the findings of these authors because the majority of those who switched banks in the research findings were uncertain on whether they have switched because of high interest on loans. There are several suggestions that can be made specifically to the South Africa's banking industry concerning the problem of switching behaviour on e-banking podiums. First and foremost, the fees that banks charge from their customers have shown to be the biggest challenge that banks need to take into consideration. The empirical analysis revealed that the majority of those who switched banks strongly agree that high bank charges is one of the factors that cause them to switch. Secondly, another area of importance noted by respondents is that banks must improve their service quality in order to meet customer demands. Thirdly, innovation through the introduction of new e-banking services such as Cellphone banking, internet banking and electronic transfer at point of sale and withdrawals has shown a strong positive impact in the customer's satisfaction level with banks. Therefore, banks must ensure that they cut costs of providing these services.
Lastly, besides the areas that are highlighted in these recommendations, a lot can be learnt from the results obtained in the research. It is true that e-banking services have an impact in the banking industry. Thus, it is crucial for banks to consider factors that are prominent drawbacks in the usage of e-banking services such as client's lack of knowledge, insecurity and threats of technologies. It is evident that the majority of bank customers are still much relying on brick and mortar banks and this might be as a result of security in using e-banking methods and lack of knowledge on how to utilize e-banking services. Thus, banks need to consider the clients awareness and education on the new banking technologies. The sample used in this study was drawn from the Polokwane city population in South Africa. The demographic characteristics are a reasonable representation of the South Africa's population, the sample did contain a higher percentage of young people and a lower percentage of old people. Future studies should consider the demographic implications of their specific age group when they develop and examine the role played by e-banking in the switching behavior of retail clients of commercial banks. Researchers could then compare their results with the results of this study. In this study quota sampling was used and this sampling technique has many limitations that affect the representation of the findings. In quota sampling there is no randomness and the likelihood of bias is high. This has negative repercussion of failure to perfectly generalise the findings of the research to the whole population.

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A Review of the Macroeconomic Policy Frameworks adopted by the BRICS countries (2000–2015)

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Abstract: Recent development in the practice of macroeconomic policy has increased the importance of monetary and fiscal policy. Monetary policy within BRICS countries has shifted towards the setting of interest rates as the key monetary instrument, along with the adoption of inflation targets as key monetary policy objectives. It is well accepted that there is no one set of macroeconomic policies that guarantees sustained growth and development in the economy. However, the BRICS countries have been following a similar trend with regard to the exchange rate policy. This is shown by the fact that the BRICS countries have moved away from using a pegged exchange rate regime towards a managed floating exchange rate regime which is in contrast with the recommendations of the Washington Consensus. On the fiscal side, the BRICS countries agreed to spend only what is necessary in order to avoid the ballooning local government debt. Summarily, the BRICS countries have performed well economically and socially although there are still some room for improvement. However, there are still other BRICS members who have government debt that are well above half of their Gross Domestic Product. Alignment of policy regimes would strengthen the macroeconomic base of the BRICS. It is recommended that all BRICS members need prioritise inclusive governance that would checkmate social ills such as poverty, inequality and unemployment, while promoting social inclusion.

Keywords: *BRICS, Macroeconomic policies, GDP, Economic Growth, Economic Development*

1. Introduction

Currently, Brazil, Russia, India, China and South Africa are widely recognised as the world's most dynamically growing economies that have the potential to be the world's largest nations if everything goes as predicted by Golden Sachs experts in 2003. O'Neil (2001) argued that the growth potential of the BRICS countries can only be unleashed if certain macroeconomic policies are adopted in a well-coordinated manner that will promote economic growth and development. Although the BRICS nations are expected to be larger than the G6 countries in the next fifty years if Goldman (2003, P.05) predictions are correct, there are some known differences in macroeconomic policies that have been adopted by the different BRICS economies over the past few decades. Moreover, this could be due to the fact that each country has a unique population size with different cultural, financial and political background. These differences might provide an advantage for some BRICS nations in terms of growth and development potential and at the same time, provide a disadvantage for others. Nevertheless, Mtonga (2014) founded that the economic growth rates of the BRICS nations have slowed down over the past few years. This may be partly due to the 2008 global financial crisis as well as the problems or difficulties faced by each of these nations which may include the lack of coordination of macroeconomic policies in order to achieve sustained economic growth and development. However, , in the last couple of years, the BRIC economies have demonstrated swift economic progress so much so that the initial four comprising of Brazil, Russia India, and China are the four biggest economies outside of the OECD (Organization for Economic Co-operation and Development). These countries are the only developing countries with an annual Gross Domestic Profits of more than $1 trillion.

The main characteristic that the BRICS have in common besides their large populations is their status as fastest growing economies and their shared idea that they are the fastest growing nations that should have a significant impact on global affairs. Their significant impact on global affairs is further supported by the fact that the BRICS countries combined, have approximately over 40 per cent of the world's human resources and more than 15 per cent of the world's Gross Domestic Product. Although there is no one set of macroeconomic policies that guarantees sustained economic development, there are certain recommended set of macroeconomic policies that BRICS and other developing countries have adopted in order to achieve economic growth and development. For instance, the Washington Consensus recommended policies have been adopted by various nations in one way or another including some of the BRICS countries. However, the countries that adopted the Washington Consensus recommended policies performed poorly due to the 2008 global financial crisis implying that they were exposed to global shocks. Macroeconomic policies are

supposed to promote economic growth and development and at the same time, limit the exposure of a country to global shocks. This provides the underlying reasons as to why this mini-research article investigates whether or not the BRICS countries have been following the same trajectory with regard to macroeconomic policies for the past fifteen years. This will be done by examining the extent to which the monetary and fiscal policy frameworks of BRICS have differed.

2. Literature Review

The Washington Consensus which was coined by John Williams in the 90s and its Augmented version developed in 2003 proposed that (but not only), privatisation of public firms, decrease in budget deficit to non-inflationary levels, adherence to World Trade Organisation (WTO) disciplines, flexible labour markets, capital account opening, anti-corruption and redirecting government expenditure towards education and infrastructure as well as corporate governance may be a good starting point in the pursuit of growth and development (Herr and Priewe, 2005). As a result, many developing countries in Latin America and Africa started to adopt most of these macroeconomic policy recommendations. However, Herr and Priewe (2005) identified some disadvantages of the Washington consensus and argued that a relatively stable monetary system and a high quality currency with a sustainable balance of payment account are the key factors in achieving sustainable growth and development in a developing country. A stable exchange rate does not necessarily imply a fixed exchange rate but rather an exchange rate that does not vary too much especially due to international shocks (Herr, 2005). With regard to the downside of Washington Consensus, Ignoring the competitiveness of exchange rate markets by recommending a completely fixed or completely flexible exchange rate regime in a country was identified as one of the downside of the Washington consensus (Herr and Priewe, 2005, p.82).

In examining the impact of fiscal policy on growth, the potential reaction of the private sector needs to be considered. The Ricardian equivalence theory explains that an increase in government debt will lead to an equivalent opposite rise in private savings, since many economic participants will assume the need to repay higher taxes later in order to pay off the debt (Kraay, 2004). However, there is not much empirical evidence for Ricardian equivalence, so it remains mainly a textbook theory (Also see, Bernheim 1987). In fact, the actual observation is that government debt is rarely paid over. More usually, it is offset by higher levels of nominal Gross Domestic Product (GDP), which is the driving factor that tends to stabilize the ratio of government debt to GDP once the fiscal emergency that prompted the debt increases has ended (IMF, 2014).

Monetary Policy: A research conducted by Kraay (2012) in India founded that requirements of economic stabilization and development should be the main guiding forces that are used by the monetary authorities in determining the supply of money and interest rates in a developing nation rather than inflation targets that have been adopted by many developing countries. With regards to exchange rate policy, most scholars are of the opinion that developing countries in Asia, Latin America and Africa should select appropriate exchange rate regimes (free or managed Floating and fixed exchange rate systems) taking into account the competitiveness of exports as well as potential of attracting speculative attacks. Looking at the control of the external account, the World Bank (2013) suggested that developing countries should act cautiously in liberalizing their capital account and carefully consider the impact of tariffs on goods and services. Available statistics from most studies suggest that most emerging nations including Brazil, Russia, India, China and South Africa have adopted inflation targeting as their main, if not as one of their monetary policy objectives during the past few decades. Whereas the World Bank (2012) also founded that since the early 90s, many developing nation's monetary objectives have been shifted away from targeting money supply towards inflation targeting. However, Although inflation targeting has a well-known record of success in many developed and developing countries over the past few decades (IMF, 2012), Kraay (2012) paper shows that Inflation targeting has not achieved the expected results in many other developing countries especially in Africa where poverty prevails.

In explaining the failure of inflation targeting, the IMF (2014) paper ascertain that there are several requirements which are vital in determining the success (or failure) of inflation targeting as the main objective of monetary policy which might not be present in some countries. These prerequisites include a flexible exchange rate regime as well as full commitment to price stability (IMF, 2012). However, economists

have argued in the past decade that the requirements provided by IMF are simply starting points and are not sufficient for inflation targeting regime to succeed. No doubt, basic economic theory suggest that the most vital requirements for inflation targeting to succeed is a sound financial system and a reliable economic data for making credible forecasts. On the other hand, available statistics show that the failure of inflation targeting in some of the developing nations in Latin America was largely due to a lack of transparency of monetary policy and policy transmission. There is therefore no doubt, that opening a country's capital account in a sequenced pattern is important as well as accruing exchange reserves and achieving current account surplus or low deficit and argues that China is a perfect example. Furthermore, there is an on-going debate that other BRICS countries can learn a lot from China with regard to monetary policy issues. For example, huge central bank interventions and sterilization to preserve surpluses in the current account is one the major lessons that Brazil, India, Russia and South Africa can learn from China but did not clearly explain the exact central bank interventions the author referred to. On the other hand, huge central bank interventions need massive amounts of foreign reserves of which some developing countries may not have especially with regard to the unpredictable exchange rate oscillations.

Capital account opening, stable monetary and exchange rate regime, flexible labour markets, anti-corruption, sustainable balance of payments, reduced budget deficits to non-inflationary levels are some of the main policy endorsements for developing nations in their search of a sustained economic trajectory. In addition, Most of these recommendations are part of those prescribed by the Washington Consensus (2003) and to a certain extent, supported by International Monetary Fund (IMF), World Trade Organisation (WTO) and World Bank. The policies of these institutions to a very a large extent, are the main policies that many developing countries including Brazil and South Africa have adopted for more than two decades. However, these recommendations are not sufficient without other fiscal buffers for developing countries; rather we do recommend that other nations should learn from China and other Asian countries. Thus, most countries that embraced the IMF and World Bank policy prescriptions did not achieve minimum targets due to the 2008 world-wide financial crisis including some of the BRICS countries namely, Brazil, Russia and South Africa (Nassif et al., 2015).

Fiscal Policy: The basic tenants' of fiscal policy is the state's ability to use taxation to generate revenue and its expenditure in order to influence the aggregate level of economic activity and also to affect income distribution as well as the allocation of resources in the economy. In addition, IMF (2015) states that fiscal policy should promote economic growth with the use of macro and structural tax systems and expenditure policies. Various researchers and economists suggested that government expenditure should be increased on research and development, infrastructure and education especially in productive economies. Investing in human resources is greatly supported by the United Nations Economic Commission for Africa (2015). Skilled labour shortage issue in South Africa and other African nations can be addressed by increasing spending on education structures. In addition, the UN Economic Commission (2015) states that one of the major lessons that African countries (including South Africa) and other developing nations can learn from the success of East Asian countries (including China) is that Africans need to shift their traditional resource endowment and comparative advantages towards skilled and knowledge based structure by investing heavily on human resources. Therefore, government expenditure can play a vital role in the improvement of workforce skills.

On the Taxation side, The Davis Tax Commission (2014) argues that the issue of inequality which is a major challenge in Brazil and South Africa can be addressed by using a taxation system that is progressive with both vertical and horizontal equity. For instance, Individuals that earn lower income should pay a tax amount that is less than the amount paid by someone who earns higher income meaning it should be progressive. However, empirical evidence suggests that tax evasion in Russia is one of the major problems and corruption is high especially among government officials. Thus, in order to increase government tax revenue in Russia, the tax collection systems need to be enhanced. In Brazil, tax on the value of goods and services (VAT) is used as one of the major sources of government revenue although the VAT is famous for being regressive (IMF, 2013). The VAT is regressive in this context due to the fact that poor people might end up paying more VAT due to their expenditure patterns. In South Africa, Khamfula (2011) suggested that one fiscal solution that South Africa can implement in order to attract more foreign firms is to offer foreign investors substantial tax holidays or tax cuts. With regard to the issue of corruption, a study conducted by Rodrik (2003) founded that corruption has a strong positive relationship with growth in GDP per capita growth in China. This was also

supported by a comparative study conducted by OECD on sustainable governance indicators within BRICS which founded that China did not only lead in increasing GDP growth rates among BRICS countries but also corruption while South Africa performed well in revenue collection. It is highly recommended that developing countries embrace a stable taxation rule and spend where essential to foster development which would protect the poor. Hence, the general impact of taxation and expenditure policies must be progressive.

3. Content Analysis: BRICS countries

Monetary policy-Monetary policy and monetary instruments within BRICS: The BRICS economies work under different monetary policy systems. Brazil and South Africa have different inflation targets while china, India and Russia use multiple monetary target systems (BRICS report, 2014). The Brazilian monetary policy in the 2000s was always rooted in central bank's inflation targeting while maintaining a very dirty floating exchange rate regime and target for a substantial primary budget surplus (Weisbrot, Johnston and Lefebvre 2014, p.10). Brazil's monetary authorities implemented official inflation point target of 4.5 per cent in June 1999 (IMF, 2014). The point targeted inflation rate was reduced to 4 per cent in 2001 and 3.5 per cent in 2003 (World Bank, 2014). The main monetary policy instrument in Brazil is the overnight interbank interest rate also known as the Over-Selic rate. Open market operations are also used in Brazil but are the primary duty of Open Market Operations Department which is well known by the Acronym Demab. On the other side, the maintenance of financial stability and creation of conditions that are required to achieve sustainable economic growth are the main goals of Russia's monetary policy (BRICS report, 2014). However, Owen and Robinson (2003) argue that in the early 2000s, the monetary policy in Russia was directed towards controlling the inflation rate and also smoothing the fluctuations of the exchange rate. For instance, after the production collapsed in the late 1990s and the Russian 1998 crisis, the central bank acted quickly to solve the problems in the banking industry and also tried to quickly enhance the payment system. From 2012, the primary objective of the Russian central bank was to decline inflation to 5 per cent annual average (IMF, 2014). Open market operations (are used to affect interest rates); standing facilities and reserve requirements are the main monetary instruments that are used by the Bank of Russia (BRICS report, 2014). This is in accordance with the GAIDAR REPORT (2014).on Russian economy.

The main objectives of the Indian monetary authorities are to maintain price stability, promote the flow of credit towards the productive sectors and achieve more inclusive economic growth (World Bank, 2014). However, International Financial Statistics paper published for the International Monetary Fund in (2010) states that monetary policy in India evolved with the rising current and capital account liberalisation, financial sector liberalisation and changing patterns of credit requirements (IMF, 2014). In addition, India adopted a multiple approach strategy in 1998 and growth in money supply is primarily used as an indicator of monetary policy measures. Central bank of India introduced a liquid adjustment facility in order to facilitate short term liquidity and provide a clear signal of short term interest rates that may be consistent with policy objectives (BRICS report, 2014). The reserve bank of India currently uses a combination of large market borrowings (sales of bonds and other securities) and strategic open market operations. China also uses a multiple approach strategy as its monetary framework. Wang and Handa (2007) state that, during the period 1993-2003, the People's Bank of China Adjusted the interest rates with the aim of targeting inflation and smoothing output. From 2004, the goal of the monetary authorities in China is to sustain the stability of its currency value without discouraging economic growth (IMF, 2014). The monetary policy instruments used by the People's Bank of China (PBC) include the reserve requirement ratio, central bank base interest rate, rediscounting, central bank lending, open market operations, and other policy instruments specified by its State Council (BRICS report, 2014). The monetary policy committee in China advises the People's Bank of China in the formulation and adjustment of monetary strategies through its various monetary instruments. In addition, the committee also provides advice on monetary policy targets for a certain period as well as application of monetary instruments (BRICS report, 2012).

The main duty of the South African monetary authority commonly known as the South African Reserve Bank (SARB) is written in the country's constitution as the protection of the value of its currency with the main interest of achieving balanced and sustained growth in the nation (BRICS statistical report, 2015). However, the official inflation target range of 3 to 6 per cent was announced in February 2000 by its minister of finance (National Treasury, 2012). Prior to that, Khamfula (2011, p.15) explain that the path to long term economic

growth was targeted by introducing macroeconomic policies aimed at reducing fiscal deficits, decreasing inflation, promoting exchange rate stability, declining barriers to trade as well as liberalising capital flows which are similar Washington Consensus policy recommendations. The South African Reserve Bank uses repo rate adjustments, open market operations and reserve requirement as its monetary instruments. The adjustments in the interest rates are mostly used to achieve the targeted inflation interval (SARB, 2014). The discussions on monetary policy objectives of BRICS reflect that these countries have a shared interest in price stabilization through some form of inflation targeting. Russia has made several changes with regard to the objective of its monetary goals while Brazil has decreased its point targeted inflation rate. The main concern of SARB has been to maintain inflation rate within its target range of 3 to 6 per cent while Chinese monetary authority sometimes uses interest rates to indirectly affect prices within the country. In India, interest rates are used to reflect the prospective objective of monetary policy and credit creation measures are signalled using the interest rates.

Exchange rate policy and financial accounts within BRICS: Brazil is known as one of the nations that have followed some of the macroeconomic strategies that are part of the Washington consensus (Fisher, 2001). These strategies include (but not only) liberalisation of trade, promotion of foreign direct investment, deregulating domestic financial markets and trade as well as price stability. The pegged exchange rate regime which was used in Brazil during the early 1990s resulted in a decline in the value of its currency and made imports more expensive (Frenkel, 2006). Currency crisis in Brazil was experienced in 1999, which led the country to adopt a floating exchange rate regime together with inflation targeting (IMF, 2006). Further declines in the regulations of financial markets were also experienced which mainly focused on decreasing the restrictions on foreign investor's participation in security markets (de Paula, 2012). Output drop in Russia was experienced during the 90s mainly due to the transformation of the economy from a command to a market economy (IMF, 2012). This was reflected by the privatisation of public firms, quick process of financial and trade liberalisation (de Paula, 2012). At that time, monetary policy authorities had to decrease the ballooning inflation rate which was 300 per cent in 1994 (de Paula, 2012). In addition, the exchange rate was kept pledged within a corridor (de Paula, 2012). After the 1998 crisis, Russia adopted a floating exchange rate regime that is administered by the relevant authorities in the context of capital account that is partly convertible (IMF, 2014). The objective was to obtain foreign reserves that will assist in preventing the rapid growth in exchange rate and maintaining it to manageable levels. Arezki et al. (2012) also supports these findings.

The IMF (2001) founded that the period from 1991 to 1997 in India reflected a period of dramatic liberalisation of trade. At the same time, the exchange rate regime in India was also shifted from being pegged to more of a controlled floating exchange rate (de Paulo, 2012). The flexible exchange rate system in India is also supported by the role that the reserve bank of India plays in the exchange rate market (IMF, 2014). This role includes the avoidance of huge transactions that would raise the volatility of the Indian currency. The IMF (2014) research publication also adds that the reserve bank of India also participates in the spot markets as well as in the market for derivatives. On the other hand, volatility of the exchange rate in India is relatively lower when compare to its counterparts that also adopted the floating exchange rate system (de Paulo, 2012). The Indian real exchange rate has been relatively stable however, the nominal exchange rate has devaluated. de Paulo (2012) further argues that interest rates in India have been sometimes used to affect the exchange rate and this has sometimes resulted to unpredicted swings in domestic interest rates.

Various researchers including IMF (2012) state that during 1985 and 1993, China had a floating exchange rate and that foreign direct investment was greatly encouraged. The official adoption of a managed exchange rate system was adopted in 1994 in china (de Paulo, 2012, p.15). However, some evidence of a fixed currency regime is shown by de Paulo in his research article published in 2002. The aims of the exchange rate systems adopted in china are also argued to have varied throughout different time periods but mostly aimed to maintain the independency of its monetary authorities, encouraging firms to avoid too much international risk, sustaining current and financial account equilibrium and promoting a stable exchange rate (IMF, 2012). On the other hand, the country also maintained control on exchange rates transactions with the aim of trying to avoid being damaged by the international financial crises. Sometimes citizens were encouraged not to take part in the money, derivative and stock market but could only purchase certain amount of shares.

South Africa has an uncontrolled exchange rate system also known as a floating exchange rate (SARB, 2016). Although the floating exchange rate is assumed to be determined by the demand and supply in theory, the South African reserve bank has played a part by purchasing and selling other currencies in the exchange rate market (IMF, 2014). The floating exchange rate system was first adopted in the 1980s and 1990s in South Africa whereby the monetary authorities of the country addressed stabilising measures in the country's exchange rate market (Van der Merwe, 1996). During the period from 1985 to 1995, a dual exchange rate system was used which involved a free floating exchange and a managed floating exchange rate (Mtonga, 2011, P.04). Mtonga (2011, P.04) also states that a managed floating exchange rate system was adopted in 1995 till 2000 and since then a free floating exchange rate regime (with inflation interval being targeted) has been adopted. The exchange rate in South Africa has mostly depreciated after inflation targeting was adopted in 2000 (IMF, 2014).

Fiscal policy: Fiscal plan is generally about the state's ability to use taxation to produce revenue and it's spending in order to impact the aggregate level of economic activity and also to effect income spreading as well as the sharing of resources in the economy. In addition, fiscal activity can be measured by observing at a country's government deficits, borrowings, taxes and its expenditure. As in many other countries, fiscal policy has also been another policy concern in the BRICS members and many other countries have been challenged with increasing fiscal deficits as well as public debt (IMF, 2014). This reflects that government revenue has not been enough to cover government expenditure in many developing countries. The BRICS summit held in Toronto in 2010 resulted in BRICS leaders agreeing to adopt responsible economic strategies, declining fiscal deficits and preventing the ever rising public debt of the respective governments (BRICS report, 2014). However, if the budget deficits are to be decreased by all BRICS members, it theoretically means revenue has to increase or expenditure must decline. Hence, one cannot change one fiscal variable without considering the impact it might have on the other (trade-off). Tax reforms have generally been driven by the need to provide a fiscal environment that is more conducive to investment, risk-taking and work incentives, while also improving the fairness, simplicity and transparency of the tax systems (OECD, 2007).

Gross Dept to GDP ratio within BRICS: Government borrowing is widely accepted as a key fiscal component in economic theory and practice especially since government's revenue seems to be inadequate to finance its expenditure. In fact, government borrowing is a worldwide fiscal consideration in that even the well developed and under-developed economies may use it to finance their expenditure (BRICS Report, 2014).The BRICS Nations are no exception with regards to net borrowing countries. In 2000, gross debt of general government (as GDP percentage) of Brazil was 66.7 per cent and slightly declined to 66.1 per cent in 2010 (International Monetary Fund, 2014). This is way above the general government debt of 40 per cent of GDP as suggested by the New Labours Approach. During the same period, gross debt to GDP percentage of Russia greatly declined from 59.9 per cent in 2000 to only, 9.9 per cent in 2010 while in India it was 71.4 per cent in 2000 and fluctuated till it was 69.2 per cent in 2010. On the other hand, the gross debt to GDP of the Chinese government was 16.4 per cent in 2000 and slightly increased to 17.7 per cent in 2010. In South African government had 42 per cent in 2000 and its debt to GDP ratio declined to 35.7 per cent in 2010 (IMF, 2014). Our contextual analysis is in agreement with the Bricks Report (2012) published by Oxford University Press. The trajectories in both analysis are the fairly the same. These observations show that the BRICS governments are indeed different and follow different steps as far as borrowings are concerned. In fact, most of the BRICS nations have decreased government borrowing since the year 2000 except China. Currently, Russia and China have debts that are way less than 40 per cent of GDP.

Taxes and government revenue: Looking at public revenue, 19 per cent of revenue of the general government of the Russian federation came from company taxes in 2000 and has fluctuated till it decreased to only 9 per cent in 2014 (World Bank, 2014). Income tax of citizens accounted for 8.2 per cent of total government revenue in 2002 and increased to 10.2 per cent in 2014 (BRICS statistical report, 2015). However, de Paula (2012, p.09) states that the state inability to collect taxes is one of the major reasons of the Russian financial problems. On the other hand, 51 per cent of Indian government revenue was from taxes in 2000 and this percentage has increased 61 per cent in 2013 (BRICS statistical report, 2015). However, de Paulo (2012) argues that the liberalisation of Indian capital account was also accompanied by a decline in import taxes. 84 percent of Chinese total revenue came from taxes in 2007 but this percentage has declined to 74 percent as of 2014 (BRICS statistical report, 2015). It is also worth noting that Value added tax was

adopted in 1994 in china and accounts for more than half of all revenues in Chinese government revenue. However, many scholars have argued that Brazil may be one of the world's most fiscal decentralised nations with sub-national government responsible for collecting taxes. Tax rates are generally viewed as high in Brazil (BRICS statistical report, 2015). Similarly, Tax is the main source of government revenue in South Africa (National Treasury, 2014). However, income tax in the country plays a role in addressing the problem of inequality in that those who earn higher incomes are taxed more and a proportion of these funds are redistributed to the poor citizens of the country in the form of social grants systems. South Africa Revenue Services commonly known as SARS collects all taxes centrally,

The fiscal policies adopted by BRICS nations reflect that all five nations have implemented some measures aiming at decrease their budget deficits especial after the 2008 global financial crisis. Brazilian fiscal authorities committed themselves to trying to maintain a primary budget surplus based on the guidelines that are stipulated every year. At the same time, India also plans to decrease its fiscal deficit. On the other hand, China has showed some relative changes in its budget expenditure which may reflect that a decline signals an attempt to decline deficits and public debt (IMF, 2015). From the 1990s, budgeting in South Africa has been made more transparent by publishing medium run government estimated expenditures over 3 year periods (BRICS report, 2014). Russia has actually taken steps to decrease its fiscal deficits, shown by a sharp decline in public spending over Gross domestic product ratio (BRICS Statistical report, 2015).

Economic outcomes of Macroeconomic policies within BRICS: A review of Brazil's macroeconomic trajectory performance from 2002 to 2012 suggests a huge impact on the reduction of poverty and inequality. Despite being extremely unequal, Brazil has reduced inequality the most over the past two decades (World Bank, 2015). Taxes are widely accepted as one of the strategies that countries can use to decrease income inequality. However, the introduction of *Bolsa familia*cash transfers from government to the poor citizens in 2003 have been adjudged by many as contributing greatly to the reduction of poverty in Brazil, but also created excessive demand for goods and services which might be the reason Brazil has been battling with inflation. Research conducted by the International Monetary Fund suggests that inflation in Brazil is generally demand driven as stated in standard macroeconomics theory and can be corrected with macroeconomic policies. On the other hand, India has since independence been a traditional mixed emerging economy with substantial private sector participation. Federal State Statistics Service (2015) is in agreement that fiscal policy in India have been planned and executed in framework alike to those of other capitalist economies where unintentional joblessness is high and economic processes have to be used to motivate real demand. However, 1991, is regarded by many economists as the shifting point for India's economy, because of the major policy shift through structural adjustment programs. Policy changes were effected across major sectors, which opened-up the economy for outside involvement in the form of foreign capital and technology.

Available statistics indicate that from 1991 to 1997, China followed a tight fiscal and monetary policy framework. However, between 1985 and 1986, after economic growth reached above 12 percent, China also adopted tight fiscal and monetary policies on account of strong investment inflows. Nonetheless, the later period was the first time the government used fiscal and monetary buffers in macroeconomic-controls. In addition, according to Sala-i-Martin (2002) the government reduced interest rates and expanded money supply at first to revive the economy, but saw a record high inflation rate of 21.7 percent in 1994. On the other hand, the foremost experience in the Chinese economy during the mid-1990s was that the government implemented policies in order to achieve non-inflation growth. This was achieved by curbing price hikes in the system and this subsequently maintained money supply growth and fiscal outlays within a moderate range. Nonetheless, Chinese economy did experience rapid economic growth with massive government intervention and currently has socialist democratic political system (United Nations, 2015). The most obvious symptom of Russia's economy is high inflation (World Bank, 2009). In addition, the Russian ministry of finance argued that the long lived decline in Russia's output is hardly due to a lack of monetary and fiscal policy measures. For instance, a firm that would be profitable in free markets face severe capital market constraints and heavy taxation in Russia. In addition, Dollar and Kraay (2002) argue that firms in Russia face great difficulty in borrowing to finance working capital ever since the early 90s. Nonetheless, ever since the fall of Old Soviet Block, most of Russian macroeconomic policy frameworks have been directed towards the sale of state owned enterprises and participation in the Global markets.

South Africa has continued to manage public finances in a counter cyclical manner to support long-run fiscal sustainability (South African Reserve bank, 2014). The contraction of the combined government balance has been sustained over the medium-term spending framework. This has been done through a control in the growing of expenditure and a recovery in revenue in line with the economic cycle (The BRICS report, 2014). The public sector has been used to sustain large-scale infrastructure projects to address transportation, water, and energy sector bottlenecks. Social income awards provide a safety net for the poor, while initiatives to support job creation have been intensified (the BRICS report 2014). South Africa's investment proportion has increased strongly over the past decade as government and public corporations have stepped up infrastructure investment, but overall asset outlay is constrained by low reserves (BRICS statistical report, 2015).

4. Conclusion and Recommendations

This paper aimed to provide a comparative analysis of macroeconomic policies adopted by the BRICS countries for the past fifteen years. Based on the research presented, it is clear that the BRICS countries have some form of inflation targets as the objective of their respective monetary policy. In addition, the article also showed that since the year 2000, all the BRICS countries have a floating exchange rate regime with some central bank participating in the Foreign Exchange Market in order to protect the value of the currency. On the Fiscal Side, the research presented has showed that all the BRICS governments have taken several steps to decreasing government borrowing and deficits especially after the 2008 Global crisis. In addition, Tax collection schemes seem to have improved in Russia and China although tax evasion is still a major challenge. Based on the results, Brazil, China and South Africa rely heavily on taxes for generating government revenue and China has taken some steps to find other sources of income.

Although the BRICS countries have performed well with using their monetary and fiscal policy, the seems to be some existing domestic, social and economic problems such as corruption, poverty, inequalities, absence of proper health care and educational facilities to mention a few. These are some of the issues that can be dealt with using both fiscal and monetary policies. Specifically, the following polices are recommended for the BRICS:

- It therefore follows that the BRICS countries should align the two policy regimes because of current macro challenges. Each of the regimes should be tailored to address a specific problem especially where it concerns structural impediments. An interesting move seems to be happening at the international space to the disadvantage of some of the BRICS countries. Thus, addressing systemic and structural deficiencies would be a step in the right direction for the BRICS. This will positively influence structural deficiencies neglected in the past. A realignment of fiscal regimes is considered necessary for the BRICS in terms of increasing their tax base instead of cutting social expenditure. Howbeit, a reallocation of government expenditure from current to capital expenditure would provide opportunity for tackling structural deficiencies
- South Africa in particular needs to change the unsupportive international climate as wells address domestic challenges. This could be achieved by a stricter management of public debt by member countries of BRICS. A further increase in the trend could lead to a credit rating downgrade to junk status, which would hurt the economies of the BRICS members.
- Monetary policy should lean towards being accommodating to partially compensate for a contractionary fiscal policy for the BRICS, which would stabilize government finances in the short and medium term.

Pockets of inequality and poverty are obvious among the member countries. It has therefore become imperative that an inclusive economic agenda be adopted across board to tackle unemployment and poverty. This wills positively impact on social inclusion. Lending for infrastructure development purposes need to be encouraged within the BRICS partnership by promoting the objectives of the BRICS bank in order to assist some of the BRICS members. There needs to be a development of proper channels that aim to deal specifically with the conflicts or disputes that may arise within the BRICS country in the future. Also, these channels might assist in protecting vital information from leaking into the hands of international speculators that can harm the growth prospects of the BRICS. All BRICS members should be encouraged and supported by other

partners to promote and maintain economic stability. The rural/urban disparities within each BRICS country need to be addressed by partnering with private sector. There is therefore a need for effective participation of citizens of member countries in the public discourse, role and debate of the role of BRICS within the international arena. This will further highlight the contemporary issues and opportunities for each member country.

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The Current Zimbabwean Liquidity Crisis: A Review of its Precipitates

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Abstract: The liquidity crisis has beleaguered banks and has been bedeviling companies since 2009, after the introduction of the multi-currency system which has affected the Zimbabwean economic development. This research paper aims at investigating the causes of the liquidity crisis faced in the Zimbabwean economy. The study used survey design and researcher administered questionnaires in collecting data from the respondents located in Harare, Bulawayo, Gweru and Masvingo. Out of the 200 questionnaires issued, 150 were successfully completed and returned resulting in a response rate of 75%. The study also used secondary data obtained from government agencies on export and import performance. SPSS AMOS was used to test the hypothesis raised and generate a path model determining the size and strength of the direct and indirect influence between the predictor variables and the downstream variable. The study identifies the following antecedents of liquidity crisis; public and investor confidence, country risk, and externalization of funds, illicit financial flows, and net export performance as significant drivers that have an effect on the current liquidity crisis. The results showed that the absence of the lender of last resort role by the central bank has no significant contribution to the liquidity crisis currently obtaining. It is recommended that the government focuses on the aforementioned antecedents in order to address the liquidity crisis.

Keywords: *Liquidity crisis, risk, Monetary and financial policy, Zimbabwe*

1. Introduction

The liquidity crisis which is differently referred to as credit crunch/financial crisis or meltdown is identified by a shortage of physical cash, lending funds, banks could be running out of cash, defaults, layoffs, bankruptcies and failing financial institutions among others. The liquidity crisis has been a problem in the Zimbabwean economy for quite some time. The country formally introduced multi- currency in 2009 as a strategic move to ease the economy which was choked by the Zimbabwean dollar. In the pre-"dollarization" period we find banks such Genesis, Tetrad, Royal, Trust and Allied collapsing. After the introduction of the multi-currency we find banks such as Interfin Bank, AfrAsia Bank Zimbabwe Limited, Renaissance merchant bank, Capital Bank and Royal Bank also going down the drainage. Liquidity risk is the epicenter of Zimbabwe economic recovery and it remains under the purview in the banking sector (Chagwiza, 2014), Liquidity crisis is the panacea to bank survival in the Zimbabwean economy (Chikoko and Pierre, 2012). The liquidity squeeze is directly felt by banks in the economy while other institutions and companies indirectly perceive the crisis. According to the Reserve Bank of Zimbabwe, (2016) as at 30 June 2016, the banking sector average prudential liquidity ratio was at 52.47% which is above the regulatory minimum requirement of 30%. This paper investigates the causes of the liquidity crisis faced in the Zimbabwean economy. Unlike previous studies by Chikoko and Pierre (2012) and Chikoko (2014) which focused on management of liquidity risk among commercial banks in the Zimbabwe, this study focuses on liquidity crisis which is an under researched area in Zimbabwe. The paper is organized as follows; it briefly explains liquidity crisis, theoretical and conceptual framework of the study. A conclusion is made based on the findings of the study and recommendation to improve.

2. Literature Review

Definition of liquidity crisis: According to Borio & Drehmann (2009) a liquidity crisis is the negative financial situation characterized by a sudden and prolonged evaporation of both market and funding liquidity, lack of cash flow, with potentially serious consequences for the stability of the financial system. It is also referred to as an acute drying up or shortage of liquidity in the real economy, which could show a fall in the prices of assets below their fundamental price, reduction in market participants or difficulties in trading assets (Amihud, Mendelson and Pedersen, 2013; Brunnermeier, 2009).

Liquidity challenges: Liquidity crisis has its roots in the hyperinflation era and was first mostly pronounced in January 2004 and subsequently, the liquidity crisis then saw the collapse of the Century discount house on January 3 2004 (Iqbal et al., 2012; Muneer & Rehman, 2012; Kairiza, 2009). The fall of Century Discount House led to the liquidity crisis especially to indigenous banks through a contagion effect which was later only partially mitigated through the prescription of the Troubled Bank Fund by the central bank. A decade-long economic collapse in Zimbabwe resulted in massive company closures and loss of jobs for the majority of Zimbabweans, seriously diminishing their ability to service their loans. Research by Mabvure, Gwangwava, Faitira, Clifford, & Michael (2012) on non-performing loans in Zimbabwe, using a case study approach to certain banks, show that bank liquidity had been on a steady decline in Zimbabwe since 2009 owing to a significant rise in nonperforming loans. The limitation of their study was that it did not carry out a statistical test to prove the association between non-performing loans and the ensuing liquidity crisis. A study by Nhavira, Mugocha, & Mudzonga (2013) on financial regulation and evaluation analysed the performance of all banks and equally found that high levels of nonperforming loans have negatively affected on the liquidity and capitalisation of the banks. No evidence of inferential analysis is shown.

Repatriation of export receipts is critical for liquidity, especially where a country has adopted foreign currency as its main currency as in the case of Zimbabwe which uses the United States dollar. Research by the Reserve Bank of Zimbabwe has shown that a number of institutions operating in Zimbabwe have externalised the US dollar in offshore accounts for speculative purposes and fear of the return of the Zimbabwean dollar or bond notes. The Reserve Bank of Zimbabwe (RBZ), in its monetary policy statement for January 2016 reported that in excess of $684 million in funds were externalised by citizens in 2015 alone whilst in excess of 1.2 billion dollars exports receipts were externalised by firms. Research into the underlying causes of the liquidity crisis in Zimbabwe has also centred on export and import performance of the economy. Research by the RBZ (2016), IMF (2016), Kramarenko et al. (2012) and Mashakada (2016) indicates that the strengthening of the United States dollar as a result of a hike in interest rate led to a decline in commodity prices, a development that undermined export receipts which then ultimately negatively impacted on liquidity conditions in Zimbabwe. Given that Zimbabwe's economy is anchored on commodities such as gold, platinum, tobacco and recently diamond, among others, its economy suffers greatly when such commodities perform poorly on the international market. The stronger US Dollar (RBZ MPS, 2016; Chikoko, 2013) also led to increased demand for cheaper imports leading to higher outflows as a result of the switching effect of the appreciation. Closely linked with a dampened export performance and increased imports has been a worsening Balance of Payments (BOP) position. In its 2010 and 2016 country reports on Zimbabwe, the International Monetary Fund (IMF) noted that Zimbabwe had been experiencing a deteriorating BOP position that led to a reduction in the banks' foreign assets and culminated in structural liquidity pressures. The limited external inflows fuelled the already tight liquidity conditions in Zimbabwe. Similarly, Mashakada (2016a) identifies the deteriorating trade deficit resulting from a depreciating Rand as a significant contributor to the liquidity crisis. This is corroborated by Kararach et al. (2010) who, in their study on currency options in Zimbabwe, found that the 'dollarization' of the economy, despite stabilising a hyperinflationary pre-dollarization crisis emanating from economic mismanagement, triggered liquidity challenges. Liquidity generally should be hinged on good economic activity that generates output for both domestic and foreign consumption thus creating liquidity.

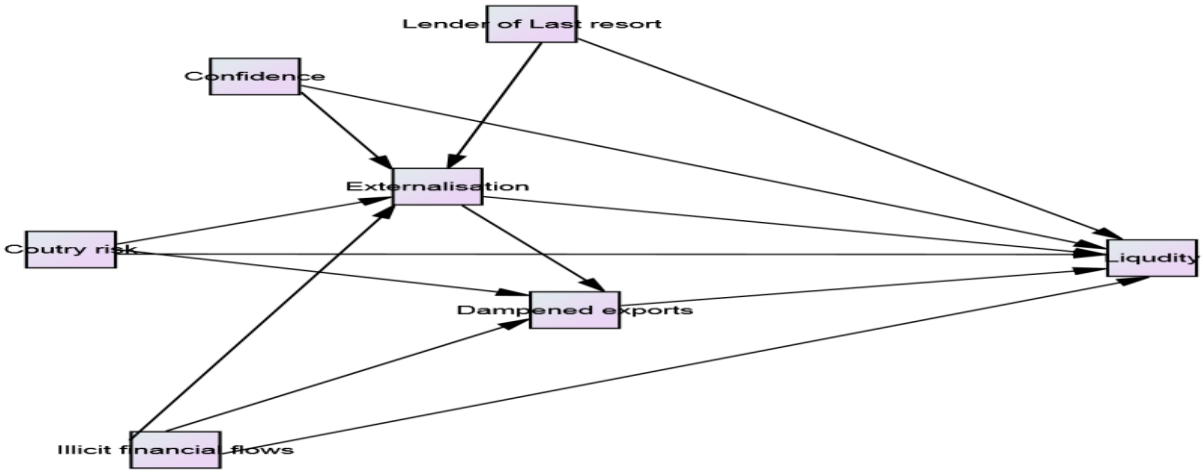
Depositor confidence in the banking sector is a critical ingredient for the liquidity health of any financial system. Tambudzai and Charumbira (n.d.), corroborated by Nhavira et al. (2013) and the RBZ (2016) identify a general lack of confidence in the financial sector as the main driver of hoarding of cash by the public resulting in cash circulating outside the banking system hence reducing the liquidity of the financial system. They associate the incentive to hoard cash to a motive to corruptly deal with the cash crisis possibly informed by the 2000 - 2008 era practices when such tendencies were rampant and profitable. Other studies on the drivers of the liquidity crises in Zimbabwe have centred on the central bank's lender of last resort function that most literature view as critical for the strength of the financial sector. Makina (2009) and Nhavira et al. (2013) present that the inability of the central bank to play the lender of last resort function worsened the liquidity situation as banks were not open to interbank trade. Similarly, Mambondiani et al. (n.d.) in their study on corporate governance and bank performance in Zimbabwe, and the IMF country report on Zimbabwe (2010) noted that the absence of the lender of last resort function renders the banking sector ill-equipped to deal effectively with liquidity shocks. Add to this the unavailability of statutory reserves which

have meant that the Zimbabwean banking system is not equipped to deal with any liquidity shocks owing to structural challenges. The unavailability of statutory reserves that are deposited with the RBZ limits the ability of the banking system to deal with liquidity challenges (IMF, 2010).

An important factor in preserving liquidity within the economy is limiting illicit financial flows. Economies that have strong liquidity postures are hinged on proper ring-fenced financial flows to curb leakage of liquidity. Research by the RBZ (2016) shows that there has been a lot of illicit financial flows that have exacerbated the liquidity situation as funds have been transferred out of the economy with rampant externalisation of funds mainly by individuals and companies in the extractive sectors. This is corroborated by Mashakada (2016) who identified rampant corruption, a lack of transparency and accountability grossly contributing to the current crisis. The connection between country risk and liquidity has been proven by a study by the IMF (2010) which showed that the obtaining level of country risk in Zimbabwe precludes foreign liquidity support. The existing indigenisation laws are not conducive for investor support as they are over-inclined to domestic expropriation. Zimbabwe has a history of the volatile takeover of a business establishment which scares away foreign investors. Fuelling the already high and volatile country risk is the long dragging of external arrears which puts pressure on the liquidity conditions as international finance institutions are reluctant to support Zimbabwe in the face of long-standing arrears (IMF, 2016; Berrospide, 2013). Clearing such arrears would improve relations with international finance institutions and hence resumption of financial support from such institutions. Mashakada (2016) posit that the crisis is worsened by the mopping up of liquidity by the Zimbabwean government through internal borrowings stressing that public borrowing by the government, which has issued in excess of 2 billion treasury bills to the banking system and continued to roll them over upon maturity has moped up liquidity.

Conceptual framework: From the above review we develop the following model informed by the contributions of these earlier researchers.

Figure 1: Conceptual model



Source: Own Formulation

3. Methodology

The aim of this study was to identify determinants of the liquidity crisis obtaining in Zimbabwe. The study used a survey for data collection targeting bank employees and captains of industry as well as the banking

public from Harare, Bulawayo, Gweru and Masvingo cities. A survey questionnaire was used as a research tool for this study because of the standardized nature of the data sought and the need to afford the respondents reference to their records and a chance for a considered response. A total of 200 questionnaires were administered and 150 were successfully completed resulting in a response rate of 75%.The study also used secondary data obtained from government agencies on export and import performance. The study focused mainly on the post "dollarization" era from 2009 to date (2017). The hypothesis was collapsed into two main categories as:

$H0_1$: There is no direct relationship between any of confidence, country risk, illicit financial flows, lender of last resort, externalization, net export performance and the liquidity level.

$H0_2$: There is no indirect relationship between any of confidence, country risk, illicit financial flows, lender of last resort and the liquidity level.

The study used SPSS AMOS to conduct structural equation modeling to test the two propositions above and generate path modeling to find the size and strength of the direct and indirect influence between the predictor variables and liquidity. The test is conducted at a 5% significance level.

4. Results

Table 1: Goodness of fit

Chi-square	2.224
Degrees of freedom	1
Probability level	0.136

The model results show an overall Chi-square value of 2.24 as shown in table 1 above indicating that even though the model was a reduced model it fits the data just as does a just-identified model. Wuensch (2016) present that a low model chi-square value is desirable as it indicates a close to perfect fit with relevant model paths. This not significant chi-square of 2.24 from the results thus proves that the fit between the data and our over-identified model does not significantly deviate from the fit between the saturated model and the data. A CMIN/DF of 2.2 was achieved demonstrating that the dropped paths have not definitely affected the model fit as it is below three as presented by Wuensch (2016). The model had a goodness of fit index (GFI) of 0.996 indicating that 99.6% of the variance in the sample variance-covariance matrix is accounted for by the model.

Correlation analysis: The correlation matrix shows that the upstream variables have low acceptable correlation levels among themselves. The lowest correlation value was 0.012 obtained between country risk and lender of last resort function whilst the highest was -0.505 which was between public and investor confidence in the financial sector and illicit financial flows. Table 2 below indicates the respective correlations among the variables.

Table 2: Correlations

			Estimate
Country risk	<-->	Illicit financial flows	0.336
Confidence	<-->	Illicit financial flows	-0.505
Illicit financial flows	<-->	Lender of last resort	0.134
Confidence	<-->	Lender of last resort	0.104
Confidence	<-->	Country risk	-0.331
Country risk	<-->	Last resort	0.012

Path diagram analysis and results: The hypothesized and tested direct and indirect relationship between the antecedents and liquidity with their respective standardized estimates are as presented below in figure 2.The model tested the impact of public and investor confidence, country risk, the absence of the lender of last resort and illicit financial flows on the level of liquidity in the economy. There are two intermediation variables in the model (externalization of funds and net export performance)

Figure 2: Path diagram analysis and results

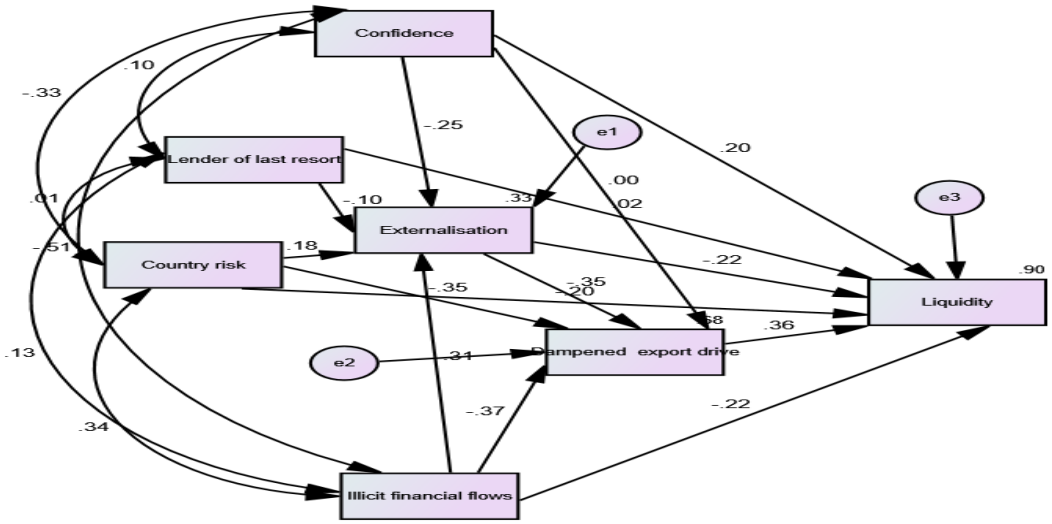


Table 3: Regression weights

				Estimate	S.E.	C.R.	P	Label
externalization		<---	confidence	-.474	.155	-3.056	.002	
externalization		<---	Country risk	.202	.082	2.447	.014	
externalization		<---	Illicit financial flows	.306	.081	3.780	***	
externalization		<---	Lender of last resort	-.271	.186	-1.456	.145	
Net performance	export	<---	Country risk	-.304	.044	-6.877	***	
Net performance	export	<---	Illicit financial flows	-.284	.043	-6.584	***	
Net performance	export	<---	confidence	-.006	.083	-.073	.942	
Net performance	export	<---	externalization	-.268	.043	-6.281	***	
Liquidity		<---	Illicit financial flows	-.091	.016	-5.844	***	
Liquidity		<---	externalization	-.092	.015	-6.181	***	
Liquidity		<---	Country risk	-.094	.016	-6.016	***	
Liquidity		<---	Lender of last resort	.017	.030	.557	.577	
Liquidity		<---	confidence	.162	.026	6.247	***	
Liquidity		<---	Net export performance	.194	.025	7.648	***	

Regression weights: Using the most likelihood estimation method for predicting the size and strength of the hypothesized relationships, the results show that

- There is a strong significant negative relationship between the confidence the public and investors have on the country's banking system and the level of externalization of funds outside the country's banking system with an unstandardized regression weight of -0.474 and a p-value of 0.002 indicating that confidence is an important factor in funds retention and remittance following international transactions. Illicit financial flows have a significant impact on liquidity. Results show a weak but significant relationship between the two with a coefficient of -0.092 and a p-value of 0.00. This implied that illicit financial flows have cost the nation in terms of the obtaining high levels of liquidity challenges in the financial sector.
- Externalization and Country risk had a significant negative impact on liquidity. The impact of externalization of funds and high country risk has been a reduction in liquidity in the economy as shown by a coefficient of -0.92 and -0.094 for the two factors respectively.
- Lender of last resort function has an insignificant role in the current liquidity crisis. The results show a weight of 0.017 at a p-value of 0.577 indicating that the current liquidity crisis in Zimbabwe cannot be attributed to the absence of a lender of last resort role by the reserve bank though public and investor confidence in the financial sector as well as net export performance had an impact on the liquidity levels.

Results indicate that a general lack of public confidence in the financial sector together with low export performance contributed significantly to the current liquidity crisis.

The indirect (mediated) effect of the determinants on externalization, net export performance and liquidity are presented indicated in table 5 below. The indirect impact of confidence on liquidity is .067. Due to the indirect (mediated) effect of confidence on liquidity, when confidence goes up by 1, liquidity goes up by 0.067. This is in addition to any direct (unmediated) effect that confidence may have on liquidity. Other determinants indirect effects are also indicated.

Table 4: Indirect Effects

	Confidence	Illicit financial flows	Country risk	Lender of last resort	Externalization	Net export performance
Externalization	.000	.000	.000	.000	.000	.000
Net export performance	.127	-.082	-.054	.073	.000	.000
Liquidity	.067	-.099	-.088	.039	-.052	.000

The results show that the mediated effects of the antecedents have low coefficients indicating that the determinants affect liquidity more without intermediation than they do with intermediation.

5. Conclusion

The severe liquidity challenges currently bedeviled the Zimbabwean economy has become a serious threat to the survival of the economy. Whilst many theories have been presented at various fora (even though without empirical support) and various arguments presented by government agencies, multilateral institutions, industries and economists alike on the major causes of the current liquidity crisis in Zimbabwe it still remained a mystifying phenomenon. This study recognizes the importance of a sound financial system for economic development. The study identifies public and investor confidence, country risk, illicit financial flows, externalization of funds and net export performance as significant drivers of the current liquidity crisis. However, the results indicated that the absence of the lender of last resort role by the reserve bank had no significant contribution to the liquidity crisis currently obtaining. The implications of this study are that to address the current liquidity crisis, the government should focus on addressing public and investor confidence, country risk, illicit financial flows, externalization of funds and net export performance which the study identifies to be the very underlying drivers behind the crises. Whilst addressing the lender of last resort function by the reserve bank could enhance liquidity, more efforts should be focused on the aforementioned

drivers. There is scope for future research to possibly consider the impact of the current liquidity crisis and explore deeper into its nature.

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Asymmetric Information and Volatility of Stock Returns in Nigeria

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Abstract: This paper investigates the effect of asymmetric information on volatility of stock returns in Nigeria using the best-fit Asymmetric Power Autoregressive Conditional Heteroskedasticity, APARCH (1,1) model, under the Generalized Error Distribution (GED) at 1% significance level from 3 January 2000 to 29 November 2016. The descriptive statistical results showed that the returns were not normally and linearly distributed, with strong evidence of a heteroskedasticity effect. The results of the analysis also confirmed the effect of asymmetric information on the volatility of stock returns in the Nigerian stock market. The asymmetric parameter (γ) was negative at (-1.00), which is statistically significant at 1% level. This confirms that there is an asymmetric or leverage effect where bad news had a more destabilizing effect on the volatility of stock returns than good news. The total impact of bad news on volatility was explosive at 2.0, during the period under review. Also, the volatility persistence which is measured by the sum of ARCH(α) and GARCH(β) stood at 1.695950. This is above unity and suggests that volatility takes a long time to attenuate in Nigeria. This could be largely ascribed to the persistent effect of the 2008 global financial crisis, which probably eroded investors' confidence in the market.

Keywords: *Asymmetric Information, Volatility, Asymmetric Power Autoregressive Conditional Heteroskedasticity, Generalized Error Distribution, Volatility Persistence*

1. Introduction

Information is a key driver of stock returns and volatility in the equity market. This information can be idiosyncratic and macroeconomic in the form of cross-sectional and time series. Generally, information comes to the market on scheduled (with prior notice of the date and time of release) or unanticipated (without notice). Information also enters the market linearly (symmetrically) or non-linearly (asymmetrically). The information can also be bad (negative) and good (positive) news with serious implications for the volatility of stock returns. The response of stock prices to information is used in this study as metrics to measure whether a stock market is symmetric or asymmetric. If the response of equity prices is to fully reflect available information without giving rise to mispricing, where investors have homogenous expectations of the distribution of stock returns and volatility and are privileged to information at the same time, and where the market price of an equity is equivalent to its intrinsic value, where investors have full knowledge of the opportunity set available to them, and nobody is privileged to explore information to profit at the expense of others in the market, then, the market is perfect or efficient or informational symmetric. Conversely, the market is informational asymmetric when there are disparities between the intrinsic and market values of financial instruments, and where investors' expectations about the probability distribution of expected returns and risks is heterogeneous. It is a situation where one party to a transaction is privileged to explore information unknown to the other party as opportunity to profit at the expense of the under-informed investors. Stiglitz (2003) defines information asymmetry as "the condition where some information is known to some, but not to all parties involved" in a transaction, and consequently cause the market to become inefficient. Stiglitz and Walsh (2002) also posit that prices and markets provide the basis of the economy's incentive system. But there are some information problems that markets do not handle, or do not handle well. The imperfect information sometimes inhibits the ability of the market to perform the tasks it performs so well, when information is complete.

In an efficient market, investors act rationally and prices of shares fully reflect all available information spontaneously. It is not possible for investors to consistently beat the market on a risk-adjusted returns basis. Fama (1970) propounded efficient market hypothesis (EMH) and further assumed that agents have rational expectations; that on average the population is correct and whenever new relevant information filters into the market, the agents update their expectations appropriately. The theory is based on the Gauss (1821)

classical linear regression model. Under this theory, trading in shares does not attract any transaction cost, no taxes and all participants have homogeneous expectations of the distribution of expected returns with equal access to information at the same time. The investment strategy best suited for this market is the "buy-and-hold" (passive) strategy. The reactions of investors are assumed to be random and to follow a normal Gaussian distribution pattern, so that the net effect on stock market returns is negligible for an abnormal profit. The returns distribution in the market is characterised with linearity, non- serial correlation, independent and identically distribution of stock returns, with zero mean and constant variance of error term (homoscedastic). The classical theory only considered the first and second moments of unconditional mean and variability of stock returns in linearity (symmetric) form. The third and fourth moments for normal distribution of returns measured by skewedness and kurtosis are (0) and (3) respectively. Further to the normal distribution behavior of stock returns, the classical economist failed to consider other statistical distributions of financial time series like Student's t, Generalized Error Distribution (GED) and Skewed Student's t-Distribution. Another behavior of stock returns under the classical linear regression model is that past and current returns are mutually exclusive. There are no serial correlations between current returns and (R_t) and past returns (R_{t-1}). This is in consistent with the Random Walk theory of Kendall (1953), which states that successive stock returns are not statistically associated.

Over recent years, the impact of information on the returns of equity markets has received considerable attention in the academic literature. An appropriate method of characterizing and summarizing the behavior of stock returns is to describe them in terms of their distribution function. The normality distribution of stock returns is questionable if macroeconomic news does not arrive linearly to the market or even if it does, if investors do not react linearly to its arrival. In both cases, assumptions for market efficiency may fail if the standard regression treats the market reaction to the same type of information as being identical (symmetric) at all time. In reality, the market, seems to treat otherwise similar information differently (asymmetrically), where there are possibilities for equity mispricing or profit opportunities. A market is informational asymmetric where prices of securities exhibit volatility clustering with large changes tend to be followed by large changes of either sign or small changes tend to be followed by small changes (Mandelbrot, 1963) within a short period of time for a given set of returns. A market, where successive stock returns are statistically correlated, and are not independently identically distributed, but asymmetrically distributed through Student's t, Generalized Error Distribution (GED) and Skewed Distribution. If an equity market is informational symmetric, then, security screening, allocation or selection and the role of professional managers is less important for investors, and it would be better to just buy a large basket of stocks and following a passive investment strategy with a view to buying and holding, and thereby reducing churning and minimizing transaction costs.

In reality, the unfolding events in the financial world economies violated some of the rules of the market efficiency; like the "buy-and-hold" investment strategy. Investors who followed this style always become victims whenever the market crashes. Adopting a passive investment strategy has been challenged especially during the global economic meltdown of 2008 or when there is a market crash such as in the US stock market. The use of the symmetry ARCH model by Engle (1982) and the GARCH model by Bollerslev (1986) to measure the effect of information on stock returns, is limited because: (i) the variance of the models is linear functions of the lagged squared residuals and the residual innovations; (ii) it has a conditional variance that only depend on the size or magnitude of the shocks i.e. lagged error, not the sign. It means that both negative and positive news have the same impact on future volatility of the same magnitude. The homoscedasticity assumption by the classicalists that the expected value of all error terms, when squared, is the same at any given point is no longer tenable in reality. A striking feature of the return series is volatility clustering. Several econometric models on changing conditional variance have been developed to test and measure volatility clustering. In modern financial literature, a number of stylized facts about the volatility of financial asset prices have emerged over the years, and have been confirmed in several studies e.g. that the variance of asset returns is not constant but time-varying (Engle, 1982; Bollerslev, 1986; Nelson, 1991). Asset prices are characterized by volatility clustering (Mandelbrot, 1963).

The GARCH model of Bollerslev (1986) gives parsimonious models that are easy to estimate and, even in its simplest form, has proven surprisingly successful in predicting conditional variance. This is a great improvement on Engle's (1982) GARCH model. There are different versions of GARCH models: from the

simplest and most robust of the family of volatility like the GARCH (1,1) model, through to sophisticated ones like EGARCH, GJR-GARCH, APAGARCH, and GARCH-M. Although, the GARCH model has proven to be useful in capturing the symmetric effect of volatility, it is believed with some limitations, such as the violation of non-negativity constraints imposed on the parameters to be estimated. The original GARCH model can be modified and extended in many ways to overcome these constraints to capture asymmetry effects using Threshold GARCH (TGARCG) proposed by Zakoian (1994), EGARCH by Nelson (1991), the GJR-GARCH model by Glosten, Jagannathan, and Runkle (1993), and the Asymmetric Power ARCH (APARCH) by Ding, Granger, and Engle (1993). The tenet of the proponents is that good and bad news of the same magnitude have differing effects on the conditional variance. Thus, it was found that Nigeria operates an informational weak-form efficient market as documented by Ayadi (1984), where not everyone has access to the same news, nor does everyone receive the news in a timely fashion (Strong, 2004). Information asymmetry has a wider application in research especially in the financial literature. The pervasive effects of information asymmetry in the market have been documented and studied in numerous contexts. However, for the purpose of this study, it will be examined in the context of the effects of asymmetric information on volatility of stock returns. The objective of this paper is to investigate the effect of asymmetric information on the volatility of stock returns in Nigeria. This has important implications for pricing financial assets, portfolio selection, and risk management. Market regulators will also find the results useful in terms of making rules to reduce asymmetry information by ensuring uninterrupted flow of information in the market. The paper is structured into four sections: Literature Review, Methodology, Empirical Results, and Summary and Discussion.

2. Literature Review

The distribution of information between economic agents accounts for the increase in the level of adverse selection effect and exacerbates the ask-bid spread (returns). The theory underpinning asymmetric information relative to the behavior of stock returns is rooted in the classical theory of finance based on the Gauss (1821) assumptions that gave birth to the Random Walk Theory espoused by Kendall (1953), the Modern Portfolio Theory by Markowitz (1952), the Capital Asset Pricing Model by Sharpe (1964), and Lintner (1965), the Efficient Market Hypothesis by Fama (1970); the Arbitrage Pricing Theory by Ross (1976); and other multi factors index models. The capital market theories are based on perfect market where information is symmetric and investors have homogenous expectations about the distribution of returns, equity prices fully reflect available information, there are no abnormal profit opportunities, no transaction costs, the investment strategy is passive ("buy-and-hold"), and no participant is more privileged to information than others. In addition, the variance of error term is constant with zero mean. The distribution of returns is normal where the maximum kurtosis is 3.0, and returns distribution is independent identically distributed, and mutually exclusive of past and present prices; prices are not auto-correlated but rather linearly dependent.

There are some challenges as to the practice of the above theories, especially in application to financial time series data. First, the controversies as to how many risk factors are to be included are still subjective today. While Sharpe (1964) used the single index factor, Ross (1976), Chen, Roll, and Ross (1986), and Fama & French (1993) used multiple factors. However, the researchers used beta as a risk coefficient. While the proponents of CAPM used a single beta to measure the risk factor, others used multiple betas, each for different factors to measure the risk. Unlike the CAPM where macroeconomic variables (systematic risk) are accounted as the only factor influencing stock returns while the company-specific factor (unsystematic risk) is assumed to be completely diversified, the multi-factor models attributed the behavior of stock returns to macroeconomic and company-specific factors. The Fama & French (1993) factor model argue that the variability in common stocks returns is explained not only by market risk as espoused by Sharpe (1964) but also by factors related to size, and book-to-market ratio. More recently, Fama & French (2015) extended the model by adding a further two factors: profitability and investment. MSCI BARRA (2013) listed six risk premier factors influencing stock returns: size (low size), book-to-market ratio (value), low volatility, high yield, quality, and momentum. A search for the appropriate factors that may influence asset returns, risk, covariance, and volatility is yet unending. There is no specific consensus on the number of factors required to adequately explain the effect of the factors on stock returns and volatility.

Researchers however began to model stock market returns jointly with their conditional volatility, acknowledging that the impact of idiosyncratic and macroeconomic variables on equity returns is neither time-invariant nor linear. Wold's (1939) Decomposition theory establishes that a financial time series has two unrelated components: deterministic and stochastic processes. The two processes are combined to form an Autoregressive Moving Average (ARMA). The error term also has two components: time-variant and time-invariant. The time-variant is conditional variance while the time-invariant is unconditional variance. Engle (1982) expressed the conditional variance as a linear function of past squared disturbances in order to develop his Autoregressive Conditional Heteroskedasticity (ARCH) model. Several parameters and a high order q to capture the volatility process and the assumption of zero weight for observations more than one month old motivated Bollerslev (1986) to generalized ARCH to include the ARMA structure known as GARCH parameterization in order to remedy the lacuna in the ARCH model. The GARCH model was based on an infinite ARCH specification to reduce the number of estimated parameters, by imposing non-linear restrictions (Alberg, Shalit, & Yosef, 2008). GARCH is a linear function of past squared innovations and lagged squared variance and account for volatility clustering. Both the ARCH and GARCH models allow bad and good news to have an equal impact on volatility, but fail to capture the leverage effect.

The failure of GARCH to capture asymmetric or leverage effect in financial time series volatility led to the development of several higher and more sophisticated GARCH models. Unlike GARCH models, they are non-linear functions of the exogenous variables but rather exponential and quadratic functions. Nelson (1991) developed the Exponential GARCH (EGARCH) model while Glosten, Jagannathan, and Runkle (1993) also developed the GJR-GARCH models to capture the leverage effect. Some of the models in this category include Threshold GARCH (TGARCH) by Zakoain (1994), and Asymmetric Power ARCH (APARCH) by Ding, Granger, and Engle (1993). The models allow bad news and good news to have different impact on volatility in a non-linear formulation. Negative shocks tend to have a higher effect on volatility than positive news. Thus, the behavior of financial time series is best described as a reflective of an asymmetric informational market where the investors' expectations are heterogeneous, stock returns distribution are not normal but of Student's t, GED, and Skewed Student's t. A market where past and present returns are mutually inclusive (autocorrelation), the variance of error term is time-variant, return is non-linear dependent, where the third and fourth moments measured by skewedness and kurtosis are important in the determination of the statistic characteristics of time series. While skewedness measures the degree of asymmetry of the distribution of returns around its mean, kurtosis measures the "fatness" of the tails of a return distribution. Similarly, in a market where the distribution of return is normal, skewedness is zero, and kurtosis is 3.0(mesokurtic). However, when the kurtosis is greater than 3.0, stock return is leptokurtic or fat-tailed or heavy-tailed. Conversely, when the skewedness is greater or less than zero, stock return distribution is asymptotic. Thus, in a financial time series, the best model to be applied is the GARCH family that exhibits the above statistical characteristics. In view of the controversies surrounding the factors affecting the behavior of stock returns, this paper will focus on market index series, which can be used to evaluate and distribute stock behavior into: returns, size, and volatility and will empirically conclude whether there is presence or absence of asymmetric information in the Nigerian stock exchange and what the effect is on the volatility of stock returns.

Empirical Reviews: Akerlof (1970) was the first to analyze the impact of information asymmetry in any market. He used the US market for used cars where the old and faulty cars are known as "lemons". He found the presence of information asymmetry in the car market was characterized by the informational level of the agents, where the car sellers are more privileged to information about the condition of the cars than the buyers, and hence they explored this privilege information to make more profit at the expense of the under-informed buyers. Easley and O'Hara (2004) found a positive correlation between information asymmetry and stock returns, where good news reduces volatility and boosts returns. Wang et al., (2005) also examine the relationship between the behavior of stock returns, volatility of stock returns (risk) and volume of trading (used as a measure of information access) and found a positive effect of the trading volume on stock returns. Depending on the level of information of Abad and Rubia (2005) state that the financial market recognizes two types of investors: informed and uninformed (less informed) agents. They found that informed agents used privilege information to obtain economic gains without justifying the fundamental value of the asset price, while uninformed agents trade for liquidity purposes only relying on public information and their personal convictions. Clarke and Shastri (2000); and Levi and Zhang, (2008) found a positive correlation

between information asymmetry and expected stock returns. Verrecchia (2001); and Gul and Qiu, (2002) tested the relationship between information asymmetry and corporate governance and found that higher corporate disclosure, reduces information asymmetry.

3. Methodology and Data

The study focuses on the secondary segment of the Nigerian capital market, relying on the Nigerian stock exchange daily closed All-Share Index (ASI) from 3 January 2000 to 29 November 2016, translating into 4167 observations. The data, in the course of this study reflected information available in the market during the period of study, and also reflected the response of market participants to information in the market during the period of study. The ASI is tested using descriptive statistics to obtain the mean, variance, skewedness, kurtosis; characteristics of the stock behavior. Further diagnostic tests were carried out to test the: normality, linearity, autocorrelation, and heteroskedasticity of the data to confirm if the statistical characteristics of the ASI are a best fit for the GARCH models used. The various GARCH models were tested to select the best in terms of the lowest value of the Akaike information Shibata, Hannan-Quinn, and Schwarz criteria employed. The economic literature shows that the GARCH specification by Bollerslev (1986) and their large extensions including EGARCH, GJR-GARCH, and APARCH will be tested among which the best will be used by the study. The parameters will be estimated using Maximum Likelihood Estimation under Gaussian, Student's t, GED, and Skewed Student distributions. The study used an OxMetrics computer econometric package to analyze the data. The first step is to take the difference of the level data (return). This is followed by applying Autoregressive order 1 AR (1) to determine the level of autocorrelation between the current and past returns. The return is squared in order to estimate the volatility.

Model Specification: The models for the various asymmetric ARCH/GARCH are specified in table 3.1 below. The table 1 also specified the GED distribution for the APARCH model.

Table 1: Asymmetric Models and GED under APARCH model

	EGARCH Model	**GJR-GARCH Model**	**APARCH Model**
Return	$R_t = ln\left[{}^{P_t}/_{P_{t-1}}\right]$	$R_t = ln\left[{}^{P_t}/_{P_{t-1}}\right]$	$R_t = ln\left[{}^{P_t}/_{P_{t-1}}\right]$
Mean Equation	$R_t = E(R_t \mid \Omega_{t-1}) + \varepsilon_t$, t=1, 2, …T,	$R_t = E(R_t \mid \Omega_{t-1}) + \varepsilon_t$, T=1,2, …T	$R_t = E(R_t \mid \Omega_{t-1}) + \varepsilon_t$, t= 1, 2, …T
AR(1)	$R_t = \mu + \tau_1 R_{t-1} + \varepsilon_t$ $t = 0, \pm1, \pm2, \ldots, T$	$R_t = \mu + \tau_1 R_{t-1} + \varepsilon_t$ $t = 0, \pm1, \pm2, \ldots, T$	$R_t = \mu + \tau_1 R_{t-1} + \varepsilon_t$ $t = 0, \pm1, \pm2, \ldots, T$
ARMA	$R_t = \mu + \sum_{i=1}^{p} \tau_1 R_{t-i} + \sum_{i=j}^{q} \lambda_1 \varepsilon_{t+} \varepsilon_t$	$R_t = \mu + \sum_{i=1}^{p} \tau_1 R_{t-i} + \sum_{i=j}^{q} \lambda_1 \varepsilon_{t+} \varepsilon_t$	$R_t = \mu + \sum_{i=1}^{p} \tau_1 R_{t-i} + \sum_{i=j}^{q} \lambda_1 \varepsilon_{t+} \varepsilon_t$
ε_t	$\sigma_t z_t;\ z_t \sim N(0,1,\upsilon)$	$\sigma_t z_t;\ z_t \sim N(0,1,\upsilon)$	$\sigma_t z_t;\ z_t \sim N(0,1,\upsilon)$
Symmetric volatility	$\sigma_t^2 = \omega + \alpha_i \varepsilon_{t-1}^2 + \beta_i \sigma_{t-1}^2$	$\sigma_t^2 = \omega + \alpha_i \varepsilon_{t-1}^2 + \beta_i \sigma_{t-1}^2$	$\sigma_t^2 = \omega + \alpha_i \varepsilon_{t-1}^2 + \beta_i \sigma_{t-1}^2$
Asymmetric Volatility	$\ln(\sigma_t^2) = \omega + \alpha_i \left[\frac{\lvert\varepsilon_{t-1}\rvert}{\sigma_{t-1}^2} - \sqrt{\frac{2}{\pi}}\right] + \gamma_i \frac{\varepsilon_{t-1}}{\sigma_{t-1}^2} + \beta_i \ln(\sigma_{t-1}^2)$	$\sigma_t^2 = \omega + \sum_{j=1}^{q} \left[\alpha_j \varepsilon_{t-j}^2 + \gamma_i (max(o, \varepsilon_{t-j}))\right]^2 + \sum_{i=1}^{p} \beta_i \sigma_{t-1}$	$\sigma_t^{\delta} = \omega + \sum_{j=i}^{q} \alpha_j \left(\lvert\varepsilon_{t-j}\rvert - \gamma_j \varepsilon_{t-j}\right)^{\delta} + \sum_{i=1}^{p} \beta_{t-i} (\sigma_{t-i})^{\delta}$
MODEL APARCH	Distribution		

GED $f(x,\mu,\sigma,\nu) = \frac{\nu}{\lambda 2^{\left(\frac{\nu+1}{\nu}\right)}\Gamma\left(\frac{1}{\nu}\right)} exp\left[-\frac{1}{2}\left|\frac{x-\mu}{\lambda\sigma}\right|^{\nu}\right] where \quad \lambda=\left[\frac{2^{-2}\Gamma\left(\frac{1}{\nu}\right)}{\Gamma\left(\frac{3}{\nu}\right)}\right]^{\frac{1}{2}}$, and $\mu, \sigma > 0, \nu > 0$ *are location, scale, and shape, parameters respectively.*

Table 2: Definitions of Variables and Parameters for estimating Conditional Mean Models

Parameters & variables	Definition of parameters and variables
AR(1)	Autoregressive of lag order 1
ARMA(p,q)	Autoregressive Moving Average of lag order (p,q)
R_t	Daily stock market return of All-share Index at time t
μ,	Constant/mean average/intercept
τ_1,	Coefficients of the lag returns
R_{t-1}	Lag Return accounting for autocorrelation at time t-1
Ω_{t-1}	Information set at time t
α_1,	Autoregressive coefficient
β_1,	Moving average coefficient
ε_t	Error term /residual/innovation/stochastic error

Table 3: Parameters and Variables for Estimating Conditional Volatility Models

Parameters & variables	Definition of parameters and variables
Ln	Natural Logarithm
σ^2	Conditional variance
$\ln(\sigma_t^2)$	Log conditional variance
ω	Constant
α_t	Coefficient of arch term. It measures the magnitude of the shocks of the news or measures the symmetric effects of the last period shocks on current volatility
ε_{t-1}^2	Arch term, squared error term at time t-1
β_i	Parameter that measures persistence in the conditional variance
σ_{t-1}^2	Garch term, squared conditional variance at time t -1
ε_{t-1}	Lagged error term
γ_i	Asymmetry or leverage effect coefficient
$\lvert\varepsilon_{t-1}\rvert$	Absolute value of the standardized residuals
ν	Degree of freedom
δ	Reflection of leverage effect

Returns

Measurement of Daily Market Returns: The daily closed index is transformed by taking its difference to enable us obtain a change and then purge the data series from the presence of unit roots. This is expressed in natural log form shown in Table 1, where the logarithm of stock market index at period $t(P_t)$is related to the index at period *t-1*and expressed by$R_t = ln(P_t/P_{t-1})$, where: R_t is a time series return on daily closed index at time *t*, and *ln* is the natural log of the daily market index.

Estimating Conditional Mean: The mean equation is given by$R_t = E(R_t|\Omega_{t-1}) + \varepsilon_t$as indicated in Table 1, where E(.|.) denotes the conditional expectation operator, $\Omega_{t-1}$is the information set available at t-1.$\varepsilon_t$are the random innovations (surprises) with zero mean and constant variance. The autoregressive of first order 1 AR(1) of returns is also expressed as $R_t = \mu + \tau_1 R_{t-1} + \varepsilon_t;\ \ t = 1, 2, \dots, T$, where τ_1,is the lag return coefficient, andR_{t-1} is the previous year return. Also, ARMA (p,q) process of autoregressive order p and moving average order q is described as $R_t = \mu + \sum_{i=1}^{p} \alpha_1 R_{t-i} + \sum_{i=j}^{q} \beta_1 \varepsilon_{t+}\, \varepsilon_t$. The ARMA mean equation model can be expressed in polynomials of degree n, p and q using backshift operator *B*as $R_t = \mu + \alpha(B)R_t + \beta(B)\varepsilon_t$.We have a perfect autoregressive process if q = 0 while we have pure moving average process if p = 0.

Conditional Variance

Conditional Variance (Symmetric Volatility): Engle (1982) pioneered the Autoregressive Conditional Heteroscedasticity (ARCH) process where he defined the error term in the mean returns (ε_t) as the innovation of the process of the form $\varepsilon_t = z_t\sigma_t$, where$z_t \sim N(0,1)$. z_t is an independently identically distributed (i.i.d) process with E(z_t) = 0 and var(z_t) = 1. The Engle (1982) ARCH model is a linear function of the lagged value of the innovations as $\sigma_t^2 = \omega + \sum_{i-1}^{q} \alpha_i \varepsilon_{t-1}^2$. However, ARCH required many parameters and a high order q to capture the volatility process. Hence, Bollerslev (1986) generalized ARCH (GARCH) by importing the lag of residual variance to reduce the number of estimated parameters and imposing nonlinear restrictions. The Bollerslev (1986) Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model is of the form $\sigma_t^2 = \omega + \alpha_i \varepsilon_{t-1}^2 + \beta_i \sigma_{t-1}^2$. To ensure that σ_t^2 is positive for all *t*. Bollerslev (1986) imposed these restrictions$\omega > 0, \alpha_i \geq 0, (for\ i = 1, 2, \dots, q),\ and\ \beta_i \geq 0\ (for\ j = 1, 2, \dots, p)$.The$\sigma_t^2$ represents the conditional variance of ASI at time *t,*ω is the intercept, while α_i *is* a coefficient (the symmetric effect of the model) which measures the recent or short-term effects of news on stock volatility. Put in another way, α_i can be referred to as a first order ARCH term which transmits news about volatility from the previous period. The ε_{t-1}^2 *is the* ARCH term this is typically interpreted as the measures of the impact of recent news on volatility. β_i is the coefficient of autoregressive component of conditional variance which can be interpreted as persistent coefficient that measures the impact of the old news on volatility or the first order GARCH term and σ_{t-1}^2 is the GARCH term that measures the long term effect of news on stock volatility.

Asymmetric Volatility: To capture the asymmetric volatility in the stock market returns, we tested EGARCH model by Nelson (1991); GJR-GARCH model by Glosten Jaganathan, and Runkle (1993); and APARCH model by Ding et al. (1993) with normal, Student's t, GED, and Skewed distributions. Nelson (1991) introduced EGARCH as an extension to the GARCH model proposed by Bollerslev (1986) to overcome some weaknesses related to the GARCH model in handling financial time series (Wallenius, Fedorova, and Collan, 2013). Nelson's EGARCH model is also superior to Bollerslev's GARCH model for studying the impact of shocks on stock and is widely used for estimating volatility in financial markets because it applies logged conditional variances and if the model parameters have negative values, the conditional variance remains positive and does not require artificial imposition of non-negativity constraints on the model parameters. From table 1 (above), the asymmetric volatility EGARCH equation is stated as log of the conditional variance$\{\ln(\sigma_t^2)\}$. There are four parameters to be estimated:$\omega, \alpha_i, \gamma_i, \beta_i$ where $\omega, \alpha_i, \beta_i$ are as previously defined, while the coefficient γ_i measures the asymmetric effect or leverage effect of the shocks on volatility. The presence of asymmetric effects can be tested by the hypothesis that $\gamma_i = 0. if\ \gamma_i$=0, it implies a symmetric effect where positive and negative shocks of the same magnitude have the same effect on volatility of stock returns. The effect is asymmetric if $\gamma_i \neq 0$. If $\gamma < 0$, (negative and significant) then, positive shock (good news) generate less volatility than negative shocks (bad news). When $\gamma > 0$, (positive and significant), it signifies that positive innovations are more destabilizing than negative innovations (Atoi, 2014). The total impact of good news on volatility is measured by |1+ $\gamma|\varepsilon_{t-1}|$, while the total impact of bad news is measured as |1- $\gamma|\varepsilon_{t-1}|$.

4. Empirical Results

Descriptive Statistics: The descriptive statistical characteristics of the daily market index returns showed average daily returns of 0.04%; compared to a very high average daily risk of 1.123% as measured by standard deviation which indicates that the stock returns in Nigeria are characterized by higher volatility. Thus, it is established that the higher the risk, the higher the volatility and the lower the returns in Nigerian stock market. The third and fourth moments as measured by skewedness and kurtosis also exhibit asymptotic and leptokurtic (fat-tailed) behavior where the degree of asymmetry distribution around the mean is 0.19 which is greater than zero for normal distribution. The kurtosis stood at 26.14, greater than the normal standard of 3.0. However, under normal distribution, R-square is expected to be greater than 60% but in this study it stood at 9% while the F-Statistics was positive (412.74) and significant at 1% level. Overall, the descriptive statistics behavior of the stock market returns in Nigeria is not normally distributed. This is shown in Table 4 below

More importantly, when applying residual diagnostic tests, the normality test by Jacque-Berra rejects the null hypothesis of normal distribution which is positive at 92987.14 and significant at 1 per cent level. The

heteroskedasticity test or ARCH-LM test also accepts the alternative hypothesis of the presence of ARCH effect in the stock market returns while the BDS test rejects the null hypothesis of linearity in the distribution of the stock market returns. The ADF exhibited no unit root in the data while the serial correlation results reject the null hypothesis of the presence of serial correlation of market returns. In summary, the behavior of stock market returns in Nigeria is nor-normal, non-linear, auto-correlated, and heteroskedastic (ARCH effect). Therefore, the best models fit for this behavior of stock returns are the ARCH/GARCH family with their higher extensions. However, the movement of market index and its corresponding first difference data is demonstrated in figure 1 (below):

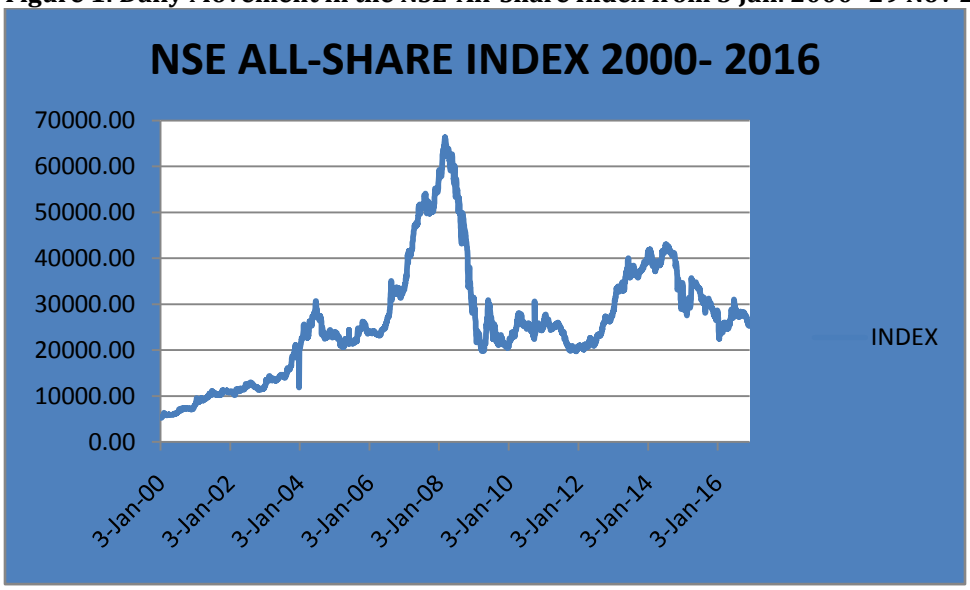
Table 4: Descriptive characteristics of Stock Market Returns in Nigeria

Mean	Std. Dev	Skewedness	Kurtosis	R-Sq	JB	Q-Stat	ADF	BDS	ARCH LM	F-Stat	BJ	Observations
0.0004	0.01123	0.1942	26.14	0.090	92987.14*	651.92*	-35.57*	0.054*	795.51*	412.74*	44.75*	4168
p-value					0.0000	0.0000	0.0000	0.000	0.0000	0.0000	0.0000	

*Note that std Dev, JB, Q-Stat, BDS, ADF, BJ, and ARCH are standard deviation, Jarque-Bera, correlogram, Brock-Dechert-Scheikman, Augmented-Dickey-Fuller, Box Jerkins, and Heteroskedasticity statistics respectively; while * implies significance level at 1 percent.*

Source: Omokehinde, Abata, Somoye, and Migiro (2017)

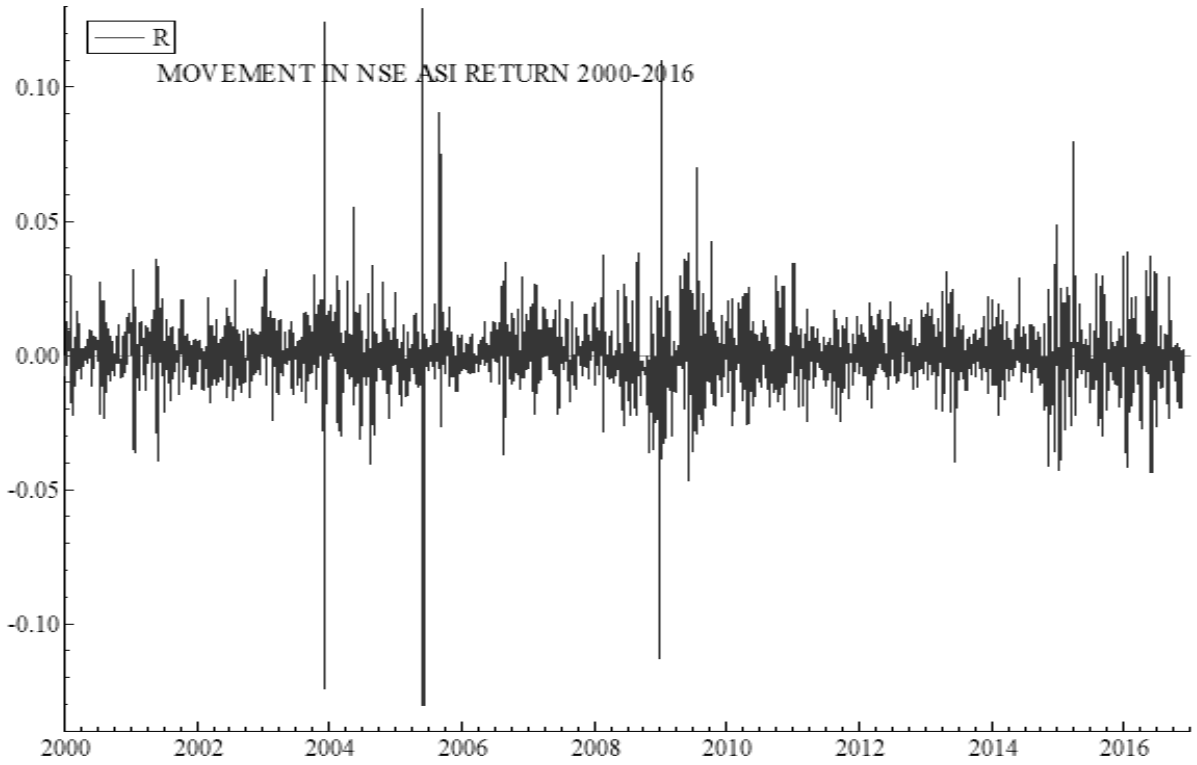
Figure 1: Daily Movement in the NSE-All-Share Index from 3 Jan. 2000- 29 Nov 2016



The daily movement of Nigerian stock market index at level form over the period 3rd January 2000 to 29 November 2016is shown in figure 4.1 above. The study revealed that the behavior of the daily index exhibits a random walk movement (RWM). The index grew by 478.55% to peak at 30,703.46 on June 18, 2004 from its beginning level of 5,306.99. The bank recapitalization news came as a surprise to the participants in the market and declined the index by 32.71% to 20,661.44 on 6 April 2005 from its first peak level. However, the success of bank recapitalization coupled with indiscriminate grating of margin facility for the acquisition of shares had driven the index to an all-time high of 66,286.58 on 4 March 2008, a growth of 220.82%. The global financial crisis in 2008 drove the index down by -70.12% to 19,803.60 a year after on 4 March 2009. The index has not yet fully recovered to the level it was at on4 March 2008. The index has been persistently hovering between 20,000 and 40,000 level since 2009 and finally stood at 25, 318.41 on 29 November2016. However, the peculiar characteristic of the index as shown in Figure 4.1 is that it is white noised. This characteristic is noted in most integrated level zero, (I(0)) variables and that is why they have to be differenced. Thus, the movement of the differenced index which is referred to stock market return is shown in figure 4.2 below:

Meanwhile, a careful look at figure 2 (above) shows that returns fluctuate around the mean value and the RWM does not emerge again after the index has been transformed to first difference or return. The fluctuations are both in the positive and negative region with clustering in volatile periods alternated by periods of calm. Hence, the stock market return is clustering or pooling with large shocks of both signs following large shocks while small shocks of both signs following small shocks is consistent with the findings of Mandelbrot (1963). This suggests that the residual is conditionally heteroskedastic and it can be represented by ARCH and GARCH models. In addition, the variance of the stock returns is not constant over time but time-varying with evidence of volatility clustering and persistence being consistent with the findings of Bollerslev (1986), Engle (1982) and Nelson (1994). There are occasional outliers induced by fundamental financial crises. In short, the Nigerian stock market return has a property of covariance stationarity or reversibility, the return is chaotic rather than martingale in nature. The sudden astronomical increase in stock market index that was witnessed in period of 2007 and 2008 is believed to have been occasioned by the recapitalization in the banking sector, the indiscriminate granting of margin facilities by financial institutions, and the lingering effect of the global financial crisis that erupted in the world capital markets including the Nigerian stock market between 2008 and 2016.

Figure 2: Daily Movement of Stock-Market Return (4 Jan, 2000 to 29Nov, 2016)



No of Years

The choice of APARCH (1,1) model as the best fit from between the most two preferred asymmetric GARCH models is taken using the four distribution criteria: normal, student-t, GED, and Skewed-t. However, the GED distribution is considered to be the most efficient because it has the larger log likelihood of 34295.9 with the lowest Shibata Information Criterion of -16.457859as shown in table 5 below:

Table 5: Selection of the Best-Fit Model

CRITERION	GJR-GARCH MODEL			APARCH MODEL		
	Student-t	GED	Skewed	Student-t	GED	Skewed
Log likelihood	32765	34159.1	32839.1	32902.2	**34295.9**	33021.2
AIC	-15.723521	-16.392636	-15.758607	-15788905	**-16.457854**	-15.845552
SIC	-15.715920	-16.385035	-15.749485	-15.779784	**-16.448733**	-15.834910
Shibata	-15.723524	-16.392639	-15.758611	-15788909	**-16.457859**	-15845558
Hannan-Quinn	-15.720832	-16.389948	-15.755380	-15.785679	**-16.454628**	-15.841788

Source: Omokehinde, Abata, Somoye, and Migiro (2017)

The asymmetric and leverage effects measured by the nonlinear asymmetric variance specifications have been pruned down to GJR-GARCH and APARCH models where APARCH (1,1) model under the GED distribution has been finally selected for the analysis of the results as shown in table 6 below:

Table 6: APARCH (1,1) Approach under GED Distribution

	Coefficient	Std.Error	t-value	t-prob
Cst(ω)	100.000000	21.500	4.651	0.0000
ARCH(α)	1.000000	0.086582	11.55	0.0000
GARCH(β)	0.695950	0.069905	9.956	0.0000
APARCH(γ)	-1.000000	0.27675	-3.613	0.0003
APARCH(δ)	0.920859	0.062108	14.83	0.0000
G.E.D.(DF)	0.174637	0.011093	15.74	0.0000

Source: Omokehinde, Abata, Somoye, and Migiro (2017)

Table 6 (above) revealed the effect of asymmetric information on the volatility of stock returns in the Nigerian stock market from 3 January 2000 to 29 November 2016. The asymmetric parameter of interest is measured by APARCH gamma (γ). The coefficient is negative (-1.000) and statistically significant at 1% level. This confirms that there is an asymmetric or leverage effect where bad news has a destabilizing effect on volatility in Nigeria. The total impact of bad news on volatility is explosive at 2.0 during the period. Also, the volatility persistence which is measured by the sum of ARCH(α) and GARCH(β) stood at 1.695950. This is above unity and suggests that it takes the volatility long time to attenuate in Nigeria. This could largely be ascribed to the persistent effect of the 2008 global financial crisis which probably has eroded investors' confidence in the market. However, the use of the ARMA (1,1)-APARCH (1,1) model provides a less significant result relative to APARCH (1,1), model as shown in table 7 below.

Table 7: ARMA (1,1)-APARCH (1,1) Approach under GED Distribution

	Coefficient	Std.Error	t-value	t-prob
Mu	5.167942	1.7948	2.879	0.0040
AR(1)	0.432953	0.089028	4.863	0.0000
MA(1)	-0.077414	0.13170	-0.5878	0.5567
Cst. (ω)	1.626415	1.7062	0.9532	0.3405
ARCH(α)	0.298091	0.051768	5.758	0.0000
GARCH(β)	0.648582	0.079763	8.131	0.0000
APARCH(γ)	-0.050815	0.055587	-0.9141	0.3607
APARCH(δ)	1.419660	0.25090	5.658	0.0000
G.E.D.(DF)	1.115214	0.060295	18.50	0.0000

Source: Omokehinde, Abata, Somoye, and Migiro (2017)

The application of ARMA (1,1)-APARCH (1,1) approach as indicated in Table 7 (above), showed that the autoregressive order 1, AR(1) parameter is positive and significant at 1% level which is different from the moving average order 1 MA(1) with a negative coefficient and insignificant probability value. Thus, the present return of the Nigerian stock market has 43.30% predictive probability dependence on the previous level of returns. Also, the asymmetric coefficient (Gamma1), although negative, is insignificant. The distribution is less significant, relative to APARCH (1,1) as shown in Table 4.32 (above). Other parameters of ARCH and GARCH were positively and significantly distributed but with less persistent volatility of 0.946673

(approximately 1) signifying that stock returns volatility persistence will take longer to decay in Nigerian stock market. Also the evidence of asymmetric volatility is confirmed in the Nigerian stock market with negative coefficient of Gamma1 (-0.050815) which suggests that bad news innovations are more destabilizing with volatility of stock returns. However, the total impact of news on volatility using this approach is 1.050815 which is 0.949185 lower than when using the APARCH (1,1) approach.

5. Conclusion and Recommendations

The paper concluded that asymmetric or leverage effect exists in the Nigerian stock market. The impact of bad news has more disturbing effect on volatility than good news. The evidence of asymmetry in the Nigerian stock market therefore suggests that information usually enter the market non-linearly in such a way that returns were nor-normally distributed, thereby, modified the variance of the error term to be time-varying instead of being constant as in a perfect market. The existence of asymmetric information indicates that the Nigerian stock market is informational in efficient. The volatility persistence was more explosive and above unity which suggests that it takes volatility persistence long to decay. That is why the 2008 global financial crisis is still persisting in the market to date, accounted for the investors' sentiments of loss of confidence in the market and their preference for investing in fixed income securities and real estate. It is therefore, recommended that the Nigerian stock market should be deepened and diversified to include trading in financial derivatives instruments with a view to boosting investors' confidence already weakened by the longer period it takes volatility persistence to decay. Financial regulators should operate a deep, efficient and uninterrupted information flows framework to reduce the effect of information asymmetry on investment decisions, increase transparency, and boost investors' confidence in the Nigerian stock market.

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The Relationship between Learning Orientation and the Performance of Small and Medium Enterprises in South Africa

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Abstract: Small and medium enterprises (SMEs) are an important vehicle in income re-distribution, poverty alleviation, employment creation and contribute to the gross domestic product of South Africa. However, SMEs in South Africa suffer from a weak level of performance and a high failure rate. The main objective of this study was to investigate the impact of learning orientation on the performance of SMEs. A quantitative approach was used, while a self-administered questionnaire was also employed during data collection process. A three- section questionnaire covering demographic information, learning orientation variables and performance variables was prepared and distributed randomly to a selected sample of 390 SME owners in Msukaligwa Local Municipality in Mpumalanga Province of South Africa. A total of 181 questionnaires were returned. Descriptive statistics, factor analysis, correlation and regression analysis were used for data analysis. The Cronbach's alpha was used to measure reliability. The results of the study revealed a significant positive relationship between learning orientation and the performance of SMEs. Recommendations to improve the learning orientation of SMEs are suggested.

Keywords: *Learning orientation, performance; SMEs, South Africa*

1. Introduction

Fatoki and Garwe (2010) point out that small and medium enterprises (SMEs) are central pillars of economic growth of most countries. Thus, countries all over the world concentrate on broadening the SME sector in order to accelerate economic growth. SMEs are of great socio-economic significance (Small Enterprise Development Agency, 2012). The SME sector is one of the solutions to the high levels of poverty and income inequality in South Africa (Abor & Quartey, 2010). SMEs account for approximately 91% of formal business entities in South Africa. In addition, SMEs contribute about 50% of the gross domestic product and 60% of employment in South Africa (Department of Trade and Industry, 2012). Unsurprisingly, SMEs have been focused on by the government as a priority for job creation to reduce the high rate of unemployment estimated to be 27.1% (Statistics South Africa, 2016). However, despite their contribution to employment creation and economic growth, SMEs suffer from a high failure rate with a negative impact on the South African economy. Approximately 75% of new SMEs in South Africa fail within the first five years of creation (Willesse, 2010). According to Van Scheers (2012:5051), some of the major challenges experienced by SMEs in South Africa are related to learning and marketing. This includes high competition, lack of managerial skills and unwillingness to attend training and seminars. Additionally, SMEs in South Africa suffer from access to finance. This results in high rate of SME failure in South Africa (Herrington & Kew, 2013).

The adoption of learning orientation can positively impact on the performance of SMEs (Rebelo & Gomes, 2011). A learning orientation focuses on understanding the relationship a firm places on its environment relative to both the customer and the competitor (Mahmood & Hanafi, 2013). Bakar et al. (2016) argue that understanding the environment a firm operates in through the learning orientation enables the business to exploit opportunities as they arise while at the same time working on minimising the threats beforehand. Beneke et al. (2016) remark that adopting learning orientation allows a firm to meet and surpass customer expectations. On that note, Haryanto, Haryono and Sawitri (2017) assert that an organisation which embrace learning orientation has a high probability of becoming a market leader.Given the fact that customers in the 21 1st century are becoming so knowledgeable about the products they buy and make comparisons before they buy, it is important for SMEs to utilise learning orientation to constantly meet their customer needs and remain profitable. However, the literature is inconclusive about the relationship between learning orientation and the performance of SMEs. In addition, the vast majority of studies on learning orientation have been done in developed countries (Dubihlela, 2013). The inconclusiveness of previous empirical studies and the lack of studies in South Africa on the effect of learning orientation on the performance of SMEs necessitated this study. Therefore, empirical findings of this study will contribute to the body of knowledge on learning

orientation in South Africa as well as assisting managers to minimise the rate of business discontinuance in this country.

Objectives of the Study-The objectives of the study are:

- To understand the learning orientation of SMEs in South Africa.
- To investigate the relationship between learning orientation and the performance of SMEs in South Africa.

2. Literature Review

Definition of Learning orientation: Learning is a process of continuous information dissemination, processing and utilisation, often used by organisations as a strategy to gain competitive advantage (Chang & Lee, 2007; Ayse, 2010; Jyathibabu, Pradhan & Faroog, 2010). Learning is viewed as the strategy used to govern and integrate the internal and external environments (Liu, 2012). According to Nasution, Mavondo, Matanda and Ndubisi (2011), learning is a technique used by organisations to combine or merge internal information. Kreiser (2011) points out that learning is the result of acquiring knowledge combined with an actual act which SMEs put into practice.Learning orientation is a tool used by organisations to develop and improve their capabilities in order to be competitive in an ever-changing market environment (Rhee, Park & Lee, 2010). Learning orientation opens new paths and enhances creative ways of doing business (Baker & Sinkula, 2007). Learning orientation is an organisational behaviour that intends to influence knowledge sharing, interpretation and renewal between employees and shareholders in inter-firm relationships (Lai, Pai, Yang & Lin, 2009). Akhtar et al. (2011) point out that a learning organisation is represented by three dimensions. These are (1) collectively committing to learning, (2) vision and (3) broad-mindedness. Learning-oriented organisations are often the best competitors in the market. Learning organisations easily and quickly keep up with rapid environmental changes (Konidari & Yvan, 2006; Saru, 2007:36).

Theory of learning orientation: Suliyanto and Rahab (2012) describe learning orientation as the value of learning on the interior of an organisation. A greater level of learning in an organisation is an indication of devotion to learning as a practice (Dill & Van Vught, 2010; Nybakk, 2012; Hussein, Mohamad, Noordin & Ishak, 2014). A learning organisation focuses on understanding customers as a process used to effectively satisfy their needs through new products and services (Altbach, Reisberg & Rumbley, 2009; Mahmood and Hanafi, 2013). The resource based view acknowledges competitive edge as the outcome of unique inputs that have been identified and specified by an organisation (Barney, 1991). An example of such resources is relationship building capacity. Learning oriented organisations have an advantage of being in a position to effectively and efficiently utilise their learning capabilities (Espedal, 2008). Lu, Zhou, Bruton and LI (2010) suggest that learning orientation permits a firm to comprehend the desires of consumers. As such a firm needs to learn customers' needs to formulate superior values and to secure a competitive edge in the marketplace (Lages, Silva, Style & Pereira, 2009). Previous studies find that organisational learning is a significant factor in obtaining a competitive advantage (Abbasi, Akbari & Tajeddini, 2015). Learning orientation has been observed as an essential variable directly linked to innovation (Rhee et al., 2010; Huang & Wang, 2011). Learning orientation has a direct and positive influence on customer value (Nasution & Mavondo, 2008).

The effect of learning orientation on the performance of SMEs: Lu, Zhou, Bruton and Li (2010) suggest that learning orientation permits a firm to comprehend the desires of consumers. As such a firm needs to learn customers' needs to formulate superior values and to secure a competitive edge in the marketplace (Lages, Silva, Style & Pereira, 2009). Organisational learning is a significant factor in obtaining a competitive advantage (Abbasi, Akbari & Tajeddini, 2015). Learning orientation has been observed as an essential variable directly linked to innovation (Rhee et al. 2010; Huang & Wang, 2011). Learning orientation has a direct and positive influence on customer value (Nasution & Mavondo, 2008). Studies by Bierly and Daly (2007), Hult, Ketchen and Slater (2007), Akhavan and Jafari (2008), Austin and Harkins (2008) and Nybakk (2012) found a significant positive relationship between learning orientation and the performance of SMEs. This can be attributed to the fact that learning orientation relates to vast organisational actions aimed at generating and providing information and awareness to build-up a competitive edge. Learning orientation is an organisation's ability to obtain, share, exploit and preserve relevant information (Jyathibabu et al., 2010).

However, studies by Salavou (2005) and Eris, Ozmen and Neczan (2012) did not find a significant positive relationship between learning orientation and the performance of SMEs. This suggests that literature is inconclusive about the direction and strength of the relationship between learning orientation and the performance of SMEs. Despite the inconclusiveness of previous research, the argument of this study is that learning orientation positively impacts on the innovativeness of SMEs. Thus learning orientation can lead to competitive advantage, which can positively impact on the performance of SMEs. Thus, it is hypothesised that there is a significant positive relationship between learning orientation and the performance of SMEs.

3. Methodology

The study followed a quantitative research design with descriptive and causal research approaches. The study area was theMsukaligwa Municipality in the Mpumalanga province of South Africa.The survey method was used for data collection. Self-administered questionnaire method was used to collect data from the respondents. Convenience and snowball sampling methods were used to identify the respondents. The two sampling methods were used due to the inability to get a sampling frame of SMEs in the study area.The scale used to measure learning orientation was adapted from previous literature (Bierly & Daly, 2007; Hult et al., 2007). The five-point Likert scale ranging from "1 strongly disagree", " 2 disagree", "3 neutral", "4 agree" and "5 strongly agree" was used to measure learning orientation. The scale to measure performance was adapted from Idah and Mahmood (2011:1), with a Cronbach's alpha coefficient of 0.76. The study used a four-point scale to measure performance. The five-point Likert scale ranging from "1 significant decline", " 2 decline", "3 remained the same", "4 increase" and "5 significant increase" was used to measure performance. All the scales used by this study have acceptable psychometric properties in terms of their reliability and validity. The questionnaire was pre-tested with twenty owners of SMEs.This made it possible to identify and eliminate problems which might be faced later in the study as well as improving the face and content validity of the questionnaire following recommendations by (Cooper & Schindler, 2008). The questionnaire was divided into three sections: A three- section A, covering demographic information, section B covering learning orientation variables and section C covering performance variables.Descriptive statistics, factor analysis, correlation and regression were used for data analysis. The Cronbach's alpha was used as a measure of reliability. A score of 0.7 is the acceptable reliability coefficient (Hair, Anderson, Tatham & Black, 2006)

4. Results and Discussion

Response rate and demographic characteristics: Three hundred and ninety (390) questionnaires were sent out to the respondents and one hundred and eighty one (181) questionnaires were returned. The response rate was 46.4%. 106 males and 75 females participated in the survey. The results indicate that females involved in business are still less than males in South Africa. Similarly, Tsele (2015) note that females are still underrepresented in business as their male counterparts continue to dominate. However, some studies attribute this to the fact that females are risk averse hence the low rate of starting and owning a business.The majority of the SME owners that participated in the survey were in the 30-39 age group with Matric qualification. This indicates that most businesses are run by the youthful generation in South Africa. The authors of this paper hence believes that this will make it easy to introduce the learning orientation to SMEs in South Africa since the youth have less resistance to change compared to old people.In addition, the majority of SMEs that took part in the survey were in the service and retail sectors, with between one and four employees and in operation for a period of six to ten years.

Descriptive statistics on learning orientation: Table 1 illustrates the results of descriptive analysis on learning orientation, of which two of the three items with the highest mean are: 'In this company learning is a necessity essential to secure the survival and longevity of the company' (mean 4.25) and 'Employees are dedicated to company goals in all sections (mean 4.25) are both equally important. This is followed by the item 'management team understood that a company's capability to learn serves as a competitive benefit' (mean=3.77). The three items with the lowest mean are: 'Employees see themselves co-partnering with management towards moving the company to the right direction' (mean=2.58); 'The company has a special technique of sharing previous experiences on company's actions in every section' (mean=2.71). The scale mean in table 1 is above 3, which shows a high level of learning orientation on SMEs. The results are

consistent with the findings of previous empirical studies on learning orientation and performance (Akhavan and Jafari, 2008; Austin and Harkins, 2008; Nybakk, 2012; Mahmood and Hanafii, 2013).

Table 1: Descriptive analysis of learning orientation

	Mean	Standard deviation
Management essentially concurs that our company's capability to learn strengthen our competitive advantage	3.77	1.044
The understanding surrounding this argument is that it is a huge investment for employees to learn and not expenditure	3.75	1.044
In this company learning is a necessity essential to secure the survival and longevity of the company	4.25	0.788
We all understand and mutually agree with the company's aims and visions in all sections and sub-sections	3.75	1.085
Employees are dedicated to company goals in all sections	4.25	0.793
Employees see themselves co-partnering with management towards moving the company to the right direction	2.58	1.140
The company staff found that their perceptions about the market place is regularly questionable	3.62	1.122
The company consistently assesses the quality of decisions and actions implemented afterwards	3.69	1.113
The company has a respectable communication platform which revives previous lessons experienced	3.52	1.077
The company has a special technique of sharing previous experiences on company's actions in every section	2.71	1.218
The company positioned a slight determination in sharing lessons and experiences	3.56	1.180
Scale mean	3.59	
Standard deviation	1.003	
Crombach's alpha	0.842	

Table 2: factor analysis of learning orientation

Item	Factor loading
In this company learning is a necessity essential to secure the survival and longevity of the company	0.937
Management essentially concurs that our company's capability to learn strengthen our competitive advantage	0.901
We all understand and mutually agree with the company's aims and visions in all sections and sub-sections	0.834
The understanding surrounding this argument is that it is a huge investment for employees to learn and not expenditure	0.803
The company consistently asses the quality of decision and actions implemented afterward	0.746
Employees are dedicated to company goals in all sections	0.709
The company consistently assesses the quality of decisions and actions implemented afterwards	0.636
company staff found that their perceptions about the market place is regularly questionable	0.588
The company has a respectable communication platform which revives previous lessons experienced	0.527
Percentage of variance explained: 66.561: KMO= 0.917; BTS p<0.001	

Items with loading below 0.300 removed

Factor analysis of learning orientation: The principal component analysis with Varimax rotation was used for factor analysis. Table 2 displays a one-factor clarification of learning orientation with 66.561 of the total variance. Two out of the eleven items have been eliminated as a result of low loading), the items which are

lower than .300 include: 'inthis company learning is a necessity essential to secure the survival and longevity of the company= 0.24'; as well as 'the company has a respectable communication platform which revives previous lessons experienced=.28'. The validation of the variables used was done through factor analysis. The Kaiser-Meyer-Olkinmeasure of sampling adequacy (KMO) and Bartlett's Test of Sphericity were used to determine the suitability of the data. The acceptable high level of learning orientation is consistent with studies such as Kotabe, Dunlap-Hinkler, Parente & Mishra (2007), Gnyawall, Singal & Mu (2009) and Kafouros, Buckley & Clegg (2012). The KMO must be at least 0.6. Learning orientation has a meaning and admissible Kaizer-Meyer-Olkin (KMO) of .817. Bartlett's test of sphericity (BTS) =2.161E3, p=0.000, df= 78.

Table 3: Descriptive analysis of performances

Performance variables	Mean	Std deviation
Sales turnover	3.75	1.017
Profit	2.16	.950
Employment	1.91	1.034
Sales growth compared to competitors	3.67	1.131
Valid N (listwise)	4	
Scale mean	2.87	
Std deviation	1.106	
Cronbach's Alpha	.708	

Performance: Table 3 shows that descriptive analysis on performance confirmed that items with the highest mean is 'sales turnover' with (mean= 3.75), as well as 'sales growth compared to competitors' being second most important item (mean= 3.67). The item with the lowest mean is 'employment' with a (mean 1.91). This means that SMEs are still lagging behind in terms of employment growth. Studies such asWorld Bank (2015), assert that it is well known that smaller and younger firms are subject to more job destruction. On that note other studies such as (Masocha and Dzomonda 2016), indicates that SMEs employ mostly below 5 workerswhich is too low considering the high unemployment in South.The scale mean for performance is 2.87.The scale mean is low indicating that SMEs display an overall weak performance. This is consistent with similar studies such as (Machirori & Fatoki, 2013).

Table 4: correlation between learning orientation and performance

	Learning orientation	Performance
Learning orientation: Pearson correlation	1	.722
Sig.(tailed)		.000
N	181	181

Table 5: Regression analysis between learning orientation and performance

Model	Unstandardized coefficient		Standardized coefficient		
	B	Std. Error of the estimate	Beta	T	Sig
1 (constant)	3.161	.234		9.245	.000
Learning orientation	.063	.0.10	.722	6.270	.000

Dependent variable: Performance

The relationship between learning orientation and performance: Tables 4 and 5 present the results of the correlation and regression. The correlation between learning orientation and performance, which is (r=.722, p=0.000). In this study the Pearson's r is .722, which is positive as it is closer to 1. This means an increase in learning orientation value will result in an increase in the value of performance; similarly a decrease in learning orientation value will lead to a decrease in the value of SMEs performance. A strong

correlation between learning orientation and performance has been affirmed with a sig value of less than .05. The regression coefficient between learning orientation and performance is predicted by Beta=.722, P<.000 with a significant T value 9.245, P<.000 and F value of 2.601 and P<000. The Beta =.722 which is closer to 1 supported by significant P value of .000 concludes that the performance of SMEs can be predicted, based on efforts invested in learning orientation. Hence, the correlation results in table 4 and the regression analysis in table 5 indicate that there is a significant positive relationship between learning orientation and the performance of SMEs. The findings are consistent with previous (Bierly & Daly, 2007; Hult, Ketchen and Slater, 2007; Akhavan and Jafari, 2008; Nybakk, 2012).

5. Conclusion

SMEs contribute positively to employment creation, poverty reduction and economic growth of South Africa. However, the failure rate of SMEs is very high in South Africa**.** The adoption of learning orientation can positively impact on the performance of SMEs. A learning orientation focuses on understanding the relationship a firm places on its environment relative to both the customer and the competitor. It was discovered that learning orientation allows a firm to be a market leader. Learning orientation also allows SMEs to be innovative which gives them a competitive advantage over their competitors. More importantly, it was found that learning orientation enable SMEs to build long lasting relationships with their customers. This critically improves their performance given the fact that customers in the 21st century are knowledgeable about what to buy and where to get it cheap. Findings from the factor analysis for learning showed that majority of the factors were retained, therefore indicating construct validity of the scales. Considering the performance of SMEs, it was discovered that overally SMEs display a weak performance. The findings of existing studies were inconclusive about the direction of the relationship between learning orientation and the performance of SMEs. The current study investigated the relationship between learning orientation and the performance of SMEs. Considering the results from both correlation and regression analysis, the results revealed a significant positive relationship between learning orientation and the performance of SMEs. It was deduced that an increase in learning orientation value will result in an increase in the value of performance and at the same time a decrease in learning orientation value will lead to a decrease in the value of SMEs performance.

Recommendations: It was discovered that learning orientation positively influences the performance of SMEs. Hence, recommendations are made to the government and SME owner/managers to fully support the adoption and implementation thereof. The government has a bigger role to play in SMEs' development. Hence, as part of the package designed for SMEs, the government should organise workshops at all levels of its structures, that is from district level, provincial and national level where SMEs are taught on how to embrace learning orientation. Government Agencies such as the Small Business Development Agency (SEDA) and the National Youth Development Agency (NYDA) should organise formal trainings to promote and encourage SMEs to be more learning oriented. Learning is a continuous process which needs SMEs to continuously search for information in the business environment. Factors which affect the learning orientation of SMEs need to be improved. Hence, owners/managers in SMEs should thrive to create a culture that supports learning orientation. Furthermore, the management needs to adopt organizational structures which favor learning orientation. To fully yield the fruits of learning orientation, the adoption and implementation thereof should follow a holistic approach. This means that it should be supported from top management up to the shop floor workers. SMEs are also recommended to create a task team which specializes on checking customer complaints and feedback as well as benchmarking from competitor activities. Customer information must not only be acquired, but also disseminated and applied within the company, calling for attention to the importance of internal communication. As such, effective communication should be promoted in SME structures by making the communication to be two way. It is also crucial for the owners of SMEs to attend training and seminars on organizational learning.

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