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Editorial

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

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Table of Contents

PAPERS

Local vs. Global Brands: Country-of-Origin's Effect on Consumer-based Brand Equity among Status-Seekers

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Abstract: This paper examines the local and global automotive brands in conjunction with country-of-origin effect on consumer-based brand equity. Consumer's level of status-seeking motivation is considered when analysing the effect of brand's country-of-origin on consumer-based brand equity. Study conducted on 181 respondents showed that consumers generally prefer Asian than European automotive brands. Asian brands also ranked highest in perceived quality and brand loyalty, followed by European brands and local brands. The main difference of high and low status-seeking consumers is found in brand association, perceived quality, and brand loyalty of local brands. Low status-seeking consumers tend to rate brand association, perceived quality, and brand loyalty of local brands higher than high status-seeking consumers. This paper exhibits that the theory of consumer ethnocentrism and global branding strategies are not mutually exclusive.

Keywords: *Country-of-Origin, Consumer-Based Brand Equity, Status-Seeking Motivation, Global and Local Brands, Automobile Industry*

1. Introduction

The rapid globalization and increased international business activity have caused the emergence of global market, where products are available outside its home country (Hsieh, 2002).For years; consumers have been relying on the impression of country-of-origin (COO) as a guidance for making purchasing decisions, especially when they are flooded with enormous amount of choices from both local and global brands. Akerlof (1970) explained the concept of "lemons" in the context of the automobile industry, as consumers may misrepresent the true quality of automobiles because they are too complicated for consumers to evaluate and consumers may lack knowledge on automobile. It is therefore important to manage brand equity because of its strategic role of gaining competitive advantage and influencing consumer decision making. However, to manage brand equity, managers must develop a thorough understanding of its formative factors (Jalilvand, Samiei & Mahdavinia, 2011). The connection between COO and brand equity have encouraged a few researchers in the past to address the dimensions of brand equity and relationship of COO and brand equity (Roth, Diamantopoulos & Montesinos, 2008; Hamzaoui-Essoussi, Merunka & Bartikowski, 2011). In the recent years Roy and Chau (2011) and Ho, Ong, Wang, Tay, and New (2012), have researched on global versus local brands on the automobile industry. Although consumers may summarize the information to an accessible level, summarizing information to global and local level may be too vague. Therefore, this research investigates at a regional level, a more accessible level as compared to COO but not as vague as global and local level.

The automobile industry is a fully-branded industry as no manufacturer would invest heavily in production, marketing, and advertising of automobile without branding it. Malaysia is the country with highest car-ownership-to-people ratio in ASEAN, with 200 car ownership in every one thousand people (Malaysian Investment Development Authority, 2012). The automobile industry is experiencing a growth of an average of two to four percent for 2012-2014, where market share for local automobile companies (58.1%) is not far ahead of the market share for foreign automobile companies (41.9%) (Malaysia Automotive Association, 2014). Automobile companies achieve performance through aggressive marketing campaign. The automobile companies have spent RM260 million by the first six months of 2013 (Marketing Magazine, 2013). The Malaysian automotive context of the competitive yet highly-subsidized local automotive sector and demand for global automotive brands provides a right context fit for this study. Hence, this research examines the relationship between COO (Local, Asia and Europe) and consumer-based brand equity of automobile industry in Malaysia. This study further examines the difference in the relationship of COO and consumer-based brand equity between high and low status-seekers.

2. Literature Review

Country-of-Origin: Country-of-origin (COO) is used as a cognitive cue for consumers to evaluate a product (Ditcher, 1962). It is an intangible product attribute and extrinsic cue for consumers to evaluate a product when product information is insufficient or difficult to manage (Huber & McCann, 1982). COO creates a halo effect and a summary of product information which helps consumers to make inferences and abstraction of the product based on the country's image they had in their mind (Sharma, 2011). Products from a certain COO may have a symbolic and emotional meaning in relation to their national identity, feeling , and status (Shukla, 2011).Brands from countries with favourable images are better received by consumers than brands from countries with unfavourable images (Verlegh, Steenkamp& Meulenberg, 2005; Yasin, Noor & Mohamad, 2007). COO consists of brand origin (BO) and country-of-manufacture (COM). BO is the country associated by consumers to the product, regardless of the place where the product was produced; whereas COM is the country where the branded product was produced or assembled (Moradi & Zarei, 2012). The issue of BO and COM was being researched since the 1980s. However, COM has slowly become irrelevant and the importance has slowly shifted towards BO as manufacturers shift to the best possible location to be cost-effective (Parkvithee & Miranda, 2012). Thus, many companies position their brands with respect to their national origin (Balabanis & Diamantopoulos, 2008; Shukla, 2011).

Consumers prefer global brands as global brands are often associated with status, wealth and prestige of consumers, which enhance their social standings (Alden, Steenkamp & Batra, 1999). On the other hand, consumers may also prefer local brands as they display consumer ethnocentrism for various reasons, such as fear of loss of jobs due to import of global brands and the unpatriotic sense when purchasing global brands (Kaynak & Kara, 2002). Besides that, local brands can better position as 'sons of the soil' to directly identify with consumers' own local traditions, customs, and culture (Cayla & Eckhardt, 2008). This research will test COO and global and local brand in conjunction with the automobile industry of Malaysia to find out its relationship with consumer-based brand equity (CBBE) for local brands, Asian brands, and Europe brands.

Consumer-Based Brand Equity: CBBE is defined as "a set of brand assets and liabilities linked to a brand, its name and symbol that adds to or subtracts from the value provided by a product or service to a firm and/or to that firm's customers" (Aaker, 1991, p.15). CBBE is the added value of a brand in the mind of consumers, allowing companies to charge a premium price (Keller, 1998). This research will use Aaker's model of CBBE. All CBBE models consist of one or more components in Aaker's model (Keller, 1993; Bendixen, Bukasa & Abratt, 2004). Besides that, it is the most widely cited and accepted framework. The Aaker's model consists of brand awareness, brand association, perceived quality, and brand loyalty (Aaker, 1991). A global brand is preferred because: 1) it is perceived to be of higher quality (Pappu, Quester & Cooksey, 2007); 2) it communicates added value by way of membership to global consumer community (McCraken, 1986); and 3) it is associated with higher prestige (Kapfere, 1997). However, the preference towards global brand may be moderated by factors like consumer ethnocentrism wherein local consumers may take pride in the countries' brand symbols and culture (Steenkamp, Batra & Alden, 2003).

Brand Awareness: Brand Awareness is a key dimension of the customer-based brand equity model and it is included in most models (Aaker, 1991; Keller, 1993; Agarwal & Rao, 1996). Aaker (1991) and Keller (1993) explained that brand recall and recognition are the most important component and measurement of brand awareness. Researchers also conceptualized the measurement for brand awareness on recall and recognition (Yoo & Donthu, 2001). Brand awareness is the first step to the development of brand equity and it could affect brand association, brand choice, and brand loyalty (Shahin, Kazemi & Mahyari, 2012). Research on high-involvement products found brand awareness to be the most significant customer-based brand equity (Im, Kim, Elliot & Han, 2012). In many studies, brand awareness acts as a component by itself and it is an important component rather than a joint component with brand association (Yoo & Donthu, 2001; Pappu, Quester & Cooksey., 2005).Countries with good images are often familiar to consumers and are perceived to be producers of quality brands (Yasin et al., 2007). This helps in consumers' recall and recognition process because brand can differentiate itself with brand origin (Keller, 2002). Research has found brand origin and brand awareness to be significantly related in the audio-visual appliance industry (Shahin et al., 2012). Thus, this research hypothesized that:

H1: Brand Awareness varies significantly for local, Asian, and European brands.

***Brand Association*:** Brand association is "anything that linked in memory to a brand" (Aaker, 1991, p. 109). It consists of image-making, product's profile, consumer's conditions, awareness, brand characteristics, sign, symbol, and so forth (Aaker and Joachimsthaler, 2000). It helps in providing value to the company, retrieving information, creating positive feeling, and providing a reason to buy the product (Aaker, 1991). A set of brand association also forms brand identity (Yasin et al., 2007). Brand association usually consists of dimensions that are unique to a product category or to a brand (Aaker, 1996). Keller (1993) noted that the uniqueness, desire, and power of brand association are necessary. Brand origin, being a secondary association and extrinsic cue, is considered as one of the source to brand image. This secondary association would affect brand association because consumer with knowledge of brand origin would associate the brand with positive or negative association (Shahin et al., 2012). There are empirical evidences that prove the said relationship (Yasin et al., 2007; Moradi & Zarei, 2012; Shahin et al., 2012). However, they were all tested in electronic appliance industry. Pappu et al. (2005) has tested the relationship in the context of passenger car. However, the research was testing COM instead of BO. The researcher also landed support from Amonini, Keogh and Sweeney (1998), stating that the importance of COM or BO to CBBE may be product or situation specific. Thus, this research hypothesized that:
H2: Brand Association varies significantly for local, Asian, and European brands.

***Perceived Quality*:** Aaker (1996) stated that perceived quality is the core component to customer-based brand equity. Perceived quality is explained as the way customer thinks the brand will perform its intent purpose as compared to alternative rather than its actually quality (Zeithaml, 1988). Perceived quality incorporates all the benefits and attributes that form a perception in the mind of consumers, from basic functional characteristics, performance and the life of the product (Takali, Hamidi, Khabiri, Sajjadi & Alhani, 2012). Research showed that perceived quality is essential for CBBE as it adds more value for customer's purchase (Low & Lamb, 2000). Brand origin image is consumers' general perception about the quality of a product from a particular country (Han & Terpstra, 1988). Brand origin of a product influences consumers' perception of a product's quality (Pappu et al., 2005, 2007). However, the study of Hamzaoui-Essoussi et al. (2011), using passenger cars from Korea and Germany in Tunisia has found contradicting result. As perceived quality placed of brand equity may vary across cultures (Jung & Shen, 2011), this research tests in the context of Malaysia. Thus, this research hypothesized that:
H3: Perceived Quality varies significantly for local, Asian, and European brands.

***Brand Loyalty*:** Aaker (1991) defined brand loyalty as the attachment of a customer to a brand. Javalgi and Moberg (1997) defined brand loyalty in two perspectives: behavioural loyalty and attitudinal loyalty. Behavioural loyalty is the actual repeat purchase of a brand or the commitment to re-buy a brand over time (Keller, 2002). Attitudinal loyalty is the tendency to choose a certain brand as the first choice (Oliver, 1997). This study adopts the definition of brand loyalty as "the tendency to be loyal to a focal brand, which is demonstrated by the intention to buy the brand as a primary choice" (Yoo & Donthu, 2001, p. 3). Most of the time, brand loyalty is as a subset of brand equity because consumers tend to be loyal to the brand with strong brand equity to them (Moradi & Zarei, 2012).Countries with favourable images have high level of brand popularity and in turn, led to consumer brand loyalty (Kim, 1995). Country's image acts as a "halo" effect when consumers have limited knowledge of the product (Erickson, Johansson& Chao, 1984). Research also showed that BO and brand loyalty are significantly related (Shahin et al., 2012). Conflicting empirical evidence was also found to prove the relationship insignificant (Moradi & Zarei, 2012). However, both researches were done in laptops, mobile phones, and audio visual electronic appliances. This research will then test in the passenger car industry. Thus, this research hypothesized that:
H4: Brand Loyalty varies significantly for local, Asian, and Europe brands.

Status-Seeking Motivation: Eastman, Goldsmith and Flynn (1999) defined status consumption as "the motivational process by which individual strives to improve his social standing through the conspicuous consumption of consumer products that confer and symbolize status both for the individual and surrounding significant others." Status consumption is the process of gaining status or social prestige through acquiring products that are associated with high social status (Jung & Shen, 2011). Consumption of status or symbolic product helps in enhancing social recognition and self-concept (Eastman et al. 1999). According to Scitovsky (1976), goods can be classified into necessities and luxuries categories. While necessities do not fluctuate according to income, luxuries do as disposable income increases. Most global brands are often treated as

luxury brand and are associated with prestige. Thus, different status-seeking-motivation consumers may have different preferences over global brands (Roy & Chau, 2011). Status-seeking consumers are more likely to purchase luxury brands than non-status-seeking consumers in order to satisfy their symbolic needs (Eastman et al., 1999).

H5: Brand awareness varies significantly with status consumption motive for (a) local brand, (b) Asian brand, and (c) European brand.

H6: Brand association varies significantly with status consumption motive for (a) local brand, (b) Asian brand, and (c) European brand.

H7: Perceived quality varies significantly with status consumption motive for (a) local brand, (b) Asian brand, and (c) European brand.

H8: Brand loyalty varies significantly with status consumption motive for (a) local brand, (b) Asian brand, and (c) European brand.

3. Methodology

The 18-item questionnaire adapted for this study uses a 5-point Likert scale. Five status-seeking motivation items were adapted from Eastman et al. (1999), two brand awareness items were adapted from Yoo and Donthu (2001), two brand association items were adapted from Pappu et al. (2005), five perceived quality items were adapted from Pappu et al. (2005), and four brand loyalty items were adapted from Yoo and Donthu (2001), Pappu et al. (2005), Yasin et al. (2007), and Tong and Hawley (2009). Respondents are required to answer all 13 CBBE item for five different brands. The unit of analysis for this study is for respondents aged 18 or above with a monthly income of RM3, 000 or above in Malaysia. Self-administrated questionnaires are distributed online via social media platform, Facebook, with convenience sampling. Through this method, a total of 181 usable questionnaires were obtained out of 200 questionnaires collected. Data collected are further tested with Cronbach's alpha coefficient to ensure reliability. As Cronbach's alpha ranges between 0.707-0.836 falls between the acceptable range of more than 0.7 (Nunnally, 1978), all items are kept. The data are also tested for normality, where "Eyeball" method of meeting the normality assumption is used (Totton & White, 2011). First, the presence of bell curve on histogram was examined. Second, the scores on a normal Q-Q plot were examined. Lastly, absence of outliers on the box plot was examined (Totton & White, 2011). Based on these screenings, the distribution of the data collected complied with normality assumption.

The respondent group comprised of 45% of male and 55% of female. Eighty-five percent of the respondents are Chinese, 6% are Malay, 6% are Indian and the remaining 3% of the total respondents consists of other races. Majority of respondents have a Bachelor's Degree (58.6%), following with Pre-University/Diploma (24.9%) and Masters (11%). Only a small amount of them are with SPM (2.8%), PhD (2.2%) and others (0.6%) for their highest level of education. Executive job holders consist of 56.9%, Management and Professional job holders have 12.7%, and 17.7% of respondents respectively. A median split at 3.6 was also used to split up respondents to high and low status-seeking motivation group. Seventy-five respondents are in high status-seeking motivation group attributed to 41% of the total respondents, while 106 respondents are in low status-seeking motivation group attributed to 59% of the total respondents.

4. Analysis & Findings

Paired sample t-test was used to compare means of dimension of CBBE for local, Asian, and European brands. In terms of brand awareness, there is no difference between local brands and European brands (M=4.2099 and M= 4.2376, $p=0.361>0.05$) (shown in Table 1). However, Asian brands (M=4.3287) are significantly higher than local brands and European brands ($p=0.002<0.05$ and $p=0.001<0.05$). Therefore, H1 is partially supported.

Brand association, on the other hand, differs significantly between local, Asian, and European brands (shown in Table 1). European brands (M=3.6920) ranked the highest, followed by Asian brands (M=3.5041) and local brands (M=1.9392). European brands are significantly higher than Asian brands ($p=0.000<0.05$) and Asian brands are also significantly higher than local brands ($p=0.000<0.05$). Thus, H2 is supported.

Table 1: CBBE

CBBE	COO	Mean	Local Mean Differences	Standard Deviation	Sig	Asian Mean Differences	Standard Deviation	Sig
Brand Awareness	Local	4.2099	-	-	-	-	-	-
	Asian	4.3287	-0.11878	0.51745	0.002	-	-	-
	Europe	4.2376	-0.02762	0.40560	0.361	0.09116	0.37078	0.001
Brand Association	Local	1.9392	-	-	-	-	-	-
	Asian	3.5041	-1.56492	0.94516	0.000	-	-	-
	Europe	3.6920	-1.75276	1.10805	0.000	-0.18785	0.48298	0.000
Perceived Quality	Local	2.0785	-	-	-	-	-	-
	Asian	3.7619	-1.68343	0.87315	0.000	-	-	-
	Europe	3.6558	-1.57735	0.97187	0.000	0.10608	0.56077	0.012
Brand Loyalty	Local	1.8923	-	-	-	-	-	-
	Asian	3.3902	-1.49793	0.93546	0.000	-	-	-
	Europe	3.2459	-1.35359	1.11499	0.000	0.14434	0.82420	0.020

Asian brands ranked the highest in perceived quality (M=3.7619), followed by Europe brands (M=3.6558), and lastly by local brands (M=2.0785) (shown in Table 1). Asian brands are significantly higher than European brands (p=0.012<0.05) and European brands are significantly higher than local brands (p=0.000<0.05). Hence, H3 is supported. Similar results were obtained for brand loyalty (shown in Table 1), where Asian brands (M=3.3902) ranked the highest, followed by European brands (M=3.2459) and local brands (M=1.8923). Asian brands are significantly higher than European brands (p=0.020<0.05) and European brands are significantly higher than local brands (p=0.000<0.05). Therefore, H4 is supported. MANOVA was used to test the difference between low and high status-seeking motivation groups of respondents (Table 2). There are no significant differences (p=0.400>0.05, p=0.176>0.05, p=0.474>0.05) between high and low status-seeking motivation group in brand awareness as they are aware of brands from different region and local brands. Thus, H5 (a), (b), and (c) are not supported. On the other hand, there is a significant difference for local brand's brand association. Low status-seeking respondent group (M=2.0377) rated local brands higher for brand association as compared to high status-seeking respondent group (M=1.8000, p=0.036<0.05). Thus, H6 (a) is supported while H6 (b) and (c) are not supported.

Table 2: MANOVA Results

CBBE	COO	Mean Low	Mean High	Sig
Brand Awareness	Local	4.2500	4.1533	0.400
	Asia	4.2901	4.1633	0.176
	Europe	4.3042	4.3633	0.474
Brand Association	Local	2.0377	1.8000	0.036
	Asia	3.6934	3.6900	0.975
	Europe	3.5448	3.4467	0.282
Perceived Quality	Local	2.2528	1.8320	0.000
	Asia	3.5726	3.7733	0.024
	Europe	3.7538	3.7733	0.768
Brand Loyalty	Local	2.1156	1.5767	0.000
	Asia	3.2229	3.2783	0.653
	Europe	3.3986	3.3783	0.821

There are significant differences between high and low status-seeking respondent for local brands and Asian brands for perceived quality (p=0.000<0.05, p=0.024<0.05). However, there are no significant differences on

high and low status-seeking respondent group rates for European brands (p=0.768). High status-seeking group rated local brands lower than low status-seeking group (M=1.8320, M=2.2528). On the other hand, high status-seeking group rated Asian brands higher than low status-seeking group (M=3.7733, M=3.5726). Hence, H7 (a) and (b) are supported but H7 (c) is not supported. In terms of brand loyalty, only local brands showed significant differences between high and low status-seeking motivation groups (p=0.000<0.05, p=0.653>0.05, p=0.821>0.05). High status-seeking respondents rated local brands lower than low status-seeking respondents (M=1.5767, M=2.1156). Thus, H8 (a) is supported while H8 (b) and (c) are not supported.

5. Discussion, Conclusion & Recommendations

This study aims to examine the relationship of global brands from different regions and local brands affecting CBBE of automobile brands in Malaysia. Overall, the results show that global brands have higher CBBE ratings as compared to local brands in terms of brand awareness, brand association, perceived quality, and brand loyalty. The results are similar to the finding of Roy and Chau (2011) and Ho et al. (2012). This strongly supports the various advantages of pursuing a global brand strategy (Steenkamp et al., 2003; Roy & Chau, 2011). However, findings show that Asian brands ranked the highest overall and in each dimension. The findings are similar to the findings of Ho et al. (2012), where consumers prefer global brands from the same region as the consumers' country. This may be due to the desire of consumers to higher prestige and status of global brands but at the same time their desire also to a brand they could closely relate to. This could suggest that consumer ethnocentrism and brand globalness could go hand-in-hand and may not be mutually exclusive. This was not found in Roy and Chau (2011) research because only one global brand, Toyota, was chosen for the research. Also, high and low status-seeking consumers will not rate global brands differently, except for perceived quality variable. This result is similar to Roy and Chau (2011), except that Roy and Chau (2011) also found that high status-seekers are more aware of global brands than low status-seekers. High status-seeking consumers rate Asian brands higher than low status-seeking consumers. This may be because low status-seeking consumers could not justify the price of Asian automobile brands, as perceived quality may take into consideration of price level (Jung & Shen, 2011). However, high status-seeking consumers generally rate local brands lower than low status-seeking consumers in all dimension of CBBE except for brand awareness. In Roy and Chau's (2011) research, only brand loyalty is favoured by low status-seekers. There is no significant difference in the knowledge of brands for high and low status-seeking consumers. The lower rating of high status-seeking consumers to local brands may be due to local brands not meeting the consumers' requirements of status and prestige to enhance their social standings.

Unlike previous studies, authors did not take into consideration regional culture characteristics, where consumers may still exercise certain level of consumer ethnocentrism. Based on the theory of consumer ethnocentrism and global branding strategy, it was found that both theories are not mutually exclusive in Malaysia's automobile industry. This is important for the automobile industry as companies wish to pursue a global branding strategy or brand extension strategy in different regions of the world, especially in Asian countries. This study is confined under several limitations which suggest the avenues for future research. Non-probability convenience sampling was used due to budget and time constraint. Future research should use a probability sampling method to avoid bias by the nature of the sampling technique. In addition, it will be a better representation of the whole population. Also, this study did not take into consideration product category as suggested by Pappu, Quester, and Cooksey (2006), as it was suggested that product category may affect the rating on CBBE of certain countries' brands.

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Validating and Identifying Health and Safety Performance Improvement Indicators: Experience of Using Delphi Technique

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Abstract: The literature on health and safety (H&S) is bound with different elements and indicators of measuring H&S performance. The purpose of this paper is to discuss the success and challenges of using quantitative and qualitative approach of Delphi technique in validating and identifying H&S performance indicators that small and medium construction enterprises (SMEs) can use to measure and monitor their H&S performance improvement at project level. Furthermore, discuss the identification of experts in the field of H&S, ways of improving consensus analysis and minimizing experts' non-response. This study is based on practical experience of the researchers pertaining to the Delphi technique method which is a constructivist or interpretive approach to knowledge. The study started with an extensive literature review to identify core elements and leading indicators characterizing H&S culture to develop a Delphi questionnaire that was used in the first round of Delphi. A four round Delphi technique was conducted to attain consensus of the identified H&S indicators. The experts were identified from published articles of H&S, practitioners' website of H&S and word of mouth. The use of email was used as a mode of communication. This study set to warn but also encourage the use of Delphi technique as a method to unearth information in areas where consensus has not been reached such as H&S performance measurement indicators for construction SMEs in South Africa.

Keywords: *Delphi technique, indicators; methodology, quantitative and qualitative*

1. Introduction

The literature on health and safety culture is abound, with different measures, Fernandez et al. (2007) indicated a lack of consensus of the indicators that constitute health and safety management system which is a critical component of H&S culture. Critical reading on H&S indicators to be used for measuring performance improvement in H&S has scantly focused on Delphi method to validate and identify the leading indicators i.e. management commitment and involvement in H&S, employee involvement and empowerment in H&S, H&S resources, H&S training, but to name a few. The few studies that have prompted the need for this study were undertaken in the United States of America. These were studies conducted by Hallowell (2008) and Rajendran (2007). Furthermore, Hallowell & Gambatese (2010) indicated that Delphi technique can be used to finalize decisions when there is lack of empirical evidence that need to be made by experts. This statement supports the need to identify critical leading indicators for measuring H&S performance using the Delphi method. Hence, the study was designed to use both quantitative and qualitative approach as the Delphi method straddles between these two approaches. It was to validated and identify, the H&S leading indicators, based on opinions and judgment of H&S experts in successive rounds of iteration that could be used to comprehensively articulate the indicators for H&S performance improvement model for SMEs. It is worth noting that lagging indicators i.e. injuries, accidents and number of deaths have been used to measure H&S performance. However, this measure is inadequate as it reports on the aftermath of what could have been prevented using leading indicators of H&S. This article therefore focuses upon primary research phase of the project where quantitative and qualitative approach of collecting data was used in order to develop a final questionnaire to test the theory using structural equation modeling with construction SMEs. This was a significant methodology choice for the second phase of this research project.

2. Methodology

It was obvious from the literature review that H&S measures or indicators of H&S culture are a controversial subject in the construction industry that continues to provoke debate i.e. there are not set H&S indicators that are tied to H&S culture, the indicators differ from study to study (see Fernandez-Muniz et al., 2007). A research method that was required that could generate and encourage the discussion of different opinions, in

the attempt to ensure that all relevant issues were validated, identified and explored (Goldschmidt, 1996) was advocated for, this immediately ruled out a one-off questionnaire, which could elicit opinions but not encourage an exploration of these opinions. Constraint of time, cost and geography also ruled out a series of individual interviews or focus groups. The Delphi method was chosen for this second phase of the PhD research project. This method suited the requirements of this research study, as one of its characteristic is to provoke discussion and assist in reaching consensus on various indicators of H&S that will improve H&S performance of small and medium construction enterprise in South Africa, while also fitting the practical constraints of the duration of this research project.

Defining the Delphi Technique: Linstone and Turoff, (1975) refused to posit an explicit definition of Delphi method for two major reasons. Firstly, they believed that a research technique should be continuously evolving and redefining itself as it is applied to different areas of research, when something has attained a point at which it explicitly definable then progress has stopped. Most importantly they believed that in its design and use Delphi is more of an art than a science. Cape (2004) in his analysis further opines that the pioneers of Delphi method did not want to constrain the researcher by stating that Delphi should be used in one specific way, and only in certain areas of research. The researcher should be free to make the Delphi method their own, to tailor the technique to suit their own requirements. Nevertheless, general descriptions of the Delphi method must be provided before the researcher can adapt the technique to his/her own research. Delphi is usually used for collecting and distilling knowledge from experts (Ziglio, 1996). The researcher purposefully selects respondents with the knowledge and experience necessary to provide useful insight into the problem or issue under investigation. The experts are asked to answer a question or series of questions. This is usually done anonymously; the experts are in contact with the researcher but not with each other. The researcher analyses the views of the experts and returns them for further comment, again ensuring anonymity. This process is repeated over a set number of rounds, allowing the experts to alter or defend their views in the light of what others have said. A well designed Delphi survey should produce; explicit reasoned, self-aware opinions, expressed in the light of the opinions of associate experts (Dyer, 1979).

Methods of achieving high response rate: In line with the aforementioned discussion of Delphi, in order to improve the response rate of experts Hsu & Sandford (2007) advocates for the following approaches;

Assistance from endorsed individuals: Hsu & Sandford (2007) indicated that an expert endorsement or recommendation can help in identifying other experts. A list of expert panelists should be prepared, and there validity approved by an expert.
Initial contact: An initial contact has to be undertaken before the first round of Delphi is administered. The first contact is required where the approved experts are contacted telephonically an explanation of the research objectives is explained to them. If the identified experts are unwilling to participate they need to inform the researcher (Hsu and Sandford, 2007).
Open-ended vs. close-ended statements: According to Hsu and Sandford (2007) the use of a close-ended questionnaire with specific statements is viewed as an advantage than using open-ended questionnaire. From the view point of a participant, if a questionnaire is easy to respond to and less time-consuming, he/she is more likely to complete and return the questionnaire. Hsu and Sandford (2007) further indicates that the use of the open-ended questionnaire which is the traditional Delphi method is necessary if basic information regarding the target issue is unavailable
Dealing with non-respondents: Ludwig (1994) indicated that a drawback to Delphi method was the questionnaire method, which may slow the process greatly as several days or weeks may pass between rounds. Being an iterative method and sequential, the problem of how to accelerate the process of data collection poses a great challenge for Delphi researchers. The need for sending reminders using telephone contact or e-mail is recommended and setting deadlines in successive rounds is viewed to be important as Delphi method involves iteration (Hsu & Sandford, 2007).
Incentives: Providing incentives to help increase response rates is well documented in the literature (James & Bolstein, 1992). Hsu & Sandford (2007) indicate that researchers using Delphi method need to prepare incentives for different rounds. In addition to using incentives it is also beneficial for researchers to enclose thank-you note for the purpose of expressing gratitude for the panelists' responses and ongoing participation.

3. Procedure of the Delphi Method

The Purposive Selection of Respondents: Delphi involves purposive selection of respondents; no standard social science sampling procedures exists. As Goldschmidt (1996) stated, the goal of purposive selection is to identify as many relevant viewpoints as possible, in the attempt to ensure that all relevant issues are identified and explored. The purposive selection has a serious impact on the outcome of the survey. The selection of the experts was through conference presentation on H&S, journal articles on H&S, personal contacts and practitioners dealing with H&S. Their conduct details were through e-mails. This contact was obtained in order to forester communication. The H&S experts were informed of the essence of the study in the introductory questionnaire survey. In order to qualify as an expert the following had to be fulfilled, each individual was required to meet at least three of the following minimum requirements: 1) minimum five years of work experience in either academia or industry; 2) at least one professional qualification: 3) an editor, book, chapter authorship: 4) minimum qualification for industry practitioners diploma and academics bachelor degree: 5) five or more publications in conferences and journals: 6) member or committee chair of faculty, 7) safety association member and 8) offers workshop or training in H&S. The H&S experts had to fulfill at least three of the eight requirements. A previous study by Rodgers and Lopez (2002) required the experts to attain at least two requirements out of five.

Optimal sample size of respondents using Delphi technique has not been established. However, literature has published research based on samples that vary from 10 and 50 as indicated by Campbell and Cantrill (2001). Furthermore, literature on use of Delphi method has supported a homogenous group of experts. Hence good results can be obtained with small panels of 10-15 individuals (Ziglio, 1996). Furthermore, recent study of Rajendran and Gambatese (2009) used a panel of 12 experts. Goldschmidt (1996) suggested that a 66% response rate is adequate and Van Beek (1996) planned for a 75% response rate for his Delphi survey; however 66.67% of the experts contacted agreed to participate in his research project. In the current study a total of 30 experts of H&S were identified of which 20 agreed to participate after completing the introductory questionnaire survey. This was deemed to be an effective and efficient method as indicated by Okoli and Pawlowski, (2004). The response rate was 66.67%, which was considered to be adequate as supported by Goldschmidt (1996) and Van Beek (1996). A few experts who did not consent to participate gave reasons such as:

"The Delphi method is an onerous task"
"I am currently busy hence will not be able to take part in this survey"
"I am currently busy and I have three children to take care of"

The experts resided in different parts of the world. This is because the validated leading indicators can be used in other developing countries and the developed countries to improve H&S performance in projects undertaken by construction SMEs. Especially with the on-going debate of what should constitute the H&S indicators for measuring performance at project level and organization level (Lingard and Rawlinson, 2005). The experts were from Australia (6), America (1), South Africa (7), Italy (1), Portugal (2), Ireland (1), Scotland (1), and Pakistan (1). The majority of experts from UK and America who were invited to participate declined the opportunity in writing or did not respond. The panel consisted of academics and industry practitioners.

Carrying out the Survey: Addler and Sainsbury (1996) suggested that Delphi survey should consist of three to four rounds that evolve from a loose and unstructured question to a more precise and structured exploration of the important issues. Hsu and Sandford (2007) on the other hand suggested that in order to improve on the response rate a structured questionnaire can be used in the first round especially where information on the subject matter is available. This study used the latter approach in order to improve on the response of the experts as indicated by Hsu and Sandford (2007) and to avoid Delphi fatigue which can be experienced by the experts as indicated by Drodge (1983) and Linstone and Turoff (1975). A well designed four round survey was used to validate and identify critical indicators of H&S that will be used by SMEs in South Africa to measure and improve there H&S performance at project level.

Preparing the Respondents for the Survey: An essential part of conducting any research is explaining to the respondents the purpose of the research and the intended outcomes. If respondents do not understand the aim of the Delphi exercise, they may answer the questions inappropriately or become frustrated and lose

interest (Ziglio, 1996). When initial contact was made with the respondents the purpose of the research was explained clearly and concisely. This ensured the respondents knew the level of the research and the direction it was taking. The experts were selected before completing the questionnaire sent to them. Furthermore, the researchers assumed that the H&S experts would naturally be happy to contribute to the research discourse in their field of expertise. Any researcher who thinks like this is taking a big risk, especially when his respondents are university professors and industry practitioners. Linstone and Turoff, (1975) indicated that a Delphi survey should provide the atmosphere of a fruitful communication process among peers. A well managed Delphi survey should be a highly motivating (Ziglio, 1996) task for the experts to be involved in, and this was the intension of the researcher. The Delphi survey was to take four months but it ended up taking 10 months due to an additional round after the third round was completed in January 2011. An additional round of Delphi was conducted which was advocated by the co-author to solidify the respondents response in each indicator. The fourth round took place between April 2011 and June 2011.

Methods of Reaching Consensus: It has been indicated that consensus forming is the essence of the Delphi technique. It can be defined as a gathering around median responses with minimal divergence (Murray & Hammons, 1995). The researcher should carefully determine in advance what particular definition of consensus is to be used in his/her study. Critics of the Delphi find the issue of consensus one of the most contentious components of the method (Crisp et al., 1997). The building of consensus using various parameters was decided upon, the parameters to derive consensus was based on both the importance and the impact scale. The two scales had to complement each other. The median importance ratings of 9 to 10 and rating of 50% and above were deemed to attain consensus. The impact percentage median rate was 90% to 100% with a participant rating of 50% and above. However, other ways of defining consensus is the acceptance of ratings higher than a previously determined number by at least 51% of the participants and the elimination of topics that are vigorously opposed (Fink et al., 1984).

In the successive rounds no indicators were omitted apart from two, where the supervisor who is a health and safety specialist piloted the round 2 Delphi questionnaire. One statement was omitted and the other statement was merged after round 2, hence the reduction of the statements/indicators were now 62 in round 3 and 4 from the previous 64. The essence of not omitting the indicators after the successive rounds as other researchers, (see Rajendran and Gambatese, 2009) was to check the consistency of the respondents and their stability. Resistance to consensus in the form of scattered distributions or outlying opinions should be considered carefully as they may yield new perspectives on the issues under investigation (Critcher and Goldstone, 1998). The indicators that never attained consensus were omitted at the end of the fourth round of the Delphi survey. The omission of the indicators was achieved based on the impact scale and importance scale. As previously indicated the results had to complement each other.

Pilot Study: The structured Delphi questionnaire survey was developed from extensive literature review hence was to be validated before it was sent to the experts. A pilot study was undertaken which included a member of the panel of experts and the supervisor who are experts in health and safety. The statistician from STATKON department at the University of Johannesburg statistics department verified the scale to be used and also clarified the wording of the statements/indicators. This approach was adapted from a study by Nichol (2007). This ensured the face validity of the questionnaire. The questionnaire for round 1 of Delphi was refined especially the wording of the statements to be more readable and easy to understand. The essence of not using all the H&S experts to pilot the questionnaire was to eliminate any attrition after the first round of Delphi (see, Cape, 2004), which is a common trend (see Hsu and Sandford, 2007) when this approach is used in the first round.

Round 1 Success and Challenges: Lessons Learnt: The first round of Delphi survey has been termed the exploration phase (Ziglio, 1996), where respondents explore the question and add new material. The approach in the study conducted had a different approach as indicated by Hsu and Sandford (2007), where a structured questionnaire was used in the first round and new ideas were added in the fourth round. The approach is discussed across this article. In the first round of Delphi which commenced in September 2010 two questions were raised by two experts, based on the questionnaire and clarity of instructions in terms of competence. The explanations were replied to the experts individually. Some further questions that were asked by the experts were:

One expert asked "if the questionnaire was validated" and
Another expert asked if the "the response were to be based on the competence of the employee"

This is the essence of the Delphi approach as it is supposed to create discussion (see Ziglio, 1996). The questions were helpful and were clarified to the experts. In the first round of Delphi the experts were asked to rate the importance and impact of the indicators without adding any indicators. This approach of Delphi differs from the traditional Delphi which gave experts an opportunity to add any statements or indicators that they thought are vital and have been omitted for example in this study health and safety (H&S) performance indicators or statements that will improvement H&S in SMEs projects. The essence of the researchers not allowing the experts to add any indicators was based on the research objective and question developed in the first round. Where the experts were asked to rate the statements/indicators on a 10 point Likert scale of importance and impact. The other reason was to use a different approach as the researchers wanted to own the Delphi approach as mentioned previously (see Cape, 2004). A total of 20 questionnaires were sent to the experts who agreed to participate in this study. Past studies for example Hsu and Sandford (2007) indicated a tendency of attrition when using Delphi method, hence caution had to be taken and constant reminders had to be sent to the experts bearing in mind there busy schedule. In round one 13 experts responded promptly, where as the other six experts were sent reminders via email, Bertin (1996) stated that the care and attention with which the questionnaire is answered by the experts is a function of their degree of motivation and the time taken in replying is to a large extent a consequence of the factor of motivation. After round one 18 experts responded, of which the analysis of round one was administered by the researchers and the questionnaire for round two was prepared and sent to the experts. Two experts who did not respond in round one did not give reasons why they did not participate even after successive reminders. Finally those experts were excluded from this study. The impact of the withdrawal of the two experts was slight, as the other experts gave the required information.

Round 2 Success and Challenges: Lessons Learnt: In round 2 of Delphi method the experts were sent the feedback of round one with there rating highlighted in yellow and the group median inserted in a separate column of there round two Delphi questionnaire. Further questions were inserted in the Delphi questionnaire round 2 where experts were given options of changing there rates and conform to the group median, or if they do not want to change and they are falling out of the required scale they should give reasons why they have the differences. Being an iteration process the experts were to give reasons some experts gave reasons and others did not. In this round a few researchers responded late and they had to be reminded of the due date and the extension of the submission date. In round two of Delphi 18 experts responded of which the number was equivalent to those who responded in round 1. The researchers who never changed there rating and were falling out of the group median within two unit Likert scale indicated that "SMEs do not have the expertise in using some of those indicators" or they "the SMEs do not have the competency and resources to undertake some actions stated". Two experts who changed there ratings in some of the statements indicated that they had made a mistake in there rating in round one. After round 2 one expert indicated the "difficulty of differentiating between the scale of importance and impact". The stability of respondents rating started to be evident in round 2. The scale of impact indicated quite a number of statements with more than two units of the group median, in comparison with the importance scale.

Round 3 Success and Challenges: Lessons Learnt: In round 3 of Delphi method the experts were sent the feedback of round two with there rating highlighted in yellow and the group median inserted in a separate column of there round two Delphi questionnaire. The Delphi round 3 questionnaire was similar to round 2 experts were given options of changing there rating if they were two unit Likert scales point out of the group median, or if they do not want to change there rating they should give reasons. Being an iteration process the experts were to give reasons some experts gave reasons while others did not. The experts who never changed there rating and were falling out of the group median within two unit Likert scale on the 10 point Likert scale of importance and impact indicated that "SMEs do not have the expertise in using some of those indicators" or they "the SMEs do not have the competency and resources to undertake some actions stated". In this round a few experts responded late, they were sent reminders and the adjusted submission date. In round three of Delphi 16 experts responded, hence two experts were omitted, one expert responded late but the other had relocated to a different country and furnished the researcher with the new email address for further

communication but did not respond. The scale of impact indicated quite a number of statements with more than two units out of the group median in comparison with the importance scale.

Round 4 Success and Challenges: Lessons Learnt: In round 4 of Delphi method the experts were sent the feedback of round three with their ratings highlighted in yellow and the group median inserted in a separate column of round four of Delphi questionnaire. This questionnaire in round four was similar to round 2 and 3 apart from a further additional question which required the experts to give any statement that they fill will improve H&S performance at project level of SMEs. The experts were still given the options of changing there rates and conform to the group median, or if they do not want to change and they are falling out of the required scale they should give reasons. Being an iteration process the experts were to give reasons of there difference to the group median, some experts gave reasons and others did not. The experts who did not give reasons were sent a mail to indicate to them that they need to give reasons on the indicators that were not conforming to the group median. In this round a few researchers responded late and they had to be reminded of the due date and the extension of the submission date. In round four of Delphi 16 experts responded of which it was the same number of respondents as in round 3. Some of the experts added few indicators for example "the H&S culture of SMEs has to change" and "clients have to be involved". In analyzing the proposed statements/indicators from the experts none of them were included in the final analyzed data. The scale of impact continued to indicate quite a number of statements with more than one outlier clustered around their group median in comparison with the importance scale. At the end of round 4 a total of 46 indicators were retained which indicated consensus. They were considered to be very important and had major impact in improving H&S performance at project level of SMEs.

4. Discussion

Success of using the Delphi Method as an Inductive Approach: Conducting the Delphi survey was a rewarding experience and highly successful. In practice the Delphi method did prove to be well suited in validating and identifying the indicators and allowing the panel of experts to discuss without any interference from other experts. This finding concurs with other studies of (see Linstone & Turoff, 1975; Ziglio, 1996). The respondents expressed there opinions and rated the indicators in a four round of Delphi survey. This Delphi approach was the appropriate method to gather opinions and initiate debate. The iterative nature of the Delphi method provided a structure within which important statements/indicators were validated and then discussed. The mode of communication, which was via email was viewed as a success, and concurs with Hsu and Sandford (2007) advocacy of using current technology. The use of a structured questionnaire and subsequent discussions in the successive rounds yielded success in this exploratory study as there was no high attrition rate of experts', four of the 20 experts were not able to participate in all the four rounds. This successful result can be inferred to the approaches discussed by Hsu and Sandford (2007), based on methods of reducing attrition in Delphi survey. The use of incentives which Hsu and Sandford (2007) also suggested was not used to entice the experts to respond. It is also important to mention that 93.75% that is 15 of the 16 experts who finished all the four rounds of Delphi gave comments on their ratings when they were two units above or below the group median as instructed in second, third and fourth round.

The experts were consistent in there comments and ratings, whereas a few of the experts agreed to change their rating marginally after the successive rounds. It cannot be verified if being out of the group median or the comments other H&S experts had given and summarized in each round from round 2, 3 and 4 were a catalyst for change. However a few experts who changed there ratings indicated that they had made mistakes in their previous rounds when rating the statements/indicators. This indicates that the iterations in the various rounds yields concrete decisions unlike using a once off interview or survey in collecting data. The comments made by experts were quite motivating to indicate that this approach was a success. One expert indicated that "there should always be management commitment to improve health and safety practice". Another expert indicated that the "health and safety management system needs to be in place"

Challenges of using the Delphi method: The summary of results of previous round of Delphi, were fed back to the respondents in appropriate time with the due date to return the questionnaire indicated, but not all respondents replied promptly. There was constant delay from a few respondents in all the successive rounds, this meant that the time scheduled for each round was extended by at least three weeks and hence infringes on the start of the round to follow. The third round took longer as is was in December some of the experts in

South Africa were preparing for holidays hence could not respond to the questionnaire until January 2011, one expert in Australia was attending a conference in the United Kingdom, hence could not respond timely only until January 2011.

There was lapse of time between the third round and the fourth round of Delphi. This was caused by the co-author of this paper advocating for the fourth round of Delphi in order to consolidate the consensus as some of the indicators had outliers in the impact scale. The experts had to be informed of the fourth round and they were sent the fourth round Delphi questionnaire with the results of the third round, with a further three questions. The fourth round survey was conducted from early April 2011 and ended in early June 2011. The challenge was to make sure the experts understood the importance of this additional round. Four of the experts withdrew from this research project, of which two experts did not give any reasons, one was late in the submission of the third round questionnaire and the fourth expert relocated to Malaysia from Australia. One expert did not comment on his ratings being out of the group median in all the successive rounds, even after being reminded. This expert had used Delphi method in his previous research work on health and safety, and was experienced in the use of this methodology.

Measures of Reaching Consensus: The use of different parameters to define consensus in this study was viewed as a success other than depending on one parameter. The use of median, rated importance between 9 to 10 and the impact rated between 90% to 100% and the percentage response rate of 50% and over between ratings of 9 to 10 indicating major impact and very important indicators to improve H&S performance. This research project used all the mentioned parameters and ultimately eliminated the indicators that had no similar rating on the importance and impact. The elimination of the indicators, were therefore considered with great caution.

5. Conclusion

The criteria set for identifying the H&S experts proved successful as out of the 30 experts invited to participate, the 20 experts who accepted to participate qualified as H&S experts. The Delphi method also proved to be a success despite the challenges mentioned for example, the responding time of experts was poor. The success of reaching consensus using multiple parameters to decide on consensus is vital as only one or two parameters could be flawed and not giving the correct results. Furthermore the choice of the experts and the topic of discussion was a success, this is indicative of the attrition rate not being high, bearing in mind this research project adopted four successive rounds of Delphi, only 4 out of twenty experts did not complete all the four rounds, which to the researchers indicates that the approach used was a success and the topic was of interest to the majority of the experts. The researchers would also like to warn novice researchers to be careful when using this method. They should be careful with the approach they would like to adopt in the first round that is open ended or closed-ended questionnaire. The authors believe that these two different approaches could yield different response rate and findings of a particular study. The feedback process also needs to be taken into consideration and the type of questions to be asked in the successive rounds need to be decided before the commencement of the Delphi. The instructions of the questionnaire need to be clearly stated and be specific not ambiguous so as to achieve the correct results.

In order to improve on the response rate the authors are advocating for constant reminder to the experts shortly before the closing date and after the closing date of returning the questionnaire. Extension of time should be granted if the experts are not able to respond on the proposed date. The use of “polite” words such as please, thank you in advance etc. proved to be a success and the need for the researchers to be patient with the experts is deemed to be a success even if the experts did not respond after the first or second reminder these suggestion used in this present study, concur with the suggestions of Hsu and Sandford (2007). Despite the challenges and the lessons learnt when using Delphi method to identify and validate the H&S indicators tailored for SMEs in construction industry in South Africa. It is worth noting that the Delphi approach was an appropriate method of great significance that identified the critical H&S leading indicators for SMEs. These leading indicators are viewed as a channel that negates the popular use of lagging indicators e.g. accidents, injuries and death to measure H&S performance in the construction industry. This study derives the importance of using Delphi method in the area of identifying leading indicators that are proactive. These indicators will inform construction SMEs of eventuality of an accident or injury to occur.

Possible Improvement to the Delphi Approach used in this Study: The main improvement deemed in this Delphi study is that as experts did not have face-to-face contact. There is a possibility that statements/leading indicators can be wrongly interpreted. Therefore, the experts could have been accorded the opportunity to comment on the statements. Furthermore, the need to use an open-ended questionnaire in the first round of Delphi could have assisted in thoroughly evaluating the experts' knowledge in this area of study.

Further Research: Based on the discussions in this paper the researchers are proposing the use of open-ended questionnaire in the first round of Delphi method, in a later study using the same team of experts. This will help in comparing the challenges and success of using an open ended questionnaire approach and the current closed-ended approach and also compare the final results of the two approaches.

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Effect of the Subprime Crisis on Return and Volatility of the Turkish Stock Market

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Abstract: The aim of this paper is to investigate the return and volatility behaviors of the Turkish Stock Exchange in response to the mortgage crisis using daily observations for the period June 2004 to June 2014. The data are divided into three sub-periods to allow for the investigation of the behavior of the stock market during each sub-period. We employ the GARCH, EGARCH and GARCH-M models to capture volatility. The results indicate that the subprime crisis both induced a notable increase in volatility and changed the relationship between risk and expected return on the Turkish Stock Exchange.

Keywords: *Volatility, Subprime crisis, Turkish Stock Market*

1. Introduction

Emerging markets play an important role in portfolio investment and risk management as they follow capital flows around the world. Because the low degree of correlation with developed markets gives investors an opportunity to diversify, examining the behavior of stock returns and volatility in emerging markets has become common topic in finance literature. Volatility in financial markets has received substantial attention in the literature, particularly with respect to volatility clustering, risk-return relationships and duration of shocks. It is important for investors to know how a subprime crisis shapes stock market return and volatility structure. For example, a higher return is expected by investors because of increasing volatility during a crisis period. Moreover, mortgage crisis causes large drops in asset prices and market values of portfolios covering asset-backed securities as evidenced by the collapse of AIG, FannieMae, Freddie Mac, Lehman Brothers and also show their roles in the financial contagion of the crisis. Longstaff (2010) contends that such financial contagion is extended via liquidity and risk-premium channels.

The impacts of subprime crisis have been an important issue in academic literature during and shortly after crisis period because of its very severe effects on financial markets and reel economy in all over the world. Therefore, there are many studies that have attempted to investigate the impacts of crisis especially in terms of the impact of volatility on stock return behaviors. We summarized herein several of these studies. Celikkol et al. (2010) analyzed the impact of the bankruptcy of Lehman Brother's on the volatility structure of the Turkey Stock Exchange and found that the bankruptcy increased the volatility and returns in the stock market index. Çağıl and Okur (2010) used GARCH models to investigate the impact of the 2008 financial crisis on the Istanbul Stock Exchange. The result of the study revealed that unconditional volatility of the Istanbul Stock Exchange increased between 2007 and 2010.Singhania and Anchalia (2013) investigated the impact the 2008 subprime crisis and the last European debt crisis had on the Asian stock market. Their findings indicate that all stock market returns exhibited volatility clustering, volatility persistence, asymmetry and leverage effects. Furthermore, the two financial crises impacted the Asian financial markets differently. While Japan, China and India were affected positively by the subprime crisis, the European debt crisis had a negative impact on the stock returns of India and China. Ramlall (2010) found that the US subprime crisis significantly impacted volatility clustering and induced the increment of leverage effects in major international financial markets. He further noted that the GARCH (1,1) model is sufficient for modeling conditional volatility.

Al-Rjoub and Azzam (2012) examined the behavior of the Jordanian stock exchange during the financial crisis. The data consisted of daily, weekly and monthly return series from banks, insurance, services, industrial sectors and the ASE index from 1 January 1992 to 2 July 2009. They employed the GARCH-M model to capture the relation between returns and volatility, and they used the Chow breakpoint to examine the beginning and ending dates of the crash and to detect structural changes in parameters. The results showed that the crisis negatively affected all stock returns and that the time-varying trend in the volatility increased during crisis periods. Michelfelder and Pandya (2005) investigated the return volatility of both emerging and mature stock markets by using the EGARCH-SGED model. The majority of market returns exhibited negatively skewed distributions. They also found that the half-life of volatility in an emerging market was shorter than in

mature markets, and they emphasized that the impact of non-trading days on volatility was greater in mature markets than in emerging markets. Cheong et al. (2012) investigated the impact of the 2007-2008 subprime crises on long-run and short-run components of volatility on the US, Malaysia and Indonesian equity markets. Cheong divided the stock return data into three periods based on the subprime crisis timeline. The results showed that the half-life of volatility of the US equity market was shorter than that of the other equity markets. In addition, they also reported that the advantage effect of the subprime crisis on stock market volatility was temporary, which means that the permanent volatility component had no asymmetric response to volatility.

Thao and Daly (2012) focused on the impact of the recent subprime crisis in the Southeast Asian region between 2006 and 2010. The results revealed a bi-directional relationship between the equity markets exists. Arora et al. (2009) examined the behavior of stock returns and the volatility of the indices of emerging markets and developed markets. After noting the importance of the time interval, they employed the GARCH and TAR-GARCH methodologies to return series on daily, weekly, monthly and annual frequencies. The result showed the GARCH (1,1) adequately explains the volatility pattern in most markets and that asymmetric volatility appeared in some stock exchanges with varied frequencies. Lastly, they reported that the ratio of stock returns to volatility for emerging markets was higher than it was for developed markets. Nieh et al. (2012) utilized the Enders–Siklos asymmetric threshold cointegration test and found that China had an increased impact on the Asian markets during the subprime crisis. They further found that asymmetric cointegration relationships between the US and Asian markets existed during both periods of the crisis. Beyond these findings, they suggested that the recent financial crisis bounded international portfolio diversification. Majid and Kassim (2009) explored empirically the effects of the subprime crisis by using daily data of five selected stock markets for the period February 15, 2006, to December 31, 2008. They employed the VAR framework and variance decomposition methods to detect the cointegration of stock markets. The results showed the increased level of correlations between the markets during the subprime crisis. According to the cointegration test results, markets had a long-run equilibrium relationship during this period. Finally, the study revealed the increasing effect of major financial markets on emerging markets.

The papers mentioned above were generally conducted during the subprime crisis period. However, since impact of subprime crisis has taken long time in all over the world, it is still being an important issue on academic literature. Additionally, newly improving econometric methods pay attention to the contagion and spillover between emerging and mature markets instead of country specific effects after the crisis periods. For example Yan et al. (2015) examine the subprime crisis in terms of transmition mechanisms and find that the subprime crisis is transmitted other equity markets via cross-border banking credit rather than international portfolio or trade flows. They also propose to apply banking regulation and capital constraints to decrease the weakness of financial markets. Galariotis et al. (2015) investigate the behaviors of market participants and their decisions on same direction and find that herding behaviors in UK and US stock market change during the subprime crises period due to fundamental macroeconomic news. Kim and Ryu (2015) focus on the futures market traders based on Korea and US during subprime crisis. They find that foreign investors are more sensitive than domestic investors to the subprime shocks during the crisis. Luchtenberg and Vu (2015) investigate the determinants of financial contagion during the 2008 financial crisis and stress the importance of relation between interest rates and financial contagion. Unlike previous studies, Shalini and Prasanna (2015) put emphasis on the impact of the financial contagion on commodity market. They point out the role of systematic risk in volatility patterns of Indian commodity markets.

Vithessonthi and Tongurai (2015) examine the impacts of subprime crisis in terms of firm performance. According to their results, while leverage effect is positive for small firms, large firms have negative leverage effect in Thailand equity market. Since stock market is used as proxy for real economy, Guo (2015) detect significant cross-correlation between China's stock market and GDP. He also suggests that policymakers should improve deregulation related with financial markets. In another study, Zhang and Li (2013) employing the DCC-GARCH approach find that subprime crisis have permanent impact on conditional correlation relationships between U.S, Europe and BRICS countries. Using event study methodology, Aizenman et al. (2015) point out the differences of effects of shocks originated from US subprime and Europen debt crisis on emerging markets. They stated subprime crisis have a consistently negative impact on the equity and bond markets in emerging markets. While there are many studies on financial crashes in developed and emerging

markets, there have not been many works focused on the Turkish financial markets. The Turkish stock market was negatively affected by the subprime crisis of 2007-2008 such that Turkey's market capitalization declined by more than half in 2008. Not only did the stock market register its largest drop of 63% as a result of the financial crisis, but the turnover ratio of the BIST, which was %154 in 2005, dropped to nearly %118 in 2008 (Gammoudi and Cherif M, 2014). We fill this gap by investigating the subprime crisis for the Turkish stock market using ARCH family models to examine the dynamics of the stock returns and volatility, thereby expanding the recent works of Chong (2011), who studied the impact of the subprime credit crisis of 2007 on the return and volatility of the S&P 100 Index. Return data are divided into 3 periods to investigate the behavior of stock market returns and volatility and then analyze the effects of the crisis on the market. The ARMA-GARCH approach is employed to detect volatility clustering and the duration of shocks. The results show that the crisis has only a transitory impact on the volatility of the market and no significant effect on stock market return. The remaining paper is organized as follows. Section two discusses the data and methodology employed in the study, and section three presents the results of the models. Section four contains concluding remarks.

2. Methodology

The US subprime mortgage crisis started with the increase in the Libor-OIS spread on June 1 2007,and ended April 2, 2009, with the declaration of leaders to supply more than 1 trillion dollars to improve international finance and trade and thus improve the economic outlook for the future(Ait-Sahalia et al., 2012). This study was divided into three periods, namely, the pre-crisis period from June 04, 2004, to July 29, 2007;the crisis period, which began on June 2, 2007,and ended on April 2, 2009; and the post-crisis period, which began on April 3, 2009,and, for the purposes of this study, ran through June 03, 2014.The groupings of data into the three sub-periods allowed us to assess whether the volatility of the stock markets changed due to the crisis. For this purpose, we used general autoregressive conditional heteroskedasticity models to capture volatility persistence, asymmetric volatility and return- volatility relations in the stock market. Data were obtained from a data stream data base. Returns are calculated by taking the first differences of the natural logarithms of the closing price index:

$$R_t = (\ln P_t - \ln P_{t-1}) \quad (1)$$

Where R_t represents stock return at time t, P_t represents the closing value of the BIST index at time t, P_{t-1} represents the closing value of the BIST index at time t -1.

GARCH model

The autoregressive conditional heteroskedasticity (ARCH) model developed by Engle (1982) explains the forecast of conditional variance in terms of past squared residuals. Bollerslev (1986) generalized the ARCH model by adding its lagged values to the conditional variance equation, which is termed the generalized autoregressive conditional heteroskedasticity (GARCH).The conditional variance equation in the GARCH (1,1) model takes the form of Equation (1).

$$\sigma_t^2 = \omega + \alpha\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2 \quad (2)$$

GARCH models satisfy the stability conditions that remain for constraints $0< \omega$, $0\leq\alpha$, $0\leq\beta$, $\alpha+\beta<1$.While the reaction to volatility is measured by α, the persistence of volatility is measured by the β parameter. If the sum (α+β) is close to one, then shocks to the current volatility continue for a long time into the future. If the sum is equal to one, unconditional variance is non-stationary, and as such, it cannot be modelled by a vanilla GARCH.

GJR-GARCH model

The GJR-GARCH model, which was proposed by Glosten et al. (1993), captures the asymmetric effect of positive and negative shocks on volatility. The GJR-GARCH (1,1) model is formulated following Alexander(2008):

$$\sigma_t^2 = \omega + \alpha\varepsilon_{t-1}^2 + \lambda 1_{\{\varepsilon_{t-1}<0\}}\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2 \quad (3)$$

In this model,$\varepsilon_{t-1}^2<0$ (negative shocks) and$\varepsilon_{t-1}^2>0$ (positive shocks) have different effects on the conditional variance. If the leverage effect exists, effects of negative shocks on conditional volatility are given by $\alpha + \lambda$.

GARCH in Mean Model

Sharpe (1964) posits that according to the capital asset-pricing model, a higher expected return is associated with higher risk. He also contends that the model implies a positive linear relationship between the expected return of any asset and its risk, which is measured by a constant beta. Engle et al. (1987)allow for modelling risk and volatility simultaneously in a conditional mean equation, known as the GARCH in mean model, as a function of the conditional variance. A simple GARCH(1,1)-M model can be written as:

$$r_t = u + \delta\sigma_t^2 + a_t, \quad (4)$$

$$\sigma_t^2 = \omega + \theta a_{t-1}^2 + \beta\sigma_{t-1}^2$$

The parameter δ can be interpreted as a risk premium, while a positive and significant c means that the return is positively related to its volatility.

3. Results

We present the descriptive statistics of a return series that includes the first through fourth moments for before the crisis, during the crisis and after the crisis in Table 1.

Table 1: Descriptive Statistics of Return Series

	Before crisis	During crisis	After crisis
Mean	0.0013	-0.0013	0.0008
Std. Dev.	0.0161	0.0242	0.0154
Skewness	-0.4532	0.1081	-0.4356
Kurtosis	4.3887	5.4117	6.8554
Jarque-Bera pr.	0.0000	0.0000	0.0000
ADF	0.0000	0.0000	0.0000

The Turkish stock market faced negative returns with the onset of the subprime crisis, while the after-crisis market recorded positive average daily returns. Volatility as measured by the standard deviation, increased during the crisis compared to before the crisis. However, the returns for all periods except during the crisis are negatively skewed, thus indicating that, in general, the BIST has more losses than gains in these periods, but that during the crisis period, higher returns were observed. During all periods, the values of kurtosis of log-returns are greater than three. This means that the stock returns are not normally distributed and that, as a result, we need to include time-varying variance in the model, which leads to the use of the GARCH model. The table also presents the augmented Dickey–Fuller (ADF) results, which indicate that return series are stationary in all periods.

Table 2 presents the results of the GARCH models for the pre-crash period, the crisis period and the post-crash period. The persistence measure (α + β)for all periods is significantly different from unity, thus indicating that volatility has a significant impact on stock prices. The increase in the β parameter suggests that the pre-crash period source of volatility stems from previous volatility, while the smaller value of α implies that large market shocks have little impact on future volatility. The GJR-GARCH model shows a positive and significant γ parameter for all periods, suggesting that negative shocks have a greater impact on subsequent volatility. With respect to the leverage effect, the subprime crisis has induced more asymmetric behavior in the volatility of the BIST as a result of negative news, finding that further emphasizes that future stock volatility is more heavily influenced by past negative events.

Table 2: Parameter Estimates of GARCH Models

GARCH (1,1)						
	ω	α	β	α + β	LM test	Q(24)
Before crisis	2.67E-05**	0.106*	0.787*	0.893**	0.96	0.72
During crisis	2.86E-05***	0.107*	0.846*	0.953**	0.41	0.59
After crisis	7.84E-06*	0.079*	0.887**	0.966**	0.27	0.55
GJR - GARCH (1,1)						
	ω	α	β	γ	LM test	Q(24)
Before crisis	3.57E-05*	-0.013	0.763*	0.195*	0.94	0.77
During crisis	3.75E-05**	-0.012	0.845*	0.216*	0.60	0.24

After crisis	1.05E-05*	0.034*	0.868*	0.100*	0.65	0.58
GARCH in Mean (1,1)						
	ω	α	β	δ	LM test	Q(24)
Before crisis	2.63E-05*	0.106*	0.789*	-0.112	0.95	0.68
During crisis	3.44E-05***	0.116*	0.830*	-0.036	0.45	0.46
After crisis	8.43E-06*	0.078*	0.885*	0.094*	0.24	0.46

Note: *, **, *** statistically significant at the 1%, 5% and 10% level, respectively

The impact of volatility on stock return is found to be both inverse and insignificant for the pre-crisis and crisis periods. However, in the post-crisis period, we find that a positive and significant relationship between volatility and return also means a significant time-varying risk premium in the Turkish stock market as after-crisis investors are compensated for their exposure to higher risk. Table 3 illustrates the summary statistics of a conditional volatility series that is estimated using GARCH family models for all periods. The results from Table 3 confirm that the mean of volatility increases during the subprime crisis period. However, the standard deviation increases more than three times during the crisis period compared to the pre-crisis period. It is further noted that both skewness and kurtosis are lower during the crisis period. Such findings imply that large changes in volatility are more frequent in the pre- and post-crisis periods, while the subprime crisis restricts the intervals of future expected returns.

Table 3: Summary Statistics for Conditional Volatility Series

GARCH (1,1)	**Mean**	**Median**	**Std. Dev.**	**Skewness**	**Kurtosis**
Before crisis	0.000257	0.000222	0.000112	2.701123	14.11685
During crisis	0.000597	0.000477	0.000348	1.830987	6.532438
After crisis	0.000241	0.000196	0.000149	2.80005	13.82755
GJR - GARCH (1,1)					
Before crisis	0.000258	0.000208	0.000150	3.875164	27.15005
During crisis	0.000597	0.000433	0.000423	2.314944	9.115442
After crisis	0.000243	0.000187	0.000186	3.974337	25.03065
GARCH in Mean (1,1)					
Before crisis	0.000257	0.000223	0.000111	2.677976	13.91476
During crisis	0.000601	0.000483	0.000351	1.892831	7.071602
After crisis	0.00024	0.000195	0.000147	2.801948	13.63975

4. Conclusion

The financial markets of a country are useful when reflecting on economic conditions. Thus, policy makers implement deliberate strategies to manage volatility in their stock markets, and accordingly, they must estimate volatility and take into account the impact of financial crises on markets. In this study, we investigate the role of a subprime crisis on the behavior of the daily returns of the BIST (Borsa Istanbul Stock Exchange) and estimate the volatility for the period June 04, 2004, to June 03, 2014. We divide the total sample into three periods, namely, the pre-crisis period from June 04, 2004, to July 29, 2007;the crisis period, which runs from June 2, 2007,to April 2, 2009; and the post-crisis period from April 3, 2009, to June 03, 2014. We estimate the alternative GARCH models, namely, the EGARCH and GARCH in Mean model, to model the asymmetric behavior of volatility and examine the time-varying risk premium in the stock market. The findings of our study reveal that the subprime crisis had a positive and transitory impact on the volatility of returns of the Turkey Stock Market, which is consistent with the results by Celikkol et al. (2010) and Çağıl and Okur (2010). Although there are leverage effects on the volatility of stock returns for the full sample, the crisis provoked a notable increase in the asymmetric parameter, which indicates that negative market news induces greater impact on future volatility than positive news.

With respect to the relationship between expected stock returns and conditional volatility, using the GARCH in mean model, we found a positive and significant relationship in the post-crisis period while such a relationship is insignificant in other periods. This suggests that different risk-return trade-off patterns among the whole sample could be derived from a varied mean of the volatility level. Unlike our paper by applying newly econometric techniques such as Ho (2015) use entropy density function to analyze the subprime crisis and find S&P500 index exhibited regular pattern whereas Germany and Korea, exhibit no significant pattern during the financial crisis period. Moreover Mensi et al. (2014) examine the impact of onset of subprime crisis on co movement of BRICS markets by employing quantile regression methodology. They point out that the uncertainty in economic policy of U.S has not affected the BRICS stock markets. On the other hand Koksal and Orhan (2013) point out the decoupling of emerging and developed markets during the subprime crisis according to VAR models result.

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An Optimal Peer Group Selection Strategy for Multiples-Based Modeling in the South African Equity Market

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Abstract: Although peer group selection is a key consideration when performing multiples-based valuations, there is a lack of theoretical guidance on an optimal peer group selection strategy in emerging markets. Principal Component Analysis-based biplots and correlation monoplots are used to assess the valuation performance of multiples whose peer groups are based on either industry classification or valuation fundamentals. The evidence suggests that multiples whose peer groups are based on valuation fundamentals outperform multiples whose peer groups are based on industry classifications, with a combination of valuation fundamentals Rg and RoE emerging as the optimal peer group variable. The evidence suggests that an optimal choice of peer group variable could secure an increase in valuation precision of as much as 41.77%.

Keywords: *Peer group selection, multiples, emerging markets, valuation precision, valuation*

1. Introduction

Multiples are arguably the most popular valuation approach used in practice (Bhojraj and Lee, 2002; Asquith, Mikhail and Au, 2005; Damodaran, 2006b; Roosenboom, 2007; Minjina, 2008; Dellinger, 2010; PwC, 2012). Accordingly, one would expect the construction of multiples to be underpinned by a well-researched body of evidence. However, the emerging market literature, in particular, offers surprisingly little empirical guidance in this regard. Multiples are constructed by scaling market price variables with matching value drivers (Schreiner and Spremann, 2007; Damodaran, 2009). Analysts typically start by identifying the target company's peer group, i.e. a group of companies with similar risk and growth profiles to that of the target company. A peer group multiple is subsequently estimated for the company that is to be valued, i.e. the target company, and then multiplied by the target company's value driver to estimate the value of the target company or its equity. The basic assumption underlying multiples-based modeling is that similar companies are valued similarly. Therefore, a peer group of companies should emanate a scertain degree of similarity to the target company, in terms of key factors such as size, growth prospects and profitability (Ernst and Häcker, 2012). The greater the degree of similarity between the peer group of companies and the target company, the more accurate the valuation will be. The latter is the theoretical underpinning of a multiples-based approach to company valuations. If there is a lack of comparability between the peer group of companies and the target company, a multiples-based approach seems nonsensical.

The current literature offers two approaches to peer group selection. The first approach categorizes companies together in peer groups based on their industry classification. Internationally recognized classification systems, such as the Standard Industry Classification (SIC) system or the Global Industry Classification Standard (GICS) system, for example, could be used to group similar companies together to form a peer group to the target company (Goedhart, Koller and Wessels, 2010). Categorizing companies together in various industry classifications helps explain cross-sectional variations in key fundamental valuation variables, such as multiples and historic and future growth rates. However, companies comprising a peer group based on the same SIC code may still vary substantially in terms of their business models and sales structures, for example. Consequently, an alternative approach to peer group selection would be to categorize companies together based on valuation fundamentals. However, empirical evidence regarding these two approaches to peer group selection in emerging markets is limited. The relative valuation performance of multiples whose peer group selection was based on each of these two schools of thought has not yet been pitted against each other in an emerging market context. Consequently, the focus of this paper is on investigating an optimal basis for the compilation of a target company's peer group.

The primary objective of this study is to establish the relative valuation performances of multiples whose peer groups are based on each of two major schools of thought on peer group selection, namely the industry classification and the valuation fundamentalists. To this end, the valuation performances of three different types of peer group variables (PGVs), namely industry classifications, individual valuation fundamentals and combined valuation fundamentals, are compared in the South African market. The secondary aim is to establish which of the ten PGVs, if any, offers the greatest degree of valuation precision. The third aim is to measure the magnitude of the potential improvement in valuation precision that an optimal peer group selection strategy may offer over other, sub-optimal peer group selection strategies. Section 2 offers a review of the literature, followed by the data selection process in Section 3 and the research methodology in Section 4. The empirical findings are offered in Section 5, after which concluding remarks are presented in Section 6.

2. Literature Review

Peer group selection is a key consideration when performing multiples-based valuations (Fuller and Kerr, 1981; Lang and Stulz, 1992; Fenn and Cole, 1994; Eberhart, 2001; Bhojraj and Lee, 2002; Nel, Bruwer and Le Roux, 2013a, b). Despite the lack of theoretical guidance on peer group selection in emerging markets, there are two schools of thought in this regard (Bhojraj and Lee, 2002). The first school of thought argues that peer group selection should be based on industry classification (Alford, 1992; Damodaran, 2006a; Nel et al., 2013a, b). The premise of the proponents of industry classification as a basis for peer group selection is that companies operating in similar industries will have similar profitability, growth and risk profiles. The second school of thought argues that peer group selection should be based on companies with similar valuation fundamentals (Dittmann and Weiner, 2005; Goedhart, Koller and Wessels, 2005). The premise of the proponents of valuation fundamentals as a basis for peer group selection is that companies with similarly sized economic variables will have similar profitability, growth and risk profiles. The search for the most effective basis for peer group selection is not a new phenomenon. Evidence from the developed market literature suggests that the valuation precision of multiples increases when their peer groups are based on more narrowly defined industry classifications *vis-à-vis* more widely defined industry classifications (Alford, 1992; Damodaran, 2006a; Schreiner, 2007; Henschke and Homburg, 2009). The obvious conclusion drawn from these results is that a more narrowly defined peer group contains more homogeneous companies *vis-à-vis* a more widely defined peer group, which will contain more heterogeneous companies.

Initial research findings published in the developed market literature by Alford (1992) suggested that peer group selection based on valuation fundamentals failed to result in an increase in valuation precision *vis-à-vis* peer group selection based on industry classification. However, subsequent studies by Henschke and Homburg (2009); Dittmann and Weiner (2005); Goedhart et al. (2005); Herrmann and Richter (2003); Bhojraj and Lee (2002) andCheng and McNamara (2000) found that peer group selection based on valuation fundamentals offered substantial improvements in valuation precision over peer group selection based on industry classifications. Although the evidence, therefore, suggests that multiples whose peer group selection is based on valuation fundamentals offers superior explanatory power *vis-à-vis* multiples whose peer group selection is based on industry classification, these findings emanate from studies that focused on the relatively deeply traded and liquid markets of developed countries.

Empirical evidence regarding effective peer group selection methods in emerging markets is limited. The literature offers two studies that focussed on peer group selection methodology in South Africa, one of the emerging BRICS (Brazil, Russia, India, China and South Africa) countries. The initial findings of Nel et al. (2013a) suggested that multiples whose peer groups are based on narrower industry classifications produced more accurate valuations compared to multiples whose peer groups were based on wider industry classifications. In a follow-up on their original work, Nel, Bruwer and Le Roux (2014a) also tested the valuation precision of multiples whose peer group selection was based on seven valuation fundamentals and found that there is a substantial differential in valuation precision, depending on the choice of valuation fundamental.The emerging market evidence suggests that the valuation precision of multiples increases when their peer groups are based on a combination of valuation fundamentals *vis-à-vis* single factor valuation fundamentals (Nel et al., 2014a). However, the relative valuation performance of multiples whose peer group selection was based on each of two schools of thought has not yet been pitted against each other. The

question, however, is why one would expect the results to be any different to that of the developed market literature?

Analysts encounter various challenges when transacting in emerging markets, including currency volatility, unreliable market measures and accounting differences (Damodaran, 2009). Other obstacles in emerging markets relate to corruption, lack of infrastructure, trade barriers, an unproductive labor force and skills shortages (IMF, 2012). A constraint specific to emerging markets, especially when investigating the basis for an optimal peer group selection strategy, is data limitations (Omran, 2003; Sehgal and Pandey, 2009). Based on the number of companies listed, the JSE Securities Exchange (JSE) is between 10-15% the size of the National Association of Securities Dealers Automated Quotations **(**NASDAQ), for example (Profile, 2011; World Federation of Exchanges (WFE), 2013). Given the focus of this study, the lack of depth within the JSE places a further strain on the adoption of an optimal peer group selection strategy for multiples-based valuation purposes. Accordingly, one might be inclined to expect that evidence obtained from emerging markets may differ from that obtained from the developed markets. It is hoped that this study will indicate whether this is, indeed, the case and to what extent.

Data Selection: The following variables were extracted from the McGregor BFA database, one of the leading data houses in South Africa (PwC, 2012): Market Capitalisation (MCap), Shares in issue, Gross Profit (GP), Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA), Earnings Before Interest and Tax (EBIT), Profit After Tax (PAT), Profit Before Tax (PBT), Headline Earnings (HE), Total Assets (TA), Invested Capital (IC), Book Value of Equity (BVE), Revenue (R), Cash generated by Operations (CgbO), Increase/decrease in working capital, Net Cash Inflow from Operating Activities (NCIfOA), Net Cash Inflow from Investment Activities (NCIfIA), Ordinary Dividends (OD), Taxation paid, Fixed assets acquired, Net interest paid/received, Secondary tax on entities, Capital profits/losses on financial assets, Normal taxation included in extraordinary items, Total profit of an extraordinary nature, Industry (IND), Super sector (SUP), Sector (SEC), Subsector (SUB), Company name (CPY), Ticker symbol (TIC) and Return on Equity (RoE). Company year observations for these variables for the period 2001 to 2010 were extracted from the McGregor BFA database. The entities were selected based on three criteria: 1) All multiples are positive; i.e. multiples with negative values were discarded, 2) The entities have at least three years of positive company year multiples, and 3) Each industry classification category has at least four observations that meet criteria 1) and 2) above.

A further filter was applied to remove observations located outside of the 1st and 99th percentiles from the pooled observations. This filter was applied specifically to eliminate extreme positive outliers, which could potentially distort the research results. This stems from the design of the study, which limits the downside risk of the valuations, i.e. they cannot be smaller than zero, but does not limit the upside risk of the valuations. Therefore, since the valuation errors could potentially be substantially larger than zero, the risk of distortion is on the upside. However, to prevent a biased outcome, the filter was applied on the upper and the lower ends of the pooled observations. The reasoning for this is two-fold. Firstly, excluding extreme observations will prevent the severe distortion of the research results, since the initial analysis indicated the prevalence of a significant number of outliers (Nel et al., 2013a, b). Secondly, rational investment practitioners will most certainly exclude these extreme observations when estimating peer group multiples in practice.

Note that the determination of an optimal peer group selection strategy requires the creation of peer groups based on different valuation fundamentals or combinations thereof and different industry classifications. Unfortunately, the original form of the data, as extracted from the McGregor BFA database, was not ready-for-use for the purpose of answering the research question. Consequently, the data had to be reworked substantially in order to prepare it for this study. To this end, 14 functions were coded in the *R-package* for the preparation and analysis of the data. The outputs from these functions were tested before they were applied to the data. The purpose of coding these functions was two-pronged: firstly, to prepare the data for data analysis and secondly, to calculate and analyse the valuation errors. The final population of observations represents approximately 71% of the total number of listed entities on the JSE as at 31 December 2010 and approximately 91% of the market capitalisation of the entities listed on the JSE at the same date, which serves as a fair representation for the conclusions drawn. Although various potential combinations of the market price and value drivers exist, the focus in this study was on 16 multiples within each of the five most popular

value driver categories, namely earnings, dividends, assets, revenue and cash flows (Nel, 2010; PwC, 2010; Nel, 2009a; Liu, Nissim and Thomas, 2002b; Cheng and McNamara, 2000). The framework of multiples; i.e. the ratio of the MPVs to the respective value drivers, that was used in the analysis is summarised in Table 1.

Table 1: Framework of multiples

	Value drivers				
	Earnings	**Assets**	**Revenue**	**Dividends**	**Cash flow**
P	GP	TA	R	OD	CgbO
	EBITDA	IC			NCIfOA
	EBIT	BVE			NCIfIA
	PAT				FCFE
	PBT				FCFF
	HE				
	P - Market Price				
	MVIC - Market Value of Invested Capital				
	GP - Gross Profit				
	EBITDA - Earnings Before Interest, Tax, Depreciation and Amortisation				
	EBIT - Earnings Before Interest and Tax				
	PAT - Profit After Tax				
	PBT - Profit Before Tax				
	HE - Headline Earnings				
	TA - Total Assets				
	IC - Invested Capital				
	BVE - Book Value of Equity				
	R - Revenue				
	OD - Ordinary Dividends				
	CgbO - Cash generated by Operations				
	NCIfOA - Net Cash Inflow from Operating Activities				
	NCIfIA - Net Cash Inflow from Investment Activities				
	FCFE - Free Cash Flow to Equity				
	FCFF - Free Cash Flow to the Firm				

Source: PwC (2012), Minjina (2008), Damodaran (2006a), Liu et al. (2002b), Alford (1992)

The number of observations varied for each of the 16 multiples, depending on the peer group selection method applied and how well the multiples satisfied the criteria stipulated above. Consequently, the population sizes of the multiples vary between 433 and 2 684 observations, culminating in a total population size of 260982 observations. From these observations, 16 price-multiples were constructed.

3. Methodology

The construction of multiples based on a target company's industry classification is a common phenomenon (Nel et al., 2013a; Nel, 2009a; 2009b; Goedhart et al., 2005; Liu, Nissim and Thomas, 2002a; Fernández, 2001; Barker, 1999). So, too, is a multiples-based valuation approach where peer groups are based on valuation fundamentals (Henschke and Homburg, 2009; Dittmann and Weiner, 2005; Goedhart et al., 2005; Herrmann and Richter, 2003; Bhojraj and Lee, 2002). The methodology applied in this paper is largely adopted from Nelet al. (2013a, b). However, the focus in this paper is on equity multiples in particular and the peer group selection process focuses on both industry classifications and valuation fundamentals. Valuation theory states that the Actual equity value (V_{it}^{e}) of an company (i) at a given point in time (t) is equal to the product of an Actual equity-based multiple (λ_{t}^{e}) and a specific Actual value driver (α_{it}) at that specific point in time, so that

$$V_{it}^{e} = \lambda_{t}^{e} \cdot \alpha_{it} \quad (1)$$

The objective of this study is to quantify the ability of Equation (1) to approximate actual share prices on the JSE. To this end, an out-of-sample equity-based peer group multiple ($\hat{\lambda}^{e}_{pt}$) is estimated for each company by calculating the harmonic mean of all the other remaining entities in a particular peer group. The SUB-based, P/PAT peer group multiple estimate for company A, for example, in a SUB-based peer group that contains entities A to E, would therefore be equal to the harmonic mean of the P/PAT multiples of entities B to E. The peer group multiples are estimated based on the harmonic mean since it avoids the upward bias of the arithmetic mean and is regarded as a viable and unbiased estimator (Dittmann and Maug, 2008; Bhojraj and Lee, 2002; Liu et al., 2002b; Beatty et al., 1999).

The peer groups are based on four industry classifications, namely IND, SUP, SEC and SUB; and three proxies for the valuation fundamentals, namely profitability, risk and growth. The proxies for these three variables, namely RoE, TA and Revenue growth (Rg), were used individually and in combination, culminating in seven possibilities. The seven valuation fundamentals comprised three single factor valuation fundamentals, namely RoE, TA and Rg; and three combinations of valuation fundamentals, namely RoE. TA, RoE. Rg and TA. Rg. These four industry classifications and six valuation fundamentals were used to create peer groups for the construction of the 16 multiples contained in Table 1. The out-of-sample multiple ($\hat{\lambda}^{e}_{pt}$) is estimated for each company by calculating the harmonic mean of all the companies in the peer group concerned for that specific multiple. The estimated peer group multiple of each company ($\hat{\lambda}^{e}_{pt}$) is then multiplied by the company's actual value driver (α_{it}) to calculate an equity value prediction ($\hat{V}^{e}_{it}$):

$$\hat{V}^{e}_{it} = \hat{\lambda}^{e}_{ct} \cdot \alpha_{it} \tag{2}$$

Subtracting Equation (2) from Equation (1) produces (3) for the calculation of the error margin (valuation error):

$$\hat{V}^{e}_{it} - V^{e}_{it} \tag{3}$$

Since companies with higher values will tend to have higher valuation errors, (3) will not be independent of value. It is anticipated that expressing (3) proportionally to V^{e}_{it} will improve the efficacy of the peer group multiple estimate (Beatty, Riffe and Thompson, 1999). The standardized form of (3), ε_{it}, is therefore expressed proportionally to V^{e}_{it}, where[1]

$$\varepsilon_{it} = \left| \frac{\hat{V}^{e}_{it} - V^{e}_{it}}{V^{e}_{it}} \right| \tag{4}$$

The valuation errors are calculated for each company year and subsequently aggregated. Absolute valuation errors are used since the results of central tendency measures, such as the mean, will be obscured if positive and negative valuation errors are netted, which may result in an artificially low valuation error.

The superior valuation fundamental, i.e. the valuation fundamental that produces the most accurate equity valuation, will typically be the one with the lowest summarised valuation error. This allows for the construction of a PGV value chain, which indicates the extent to which the valuation precision of multiples improved, depending on the choice of PGV. The PGV value chain indicates the potential percentage improvement (IMP) in valuation precision that may be secured by employing the optimal PGV (a PGV that has

[1] Functions for the calculation of ε_{it} and the statistical analysis thereof were developed in the Rpackage, an open source programming language that lends itself to statistical analysis and graphics (R Core Team, 2014).

the smallest ε_{it}) instead of any of the sub-optimal choices (a PGV that does not have the smallest ε_{it}).

4. Results

A comparison of the relative valuation performances of the multiples, whose peer groups are based on the two schools of thought, as discussed in Section 3, offers insight as to the ideal basis for an optimal peer group selection strategy for multiples-based valuation purposes. A PCA biplot is employed to visualise the relative valuation performance of these two schools of thought, while the correlations between the ten different PGVs is measured by the use of a correlation monoplot. It is hoped that a specific type of, and particular, PGV will emerge as the optimal basis for peer group selection purposes. In order to gain a clear perspective on the relative valuation performance of the 16 multiples, a PGV value chain is created, ranking, for each of the 16 multiples, the ten PGVs according to their respective valuation accuracies.

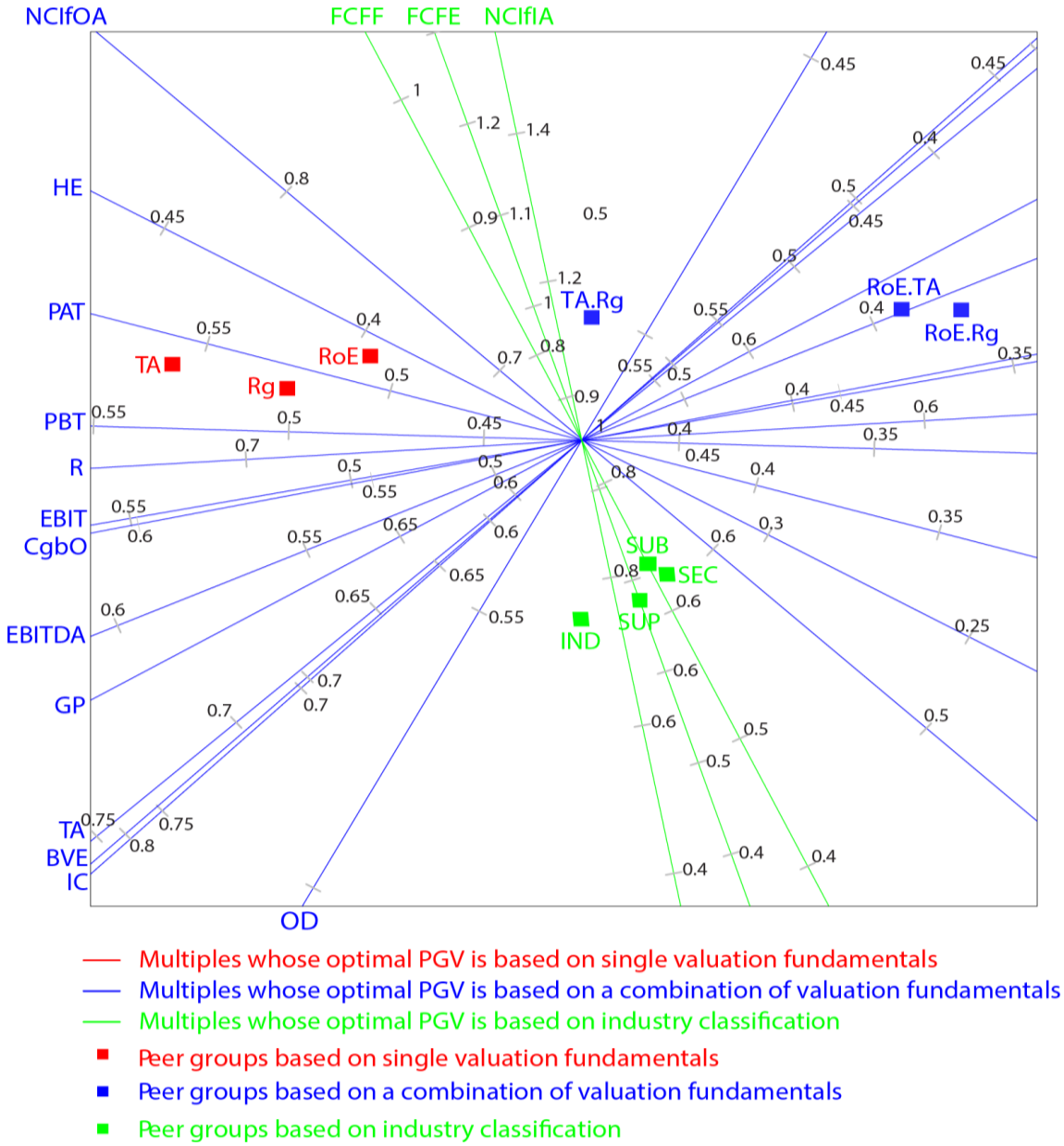
Peer group selection based on valuation fundamentals and industry classification: A summary of the absolute valuation errors of the 16 multiples whose peer groups were based on each of the ten different PGVs is contained in Table 2. The multi-dimensional nature of the data contained in Table 2 complicates a careful analysis of the general trend of the data. Since the data occupies multi-dimensional space, i.e. it encapsulates multiple coordinate axes; the use of a conventional, two-dimensional scatter plot is inappropriate (Gower, Lubbe and Le Roux, 2011). However, the use of biplots accommodates higher-dimensional data by approximating it in lower, usually two-dimensional space, thereby enabling the visualisation of multi-dimensional data. The overall valuation performance depicted in Figure 1 suggests that multiples whose peer groups are based on a combination of valuation fundamentals seem to produce more accurate valuations *vis-á-vis* multiples whose peer groups are based on industry classification. However, none of the PGVs consistently produced the most accurate valuations across all 16 multiples. Valuation fundamentals-based multiples produced the most accurate valuations for 81.25% of the multiples, while industry classification-based multiples produced the most accurate valuations for 18.75% of the multiples, i.e. for the three multiples.

Table 2: Actual valuation errors of 16 multiples whose peer groups were based on 10 different PGVs

Multiple	PGV RoE	TA	Rg	RoE. TA	RoE. Rg	TA. Rg	IND	SUP	SEC	SUB
GP	0.6496	0.6548	0.6638	0.5614	0.5977	0.6020	0.6438	0.6190	0.6178	0.6299
EBITDA	0.5275	0.5731	0.5335	0.4015	0.3911	0.4244	0.5025	0.4835	0.4754	0.4591
EBIT	0.5125	0.5446	0.4987	0.3821	0.3688	0.4020	0.4657	0.4398	0.4383	0.4249
PAT	0.4860	0.5717	0.5306	0.3750	0.3688	0.4520	0.4308	0.4232	0.4188	0.4199
PBT	0.4581	0.5320	0.5131	0.3382	0.3323	0.4338	0.4209	0.4083	0.4061	0.4065
HE	0.4028	0.4237	0.4154	0.2956	0.2888	0.3565	0.3130	0.3140	0.3156	0.3375
TA	0.6108	0.6300	0.6274	0.4844	0.4716	0.5630	0.6278	0.6007	0.5753	0.5706
IC	0.6246	0.6508	0.6477	0.5184	0.4950	0.5830	0.6526	0.6264	0.5957	0.5937
BE	0.4888	0.6495	0.6400	0.3852	0.3782	0.6246	0.5770	0.5750	0.5918	0.5824
R	0.6737	0.6951	0.6991	0.5734	0.6070	0.6824	0.6782	0.6398	0.6316	0.6249
CgbO NCIfOA	0.5918	0.5919	0.5405	0.4689	0.4049	0.4461	0.4989	0.4984	0.4998	0.5104

	0.7458	0.7879	0.7342	0.6343	0.5679	0.6961	0.5964	0.6144	0.6194	0.6168
NCIfIA	1.1020	1.1825	1.1159	1.0832	1.0357	1.2138	0.7594	0.7777	0.7692	0.8160
OD	0.5085	0.5534	0.5175	0.5012	0.4446	0.5119	0.5109	0.5446	0.5358	0.5625
FCFE	0.9653	1.0349	1.0154	0.8850	0.8448	1.0251	0.6842	0.6802	0.6859	0.7135
FCFF	0.8607	0.9228	0.8306	0.7368	0.7133	0.7690	0.6056	0.6158	0.6288	0.6509

Fig 1: PCA biplot of multiples whose peer groups are based on 10 different PGVs (colour-coded)



NCIfIA, FCFE and FCFF. The latter is evident from the colour-coded axes in Figure 1, which depict the PGV basis which produced the most accurate valuations for each multiple.

However, a distinction should be made among the valuation fundamentals-based peer groups. As concluded by Nel et al. (2014a), multiples whose peer groups are based on a combination of valuation fundamentals generally produced more accurate valuations than multiples whose peer groups are based on single valuation fundamentals. This is evident from the location of the three single valuation fundamental PGVs, RoE, Rg and TA, relative to their combination of valuation fundamentals-based counterparts, TA. Rg, RoE. TA and RoE. Rg. Note that, among the combination of valuation fundamentals, TA. Rg produced far less accurate valuations than RoE. TA and RoE. Rg, which is reflected in its location – a substantial distance from RoE. TA and RoE. Rg. TA. Rg is the only combination of valuation fundamentals-based peer group that occasionally produced less accurate valuations than one or more of the single valuation fundamentals, as was the case with the NCIfIA multiple, for example. One should also consider the location of the 10 PGVs relative to the origin. It is evident that single valuation fundamentals generally produced the least accurate results, since they are located the furthest to the left of, and slightly above, the origin. However, single valuation fundamentals occasionally offered a moderate valuation performance by producing valuations that were more accurate than one or more of the industry-based PGVs. RoE, for example, did so for the BVE multiple.

Industry-based peer groups generally offered a moderate degree of valuation precision, since they clustered together at the level of the origin. However, three notable exceptions occurred in the case of the multiples NCIfIA, FCFE and FCFF, where the location of the industry-based peer groups were the furthest below the origin, i.e. for these three multiples, they produced the most accurate valuations. The combination of valuation fundamentals-based peer groups generally offered the highest degree of valuation precision, since they were located the furthest to the right of the origin. The exception was TA. Rg, which was located further to the left of RoE. TA and RoE. Rg and closer to the origin, reflecting it's generally moderate degree of valuation precision. Note that the biplot in Figure 1 does not display the actual data set, as contained in Table 2, which, geometrically, lies in a ten-dimensional space, but rather an approximation of the data in two dimensions. Although a certain loss of information is, therefore, inevitable when employing biplots, they are able to accommodate more than two variables in the form of calibrated axes, which would not be able to intersect orthogonally in two dimensions. Although the PCA-based biplot in Figure 1 approximates the data in the best possible two-dimensional space, the reduction of the multi-dimensionality of the data culminates in a loss of data accuracy (Greenacre, 2007). If the loss of information resulting from this approximation is negligible, much can be learned about the multi-dimensional nature of the data. Consequently, it is also necessary to evaluate the quality of the PCA biplots.

Table 3: Predictivity readings over 16 multiples

Multiple	Predictivity
GP	0.822
EBITDA	0.928
EBIT	0.910
PAT	0.979
PBT	0.979
HE	0.969
TA	0.963
IC	0.957
BE	0.703
R	0.773
CgbO	0.765
NCIfOA	0.952

NCIfIA	0.972
OD	0.573
FCFE	0.974
FCFF	0.970

The quality of the PCA biplots: In order to assess the loss of information accompanying the use of PCA biplots, one must consider the biplot's overall quality of display, the accuracy of its calibrated axes and that of its sample predictions. A higher overall quality of display reading reflects a less significant loss in data accuracy and *vice versa*. In Figure 1, the quality of display is 88.67%, which reflects the proportion of the total variation in the data accounted for in the remaining eight dimensions. The accuracy of the approximations of the individual axes in the biplot is known as the axes' productivities. These values, which can be obtained from the output of the *PCAbipl* function in the *R-package,* are contained in Table 3.[2] From Table 3, it is evident that the greatest loss in accuracy occurs with OD and, at 57.3%; it indicates that the presentation of OD is the poorest of all the multiples. The quality of display reading of 88.67% and the axes' Predictivity readings, as contained in Table 3, confirmed a negligible loss of data accuracy. Predictions can be read from the PCA biplot by projecting from a sample point onto any axes and obtaining a reading from the nearest marker on these axes. A good approximation will result in good predictions. The approximations of the actual data points, as displayed in Figure 2, together with the actual data points, are contained in Table 4. As is evident, the Actual (Act) and Predicted (Pre) values are very similar.

Table 4: PGVs: Actual (Act) and Predicted (Pre) valuation errors over 16 multiples

Multiple	**PGV**									
	RoE		**TA**		**Rg**		**RoE.TA**		**RoE. Rg**	
	Act	**Pre**	**Act**	**Pre**	**Act**	**Pre**	**Act**	**Pre**	**Act**	**Pre**
GP	0.6496	0.6369	0.6548	0.6624	0.6638	0.6517	0.5614	0.5808	0.5977	0.5742
EBITDA	0.5275	0.5068	0.5731	0.5598	0.5335	0.5367	0.4015	0.3922	0.3911	0.3777
EBIT	0.5125	0.4809	0.5446	0.5327	0.4987	0.5087	0.3821	0.3725	0.3688	0.3573
PAT	0.4860	0.4972	0.5717	0.5589	0.5306	0.5269	0.3750	0.3770	0.3688	0.3562
PBT	0.4581	0.4701	0.5320	0.5326	0.5131	0.5018	0.3382	0.3442	0.3323	0.3245
HE	0.4028	0.3873	0.4237	0.4334	0.4154	0.4081	0.2956	0.3011	0.2888	0.2845
TA	0.6108	0.5968	0.6300	0.6453	0.6274	0.6263	0.4844	0.4865	0.4716	0.4749
IC	0.6246	0.6172	0.6508	0.6626	0.6477	0.6451	0.5184	0.5129	0.4950	0.5023
BVE	0.4888	0.5824	0.6495	0.6571	0.6400	0.6274	0.3852	0.4132	0.3782	0.3950
R	0.6737	0.6756	0.6951	0.7114	0.6991	0.6940	0.5734	0.6026	0.6070	0.5915
CgbO	0.5918	0.5357	0.5919	0.5839	0.5405	0.5617	0.4689	0.4344	0.4049	0.4204
NCIfOA	0.7458	0.7244	0.7879	0.7870	0.7342	0.7502	0.6343	0.6138	0.5679	0.5895

[2] The *R code* for constructing the PCA biplots utilises the *UBbipl package*, which is available at the following link http://dl.dropbox.com/u/17860902/UBbipl_1.0.zip

NCIfIA	1.1020	1.1236	1.1825	1.1829	1.1159	1.1217	1.0832	1.0877	1.0357	1.0442
OD	0.5085	0.5223	0.5534	0.5402	0.5175	0.5347	0.5012	0.4775	0.4446	0.4744
FCFE	0.9653	0.9795	1.0349	1.0547	1.0154	0.9936	0.8850	0.8908	0.8448	0.8484
FCFF	0.8607	0.8277	0.9228	0.8963	0.8306	0.8475	0.7368	0.7285	0.7133	0.6953

Table 4...continued

Multiple	**PGV TA. Rg**		**IND**		**SUP**		**SEC**		**SUB**	
	Act	**Pre**	**Act**	**Pre**	**Act**	**Pre**	**Act**	**Pre**	**Act**	**Pre**
GP	0.6020	0.6164	0.6438	0.6353	0.6190	0.6292	0.6178	0.6274	0.6299	0.6255
EBITDA	0.4244	0.4668	0.5025	0.4943	0.4835	0.4824	0.4754	0.4789	0.4591	0.4761
EBIT	0.4020	0.4457	0.4657	0.4546	0.4398	0.4441	0.4383	0.4410	0.4249	0.4401
PAT	0.4520	0.4651	0.4308	0.4317	0.4232	0.4221	0.4188	0.4193	0.4199	0.4225
PBT	0.4338	0.4329	0.4209	0.4204	0.4083	0.4093	0.4061	0.4061	0.4065	0.4072
HE	0.3565	0.3672	0.3130	0.3246	0.3140	0.3187	0.3156	0.3169	0.3375	0.3210
TA	0.5630	0.5541	0.6278	0.6072	0.6007	0.5944	0.5753	0.5907	0.5706	0.5855
IC	0.5830	0.5762	0.6526	0.6303	0.6264	0.6179	0.5957	0.6143	0.5937	0.6091
BVE	0.6246	0.5175	0.5770	0.5943	0.5750	0.5748	0.5918	0.5691	0.5824	0.5616
R	0.6824	0.6534	0.6782	0.6501	0.6398	0.6435	0.6316	0.6415	0.6249	0.6418
CgbO	0.4461	0.5026	0.4989	0.5123	0.4984	0.5025	0.4998	0.4996	0.5104	0.4986
NCIfOA	0.6961	0.7043	0.5964	0.6141	0.6144	0.6083	0.6194	0.6065	0.6168	0.6151
NCIfIA	1.2138	1.1802	0.7594	0.7528	0.7777	0.7704	0.7692	0.7753	0.8160	0.8166
OD	0.5119	0.5021	0.5109	0.5413	0.5446	0.5353	0.5358	0.5335	0.5625	0.5297
FCFE	1.0251	1.0039	0.6842	0.6761	0.6802	0.6838	0.6859	0.6860	0.7135	0.7175
FCFF	0.7690	0.8299	0.6056	0.6215	0.6158	0.6224	0.6288	0.6226	0.6509	0.6427

The comparison between the actual and predicted data points over all 16 multiples in Table 4 indicates that the loss in data accuracy is negligible. The predictions contained in Table 4 can be read from the PCA biplot displayed in Figure 2. As is evident from Figure 2, projecting all the sample predictions on a biplot would cluster the display and seems nonsensical. However, consider the perpendicular readings of the PGV RoE.Rg, for example, from Figure 3.

Figure 2: PCA biplot of multiples whose peer groups are based on 10 different PGVs (all sample predictions included)

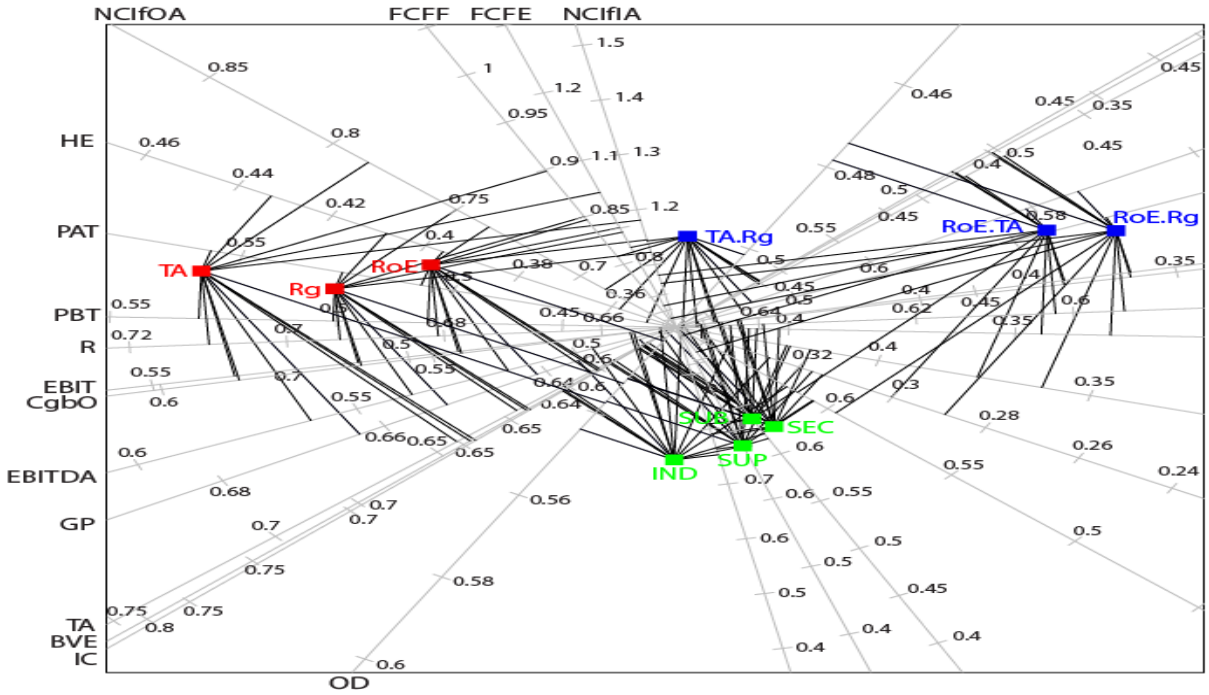
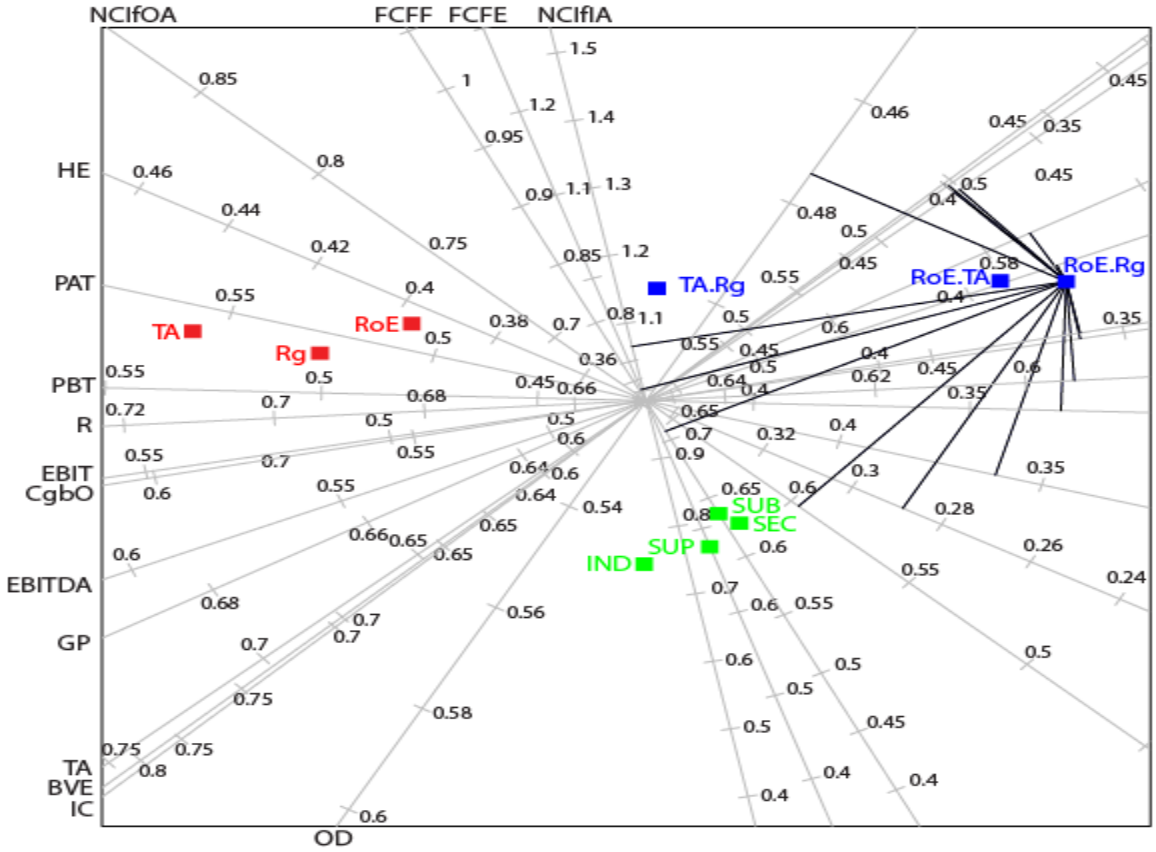


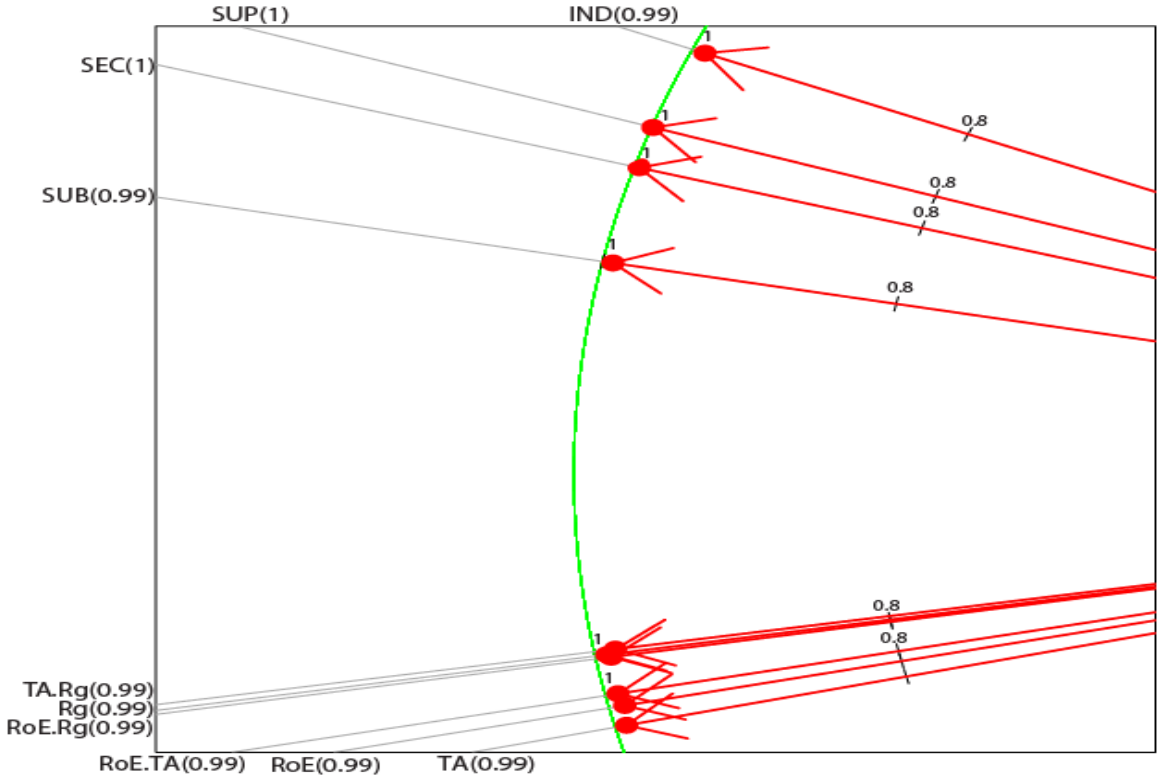
Figure 3: PCA biplot of multiples whose peer groups are based on 10 different PGVs (RoE.Rg sample predictions included)



The projection onto the OD axis, for example, indicates a reading somewhere between 0.46 and 0.48, but somewhat closer to 0.48 than to 0.46, which corresponds to the 0.4744 prediction in Table 4. Although not shown here, similar readings can be traced to Table 4 for all 15 other multiples. If an exact reading from the biplot is required, it can be achieved algebraically. By default, PCA biplots constructed with *UBBipl* optimise the relative distances between the positions of the data points and their relationships with the calibrated axes. However, the default setting of the PCA biplots do not optimise the correlations between the calibrated axes, as reflected by the angles between them. Although the angles between these axes are indications of the correlations among the PGVs, these angles are not optimised. To gain an accurate representation of the correlations, a correlation monoplot is required.

Correlations among the PGVs: In order to gain an understanding of the correlations between the 10 PGVs, one has to transpose the data matrix, as contained in Table 2. The inter-correlations within and between each of the three PGV categories is depicted in the correlation monoplot in Figure 4.

Figure 4: Correlation monoplot of the 10 different PGVs



From the degree of approximations (indicated in parenthesis) it is clear that the correlation monoplot approximates the PGVs very well, since they all have values of 0.99 or higher. All 10 PGVs are positively correlated. The inter-correlations between two of the three combinations of valuation fundamentals, namely TA.Rg and RoE.Rg, are particularly highly positively correlated, almost to the extent that they overlap each other. Although RoE.TA is also highly positively correlated with TA.Rg and RoE.Rg, it is positioned at a wider angle from TA.Rg and RoE.Rg. While the inter-correlations between the three single valuation fundamentals are also highly positive, the positive inter-correlations between the industries classification-based PGVs are far weaker. Equally evident is the weak positive correlation between the valuation fundamentals-based PGVs and the industry classification-based PGVs. This is in line with the superior valuation performance of the multiples whose peer groups were based on valuation fundamentals, particularly a combination of valuation fundamentals, rather than on industry classification. The question that remains is whether any of the ten PGVs emerged as the *de facto* PGV of choice and whether these differences in valuation performance among the ten PGVs are substantial.

Optimal PGVs and potential gains in valuation precision: From the relative positions of the 10 PGVs in Figure 1, it is evident that the magnitude of the difference in relative valuation performance of the 10 PGVs is substantial. A comparison between the valuation precision of multiples whose peer groups are based on valuation fundamentals with that of multiples whose peer groups are based on industry classification is summarised in Table 5. The 10 PGVs, six valuation fundamentals and four industry classifications, are ranked from least accurate PGV to the most accurate PGV, indicating the IMP that may be secured when substituting each sub-optimal choice of PGV with the optimal PGV. Therefore, the least accurate choice of PGV is situated furthest to the left of Table 5 and carries the highest IMP in valuation precision, while the optimal choice of PGV is situated furthest to the right and carries no IMP, i.e. the IMP is zero.

Table 5: IMP in the median valuation errors based on 10 PGVs

GP										
Peer group	Rg	TA	RoE	IND	SUB	SUP	SEC	TA_Rg	RoE_Rg	RoE_TA
IMP	15.43%	14.26%	13.58%	12.80%	10.87%	9.31%	9.13%	6.74%	6.07%	0.00%
N	1963	2415	2176	2356	1790	2338	2235	606	814	716
EBITDA										
Peer group	TA	Rg	RoE	IND	SUP	SEC	SUB	TA_Rg	RoE_TA	RoE_Rg
IMP	31.76%	26.69%	25.86%	22.17%	19.11%	17.73%	14.81%	7.85%	2.59%	0.00%
N	2634	1989	2395	2345	2328	2229	1768	603	777	815
EBIT										
Peer group	TA	RoE	Rg	IND	SUP	SEC	SUB	TA_Rg	RoE_TA	RoE_Rg
IMP	32.28%	28.04%	26.05%	20.81%	16.14%	15.86%	13.20%	8.26%	3.48%	0.00%
N	2620	2370	1979	2276	2259	2161	1723	601	775	812
PAT										
Peer group	TA	Rg	RoE	TA_Rg	IND	SUP	SUB	SEC	RoE_TA	RoE_Rg
IMP	35.49%	30.49%	24.12%	18.41%	14.39%	12.85%	12.17%	11.94%	1.65%	0.00%
N	2619	1965	2310	586	2128	2112	1609	2015	766	809
PBT										
Peer group	TA	Rg	RoE	TA_Rg	IND	SUP	SUB	SEC	RoE_TA	RoE_Rg
IMP	37.54%	35.24%	27.46%	23.40%	21.05%	18.61%	18.25%	18.17%	1.74%	0.00%
N	2619	1965	2306	589	2159	2142	1613	2043	767	810
HE										
Peer group	TA	Rg	RoE	TA_Rg	SUB	SEC	SUP	IND	RoE_TA	RoE_Rg
IMP	31.84%	30.48%	28.30%	18.99%	14.43%	8.49%	8.03%	7.73%	2.30%	0.00%
N	2601	1960	2325	589	1656	2064	2162	2178	776	810
TA										
Peer group	TA	IND	Rg	RoE	SUP	SEC	SUB	TA_Rg	RoE_TA	RoE_Rg
IMP	25.14%	24.88%	24.83%	22.79%	21.49%	18.03%	17.35%	16.23%	2.64%	0.00%
N	2656	2684	1993	2458	2664	2589	2142	609	788	816
IC										
Peer group	IND	TA	Rg	SUP	RoE	SEC	SUB	TA_Rg	RoE_TA	RoE_Rg
IMP	24.15%	23.94%	23.58%	20.98%	20.75%	16.90%	16.62%	15.09%	4.51%	0.00%
N	2682	2655	1997	2662	2462	2588	2163	611	788	816
BVE										
Peer group	TA	Rg	TA_Rg	SEC	SUB	IND	SUP	RoE	RoE_TA	RoE_Rg
IMP	41.77%	40.91%	39.45%	36.09%	35.06%	34.45%	34.23%	22.63%	1.82%	0.00%
N	2637	1964	589	2303	1879	2409	2389	2418	784	809
R										
Peer group	Rg	TA	TA_Rg	IND	RoE	SUP	SEC	SUB	RoE_Rg	RoE_TA
IMP	17.98%	17.51%	15.97%	15.45%	14.89%	10.38%	9.21%	8.24%	5.54%	0.00%
N	1965	2394	598	2386	2167	2366	2263	1813	811	711
CgbO										
Peer group	TA	RoE	Rg	SUB	SEC	IND	SUP	RoE_TA	TA_Rg	RoE_Rg
IMP	31.59%	31.58%	25.09%	20.67%	18.99%	18.84%	18.76%	13.65%	9.24%	0.00%
N	2615	2369	1974	1626	2012	2171	2155	761	596	807
NCIfOA										
Peer group	TA	RoE	Rg	TA_Rg	RoE_TA	SEC	SUB	SUP	IND	RoE_Rg
IMP	27.92%	23.85%	22.65%	18.42%	10.47%	8.31%	7.93%	7.57%	4.78%	0.00%
N	2616	2350	1964	575	737	1818	1425	1937	1952	802
NCIfIA										
Peer group	TA_Rg	TA	Rg	RoE	RoE_TA	RoE_Rg	SUB	SUP	SEC	IND
IMP	37.44%	35.78%	31.95%	31.09%	29.89%	26.68%	6.94%	2.35%	1.27%	0.00%
N	458	2577	1892	2178	569	755	724	1094	994	1110
OD										
Peer group	SUB	TA	SUP	SEC	Rg	TA_Rg	IND	RoE	RoE_TA	RoE_Rg
IMP	20.96%	19.66%	18.36%	17.02%	14.09%	13.15%	12.98%	12.57%	11.29%	0.00%
N	1176	1672	1661	1504	1341	433	1682	1529	553	661
FCFE										
Peer group	TA	TA_Rg	Rg	RoE	RoE_TA	RoE_Rg	SUB	SEC	IND	SUP
IMP	34.27%	33.65%	33.01%	29.53%	23.14%	19.48%	4.67%	0.83%	0.58%	0.00%
N	2607	490	1927	2196	656	779	921	1249	1384	1372
FCFF										
Peer group	TA	RoE	Rg	TA_Rg	RoE_TA	RoE_Rg	SUB	SEC	SUP	IND
IMP	34.37%	29.64%	27.09%	21.25%	17.81%	15.10%	6.96%	3.69%	1.66%	0.00%
N	2596	2188	1928	520	665	787	1030	1400	1544	1556

The following can be gleaned from Table 5: Firstly, multiples whose peer groups are based on single valuation fundamentals generally perform the least accurate equity valuations. This is reflected in a sub-optimal IMP range of 12.57% to 41.77% and the fact that none of the multiples whose peer groups were based on single valuation fundamentals produced the most accurate valuation for any of the 16 multiples. Secondly, multiples whose peer groups are based on industry classifications generally perform more accurate valuations than multiples whose peer groups are based on single valuation fundamentals, but less accurate valuations than multiples whose peer groups are based on a combination of valuation fundamentals. Multiples whose peer groups are based on industry classifications indicate a sub-optimal IMP, ranging from 0.58% to 36.09%, and produced the most accurate valuations for three, or 18.75%, of the multiples, namely NCIfIA, FCFE and FCFF. Thirdly, multiples whose peer groups are based on a combination of valuation fundamentals generally perform more accurate valuations than multiples whose peer groups are based on industry classifications, culminating in a sub-optimal IMP ranging from 1.65% to 39.45%, and produced the most accurate valuations for 13, or 81.25%, of the multiples. Two further questions beckon attention: Firstly, is it possible to further enhance the results obtained from this study by extending the proxy variables, especially in light of the emerging market challenges alluded to in Section 2, or will the emerging market context obscure a deeper analysis in this respect? Secondly, are the results obtained from this study methodology-specific, i.e. will the application of different methodologies yield different results?

An emerging market perspective: Although very few studies have been conducted on peer group selection in emerging markets, the topic has been covered in a number of studies in the developed market literature. Unfortunately, the scope of an investigation into an optimal peer group selection strategy in emerging markets is hamstrung by data limitations. Consider, for example, the evidence from this study, which suggests that multiples whose peer group selection is based on a combination of valuation fundamentals produce more accurate valuations than multiples whose peer group selection is based on single valuation fundamentals or industry classification. By implication, South African analysts should therefore employ a combination of valuation fundamentals for peer group selection purposes when employing multiples to perform equity valuations. The evidence also suggests that analysts should take cognisance of the substantial precision gains offered by RoE.TA and RoE.Rg, the latter in particular. Based on these results, one could envisage that a peer group selection strategy based on a triple combination of proxies for growth, profitability and risk, for example, would secure a further refinement in valuation precision. Therefore, the construction of multiples based on a combination of all three single valuation fundamentals, namely RoE.TA.Rg, was also tested, but due to the limited depth of the South African market, the number of peer groups produced by a triple combination was negligible. Consequently, the combination RoE.TA.Rg was excluded from this analysis.

Despite this limitation, the research results of this study concur with evidence from the developed capital markets regarding peer group selection. The empirical evidence from the developed market literature indicates that multiples whose peer groups are based on a combination of valuation fundamentals, particularly a combination of profitability and risk or a combination of profitability and growth, yield the most accurate equity valuations. It is of interest to note that the concurrence of the South African results with that of the developed market literature is independent of the methodology applied. As alluded to in Section 2, authors who applied different methodologies to the one applied in this study, obtained similar results (Henschke & Homburg, 2009; Schreiner, 2007; Bhojraj & Lee, 2002).However, the allure of the methodology employed in this study is that, unlike most theoretical models that are based on simplified realities, it is a realistic, if not near exact, reflection of how multiples are applied in practice. The latter is probably also the main reason that this approach has become so popular in the finance literature. It was introduced into the finance literature by Alford (1992), in a joint research effort between the Massachusetts Institute of Technology and corporate financiers from Ernst and Young and has subsequently been refined by various other scholars (Nissim, 2011; Minjina, 2008; Liu et al., 2007; 2002a; 2002b; Dittmann & Weiner, 2005; Cheng & McNamara, 2000; Gilson, Hotchkiss & Ruback, 2000).

5. Conclusion

The primary aim of this paper was to establish whether there is an optimal basis for peer group selection. At its core, this entails a comparison of the valuation performance of multiples whose peer groups are based on industry classifications with multiples whose peer groups are based on valuation fundamentals. The evidence

suggests that multiples whose peer groups are based on a combination of valuation fundamentals generally perform more accurate valuations than multiples whose peer groups are based on single valuation fundamentals or industry classifications. This holds true for 81.25% of the multiples tested in this study. The three multiples offering evidence to the contrary were NCIfIA, FCFE and FCFF. In other words, for 18.75% of the multiples tested, the evidence suggested that industry classification was the optimal basis for peer group selection. From these results it is evident that multiples whose peer groups are based on valuation fundamentals, particularly a combination of valuation fundamentals, dominate the valuation performance space in the South African market. The secondary aim was to establish which of the ten PGVs tested in this study, if any, offered the greatest degree of valuation precision. The evidence suggests that, for the 81.25% of the multiples tested in this study, the optimal choice of PGV is a combination of the valuation fundamentals Rg and RoE. The optimal choice of PGV for 12.50% of the multiples tested in this study was IND and for 6.25% of the multiples it was SUP. All 16 multiples that were tested in this study produced the least accurate valuations when their peer groups were based on single valuation fundamentals.

The third aim was to measure the magnitude of the potential improvement in valuation precision that an optimal choice of a PGV could potentially have on a sub-optimal choice of PGV. The research results suggests that the increase in valuation precision that could be secured by switching from sub-optimal PGVs to the optimal PGV could be as much as 41.77%, which is substantial. As was the case with previous research, the evidence indicated that multiples whose peer groups are based on single valuation fundamentals produced the least accurate valuations for all 16 multiples, even less accurate than those multiples whose peer groups were based on industry classification. In general, multiples whose peer groups were based on industry classification produced more accurate valuations compared to those whose peer groups were based on single valuation fundamentals, but less so than multiples whose peer groups were based on a combination of valuation fundamentals, RoE.Rg and RoE.TA in particular. Therefore, the superior valuation performance of multiples whose peer groups are based on a combination of valuation fundamentals, RoE.Rg in particular, as deduced from the cross-sectional analysis conducted in previous studies, seems to hold when compared to those multiples whose peer group selection was based on industry classification.

The research results therefore presented empirical evidence in favour of the use of a combination of valuation fundamentals, rather than industry classification, as a basis for peer group selection. Equally evident was that the superior valuation performance of multiples whose peer groups were based on a combination of valuation fundamentals does not apply to all multiples, i.e. each multiple should be considered in isolation. However, investment practitioners should perhaps also consider more carefully their choice of PGV, since this may enable them to secure precision gains of up to 41.77%. The following implications can be gleaned from these findings: Firstly, the results offer a comparative synopsis between the two schools of thought on peer group selection. As such, it offers a best practice guideline to analysts in emerging markets for peer group selection purposes. This is particularly helpful in emerging markets where there is limited empirical evidence on peer group selection and where failure to agree on valuations is cited as the main reason that transactions in emerging markets are not finalised.

Secondly, the proper construction of multiples requires a careful consideration of analysts' peer group selection strategies on an inter-school of thought basis and on an intra-school of thought basis. It was evident that neither of the two schools of thought on peer group selection produced the most accurate valuations among all 16 multiples that were investigated in this study. Therefore, peer group selection should not be based on a particular school of thought, but rather on a specific PGV on a case-by-case basis, regardless of the school of thought that the PGV represents. Generally, on an inter-school of thought basis, analysts should employ a peer group selection strategy that is based on valuation fundamentals, rather than a strategy that is based on industry classification. However, analysts should also guard against adopting a *carte blanche* approach to peer group selection that is based solely on a combination of valuation fundamentals. The latter observation seems particularly apt when employing the cash flow-based multiples NCIfIA. FCFE and FCFF, where a peer group selection strategy based on industry classification seems to present a more appropriate alternative. On an intra-school of thought basis, analysts should refrain from using single factor PGVs as a basis for peer group selection, since they generally produce the least accurate valuations. Thirdly, the evidence suggests that the valuation precision of multiples depends on the choice of PGV. Therefore, analysts

should refrain from employing their favourite multiples before due consideration of their peer group selection strategy.

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Determinants of Poverty of Households: Semi parametric Analysis of Demographic and Health Survey Data from Rwanda

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Abstract: The main objective of this research is to identify the key determinants of poverty of household in Rwanda based on asset index and semi parametric modeling**.** The asset index for each household is established and thereafter the generalized additive mixed model is used to ascertain the key determinants of poverty of households in Rwanda. The semi parametric generalized additive mixed model allowed us to study the impact of nonlinear predictors as nonparametric and categorical predictors as parametric to the asset index. Using the Rwanda Demographic and Health Survey (2010), the characteristics of households and household heads are considered. Our findings show that the level of education, gender and age of household head, region (province), size of the household (number of household members) and place of residence (urban or rural) are significant predictors of poverty of households in Rwanda.

Keywords: *Asset index, smooth function, variable reduction*

1. Introduction

The measurement of the socio-economic status of household is essential for health research, program targeting and policy monitoring and evaluation**.** The measurement and analysis of poverty in developing countries has classically been built on income and consumption. However, collecting data on income and expenditure can be time consuming and expensive (Vyas & Kumaranayake, 2006). Furthermore, in developing countries, measurement of consumption and expenditure is awash with problems such as recall and reluctance to reveal information. Moreover, prices are more likely to vary considerably across time and areas, requiring complex adjustments of the expenditure figures to reflect these price differences (Deaton & Zaidi, 1999; Lokosang et al., 2014). Sahn and Stifel (2003) studied the theoretical framework underpinning household income or expenditure as a tool for classifying socio-economic status (SES) in developing countries. Several researchers (Filmer & Pritchett, 1998; Filmer & Pritchett, 2001; Montgomery et al., 2000; Lokosang et al., 2014) used Principal Component Analysis (PCA) to create an asset index, using the demographic health survey variables such as durable goods, source of drinking water, toilet facility and housing quality to describe the household welfare, instead of using a household's income or expenditure.

There are other methods in the literature used to compute the weights of an asset index other than PCA. For instance, multiple correspondence analysis is similar to PCA, however is used for discrete data (Galbraith et al., 2002; Booysen et al., 2008). Sahn and Stifel (2003) utilized factor analysis, with a similar target to PCA, in terms of expressing a set of variables into a smaller number of indices or factors. The difference between PCA and factor analysis is that, while there are no assumptions associated with PCA, the factors derived from factor analysis are assumed to represent the underlying processes that result in the correlation between the variables. The main problem of the factor analysis method is that not all the assets show a linear relationship with living standards. PCA is the widely used method because it is computationally easier, it uses the type of data that can be easily collected in household surveys (Vyas & Kumaranayake, 2006), and it uses all of the variables in reducing the dimensionality of the data. PCA, as in the case of other statistical methods, has advantages and disadvantages. The main challenge of PCA based indices is to ensure that the range of asset variables used is broad enough to avoid problems of clumping and truncation (Habyarimana et al., 2015). Once these specific problems are identified, one of the solutions is to include additional variables that capture inequalities between households (McKenzie, 2005).

The previous studies done on the determinants of poverty of households used consumption or expenditure and/or parametric regression as their primary analysis (Jalan & Ravallion, 2000; Mok, Gan, & Sanyal, 2007; Muller, 2002; Rodriguez & Smith, 1994;Achia et al., 2010). However, these parametric models may suffer from inflexibility in modelling complicated relationships between the poverty index and the determinants

where the functional form is not known. For this reason, it is very crucial to assess the determinants of poverty of households based on flexible models that let the data determine the most appropriate functional forms. The combination of parametric and nonparametric methods is more powerful than any single method in many applications. Therefore, the current study focuses on the application of an asset index of each household in Rwanda, computed using PCA (Habyarimana et al., 2015) and, thereafter, using the semi parametric regression model to identify the key determinants of poverty of households in Rwanda. There is no study in the literature using the asset index from RDHS (2010) data and the generalized additive mixed model as primary tools of analysis. The findings of this study will endeavor to contribute to identifying the key factors of poverty of households in Rwanda and, hence, contribute to the effort of the Economic Development and Poverty Reduction Strategy of Rwanda.

Source of data: The Rwanda Demographic and Health Survey (2010) was done in two stages. In the first stage, 492 villages were considered with 12540 households, of which 2009 and 10531 were urban and rural respectively. Secondly, systematic sampling was used to select households in the selected villages. All women and men, aged between15-49 and 15-59 respectively, were eligible to be interviewed. The survey had various types of questionnaires such as for households, men and women. Only the household data to identify the factors determining the poverty among households in Rwanda was used. The questionnaire included household ownership of durable goods, school attendance, source of drinking water, sanitation facilities, washing places and housing characteristics such as building material.

2. Methodology

Principal component and computation of poverty index: Principal component analysis (PCA) is a multivariate statistical technique that linearly transforms an original data set of variables into a considerably smaller set of uncorrelated variables that represent most of the information in the original set of variables (Joliffe,2002; Manly,2004). The coefficients of principal components are chosen such that the first component accounts for as much of the variation in the original data as possible, subject to the condition that the sum of the squares of the scoring factors (or weights) is equal to 1. The second component is completely uncorrelated with the first one, and explains additional, but less variation, than the first component, subject to the same constraint of the sum of the squares of the scoring factors equal to 1. The subsequent components are uncorrelated with the previous components; then, each component captures an additional dimension in the data, while explaining smaller and smaller proportions of the variation of the original variables in the data. The remaining components are computed in a similar fashion. The cut-off point for the number of principal components is based on the magnitude of their variances. The graphical method, called a screed diagram, uses the steepness of the graph change as a cut-off point.

The first principal component is used as the household's wealth index (Filmer & Pritchett, 1998; Manly, 2004; Habyarimana et al., 2015). The scoring factors for each indicator from this first principal component are used to generate a household score. For the Rwanda household questionnaire data, which has 53 variables, the PCA analysis, internal coherence and robustness is tested and their corresponding percentage in the wealth quintile established (Habyarimana et al., 2015). Based on the results of the asset index, the household is classified as poor or not, making the response variable binary. The data about key poverty determinant variables for household heads such as age of household head, level of education of household head, gender of household head, and for the household itself such as size of household, location of residence and province, were compiled from the survey.

Generalized additive mixed model: The parametric models offer a strong tool for modeling the relationship between the outcome variable and predictor variables when their assumptions met. However, these models may suffer from inflexibility in modelling complicated relationships between the outcome variable and the predictor variables in some applications and the parametric mean assumption may not always be desirable, as suitable functional forms of the predictor variables may not be known in advance and the response variables may depend on the covariates in a complicated manner (Lin & Zhang, 1999). The generalized additive mixed model (GAMM) relaxes the assumption of normality and linearity inherent in linear regression. The flexibility of nonparametric regression for continuous predictor variables, coupled with linear models for predictor variables, offers ways to reveal structure within the data that may miss linear

assumptions. This flexibility of GAMM motivated the use of semi parametric logistic mixed model to assess the determinants of poverty of households in Rwanda.

Model* Overview*: The generalized additive model (GAM) is a flexible model that allows non-normal error distributions. This enables modelling outcome variables with distributions such as Poisson and binomial. Generalized additive model extends the generalized linear model (GLM) by permitting the predictor function to comprise a priori unspecified nonlinear functions of some, or all, the covariates (Hastie & Tibshirani, 1990). Consider a random outcome variable Y and a set of predictor variables $x_1, x_2, \dots, x_k$.A regression procedure can be viewed as a method for estimating the expected value of Y, given the values of $x_1, x_2, \dots, x_k$. The standard linear regression model assumes a linear form for the conditional expectation as follows:

$$E(Y|X_1, x_2, \dots, x_k) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k \quad (2)$$

Where $\beta_0, \beta_1, \beta_2, \dots, \beta_k$ are, in general, obtained using least square methods. GAM generalizes equation (2) by modelling the conditional expectation as

$$g(\mu_j) = X_j \beta + f_1(x_{j1}) + f_2(x_{j2}) + \cdots + f_k(x_{jk}) \quad (3)$$

where $\mu_j = E(Y_j)$, $X_j \beta$ is the linear parametric component of the model with X_j, the j^{th} row of the design matrix X associated with covariates which are modelled linearly to Y_j, as in GLM, β is the parameter vector, Y_j is from the exponential family distributions, g (.) is a known, monotonic twice differentiable link function, and $f_j(.)$ are smooth functions. If no linear component is included in model (3), then the model is known as nonparametric, but a model whose predictions consist of both linear and unspecified nonlinear functions of predictor variables is referred as semi parametric. In order to be estimable, the smooth functions f_j have to satisfy standardized conditions such that $E[f_j(X_j)] = 0$, since, otherwise, there will be free constants in each of the functions (Hastie & Tibshirani, 1990).

The generalized additive mixed model (GAMM) can be seen as an extension of GAM to incorporate random effect or an additive extension of the generalized linear mixed model of Breslow and Clayton (1993), to allow the parametric fixed effects to be modeled nonparametrically, using additive smooth functions in a similar spirit to Hastie and Tibshirani (1990). Therefore, Lin and Zhang (1999) formulated GAMM as follows

$$g(\mu_j) = \beta_0 + f_1(x_{j1}) + f_2(x_{j2}) + \cdots + f_k(x_{jk}) + z_j b \quad (4)$$

where g(.) is a monotonic differentiable link function, $X_j = (1, x_{j1}, x_{i2}, \dots, x_{jk})$ are m covariate associated with fixed effects and $q \times 1$ vector of covariates Z_j associated random effects, $f_j(.)$ is a centred twice differentiable smooth function, $\boldsymbol{b}$ is the random effect and is assumed to be distributed as $N\{0, K(\vartheta)\}$and ϑ is a $q \times 1$ vector of variance components.

A fundamental feature of GAMM (4) over GAM is that the additive nonparametric functions are used to model covariate effects and random effects are used to model the correlation between observations (Lin & Zhang, 1999; Wang, 1998). If $f_j(.)$ is a linear function, then GAMM (4) reduces to generalized linear mixed model (GLMM) of Breslow and Clayton (1993).

For a given variance component ϑ, the log-likelihood function of $\{\beta_0, f_j, \vartheta\}$ is given (Lin & Zhang, 1999) by

$$\exp(l[y; \beta_0, f_1(.), \dots, f_k(.), \vartheta]) \propto |K|^{-1/2} \int \exp(-\frac{1}{2\varphi}\sum_{j=1}^{k} d_i(y; \mu_j) - \frac{1}{2} b' K^{-1} b) db \quad (5)$$

Where $y_j = (y_1, y_2, \dots, y_k)$ and $d_j(y; \mu_j) \propto -\int_{y_j}^{\mu_j} (y_j - u)/v(u) du$ defines the conditional deviance function on $\{\beta_0, f_j, \vartheta\}$ given **b**. The statistical inference in GAMM includes inference on nonparametric function $f_i(.)$, that needs the estimation of smoothing parameter as well as inference on the variance components ϑ. The linear mixed models and the smoothing spline estimators have close connections (Green & Silverman, 1993; Lin & Zhang, 1999; Verbyla, Cullis, Kenward, & Welham, 1999).

Inference on the nonparametric functions can be done either by natural cubic smoothing estimation spline or double penalized quasi-likelihood.

Given ϑ and λ, the natural cubic smoothing spline estimators of the $f_i(.)$maximize the penalized quasi-likelihood as follows

$$\exp[l[y;\beta_0,f_1(.),f_2(.),\dots,f_k(.),\vartheta]-\frac{1}{2}\sum_{j=1}^{k}\lambda_i\int_{s_i}^{t_i}f_i^{"}(x)^2\,dx$$

$$=l[y;\beta_0,f_1(.),f_2(.),\dots,f_k(.),\vartheta]-\tfrac{1}{2}\textstyle\sum_{i=1}^{k}\lambda_i f_i^{'}H_i f_i \qquad (6)$$

Where $(s_i,t_i)$is the range of the i^{th}predictor variable and $\lambda_i$are smoothing parameters that regulates the tradeoff between goodness of fit and smoothness of the estimated function. In addition, $f_i(.)$ is an $r_i\times 1$ unknown vector of the values of $f_i(.)$, calculated at the r_i ordered values of the $x_{ji}(j=1,2,\dots,k)$ and H_i is the smoothing matrix (Green & Silverman, 1993).GAMM, given in (4), can be formulated in matrix form as

$$g(\mu)=\mathbf{1}\beta_0+M_1f_1+M\,f_2+\cdots+M_kf_k+Zb \quad (7)$$

where$g(\mu)=[g(\mu_1),g(\mu_2),\dots.,g(\mu_m)]$, 1 is an $m\times 1$ vector of ones, M_i is an $m\times r$ matrix, such that the j^{th} component of M_if_i is $f_i(x_{ji})$ and $Z=(Z_1,Z_2,\dots,Z_m)$. The numerical integration is needed to estimate the equation (6). The natural cubic smoothing spline estimators of $f_i(.)$, evaluated by explicit maximization of equation(7), is sometimes challenging. To solve this problem,Lin and Zhang (1999) proposed the double penalized quasi-likelihood model as an alternate viable approach for approximation in the model, where the smoothing function $f_i(.)$ is re-parameterizedin terms of β_i and $a_j$in a one-to-one transformation as $f_{i=X_i^*\beta_i+B_ia_i}$, and then, the double penalized quasi-likelihood with respect to (β_0,f_i) and b is given by

$$-\frac{1}{2\varphi}\textstyle\sum_{i=1}^{m}d_i(y;\mu_i)-\frac{1}{2}b^{'}K^{-1}b-a^{'}\Gamma^{-1}a \qquad (8)$$

where $f_i^{'}H_if_i=a_i^{'}a_i$, $a=(a_1^{'},\dots,a_k^{'})$, $\Gamma=diag(\tau_1I,\dots,\tau_kI)$ and $\tau_i=\frac{1}{\lambda_i}$ note that small values of $\tau=(\tau_1,\dots,\tau_k)$ correspond to over smoothing (Breslow & Clayton, 1993;Lin & Zhang, 1999).

3. Model fitting and interpretation of the results

The main objective was to model continuous variables nonparametrically and other covariates, modelled parametrically using generalized additive mixed model. The various procedures for estimation discussed for fitting GAMM can be used when fitting the semi parametric logistic mixed model (9). The library mgcv from R package was used to fit the data. R package has many options for controlling the model smoothness, using splines such as cubic smoothing splines, locally-weighted running line smoothers, and kernel smoothers. For more details, see the following authors:(Green & Silverman, 1993; Hardle, 1990; Hastie & Tibshirani, 1990; Ruppert et al., 2003). The present study used the shrinkage smoothers (spline) to fit the model (9). The shrinkage smoothers have several advantages, for instance, helping to circumvent the knot placement. In addition, the method is constructed to smooth any number of covariates. Moreover, the creation of shrinkage smoothers is made in a way that smooth terms are penalized away altogether (Wood, 2006). The main effect is considered, and also possible two way interaction effects, where the AIC of each model is examined and the inference of smooth function and the p-value of the individual smooth term. Finally, the model with smaller AIC and higher value of degree of freedom and highly statistically significant was selected as follows

$$g(\mu_i)=\beta_0+\beta_1Education_j+\beta_2Gender_j+\beta_3Place\ of\ residence_j+\beta_4Province_j+\beta_5Size_j+\beta_6Province_j*Place\ of\ residence_j+(Age_j)+f_2(Age_j)*Gender_j+b_{0j} \quad (9)$$

Where $g(\mu_i)$ is the logit link function, $\beta's$ areparametric regression coefficients, $f_j's$ are centred smooth functions and b_{0i} is the random effect distributed as $N(0,K(\vartheta))$.

The results from model (9) are presented in Table 1,2 and 3 and in Figure 1 and 2. From Table1, it is observed that the level of education of the household head significantly affects the socio-economic status of the household, where the poverty of the household increases by decreasing the level of education of the household head. Furthermore, it is observed that a household with a household head with secondary education, primary education or no formal education is 4.1850($e^{1.4315}$), 14.2008 ($e^{2.6533}$) or 24.5154 ($e^{3.1993}$) times respectively, more likely to be poor as compared to a household with a household head with tertiary education. A household from an urban area is 0.7703($e^{-0.2061}$) times less likely to be poor than a household from a rural area, as seen in Table 1. The size of the household significantly affects the socio-economic status of the household, also shown in Table1. A family of four members or less is0.6433 ($e^{-0.4411}$) less likely to be poor than a family of five members or more (Table1).

Interaction effects fixed parameters: In this study, not only are the main parametric effects considered, but also considered are the two-way interaction effects. Of interest, are the interaction effects between province or region and place of residence (urban or rural). Figure1shows that in all provinces a rural household is more likely to be poor as compared to an urban one. In the same figure, it is observed that there is a big gap, in terms of poverty, between a rural and urban household from Southern province and Western province. However, this gap is smaller in Kigali and Eastern province.

Approximate smooth function: In Figure2, the estimated smoothing components for household socio-economic status are observed. The Y-axis represents the contribution of smooth function to the fitted values for household socio-economic status. In each figure, the smooth curve denotes the estimated trend of GAMM; **s** is a smooth term and the number in parentheses represents the estimated degree of freedom (edf). The effects of age and gender (female) on household socio-economic status is presented in Figure 2B; the trend shows that the poverty of a household headed by a younger female increases with the age of the household head to approximately 35, and then from there, the poverty decreases up to the age of approximately 60 years. The test statistics is 2.110 with 3.7492degrees of freedom with a high significance (p-value=0.000184***)against the assumption that the interaction of age and female gender is linearly associated to the socio-economic status of the household. In Figure 2 panel C the poverty of a household headed by young male decreases with increasing age up to approximately 30 years old. However, the poverty decreases with the increasing age of the head from approximately 35 to 60 years old. In addition, from 60 years of age, the poverty of a household increases with the increasing age of the household head regardless of the gender of the household head. The statistic test is 1.484 with 4.0044 degrees of freedom(p-value=0.004930**) against the assumption that the interaction of age and male gender is linearly associated to the socio-economic status of the household.

Table1: The parameter estimates of the fixed part of the GAMM

Variables	Estimates	Standard error	t-value	p-value
Intercept	-2.9738	0.5666	-5.249	1.56e-07***
Education (ref=Tertiary)				
Secondary	1.4315	0.5675	2.523	0.011663*
Primary	2.6533	0.5608	4.732	2.25e-08***
No education	3.1993	0.5618	5.694	1.27e-08***
Gender(ref=Female)				
Male	-0.4408	0.0462	-9.550	<2e-16***
Province(ref=Eastern)				
Kigali	-1.1111	0.3021	-3.678	0.000236***
Southern	0.9197	0.1094	8.409	<2e-16***
Western	0.5754	0.1113	5.168	2.40e-07***
Northern	0.6429	0.1214	5.297	1.19e-07***
Place of residence(ref=rural)				
Urban	-0.2061	0.3814	-0.540	0.588879
Size of household(>4=ref)				
Less or equal to 4	-0.4411	0.0451	-9.782	<2e-16***

Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table 2: **GAMM with two way interaction effects**

Variable	Estimate	Standard error	t-value	p-value
Province by place of residence (ref=Eastern and rural)				
Kigali urban	-1.4308	0.5232	-2.735	0.006253**
Southern urban	-0.812	0.4436	-1.831	0.067144.
Western urban	-0.9656	0.5530	-1.746	0.080820.
Northern urban	-0.0693	0.57064	-0.121	0.903381

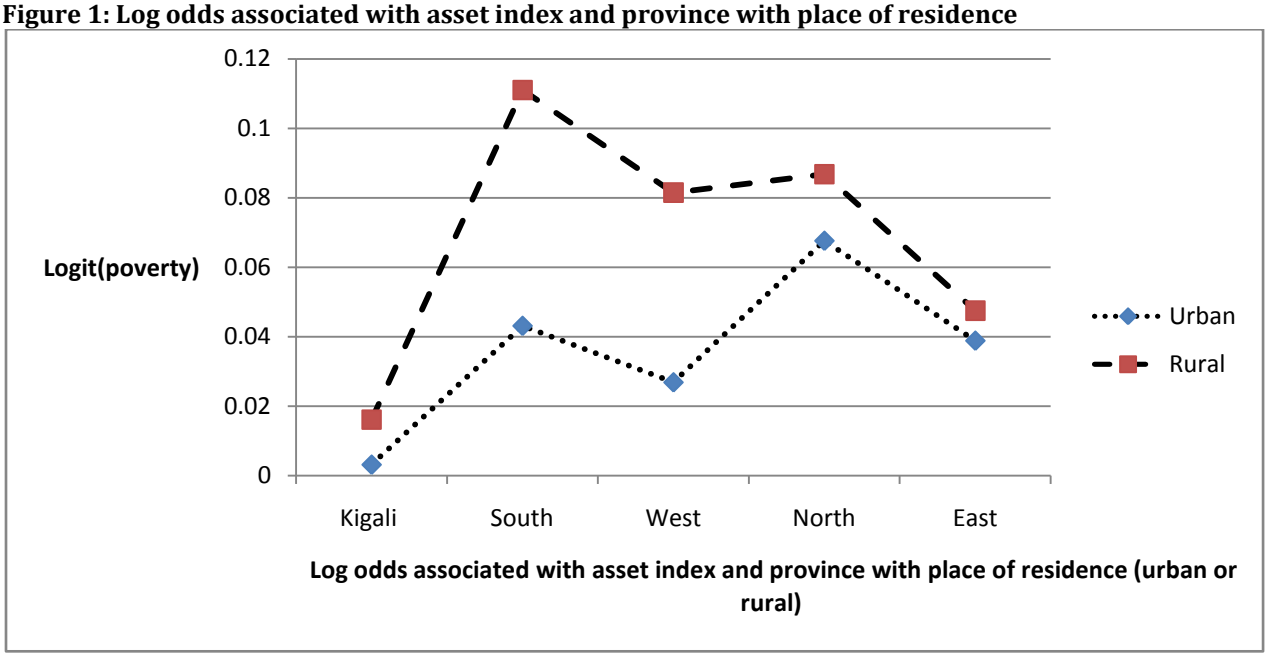
Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table3: Approximate significance of the smooth term

Smooth terms	Edf#	F-value	P-value
S(Age)	0.4882	0.0.318	0.062208.
S(Age): Female	3.7492	2.110	0.000184***
S(Age):Male	4.0044	1.484	0.004930**

Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1; # estimated degree of freedom

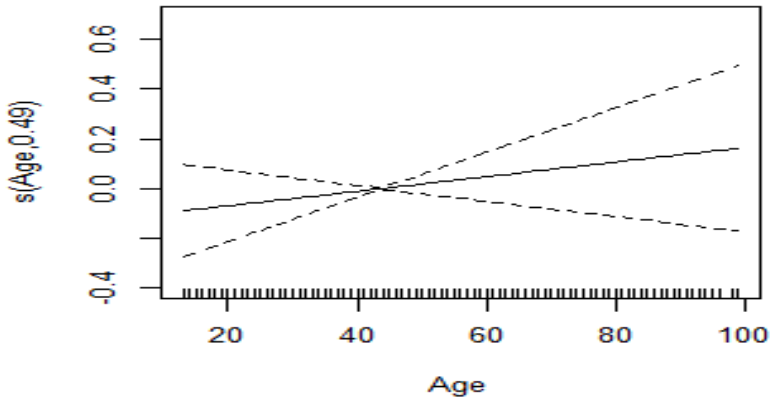
Figure 1: Log odds associated with asset index and province with place of residence



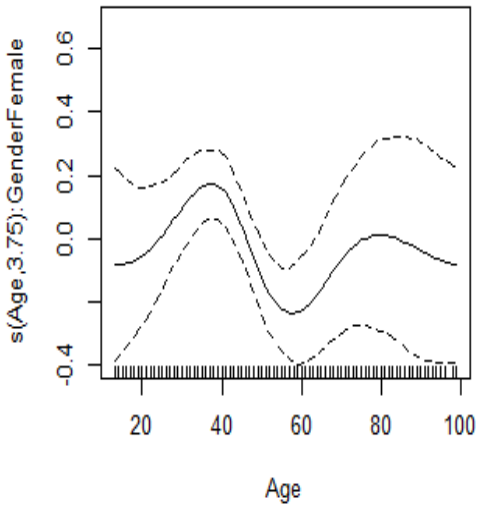
Discussion: The main idea of the nonparametric methods is to allow the data determine the most appropriate functional forms.Wu and Zhang (2006)argue, that nonparametric and parametric regression methods should not be regarded as competitors; rather complements of each other. The combination of these two methods is much more powerful than any single model. This study first created the socio-economic status of each household. Thereafter, the generalized additive mixed model, that relaxes the assumption of normality and linearity inherent in linear regression, was used. The flexibility of nonparametric regression for continuous covariates combined with linear models for predictor variables provides a means to uncover structure within the data that may be missed by linear assumptions. The combination of nonparametric and parametric models (semi parametric) was very useful to the study because of non-linearity from continuous covariates and interaction effects of categorical predictors and continuous covariates and the linearity of categorical data. The asset based measurement of poverty is increasingly being used, but it has some limitations. The asset index from the DHS data set is more reflective of long-run household wealth or living standards (Filmer & Pritchett, 2001). Then, in the case of Rwanda, if the need is the current resources available to households, an asset index may not be the most appropriate measure.

Figure 2: Smooth function of household socio-economic status with age by gender and 95% confidence interval

A



B



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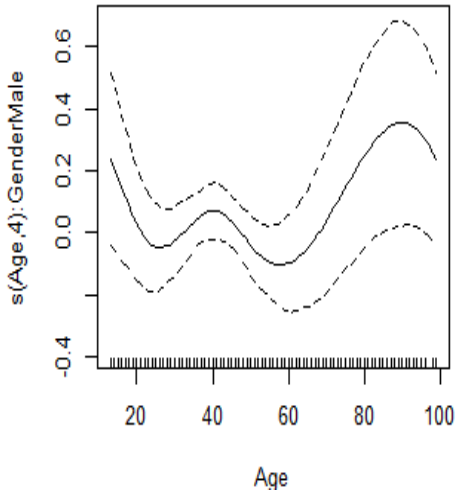

4. Conclusion and Recommendations

Based on the asset index from RDHS (2010) and the generalized additive mixed model, this paper identified the key determinants of poverty of households in Rwanda. The results showed that the education level, gender and age of a household head, the size of household (number of household member), place of residence and province are the determinants of poverty of households in Rwanda. The trend of poverty of households headed by a young female was found to increase with the increasing age of a household head (approximately up to 35 years old);but it decreased for a household headed by a young male of the same age. This is in line with other findings such as those of Sahn and Stifel (2000), Gounder (2012) and Habyarimana et al.(2015).However, in these previous studies (Gounder, 2012; Sahn & Stifel, 2000), where the gender of a household head was considered in parametric regression(logistic regression)models, it was found that a household headed by a female was more likely to be poor than a household headed by a male. However, the use of a semi parametric logistic mixed model revealed that it is only true when both male and female are

young (up to 35 years old). They methodological difference in our model as compared to (Gounder, 2012; Sahn & Stifel, 2000; Habyarimana et al., 2015) is the combination of nonparametric and parametric models (semi parametric) to account for non-linearity from continuous covariates and interaction effects of categorical predictors and continuous covariates and the linearity of categorical data as previously stated. Otherwise, the household headed by a female is slightly better off than a household headed by a male Figures2B and 2 C.

A rural household in all provinces is more likely to be poor than an urban household this is in line with other findings such as (Achia et al., 2010; Habyarimana et al., 2015).This supports the existing policy of grouped settlements where people are advised to build their houses in villages known as *Imidugudu*. In addition, the big gap between rural households in Southern province and Western province (Figure2) suggests the need for a detailed study to investigate the causes of this gap, possibly leading to a special targeting policy for reducing the high differences between rural households. It was also found that the poverty of household decreases with increasing the level of education of household head, this result was consistent with other authors (Achia et al., 2010; Saidatulakmal &Riaz, 2012; Habyarimana et al., 2015). This highlights the necessity for universal education. However, it can be more beneficial if universal education reaches tertiary education.

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Indirect Tax Incidence under Inelastic Underground Economy Demand

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Abstract: This paper demonstrates theoretically that a profit tax does not affect the distribution of the firm's operations between the official and the underground economy. Or, if the firm was initially operating only officially, direct taxation of its business would not be a reason to go underground. Indirect taxation in the form of a sales tax does influence an already existing mix of official and underground activities, favoring the latter. And, it does constitute a reason to "go underground" for an otherwise fully official business. This is a thesis robust to market structure changes and to introducing tax evasion in the usual sense, provided the underground demand is inelastic. The tax authority can still collect the planned tax revenue through a combination of a cash-flow tax with indirect taxation, under only consumer-surplus loss by the underground customer.

Keywords: *Inelastic underground demand, Business-tax shift, Tax policy*

1. Introduction

The literature on the underground economy is vast (see e.g. Aureo & Scheinkman, 2008; Charmes, 2012). And, the literature on tax evasion is equally large; (see e.g. the fall 2014 symposium on "Tax Enforcement and Compliance" in the *Journal of Economic Perspectives*). But, to this author's knowledge, the possibility that a tax on business may not be evaded just because it may be shifted to the underground customer has certainly slipped attention. Abstracting from cost-of-capital considerations, such should be the case in so far as an indirect tax is concerned. Even if underground economy was inexistent, it would have to be invented to shift indirect taxation on official sales to the underground customer, to cover with it official business tax payments, and escape the indirect tax on the output that is disposed underground. This has serious welfare implications not so much for the firm as for the consumer. For the firm, if indirect taxation corrects for market power as Dillén (1995) argues, and if the ability to shift this taxation forward increases with market power as Karp & Perloff, (1989) appear to suggest, the corrective power of indirect taxation decreases. Yet, this decline might be countered under optimal indirect taxation, because it presupposes equalization of the after-tax Lerner indexes, tax rates increasing subsequently with inelasticity as very well Wang (2011) notes, and increasing inelasticity is one factor conferring increasing market power. But, for the consumer the benefit from having the possibility to buy underground is great since what this means in the price-quantity space of the official economy is a leftward shift of the demand curve enough to cancel out the deadweight loss of taxation.

This is an eventuality worth contemplating to the extent underground demand is inelastic as is supposed to be the case *a priori* since, (i) something that costs for a buyer x monetary units officially, someone buying it underground is willing to pay any fraction γ of x even if this fraction doubles and triples with the passage of time, suffices to continue γ being less than x, and (ii) at the given underground market price, an underground buyer does not change the seller that circumstances dictate to the buyer. Habit formation might be one, for instance, reason explaining this persistence of underground exchange (see e.g. Koehne & Kuhn, 2015). Another reason could be a network effect, encouraging underground workers to keep purchasing underground commodities (see e.g. Fortin et al., 2000). And, still another reason in combination perhaps with the two previous ones might be chronic unemployment (see e.g. Windebank, 2004). In what follows, the next section elaborates upon the idea of underground forward indirect-tax shift exhaustively, taking as a benchmark case that of perfect competition in either type of economy. Methodologically, it is actually a quasi-perfectly competitive case: Once the firm can shift production and output sold across economy types, the long-run constant-cost type of industry becomes immaterial. And, so does the specific shape of the demand curve given that the customer too, can shift across economy types. Consequently, we do not have a "textbook perfect competition case", and no precise statements can be made about the tax incidence; but recall that the emphasis here is the study of the possibility of shifting indirect taxation onto the underground customer and not the precise shift. Section 3 concludes this exercise by deliberating about the welfare and policy implications of this idea.

2. Formal Considerations

Starting from full underground production at long-run perfectly competitive equilibrium, expanding to official production entails costs *à la* increasing-cost industry. But, starting from "fully official equilibrium", expanding underground is carried out *à la* decreasing-cost industry. The expansion is prompted presumably by expanding market demand. If the level of demand is given, the shift of production between the formal and the informal sectors is made along a positively sloped curve whose points indicate the sectoral composition of output at various prices in the sector share (horizontal axis) – price (vertical axis) space in which the long-run equilibrium of the official sector is located at the share which is equal to one. And, once the customer too, can shift across economy types, the perfectly competitive firm itself is facing a negatively sloped demand curve, which can exploit it not as a price-maker but only by varying its product across sectors. Measuring the output of both sectors from the origin of the axes in the output-price space, the demand curve is the line connecting the official equilibrium at official price-output, with the underground one at underground price and total, i.e. formal and informal output. These are in sum the considerations surrounding the notion of perfect competition which is appropriate to the study of the topic investigated below as follows:

The Basic Argument: Suppose for a moment that a fraction m of a perfectly competitive firm's product is already channeled into the underground economy in order to avoid excessive regulations and institutional constraints but not for tax evasion purposes. Such an assumption is plausible if one judges from what, for example, Singh et al. (2012) report. Using the superscript "s" in connection with the standard profit maximization under perfect competition, we have that profit:

$$\Pi^s = (1-m)(p-c)Q + m(p'-c')Q \quad (1)$$

with $p > p'$ and $c > c'$, where p is the constant price, c is the constant average and marginal cost, Q denotes quantity, and the prime ($'$) connotes the underground economy. Production underground is presumably cheaper than officially while who would buy underground if the price there was not lower than that in the official sector. Setting $d\Pi^s/dQ = 0$, one obtains that:

$$p^s = c + \frac{mc'}{1-m} - \frac{m}{1-m}p'^s \quad (2)$$

Marginal cost pricing in the official economy, $p^s = c$, implies from (2) such pricing underground too, $p'^s = c'$. Would the introduction of direct taxation in the official of course economy alter this pricing behavior of this firm, or would such taxation be a motive to go underground for a firm operating only officially? Using index "π" for profit maximization with a profit tax, $\tau\epsilon(0,1)$, profits are:

$$\Pi^\pi = (1-m)(1-\tau)(p-c)Q + m(p'-c')Q \quad (3)$$

From the condition $d\Pi^\pi/dQ = 0$:

$$p^\pi = c + \frac{mc'}{(1-m)(1-\tau)} - \frac{m}{(1-m)(1-\tau)}p'^\pi \quad (4)$$

with $p^\pi = c <=> p'^\pi = c'$ and hence, $p^\pi = p^s$ and $p'^\pi = p'^s$ at the Q's maximizing (1). These are the Q's maximizing (3) too, because $p^\pi > c <=> p'^\pi < c'$ and $p^\pi < c <=> p'^\pi > c'$. This is a replication of the well-known result that assuming away cost-of-capital considerations, a profit tax does not affect decision-making, since the same pricing derives from the "s-problem", too. The profit tax rate may be positive but fully borne by the firm and does not affect the distribution of the firm's operations between the official and the underground economy. Or, if the firm was initially operating only officially, direct taxation of its business would not be a reason to go underground.

Let us ask the same question for the case of indirect taxation. Using index "a" for profit maximization with an *ad valorem* tax, $t\epsilon(0,1)$:

$$\Pi^a = (1-m)[(1-t)p - c]Q + m(p'-c')Q \quad (5)$$

The first order condition gives that

$$p^a = p^s/(1-t) \quad (6)$$

At the optimal Q's of the "s-problem", $p'^a = c'$ implies that $p^a = c/(1-t) > c => 0 > -t$, which is true, while $p^a = c$ implies that $p'^a = c' + [t(1-m)c/m] > c' => t(1-m)c > 0$, which is also true. It follows that if the demand underground is inelastic, it will pay to keep official behavior unaltered and shift the tax to the underground customer by raising underground price given the quantity sold there. Or, if the firm was operating only officially before the indirect tax, it would be advantageous to start operating underground as well: The avoidance of indirect taxation is a reason to go underground provided that underground demand is inelastic.

These results are illustrated through Figure 1 where the price relationships (p, p') are given by lines $OZ = [c/(1-t)] + \{mc'/[(1-m)(1-t)]\} > O\Gamma = c + \{mc'/[(1-m)(1-\tau)]\} > OA = c + [mc'/(1-m)]$ and where the trigonometric tangents of $\omega, w,$ and v are $m/(1-m), m/[(1-m)(1-t)]$, and $m/[(1-m)(1-\tau)]$, respectively. For simplicity, $t = \tau$ has been postulated so that ZH can be parallel to $\Gamma\Delta$. For simplicity too, underground demand, D^u, has been assumed to be fully inelastic for the individual seller, and S^u and S^f are the underground and the official market supply, with the superscripts "u" and "f" denoting presumably the underground and the official economy, respectively. With regard to the inelasticity of D^u, it should be repeated that there is no *a priori* reason why should an underground buyer change the underground seller with whom the buyer deals at the given underground market price and so long as this price is lower than the official one. Moreover, the percentage corresponding to m is hypothesized to be less than 50 percent so that $m/(1-m) < 1$. Line AB is the case before any tax, with optimal price combination (p^s, p'^s) at point Λ. A profit only tax would be associated with a line like $\Gamma\Delta$, cutting AB from above at Λ, leaving unchanged this price combination. And, a sales only tax is illustrated *via* ZH.

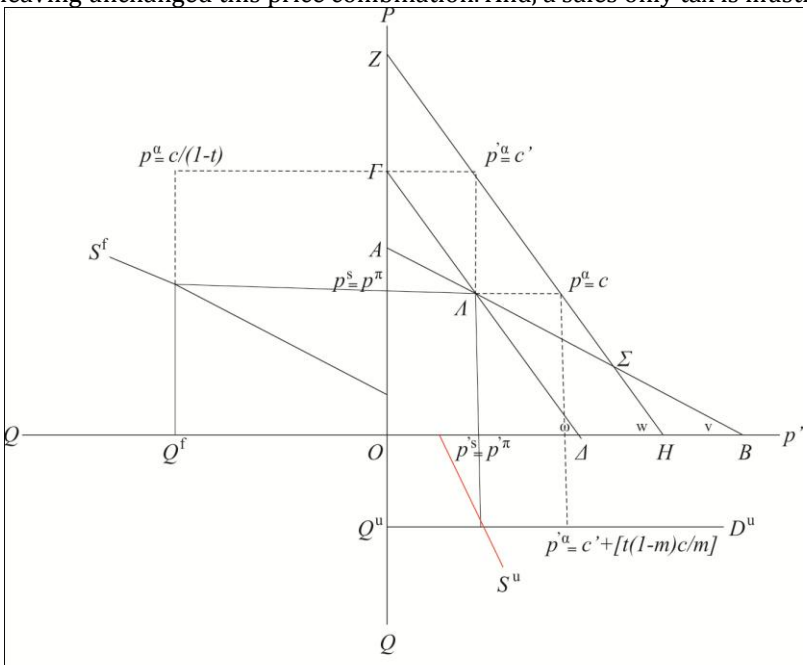

Figure 1: Underground Economy and Taxation

What should the policymaker do to restore the tax revenue which is presumably pre-determined in line with optimum societal welfare? The answer is to levy a profit tax yielding revenue equal to mtpQ beyond the revenue (1-m)tpQ from the ad *valorem* tax. The profit tax would not alter p^a: From the maximization of:

$$\Pi^{a\pi} = (1-m)(1-\tau)[(1-t)p - c]Q + m(p' - c')Q$$

relation (6) is reproduced in the form:

$$p^{a\pi} = p^{\pi}/(1-t).$$

Diagrammatically, the new price line would cut ZH from above at point Σ. Part $(1-m)tpQ$ of tax payment is shifted by the firm to the underground customer and part $mtpQ$ is borne by the firm. As the concluding section below notes, the proposed tax scheme does entail welfare losses especially on the part of the underground customer, and the policymaker cannot avoid the emergence of underground operations. But, the tax authority can certainly collect the planned tax revenue, which supposedly has been budgeted having taken into account this welfare loss.

3. The Issues of Imperfect Competition and Tax Evasion

Would our conclusions so far be modified under profit maximization with perfect competition in the official economy but *Cournot* competition in the underground economy? After all, not all firms decide to go

underground. This only is assumed here to be the difference among firms. And, subsequently, quantity competition is plausible to contemplate, too. Denote profit in this case by superscript "κs":

$$\Pi^{\kappa s} = (1-m)(p-c)Q + m[(e - bQ - b\bar{Q}) - c']Q \quad (7)$$

where $p' = e - bQ - b\bar{Q}$, with $\bar{Q}$ being the output of underground rivals, and with e and b being some constants. From the condition that:

$$\frac{d\Pi^{\kappa s}}{dQ} = (1-m)(p-c) + m(p' - c') - mb(Q + \bar{Q}) = 0$$

and from the condition that at the optimum:

$$Q + \bar{Q} = \frac{N(e-c')}{(N+1)b}$$

one obtains that:

$$p^{\kappa s} = c + \frac{mc'}{1-m} + \frac{mN(e-c')}{(1-m)(N+1)} - \frac{m}{1-m}p'^{\kappa s} \quad (8)$$

where N is the number of firms that go underground. Marginal cost pricing in the official economy, $p^{\kappa s} = c$, would imply that $p'^{\kappa s} = (c' + Ne)/(N+1)$, which exceeds c' given that $e > c'$.

Under a profit tax and profits indexed now by "$\kappa\pi$":

$$\Pi^{\kappa\pi} = (1-m)(1-\tau)(p-c)Q + m[(e - bQ - b\bar{Q}) - c']Q \quad (9)$$

the relationship between prices becomes:

$$p^{\kappa\pi} = c + \frac{mc'}{(1-m)(1-\tau)} + \frac{mN(e-c')}{(1-m)(1-\tau)(N+1)} - \frac{m}{(1-m)(1-\tau)}p'^{k\pi} \quad (10)$$

and as before, a profit tax does not affect decision-making, since $p^{\kappa\pi} = c(= p^{\kappa s})$ implies that $p'^{\kappa\pi} = p'^{\kappa s}$.

But, in view of an *ad valorem* tax:

$$\Pi^{\kappa a} = (1-m)[(1-t)p - c]Q + m[(e - bQ - b\bar{Q}) - c']Q \quad (11)$$

the price relationship becomes:

$$p^{\kappa a} = p^{\kappa s}/(1-t) \quad (12)$$

At the optimal Q's of the "κs-problem", $p'^{\kappa a} = c'$ implies that

$$p^{\kappa a} = \frac{c}{(1-t)} + \frac{mN(e-c')}{(1-m)(1-t)(N+1)}$$

while from $p^{\kappa a} = c$ follows that

$$p'^{\kappa a} = c' + \frac{t(1-m)c}{m} + \frac{N(e-c')}{(N+1)}$$

The diagrammatical illustration of these results is a scaled-up version of Figure 1, which need not bother us, since the essence of the argument remains the same: The underground economy is an outlet for forward indirect tax shift. It can be easily checked that this would also be true if imperfect competition in the official economy was introduced; the mathematical relationships would only become more complicated. Neither the introduction of tax evasion would alter this argument. Letting φ be the probability of detection, (3) becomes:

$$\Pi^{\varepsilon\pi} = \varphi(1-m)(1-\tau)(p-c)Q + (1-\varphi)(1-m)(p-c)Q + m(p' - c')Q \quad (13)$$

with

$$p^{\varepsilon\pi} = c + \frac{mc'}{(1-m)(1-\varphi\tau)} - \frac{m}{(1-m)(1-\varphi\tau)}p'^{\varepsilon\pi} \quad (14)$$

while (5) becomes:

$$\Pi^{\varepsilon a} = \varphi(1-m)[(1-t)p - c]Q + (1-\varphi)(1-m)(p-c)Q + m(p' - c')Q \quad (15)$$

with

$$p^{\varepsilon a} = \frac{c}{1-\varphi t} + \frac{mc'}{(1-m)(1-\varphi t)} - \frac{m}{(1-m)(1-\varphi t)}p'^{\varepsilon a} \quad (16)$$

where the letter "ε" in the superscript designates the tax evasion case. Comparing (14) and (16) with (4) and (6), the only change is that τ and t are now multiplied by φ. In the presence of both taxes, $\Pi^{a\pi}$ above becomes

$$\Pi^{\varepsilon a\pi\,1} = \varphi(1-m)(1-\tau)[(1-t)p - c]Q + (1-\varphi)(1-m)[(1-t)p - c]Q + m(p' - c')Q \quad (17)$$

with

$$p^{\varepsilon a\pi\,1} = \frac{c}{1-t} + \frac{mc'}{(1-m)(1-t)(1-\varphi\tau)} - \frac{m}{(1-m)(1-t)(1-\varphi\tau)}p'^{\varepsilon a\pi\,1} \quad (18)$$

when tax evasion refers only to the profit tax, and

$$\Pi^{\varepsilon a\pi\,2} = \varphi(1-m)(1-\tau)[(1-t)p - c]Q + (1-\varphi)(1-m)(1-\tau)(p-c)Q + m(p' - c')Q \quad (19)$$

with

$$p^{\varepsilon a\pi\,2} = \frac{c}{1-\varphi t} + \frac{mc'}{(1-m)(1-\tau)(1-\varphi t)} - \frac{m}{(1-m)(1-\tau)(1-\varphi t)} p^{'\varepsilon a\pi\,2} \quad (20)$$

when the case is that of indirect tax evasion. Clearly, $p^{\varepsilon a\pi\,1} = p^{\varepsilon\pi}/(1-t)$ and $p^{\varepsilon a\pi\,2} = p^{\varepsilon a}/(1-\tau)$. And, in the presence of *Cournot* competition underground, (13) becomes

$$\Pi^{\varepsilon\kappa\pi} = q(1-m)(1-\tau)(p-c)Q + (1-q)(1-m)(p-c)Q + m[(e-bQ-b\bar{Q})-c']Q$$

with

$$p^{\varepsilon\kappa\pi} = c + \frac{mc'}{(1-m)(1-\varphi\tau)} + \frac{mN(e-c')}{(1-m)(1-\varphi\tau)(N+1)} - \frac{m}{(1-m)(1-\varphi\tau)} p^{'\varepsilon\kappa\pi}$$

while (15) becomes

$$\Pi^{\varepsilon\kappa a} = q(1-m)[(1-t)p-c]Q + (1-q)(1-m)(p-c)Q + m[(e-bQ-b\bar{Q})-c']Q$$

with

$$p^{\varepsilon\kappa a} = \frac{c}{1-\varphi t} + \frac{mc'}{(1-m)(1-\varphi t)} + \frac{mN(e-c')}{(1-m)(1-\varphi t)(N+1)} - \frac{m}{(1-m)(1-\varphi t)} p^{'\varepsilon\kappa a}$$

Relations $p^{\varepsilon\kappa\pi}$ and $p^{\varepsilon\kappa a}$ are (14) and (16), respectively, incorporating the impact of the ratio: $mN(e-c')/(N+1)$. Would different detection probabilities for the two taxes, φ for the direct tax, and ψ for the indirect tax, alter the picture? Profits for the basic case are now:

$$\Pi^{\eta a\pi} = \varphi(1-m)(1-\tau)[(1-t)p-c]Q + (1-\varphi)(1-m)[(1-t)p-c]Q + \psi\,(1-m)(1-\tau)[(1-t)p-c]Q + (1-\psi\,)(1-m)(1-\tau)(p-c) + m(p^{'}-c')Q$$

with

$$p^{\eta a\pi} = \frac{[(1-\varphi\tau)+(1-\tau)]c}{\theta} + \frac{mc'}{(1-m)\vartheta} - \frac{m}{(1-m)\theta} p^{'\eta a\pi}$$

where $\theta = [(1-t)(1-\varphi\tau) + (1-\tau)(1-\psi t)]$, and the answer to the last question is certainly negative.

4. Empirical Considerations

To sum up, a positive correlation coefficient between underground economy and indirect tax incidence estimates would be echo empirically the general conclusion from these considerations. Of course, calculating this coefficient or engaging in more detailed empirical work based on these estimates would turn out to be quite a perplexed task. For one thing, the estimates should be not only by consumption type but also for those types whose underground demand is taken somehow to be price inelastic. If not anything else, underground economy statistics are provided as percentages of gross domestic product (GDP), and so should tax incidence estimates be, but such an approach would assume away the issue of underground demand elasticity. And, even if so was actually assumed, the standard approach to estimate tax incidence has to calculate from consumer price index and aggregate tax rate on consumption, consumption, and output data the quantities involved in a formula like the following one:

$$I = \frac{p-p_\xi}{t} + \frac{p_\xi - p_\zeta}{tp}$$

where I is the aggregate tax incidence index, while p, p_ξ, and p_ζ, are the recorded consumer price index, the consumer price index estimated in the absence of taxes, and the consumer price index derived somehow at perfectly competitive equilibrium in the absence of taxes too, correspondingly (see e.g. Karp & Perloff 1989). "Heroic" assumptions have to be made to derive such an I, before finally is expressed as a percentage of the GDP. Such a task lies certainly outside the scope of this paper.

Moreover, the formula above raises the issue of the role of market power in the official economy, because it contains two terms acknowledging thus that the real world is not a perfectly competitive one: To assume so has been found to underestimate the incidence, and the second term on the right of the formula corrects for this underestimation. It implies that increased market power increases the ability to shift a tax in line with theoretical arguments like that by Peitz & Reisinger (2009). But, again, is this true if as Konrad et al. (2014, 173), for instance, argue: "Relative to perfect competition, a monopolist bears a large share of the burden of a tax increase... as buyers constrain the pricing behavior of a monopolist"? We saw that this paper does support the former viewpoint. To continue the present paper searching for the conditions that would refute this viewpoint, construct a tax incidence index accordingly, and undertake an empirical work under again the aforementioned "heroic" assumptions accompanying it, comprises a different rather research agenda. It is

enough for us here to have established the intuitive result that there is a positive correlation between underground economy and indirect tax incidence.

5. Conclusion

Indeed, it follows from the above algebra that the underground economy is clearly an outlet of relief from indirect taxation. And, it appears that this is a state of affairs not to be worrying a government with a tax authority tying indirect taxation with corporate income taxation as outlined earlier. This, too, is a conclusion with much intuitive appeal. Practically the proposed tax combination presupposes a rough only knowledge of m by sector. More important matter is the welfare implications of this combination. It entails loss of consumer surplus beyond the intrinsic regressiveness of a sales tax and especially so with regard to the underground customer whose demand is inelastic and who by no means can be identified with a white-collar worker. Even more so when optimal indirect taxation presupposes equalization of the after-tax Lerner indexes of all commodities and hence, higher tax rates for commodities that have low price elasticities of demand or supply provided that the marginal disutility of labor is constant (see e.g. Wang, 2011).

At the other end, we know from Harberger (1964) that when all commodities are taxable, the Harberger triangles tend to overestimate the welfare loss caused by indirect taxation; much more so when relief is found in the underground economy, we should add in this paper. So, the proposed tax combination is expected to be more or less neutral with regard to the overall consumer welfare; much more so if underground economy is assumed to be maintaining full the overall employment, implying inelastic labor supply and hence, a uniform tax rate on all goods at the optimum. Of course, the complexity of the real world prevents taxation from being designed optimally, and what should be sought as a second best is a well-designed, Pareto improving indirect tax structure. Ideally, a government should be weighing the costs and benefits of any policy scheme and hence, of the proposed one too, before implementing it in practice. This translates to confining losses to those in consumer surplus, which are inescapable given the conditions of inelasticity surrounding underground demand. Towards this end, the profit tax may take the form of cash-flow tax as outlined by the relevant literature (see e.g. Edwards, 2003 and Kanniainen & Panteghini, 2013). In addition, indirect taxation may be structured so as to alleviate distortions from imperfect competition *à la* Guesnerie & Laffont (1978), Dillén (1995), and others who consider efficiency-restoring indirect taxation when firms engage in Bertrand-Nash games. Such indirect taxation would compensate for the welfare loss associated with the inelasticity of underground demand.

The combination of a cash-flow tax with indirect taxation countering market power is an eventuality worth considering empirically too, because as, for instance, Gillis & Kannekens (2014) report, there is an overwhelming expansion of indirect taxation, which Bernardi (2013) among others fears that will exacerbate the economic slump at least in so far as European Union is concerned. If both Bernardi and the thesis herein are correct, the slump will be about the official economy but will be countered by the underground consumer and producer. For example, Doerrenberg & Duncan (2014:Abstract) "find that access to evasion opportunities reduces the effective tax rate and therefore dampens real behavioral responses [and] that the benefits of tax evasion are not limited to the side of the market with access to evasion but are partly shifted to the non-evading side of the market". It is a finding readily extendable to include the underground economy in general, countering, for example, Torregrosa's (1999) conclusion that indirect taxation under imperfect competition reduces the balanced budget multiplier. Capital and labor will do move underground in response e.g. to fiscal consolidation, leaving the "overall" multiplier unchanged, or perhaps, increasing it.

The problem with the tax and the overall fiscal policy is that it is made within the partial equilibrium context of official only economy and may be frustrated by the general equilibrium workings deriving from the presence of an underground sector as well. The same applies to monetary policy. If, for example, as Schmitt-Grohé & Uribe (2003:Abstract) maintain, "the nominal interest rate acts as an indirect tax on monopoly profits [and] the social planner [does not have] access to a direct 100 percent tax on profits, he will always find it optimal to deviate from the Friedman rule by setting a positive ... nominal interest rate", the tax will pass on to the consumer, encouraging underground economy. Another example is that increased money supply to stimulate consumption will make easier the shift the indirect tax because underground transactions

are carried through mostly on cash and the increased cash will make them easier: What will be stimulated is underground rather than official consumption.

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The Influence of Supplier Involvement on Communication, Relationship Longevity and Business Performance in Small, Medium and Micro Enterprises in South Africa

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Abstract: Most firms are increasingly realizing the benefits of involving the outside suppliers by considering their manufacturing processes and technological capabilities, especially regarding quality, time to market, configuration, control and cost. Nevertheless, in the context of small to medium enterprises (SMEs), scant attention has been given to the empirical investigation into the influence of supplier involvement on business performance. The purpose of this study was to examinethe influence of supplier involvement on business performance and the mediating role of communication and relationship longevity among SMEs in South Africa. Five hypotheses were posited and sample data of 302 were collected from Gauteng Province of South Africa, to empirically test these hypotheses. The results of this study showed that, supplier involvement has influence oncommunication, relationship longevity and business performance in SMEs context in South Africa. The managerial implications of the findings are discussed and limitations and future research directions are indicated.

Keywords: *Supplier involvement, Communication, Relationship longevity, Business performance, Small, Medium and Micro Enterprises*

1. Introduction

The current received wisdom is that supply chain management has become an important determinant of sustainable competitive advantage for firms worldwide. The contemporary supply chain management accentuates on how to maximize the overall value of the firm and enhance performance through effective communication of information and the long term relationships that result from integration of supply chain partners. It is argued that supplier involvement in new product development is augmenting in importance recently (Wisner, 2003). Thus, supplier involvement is advocated to provide vast opportunities for firms to improve their project electiveness in terms of low product costs and high quality as well as project science - on the aspect of development costs and time (Ulaga & Eggert, 2006). Increasingly, manufacturing firms today are involving suppliers in the development of their new products in order to cope with the ongoing challenge of increased global competition and maximizing customers' satisfaction in high innovation, quality and low cost demanding market conditions (Wisner, 2003). Supporting this observation is a growing body of recent empirical business to business (B2B) marketing literature devoted to explore the supplier relationship management issues, such as supply base consolidation (Eggert & Ulaga, 2010), supplier portfolio management (Wagner & Johnson, 2004), value creation through key relationship status (Ulaga & Eggert, 2006), and the supplier relationship management framework (Moeller, Fassnacht & Klose, 2006).

Supply chain success depends on the ability of the supply chain partners' management to assimilate the various goals and strategies of diverse supply chain partners (Corsten & Felde, 2005). In other words, these joint efforts are achievable by developing long term supplier-buyer relationships combined together by effective communication of essential information. Thus, the endorsement of both the supplier and customer's efforts in the value creation process is required, which suggests the need to further investigate the influence of supplier involvement on communication and key supplier long term relationship management as well as the ultimate effect on business performance. Key supplier-buyer long term relationship in this paper focuses on the management of strategic relationships that emanate from the buyer-seller exchanges. Previous literature suggests that key partner relationships must be considered as the main source of competitive advantage (Wisner, 2003) and a podium for value differentiation in supply chains that results in enhanced business performance(Ulaga & Eggert, 2006). For instance, studies revealed that through profound dependence on their suppliers, the Japanese manufacturers brought new automobiles to market at a faster pace, through less effort (less development hours, and few engineers involved) and with more innovative

features (Kamath & Liker, 1994; Ragatz et al., 1997). More so, the extant literaturein this area reveals the importance of effective communication in building long term relationships with the key suppliers in buyer–seller exchanges (Pressey, Winklhofer & Tzokas, 2009).

However, the field suffers from serious gaps. Little attention has been paid to the effect of supplier involvement on communication of essential information between firms, longevity of the buyer-seller relationships between the firms, and ultimately the performance of the business of each firm. In fact, most studies on supplier involvement have investigated the antecedents to increased supplier involvements in radical innovations as well as new product performance outcomes of supplier involvement (Song & Benedetto, 2008). These studies did not; howeverinvestigate the impact of supplier involvement on communication between the suppliers and their buyers. The previous studies did not consider the effect of supplier involvement on the longevity of the supplier-buyer relationships between firms. Moreover, the focus so far was on the new product performance outcome of supplier involvement, and less has been done to address the supplier involvement effect on business or firm performance. Thus, rarely can one find supplier involvement being studied as the predictor variable of business performance in supplier-buyer relationships of firms. In addition, little is known about communication and supplier-buyer relationship longevity as mediators for the relationship between supplier involvement and business performance. Moreover, the previous literature regarding the supplier involvement has concentrated mainly on larger firms, while little evidence is available for Small, Medium and Micro Enterprises (SMMEs). However, supplier involvement may be of greater importance even to those neglected SMMEs. A notable exception is the work of Song and Benedetto (2008) which investigated supplier involvement in new ventures.Hence, the main purpose of this study is to evince the impact of supplier involvement on communication of essential information, supplier-buyer relationship longevity and business performance, supply chain performance in SMMEs operating in South Africa.

SMME dependency on suppliers for potential investment, providing investment funds in return for a share of the SMME business or generated profits is augmenting recently (Song and Benedetto, 2008). According to Song and Benedetto (2008), when selecting from among potential suppliers, SMMEs qualify them on the basis of their skills and abilities, select the best suppliers as potential partners, conduct entrepreneurial marketing as appropriate to get them interested and involve them in the innovation, and encourage them to commit financial resources. Indeed, SMMEs may be critically dependent on their suppliers for the required and critical capabilities, and even for their improved performance in the marketplace. This paper therefore, seeks to examine the influence of supplier involvement in product development on communication of essential information, buyer-seller long term relationships and business performance of SMMEs. It seeks to determine the impact of supplier involvement on communication of essential information in SMME's buyer-seller relationships. In addition, this paper seeks to ascertain the influence of supplier involvement on SMME's buyer-seller long-term relationships. It also seeks to determine the influence of communication of essential information on SMME buyer-seller long-term relationships. Moreover, this paper seeks to ascertain the impact of communication of essential information on business performance of SMMEs. Lastly, this paper seeks to determine the impact of SMME buyer-seller long-term relationships on business performance. The remainder of the paper is structured as follows: literature review, which includes the theoretical, empirical review, conceptual model and hypotheses development. - Subsequentto this is the methodology section, then the findings as well as the conclusions and recommendations.

2. Literature Review

Theoretical Background

Relational View: The fundamental premise of the relational view theory is the resource-based view postulated by Penrose in 1959. This view extending from the resource based view, is formed on the basis that productivity gains in the value chain are possible, especially when the buyer-seller exchange partners are willing to make relation-specific investments and combine them in a unique way (Dyer & Singh, 1998). The relational view advocates that successful business relational exchanges result from certain characteristics of the relationship, and these comprise communication, trust, commitment and cooperation (Mehta, Larsen, Rosenbloom & Ganitsky, 2006; Wittmann, Hunt & Annett, 2009; Muthusamy et al., 2007; Robson,

Spyropoulou, & Al-Khalifa, 2006). Supplier-buyer partnerships characterized by effective communication of essential information generate inter-firm trust, which promotes cooperation through supplier involvement in innovations and product developments (Sarkar et al., 2001). Effective cooperation, in turn, allows the partners to successfully combine their resources in ways that contribute to the development of competitive advantages and ultimately improve the business performance (Madhok & Tallman, 1998). Thus, the relational view advocates that successful supplier-buyer exchange partnerships are characterized by trust, which results in relationship commitment and consequently free and effective communication of essential information, as well as effective cooperation among the partnering firms., (Wittmann et al., 2009). Thus, the notion that a firm's critical resources may span firm boundaries and may be embedded in inter-firm routines and processes (- (Robson et al., 2006), evinces the need for effective communication of essential information and commitment to strategic relationships in firm's supplier involvement practices, in order to enhance performance. Relating the relational view theory to the current study, this paper submits that an effort by SMME owners or managers to involve suppliers in their product development is likely to create a supportive inter-organizational environment to enhance effective communication of essential information. The other likelihood is that both firms may commit to long-term buyer-seller relationships. Furthermore, as a result of effective communication of essential information between the partners and in accordance to the relational view theory, partner's commitment to long-term buyer-seller relationships is likely to be raised and ultimately, SMME business performance -maybe enhanced. For thisreason, supplier involvement in SMME product development will eventually lead to improved SMME business performance.

Empirical Review

Supplier Involvement: Supplier involvement as defined by Lau (2011) refers to the direct participation of the supplier during the product development processes. Most firms are increasingly realizing the benefits of involving the outside suppliers by considering their manufacturing processes and technological capabilities, especially regarding quality, time to market, configuration, control and cost (Burt, Petcavage & Pinkerton, 2010). As such, more and more suppliers are becoming involved and active in their customers' development projects from the beginning, when they can have a major impact on performance, time, cost and quality (Burt et al., 2010). The involvement of suppliers in the customer-firm's project helps provide necessary information, as it includes expertise regarding new ideas and technology. This in turn helpsin identifying potential problems and enables the problems to be resolved timely. Partnerships with suppliers in product development require vast resources, comprising time, effort and money for the effective coordination and communication of essential information for both partnering firms. Supplier involvement is helpful in assuring that what is specified is also procurable and represents goods value (Leenders et al., 2002).

Communication: Effective communication refers to regular and genuine contacts between buying and selling firms, either personally or through technology enabled communication devices (Prahinski & Benton, 2004). It can also be viewed as the hinge of the buyer-seller relationships between firms. Previous studies (Krause, 1999; Newman & Rhee, 1990; Galt & Dale, 1991) have revealed the essence of two-way and collaborative inter-organizational communication for successful buyer-supplier relationships. Thus, according to Carr and Pearson (1999), buyers and suppliers need to commit a greater amount of sensitive information and be willing to share sensitive design information so as to find joint solutions to material problems and design issues. Communication is essential to conduct dialogue, provide feedback and clarification in order to reduce ambiguity and uncertainty in any relationship (Prahinski & Benton, 2004). Similarly, communication that is collaborative in nature is also important in building long-term buyer-supplier relationships, where the buyer firms involve their key suppliers in product development projects.

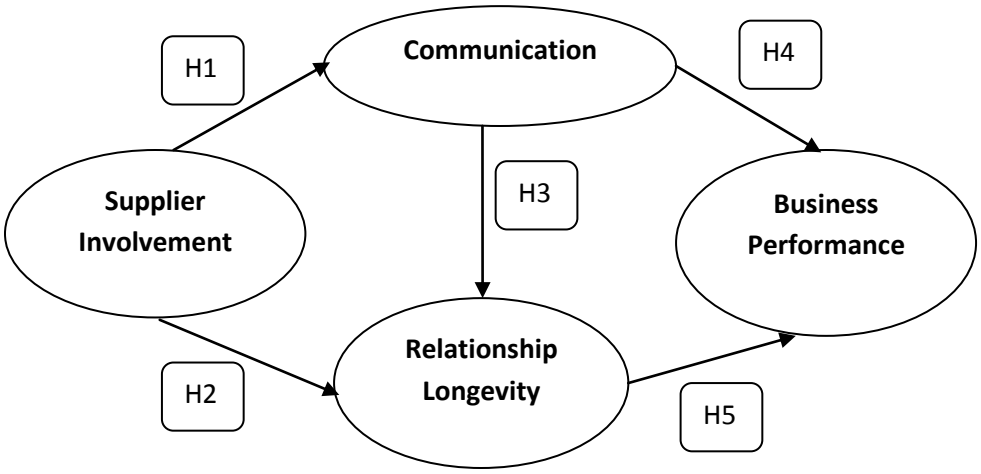
Long-term relationships: The longevity in the nature of supplier contracts is augmenting in importance recently. In such supplier contracts, more and more suppliers are expected to provide customers with information regarding their processes, quality performance, and even the cost structure (Chen & Paulraj, 2004). The buyer-seller relating firms (through these close relationships) are more willing to share risks and incentives as well as sustaining their relationship over a longer period of time (Chen & Paulraj, 2004). In addition, there are considerable changes in the contemporary nature of buyer-supplier relationships and these changes include three key aspects of supplier relationships which are: the current trend to build a long-term relationship with suppliers rather than short-term contracts (Ogden, 2006). Also, firms' current use of

fewer suppliers over a longer period of time rather than keeping a large base of suppliers allows them to change suppliers for almost every contract. Lastly, the relationship with suppliers is currently being enhanced into the strategic level where suppliers are now considered as an integral part of the firm's operations (Kotabe, Martin and Domoto 2003; Chen & Paulraj, 2004). These changes have resulted in several dimensions of collaboration, such as supplier involvement in product design and development, joint improvement program as well as profit and risk sharing (Chen & Paulraj, 2004).

Business Performance: From a business perspective, understanding the antecedents of SMME performance has occupied an immense position in the extant business management literature. There seem to be a general recognition that supplier involvement enhances a firm's product performance and yet there is no general consensus on how to measure a firm's performance (Vorhies and Morgan, 2005). While some streams of product innovation research have tended to treat product performance as part of firm performance, this study seeks to measure profitability, sales growth, market share, as overall firm performance (Homburg and Pflesser, 2003; Hooley et al., 2005; Wong and Merrilees, 2007). Thus, business performance in this study is defined in terms of the SMME's profitability, sales volume, growth and market share.

Conceptual Model and Research Hypothesis: In order to empirically test the interrelationships between supplier involvement, communication, buyer-seller long term relationships (longevity) and business performance in SMMEs, a conceptual model is developed premised on the reviewed supply chain management literature. The conceptual model is grounded in the Relational View, which provides a solid foundation for the current study. In this conceptualized model supplier involvement is the predictor while communication and buyer-seller long term relationships are the mediators. Business performance of SMMEs is the single outcome variable. Figure 1 depicts this conceptualized research model. The hypothesized relationships between the research constructs will be discussed hereafter.

Figure 1: Conceptual Model



Supplier Involvement and Communication: Supplier involvement has gained considerable attention in supply chain management literature as a result of the value it creates to buying firms (Sahin & Robinson, 2005). The supply chain literature reveals that properly timed supplier involvement in the buying firm's product development project is critical for facilitating the coordination and communication of essential information from the supplier to manufacturer and customer, as well as the backward flow from customer to manufacturer and supplier (Quesada, Rachamadungu, Gonzalez & Martinez, 2008). There is a consensus in the literature that higher levels of supplier involvement in buying firms' product development projects lead to lower development costs, fewer engineering changes, higher quality with fewer defects, shorter time to market, highly standardized components, and detailed process data as well as efficient and effective communication of essential information between firms (Monczka et al., 2000; Igot 2007; Bonaccorsi & Lipparini, 1994). Similarly, the current study submits that properly timed supplier involvement in the buying firm (SMMEs') product development influences the flow of essential, timely, accurate and quality information

and eventually enhances communication between SMMEs and their suppliers. Previous studies have also found a positive relationship between supplier involvement through integrations and information sharing (communication of essential information) (Sahin& Robinson, 2005) Hence, SMMEs' involvement of their suppliers in their product development project can be expected to increase the intensity and effectiveness of communication between buying firms and their suppliers in South Africa. Therefore, it can be hypothesized that:

H1: SMEs' supplier involvement in product development project positively influences their communication of essential information with suppliers.

Supplier Involvement and Relationship Longevity: Drawing from previous studies, supplier involvement in the buying firm's product development projects has a consequential significant impact on the establishment of long term buyer-supplier relationships (Madlberger, 2009). Supplier involvement has been previously linked to supplier dependence and commitment (Lau, 2011). The arguments raised are that involving suppliers in product developments of the buying firm helps to secure resources and capabilities needed for product innovation which the buying firm (SMME) does not have (Lau, 2011). On the other hand, supplier involvement helps the suppliers to learn about new technology by participating in the buying firm's new product development project (Athaide & Klink, 2009). Thus, such dependence on each other for the mutual benefits will make the buying firm to relyon suppliers for itsnew product's success, while suppliers may depend on the buying firm for their own development. . This will in turn make both firms to commit themselves to the strategic buyer-supplier relationships, by investing in the relationships. Commitment has been defined by Lau (2011) as the degree to which the supplier feels obligated to continue business with the particular buying firm. As in Lau (2011), commitment in this study encompasses loyalty to and longevity of the buyer-supplier relationship. A study by Lau established a positive relationship between supplier dependence, supplier involvement and supplier commitment. This study similarly submits that supplier involvement has a positive influence on buyer-supplier relationship longevity. Therefore, it can be posited that:

H2: Supplier involvement in SMMEs' product development projects positively influences the buyer-supplier relationship longevity.

Communication and Relationship Longevity: The extant literature indicates that good and effective communication of essential information, participation and feedback facilitates the buyer-supplier relationship longevity (Prahinski & Benton, 2004; Anderson, 1987). The arguments presented are that communication that is collaborative coupled with supplier development programs enhances the closeness and longevity of the buyer-supplier relationships (Prahinski & Benton, 2004). Thus, for the buying firm, the primary objective of the supplier development program, through supplier involvement, is tomake use of few key suppliers to meet its current and future needs. Therefore, it is through the supplier development program communication efforts and effectiveness that the buyer-supplier relationship longevity is developed. Previous studies have linked collaborative communication to supplier commitment, coordination and satisfaction (Mohr, Fisher & Nevin, 1996; Prahinski& Benton, 2004). A study by Mohr et al. (1996) showed a significant relationship between collaborative communication, commitment, coordination and satisfaction. In support of this finding, Prahinski and Benton (2004) revealed that the use of collaborative communication has a positive influence on the supplier's perceptions of the buyer-supplier relationship. Similarly, this study, interprets the SMME's supplier development program (through supplier involvement) communication effort as an example of the SMMEs' commitment and cooperation attempts to build long term relationships with their suppliers. Hence, this study hypotheses the following:

H3: Collaborative communication of essential information between SMMEs and their suppliers has a positive influence on buyer-supplier relationship longevity.

Communication and Business Performance: An SMME's level of business performance can be dependent upon the extent of its communication effort in supplier involvement as a supplier development program (Prahinski& Benton, 2004). Indeed, communication of essential information has been linked to improvements in business quality performance and ultimately to overall firm performance (Litz & Stewart, 2000; Cater and Miller, 1989; Reid & Adams, 2001). A study by Carter and Miller (1989) revealed that when communication of essential information occurs among other functions between the buyer and supplier firms, in addition to the buying-selling interface, the supplier's quality performance is enhanced when compared to that which is

experienced when only the buying firm's purchasing department and supplier's sales department act as the inter-organizational communication channel. In addition, poor communication was reported to be the source of many supplier product problems and a fundamental weakness in the interface between buying firms and their suppliers that constrains business performance (Newman & Rhee, 1990). This study submits that collaborative communication between SMMEs and their suppliers has a positive influence on business performance of SMMEs. This hypothesis is stated as:
H4: Collaborative communication of essential information between SMMEs and their suppliers has a positive influence on SMME business performance.

Relationship Longevity and Business Performance: The existing literature shows that firms would enjoy benefits by placing a larger volume of business with fewer suppliers using long-term contracts (Lau, 2011; Hahn, Pinto, & Brag, 1983). The argument is that a supplier will become part of a well-managed chain through long-term relationships with its buyers and will have a long term effect on the competitiveness of the entire supply chain (Choi & Hartley, 1996; Kotabe et al., 2003). Business performance has previously been linked to and shown as an outcome of long-term relationships and buyer-supplier coordination. A study by De Toni and Nassimbeni (1999) revealed that a long-term relationship between the buyer and the supplier stimulates the intensity of buyer-supplier coordination, which in turn, enhances firm performance. In support, a study by Carr and Pearson (1999) found that well managed long-term relationships with key suppliers have a positive influence on supplier performance of a firm. Based on the above empirical evidence, this study posits that:
H5: Buyer-supplier relationship longevity has a positive influence on SMME business performance

3. Methodology

Sample and data collection: The data for this research was collected from Gauteng Province of South Africa. The research sampling frame was the Gauteng Enterprise Propeller of South Africa. Students from the Vaal University of Technology were recruited to distribute and collect the questionnaires after appointments with target small businesses were made by telephone. Of the total of 500 questionnaires distributed, 302 usable questionnaires were retrieved for the final data analysis, representing a response rate of 60.4 percent.

Measurement Instrument and Questionnaire Design: Research scales were operationalized on the basis of previous work. Proper modifications were made in order to fit the current research context and purpose. "Supplier involvement" measure used a six-item scale adapted from Chen and Paulraj (2004). "Communication" measure used six-item scales while "business performance" used a two-item scale measure adopted from Rivard, Raymond and Verreault (2006). Finally, "relationship longevity" was measured using a six-item scale adapted from Ganesan (1994). All the measurement items were measured on a five-point Likert-type scales that was anchored by 1= strongly disagree to 5= strongly agree to express the degree of agreement.

Table 1: Sample Profile Characteristics

Number of employees	**Frequency**	**Percentage**
≦20	152	50.3%
21-50	80	26.5%
≧ 51	70	23.2%
Total	**302**	**100%**
Participants working experience	**Frequency**	**Percentage**
≦ 5 years	180	59.6%
5-10 years	102	33.8%
≧ 10 years	20	6.6%
Total	**302**	**100%**
Industry	**Frequency**	**Percentage**
Manufacturing	122	40.4%
Service	180	59.6%
Total	**302**	**100%**

Respondent Profile: Table 1 presents the profile of the participants. The profile indicates that about three quarters of the participating small businesses employed less than 50 workers (76.8%), while less than a quarter had a workforce above 51 employees (23.2%). More than half of the participants had less than 5 years working experience (59.6%), more than a quarter of the participants had 5-10 years working experience (33.8%), and less than a quarter had above 10 years working experience (6.6%). The study also indicated that the majority of the participants belonged to the service sector, which occupied 59.6%, while the manufacturing sector occupied the remainder.

4. Results of data Analysis

Table 2: Accuracy Analysis Statistics

Research Construct		Descriptive Statistics			Cronbach's Test		C.R. Value	AVE Value	Highest Shared Variance	Factor Loading
		Mean Value		Standard Deviation	Item-total	α value				
SI	SI1	3.973	4.299	0.643	0.533	0.866	0.867	0.435	0.476	0.542
	SI2	4.520		0.551	0.681					0.867
	SI3	4.507		0.575	0.651					0.851
	SI4	4.380		0.671	0.794					0.747
	SI5	4.407		0.602	0.773					0.754
	SI6	4.007		0.617	0.568					0.526
CO	CO1	4.260	4.420	0.560	0.463	0.878	0.883	0.452	0.476	0.767
	CO2	4.513		0.539	0.740					0.772
	CO3	4.467		0.608	0.781					0.813
	CO4	4.453		0.596	0.743					0.774
	CO5	4.353		0.556	0.668					0.735
	CO6	4.473		0.598	0.725					0.611
LR	LR1	4.373	4.318	0.607	0.596	0.913	0.914	0.548	0.343	0.939
	LR2	4.360		0.558	0.775					0.958
	LR3	4.307		0.600	0.826					0.743
	LR4	4.360		0.626	0.660					0.844
	LR5	4.233		0.560	0.876					0.723
	LR6	4.273		0.565	0.825					0.546
BP	BP1	4.087	4.080	0.633	0.867	0.929	0.927	0.775	0.257	0.899
	BP2	4.073		0.635	0.867					0.959

Measurement Instrument Validation: Analysis of Moment Structures 22 (AMOS 22) was used to test the conceptual model fit, reliability and validity of measures using confirmatory factor analysis (CFA) that combined each research construct measured by reflective indicators (Anderson and Gerbing, 1988). First, a confirmatory factor analysis model that included the four research constructs was assessed to check the model fit. The overall model statistics indicated that the ratio of chi-square (CMIN=504.988) to degrees of freedom (DF=142), i.e.(χ^2/df) = 3.556, the goodness-of-fit-index (GFI), the comparative-fit-index (CFI), the incremental fit index (IFI), the relative fit index (RFI), the normed fit index (NFI) and the root mean square error of approximation (RMSEA) are 0.866, 0.923, 0.924, 0.863, 0.897and 0.092, respectively. All these measures were considered statistically significant and therefore, confirming a robust and acceptable model fit

(Bentler, 1990; Bentler & Bonett, 1980). Table 2 presents key descriptive statistics of reliability analyses for the four constructs. The composite reliabilities are above 0.85 and therefore well above the recommended minimum threshold of 0.6 (Bagozzi and Yi, 1988). The average variance extracted (AVE) ranges from 0to 0.78 (Fornell and Larcker, 1981). In addition, all of the coefficient alpha values exceeded 0.8 and according to Nunnally (1978), the threshold value is 0.7 and all the factor loadings were significantly above the recommended thresh-hold of 0.5 (Anderson and Gerbing, 1988). These results confirm measurement reliability and provide support for an acceptable degree of internal consistency between the corresponding indicators and satisfied the minimum requirements for justifying convergent validity (Bagozzi, Yi, and Phillips, 1991).

To investigate the distinctiveness of constructs, the assessment of discriminant validity wastested. Although, the inter-correlations between the research constructs were relatively high, they werestill marginally acceptable (Hulland, 1999). However, to further check discriminant validity the current study compared the average variance-extracted (AVE) estimates of the measurements with the square of the parameter estimate between the measurements. If the average variance-extracted estimates of the constructs were found to be greater than the square of the correlation between two constructs, then, evidence exist to justify discriminant validity (Fornell & Larcker, 1981). For example, the relationship between "Business Performance" and "Long-term Relationship," yielded an AVE estimate for "Business Performance" of 0.775 while that of "Long-term Relationship" was 0.548. These two average variance-extracted estimates weregreater than the square of the correlation between "Business Performance" and "Long-term Relationship" (0.586˚2 =0.343); see Table 4. Therefore, the result provides support forthe discriminant validity of the constructs. Overall, the two approaches used to check discriminant validity suggested that discriminant validities indeed existed.

Table 3: Inter-construct correlation Matrix

Research Constructs	**SI**	**CO**	**LR**	**BP**
Supplier Involvement (SI)	1			
Communication (CO)	.690**	1		
Long-term Relationship (LR)	.486**	.586**	1	
Business Performance **(BP)**	.373**	.337**	.507**	1

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

Table 4: Highest Shared Variance

	SI	**CO**	**LR**	**BP**
SI	1			
CO	**0.476**	1		
LR	0.236	**0.343**	1	
BP	0.139	0.114	**0.257**	1

Path Modeling: Structural equation modeling (SEM) was conducted to test the validity of the proposed model and the hypotheses also usingAMOS 22 statistical software program. Table 4 presents the estimated model, illustrating the direction and magnitude of the impact of the standardized path coefficients. Recommended statistics for the overall structural equation model assessment also showed acceptable fit of χ^2/df=2.471; GFI=0.894; CFI=0.952;IFI=0.953; RFI=0.902; NFI=0.924and RMSEA=0.071.The model's fit, as indicated by these indexes, was deemed satisfactory, thereby providing a good basis for testing the hypothesized paths. The parameter estimates of the structural model exhibited the direct effects of one construct on the other. A significant coefficient at a certain level of alpha thus reveals a significant

relationship among the latent constructs (see Table 5). The results in Table 4 provided support for the all theproposed five research hypotheses. The pathcoefficients for H1, H2, H3, H4 and H5 are 0.819, 0.225, 0.328, 0.05 and 0.474 respectively. All coefficients for the hypothesesweresignificant at a confidence level (*p* value) of 0.01.

Table 5: Results of Structural Equation Model Analysis

Path	Hypothesis	Coefficients
Supplier Involvement (SI) → Communication (CO)	**H1**	**0.82**
Supplier Involvement (SI) →Long-term Relationship (LR)	**H2**	**0.23**
Communication (CO) → Long-term Relationship (LR)	**H3**	**0.33**
Long-term Relationship (LR) → Business Performance (BP)	**H4**	**0.05**
Communication (CO) → Business Performance (BP)	**H5**	**0.47**

Structural Model Fits: $\chi^2/df = 2.471$; GFI = 0.894; CFI = 0.952; IFI = 0.953; RFI = 0.902; NFI = 0.924 and RMSEA = 0.071.
[a]Significance Level $p<0.05$; [b]Significance Level $p<0.01$; [c]Significance Level $p<0.001$.

5. Discussion and Conclusion

The study worked towards determining the influence of supplier involvement on business performance, with supplier-buyer long-term relationship and supplier-buyer communication as influential mediators. This study intended to contribute to theoretical understanding in supply chain management, from the perspective of the SMEs in South Africa. More specifically, the study examined this using the Relational view (Penrose, 1959). Five hypotheses were proposed for the study and tested. Research hypotheses were supported to some degree by empirical findings. As interred by the empirical findings, supplier involvement has a positive impact on communication (0.82), which is much stronger than its influence on long-term relationship between supplier and buyer (0.23). This highlights the significance of the supplier's active participation in product development that contributes to good exchange of information between the supplier and buyer. Although the influence is positive, the impact of communication on long-term relationship is surprisingly weak (0.33), as is the influence of a long-term relationship on business performance (0.05). Such a weak relation between long-term relationship and business performance may be explained by possible differences in expectations of the supplier and the buyer, pertaining to the shared values, information and contributions in collaborations (Andersen, Christenssen & Tamgaard, 2009). The different types of collaborations that suppliers and buyers engage in and how long the collaborations are intended to last may also have an underlying role in the longevity of the relationship. Comparatively, the influence of communication on business performance was moderately stronger (0.47) than the influence of a long-term relationship on the same (0.05).

Implications of the Study: The study contributes meaningfully towards both practical and academic insights pertaining to supply chain management and the resultant business performance. Fundamentally, there are important insights on the significance of supplier involvement and communication between suppliers and buyers. Moreover, the study speaks to alternatives of enhancing business performance for SMMEs in South Africa by enriching relations between suppliers and buyers. As increasing importance is placed on South Africa's growth of SMMEs (Department of Trade and Industry, 2005), their successful management and performance is vital to the growth of the economy. Contributions to academia point to the ability of supplier involvement to enhance business performance – through the improvement of communications between suppliers and buyers. The significance of the causal relationship between the two not only confirms their importance to SMMEs, but also identifies them as vital influencers within supply chain management. The performance of a business has a bearing on the degree to which sharing of information between suppliers and their buyers is effective (Turner, Varghese, & Walker, 2008). The study infers, however, that acceptable levels

of communications between SMME suppliers and buyers in South Africa do not necessarily translate to longer relationships between the two parties. This may be peculiar to SMMEs included in the study and be reflective of SMMEs in contexts outside of South Africa.

The study also questions the importance the longevity on relationships between SMME suppliers and their buyers in South Africa. This alludes to practical implications surrounding relationships between suppliers and buyers. Empirical causal relationships suggest that, practically, the longevity of the supplier-buyer relationship does little to determine business performance. This may reflect the reality that SMMEs in South Africa have particular determinants for relationship longevity or that maintenance of long-term relationships is considered separate from the supply chain management processes. Moreover, the context of relationship management may well be particular to a South African business context that differs from relationship management principles held by larger enterprises or Western economies. Structural changes that result from Black Economic Empowerment (BEE) measures that encourage growth in SMMEs, may have significant influence on relationships between business partners, and the longevity thereof. Determinants of the longevity of the relationships between suppliers and buyers may be directed by partnerships recommended by South Africa's changing BEE policies. This may directly affect certain SMMEs to continuously foster relationships that are economically more beneficial to them, based on changing BEE recommendations (Paton, 2013). As such, SMMEs may be inclined to discontinue some relationships in favor of more beneficial ones. In summary, this study revealed the importance of collaborative communication as a value adding aspect in supply chain management and business performance. This adds considerably to B2B marketing literature and supplier relationship practices that need to be explored within the South African context that pertains to SMMEs. Although it is supported in literature that communication is essential for relationship longevity between the supplier and buyer, it is important to explore the relevance of certain external market factors that influence the maintenance of relationships with business partners that are particular to SMMEs in South Africa.

Limitations and Future Research: Although the study highlighted the importance of both communication and longevity of supplier-buyer relationships, it has been limited in its scope to account for constraints in relationship management between suppliers and buyers. There are sufficient theoretical and practical justifications for communication being supported by supplier involvement. However, the link between communication and longevity of supplier-buyer relationship has not been delved into sufficiently, owing to possible context specific precursors that were not considered at the time of the study. Perhaps too, this study could have been affected externally by changes to economic incentivizing policies, such as the Black Economic Empowerment (BEE). Due to possible effects of BEE policies on B2B practices, most SMEEs may have been influenced in the interim, and this may not necessarily be the SMMEs' long-term operational preference. Future researches may also call for deeper understanding of longevity of relationships between SMME suppliers and their buyers. Kotabe et al. (2003) and Chen and Paulraj (2004) highlighted the fundamental strategic role played by relationship management of suppliers, which has the potential to be justified practically. This study noted theoretically the importance of longevity of relationships between suppliers and buyers, and this needs to be investigated further, particularly with reference to SMMEs in South Africa. The prospect of effective supply chain management being dependent on relationship management that is supported by communication between suppliers and buyers may well direct future research in this regard.

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The Impact of Entrepreneurial Orientation, Reconfiguring Capability and Moderation of Environmental Turbulence on Export Performance of SMEs in Nigeria

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Abstract: Entrepreneurial orientation encapsulate the firm –level process, practice and strategic orientation while dynamic capabilities view of firm consists of the structure routine and processes that constitute its ability to reconfigure its asset base to match the requirement of the changing environment. The aim of this research emanated from the fact that only few studies examined how entrepreneurial strategic orientation and reconfiguring capability impact on export performance of SMEs in turbulent environment. In order to fill this vacuum, this study delineated relationship among these constructs and employed PLS-SEM on data collected from 201 exporting SMEs in Nigeria. The findings of the study suggest that entrepreneurial orientation, reconfiguring capability, and environmental turbulent significantly related to export performance. Environmental turbulence moderates the relationship between entrepreneurial orientation, reconfiguring capability and export performance. This suggests that SMEs could benefit from reconfiguring and renewal of their asset base and act in response to opportunities and threat to realize first order transformation in growth and export performance. Besides, this study also provides research conclusion to the appropriateness of entrepreneurial orientation and reconfiguring capability when there is environmental turbulence and their lack of effectiveness when there is stability.

Keywords: *Entrepreneurial Orientation, Reconfiguring Capability, Environmental Turbulence, Small and Medium Enterprises, Export Performance*

1. Introduction

Across the globe today Small and Medium Enterprises (SMEs) have continued to be relevant in the roles of development, industrialization, poverty reduction, wealth generation, employment provision and growth of many developed and developing countries (Ogunsiji, 2010). However, SMEs in developing countries have performed below expectation in their important roles of promoting and developing economic growth (Onugu, 2005). The Major researchers in SMEs in Nigeria have concentrated on finance as the basic obstacle of SMEs, While some acknowledged the firms are operating in turbulent environment(Ogunsiji, 2002). Several studies also identified monumental challenges such as weak strategic orientations, poor infrastructure, inadequate capabilities, poor management and inadequate technological skills' development and lack of export market knowledge/experience (Adegbite, Ilori, Irefin, Abereijo & Aderemi, 2007). Responses to this critical situation culminated to yearly budgetary allocation, favorable policies, favorable pronouncement, incentives and regulations giving by local government, state government and federal government in order to diversify the revenue base (Oyefuga, Siyanbola, Afolabi & Dada, 2008).

Surprisingly, the situation becomes more disturbing, confusing and critical when the degree of poverty, unemployment and hunger that SMEs supposed to reduce continue to increase at alarming rate, in spite of all intervention's strategies, drastic measures and incentives provided yearly (Anger, 2010). A study carried out by Manufacturing Association of Nigeria (MAN) showed that just about 10 percent of industries run by its members are completely in operation. The vast majority of SMEs die before their first to five years of operation, while some disappear within sixth and tenth year of existence and the remaining ones that grow to maturity are less than five to ten percent (Onugu, 2005). Okpara (2009) revealed that the non SMEs export at independence in 1960 provided 85% of total export earning and 63% of gross domestic earning. But today, the case is different, despite the fact that 90% percent of the total manufacturing industries in Nigeria are SMEs, up till this moment insignificant numbers or less than 20% are able to export their total output (Julien & Ramangalahy, 2003; Okpara & Koumbiadis, 2009).
Nevertheless, Teece, Pisano, and Shuen (1997) revealed that the major objective of the strategic management field is to make available philosophical and theoretical explanation of how a firm gains a competitive advantage. Dynamic capabilities' frame work contained by strategic management argues that a firm that can

build up innovative capabilities and resources crucial to addressing changes in the external environment by integrating updating its already available capabilities would achieve competitive advantages (Teece et al., 1997). The reviews on literature have shown that study on dynamic capability View have only focused on established organization, this neglects new ventures and SMEs, Hence, the skills and competencies of SMEs need to be reconfigured, upgraded and recombined to ensure successful adaptation for growth (Sapienza, Autio, George & Zahra, 2006; Zahra, Sapienza & Davidsson, 2006). Studies have shown successful entry and survival especially in exporting as a result of dynamic capabilities (Sapienza et al., 2006). Hence, the basic objective of this study is to employ strategic entrepreneurial orientation, reconfiguring capability and environmental turbulence as fundamentals to predict export performance in Nigeria under the guide of resources based view and dynamic capability view.

2. Entrepreneurial Orientation and export performance

An entrepreneurial firm is the one that engages in product innovation, always undertake risky ventures, and is always the first to come up with proactive innovation, beating competitors to a punch (Miller & Friesen, 1983). Several studies suggested that EO is the key to achieve competitive advantages and avenue to stimulate profitable performance (Zahra & Covin, 1995). Therefore, being proactive, innovative, and risk taking could lead to superior performance (Lumpkin & Dess, 1996). In the context of export venture, limited studies have investigated the roles of entrepreneurial oriented activities and its components in achieving superior performance. Management towards risk- taking was positively related to export performance and firms that are more open to innovation perform better in export business (Calantone, Kim, Schmidt & Cavusgil, 2006). Balabanis and Katsikea (2003) studied the relationship between implementation of entrepreneurial oriented behavior and export performance in UK and found out that EO has a positive relationship with export performance. In a nut shell, the argument of the statistically significant relationship between export performance and EO can be established on the following: First, prime mover advantage implied by EO (Wiklund, 1999; Zahra & Covin, 1995), where Pro-activeness, innovativeness and risk taking enable a firm to transform its economic performance (Naman & Slevin, 1993). In addition, the complex, unpredictable and turbulent nature of export market environment encourage and provide better avenue for higher performance (Balabanis & Katsikea, 2003). Adopting EO in exporting SMEs would boost SMEs' export performance (Knight & Cavusgil, 2004). Thus being entrepreneurially postured or oriented would assist SMEs' exporters to achieve success. Therefore the following hypothesis is posited:

H1: There is a significant relationship between Entrepreneurial orientation (EO) and export performance.

Reconfiguring Capability and Export Performance: Reconfiguring capability (RC) can be referred to as ability to redesign certain element or components of a system. Addition or deletion of product line from the boundary of the firm or movement of product line between the unit boundaries of the firm (Karim & Mitchell, 2004). Dynamic capabilities' frame work contained by strategic management argues that a firm that can build up innovative capabilities and resources crucial to addressing changes in the external environment by integrating updating its already available capabilities would achieve a competitive advantage (Teece et al., 1997). Meanwhile, reconfiguring capabilities (RCs) are innovative capabilities that can be used to address changes of firms' capabilities in dynamic environment in order to achieve competitive advantage. International entrepreneurship (export related activities) involves expanding the firm's operations into new geographical market as well as presents opportunity for growth and value creation (Jantunen, Puumalainen, Saarenketo & Kyläheiko, 2005). This implies that reconfiguring capability is an appropriate mechanism that could impact on export performance. Secondly, Firm employs RCs to be familiar with environment and take action concerning opportunities and threat by extending, modifying, changing and creating firm's ordinary capabilities to achieve first order change (Winter, 2003), and reconfiguring capability would have an impact on export performance through modification, change and recreation in order to improve the performance of the firm. Therefore a high level of activities in term of implementing organizational changes and proficiency in reconfiguring actions would have positive effect on export performance. Having considered the above discussion, this study hypothesizes that:

H2: There is significant relationship between reconfiguring capabilities and export performance

Environmental Turbulence and Export performance: A turbulent environment is an environment with high degree of inter-period change that causes dynamism and uncertainty. This type of environment is characterized with unfamiliar, hostile, heterogeneous, uncertain, complex, dynamic and volatile. Combined jointly, these descriptions amount to a measure of environmental turbulence (Covin & Slevin, 1989; Dess & Beard, 1984; Eisenhardt & Bourgeois, 1988; Glazer & Weiss, 1993). For an export firms to succeed and have sustainable competitive advantage would depend on its ability to find its feet to the varying environment through the support of tactical and strategic orientations. Hence, the complexity and turbulence nature of international enviroment would always increase the needs for strategic activities and planning. Cavusgil and Zou (1994) contended that this has a positive implication on export performance. This is practical to observe for firms that are operating in overseas marketing and vulnerable to vary and complicated environmental context both at industrial level, firm's level and even in their host and home country. It is now left for such SMEs in turbulence environment to adopt the best strategic approach to face and challenge the situation at hand in order to succeed in foreign market (Kaynak & Kuan, 1993). It has been proposed that firms should align with environmental conditions in order to realize superior performance in abroad, accordingly environmental turbulence would have impact on export performance as environmental characteristics post specific challenges when the firm cross boarder (Sundqvist, Kyläheiko, Kuivalainen & Cadogan, 2012). This further implies that the more turbulent the market needs, the more creative firms would be even though explorative activities in turbulence environment are inherently risky, activities increase the likelihood of achieving higher performance level above historical average (Garcia & Calantone, 2002). Therefore this study proposes that:

H3: Environmental turbulence is significantly related to export performance

Environmental Turbulence and Entrepreneurial orientation: Environmental turbulence is a potential contingent factor that may influence the effectiveness of the usage of the strategic orientations. Lumpkin and Dess (2001) contended that when the environment is turbulent, hostile, full of uncertainty, the qualities associated with entrepreneurial orientation can be justified for its ability to seize new market and opportunity in spite of unfriendly situation. Several scholars like Miller and Friesen (1983), Covin and Slevin (1989), Lumpkin and Dess (2001), Wiklund and Shepherd (2005), and Boso, Cadogan and Story (2012) subscribed to the fact that only through adopting an entrepreneurial orientations can exporting firms effectively deal with prevalent forces in turbulent, hostile and dynamic export market. Wiklund and shephered (2005) declared that turbulent environment where demand regularly shift, opportunities turn out to be plentiful and performance level is expected to be at peak for firms that have special orientation in chasing after new opportunities since they possess a good fit/match between their orientation's strategy and the external environment (Zahra & Covin, 1995). Hence, this study hypothesizes the following:

H4: Environmental turbulence moderates the relationship between entrepreneurial orientation and export performance

Environmental Turbulence and Reconfiguring Capability: Reconfiguring capability is ability to build, integrate and reconfigure both external and internal resources and routine to address rapidly changing environment (Teece et al., 1997; Zahra & George, 2002). While environmental turbulence is an environments with high degree of inter-period change that cause dynamism and uncertainty. Reconfiguring capabilities could help firms to reconfigure existing functional capabilities so that they can build products that better match emerging customer needs and take advantage of technological breakthroughs and impact on export performance. Consequently, when there is high degree of turbulent environment there would be higher risk and uncertainty and reinforcing high level of proactive approach would be needed in the strategic planning process (Lindelöf & Löfsten, 2006). Adaptive capability emphasizes on the reconfiguration of resources and processes to respond to external change (Gibson & Birkinshaw, 2004). Therefore, for an export firms to succeed and have sustainable competitive advantage would depend on its ability to find its feet to the varying environment through the support of tactical and reconfiguring capabilities. Hence, the complexity and tubulence of international enviroment would always increase the needs for strategic activities and planning. Turbulent environment which sometimes characterize with high-tech industries were established to promote entrepreneurial firm–level behavior and it is potential contingent factor that may influence the effectiveness of the usage of the strategic and international capability (Miller, Dröge & Toulouse, 1988; Yeoh & Jeong, 1995). Therefore, this study hypothesizes that:

H5: Environmental turbulence moderate the relationship between reconfiguring capability and export performance

3. Methodology

A questionnaire survey was carried out among a population of SMEs that are participating in exporting in Nigeria. The sample of this study was selected from the population sampling frames; Manufacturing Association of Nigeria (MAN) Export promotion Group Directory. From this directory, about five industrial sectors were selected. About 2200 firms were identified as qualified because they met the criteria specified. To select a sample size for the population of 2200, Krejcie and Morgan (1970) sample size determination's table was used. The table showed that 331 sample sizes would be required for the population of 2200. In order to make provision for response bias an additional 40% of 331 was added making 457 sample size. Proportionate stratified and systematic samplings were employed. About twenty five days after the questionnaires have been emailed to the respondents, 118 completed questionnaires were received through e-mail and these 118 questionnaires were regarded as early responses which were further used to assess non response bias on the actual variables. In order to improve the response rate, a follow-up phone calls and series of Short Message Service (SMS) were sent to remind the SMEs 'managers who were yet to return their questionnaires. This effort yielded the largest numbers of response compared to the first response. About 120 questionnaires were returned. It was tagged as late responses which were later used to assess non-response bias. Out of 457 questionnaires that were emailed to the selected respondents, a total of 238 were returned, out of these, 2 were not usable due to excessive missing data, 2 were completely eliminated due to their selection of option 'services/government' and not 'manufacturing' as primary area of business, 2 were also removed for selection of option 'total cost of business that above #200,000,000' specified as a criteria for SMEs and 2 were also eliminated due to low level of knowledge on the topic of interest, remaining 230 useable questionnaire. Hence, the response rate was calculated as 50%, which is sufficient enough for the study (Sekaran & Bougie, 2013). In the course of preliminary analysis, 29 out 230 useable questionnaires were removed for being detected as multivariate outliers. The final data set for the study remained 201.

Measures: Entrepreneurial orientation (EO) was measured in this study by nine items of Covin and Slevin (1989). Reconfiguring capability was measured by seven item employed by Jantunen et al. (2005) to assess the success of renewal activities carried out in the community innovation survey of the European Union. Environmental turbulence's measure were adopted from Cadogan, Paul, Salminen, Puumalainen, and Sundqvist (2001) who employed measures originally used by Kohli, Jaworski, and Kumar (1993) and later adapted them in an export context. Jantunen et al. (2005) computed this scale as mean of seven items. Export performance was measured by Expert scale that was built on Cavusgil and Zou (1994) (Okpara & Kabongo, 2009; Zou, Taylor & Osland, 1998). The nine items adapted from Zou et al. (1998) called Expert scale was used to measure export performance in this study.

4. Results and Discussion

Data Analysis: The present study employed PLS path modeling (Wold, 1985), to assess and test the theoretical model. The suitability of PLS-SEM is based on the fact that the nature of the present study to some extent required explorative tool to extend some of the constructs used in the study. PLS-modeling has also been suggested as prediction oriented for an extension of any existing theory (Henseler, Ringle, & Sinkovics, 2009). Against this background, the present study employed a two step process to calculate and report the result of PLS-SEM path as suggested by Henseler, Ringle and Sinkovics (2009). These two -step processes are (1) the assessment of measurement model and (2) the assessment of a structural model (Henseler & Ringle, 2009).

Assessment of measurement Model: The PLS –SEM algorithm in the first stage; all the constructs scores are estimated to determine items reliability, internal consistency, convergent validity and discriminant validity. The indicators with outer loadings between 0.40 and 0.70 were retained, while some items below the threshold of 0.40 were deleted (Hair, Hult, Ringle & Sarstedt, 2013). About 7 items were deleted out of 32 items. The remaining 25 items were retained as they have loadings that range between 0.5879 and 0.9381, this shows individual items reliability. In table 1 the composite reliability of each construct ranges between

0.817 and 0.929 which is considered satisfactory and AVE of each construct ranges between 0.533 and 0.794 which is also sufficient above the .50 threshold. This means internal consistency has been achieved in the present study. Table 1 depicts the items loadings, composite reliability and average variance extracted of the present study.

Table 1: Loadings, composite Reliability (CR) and Average Variance Extracted (AVE)

Constructs	Items	Loadings	AVE	Composite R
Entrepreneurial Orientation	EO01	0.6724	0.5237	0.8454
	EO02	0.7003		
	EO05	0.6717		
	EO06	0.7619		
	EO09	0.8026		
Reconfiguring Capability	RCD01	0.5879	0.6568	0.9297
	RCD02	0.847		
	RCD03	0.8816		
	RCD04	0.86		
	RCD05	0.7716		
	RCD06	0.858		
	RCD07	0.8286		
Environmental Turbulence	ET003	0.8447	0.5304	0.8172
	ET004	0.7265		
	ET005	0.6453		
	ET007	0.6811		
Finance	FIN01	0.8629	0.6924	0.8702
	FIN02	0.7304		
	FIN03	0.894		
Strategy	STG01	0.6978	0.6882	0.8675
	STG02	0.9001		
	STG03	0.8761		
Satisfactory	SAT01	0.9381	0.7948	0.9207
	SAT02	0.8692		
	SAT03	0.8654		

Some indicators were deleted and all the remaining indicator have high outer loadings on a construct indicating that the associated have much in common which shows this study achieved convergent validity. The average variance extracted was .50 and the square root of the AVE was greater than correlation among latent constructs which indicates discriminant validity was achieved (Hair, Sarstedt, Pieper & Ringle, 2012). Table 2 depicts the square root of the average variance extracted and the correlation of latent variables.

Table 2: Square root of Average Variance Extracted and the correlation of latent Variables

Latent Variable	1	2	3	4	5	6
Entrepreneurial Orientation	**0.7236**					
Environmental Turbulence	0.2652	**0.7282**				
Reconfiguring Capability	0.2886	0.5399	**0.8104**			
Satisfaction	0.429	0.6472	0.5349	**0.8915**		
Strategy	0.3094	0.3843	0.5667	0.6488	**0.8295**	
finance	0.301	0.3722	0.4968	0.5832	0.6971	**0.8321**

Note: Diagonal elements (figures in bold) are the square root of the variance shared the construct and their measures. Off diagonal elements are the correlations among construct.

Assessment of structural Model: Having confirmed that the construct measures are reliable and valid, the next line of action in this study was to address the assessment of the structural model result. Standard

bootstrapping procedure was used with a number of 5000 bootstrap samples and 201 cases to assess the significance of the paths (Henseler et al., 2009). Figure 1 depicts how bootstrapping of PLS-SEM Algorithm was used to assess the significance of the path coefficients.

Figure 1: Structural Model

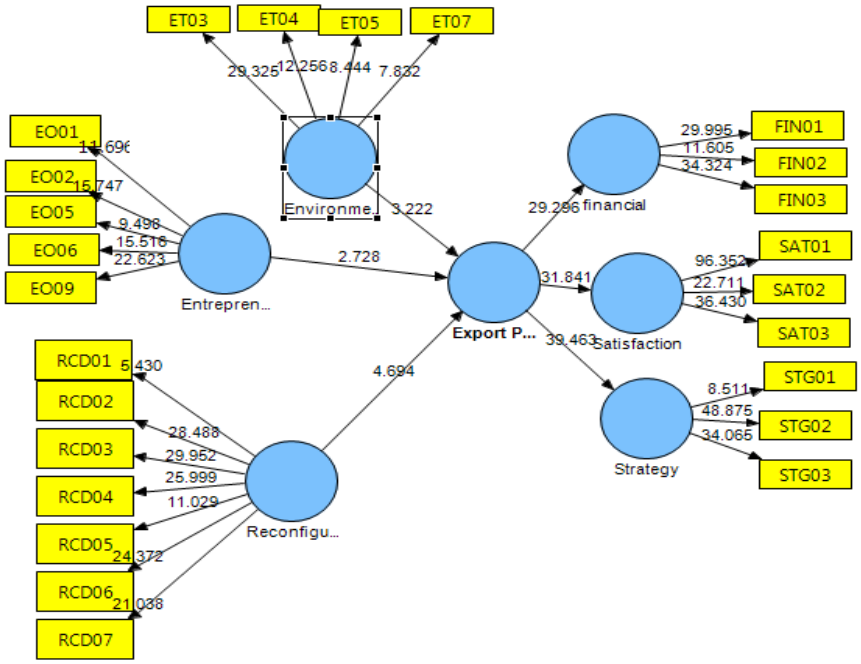


Table 3: The Result of structural Model and Moderator

	Relationship	β	S. E.	T. S.	P. V.	Decision
H1	Entrepreneurial O. -> Export P.	0.2145	0.0786	2.729	0.003	supported
H2	Environmental T -> Export P.	0.2742	0.0851	3.222	0.000	Supported
H3	Reconfiguring C. -> Export P.	0.4033	0.0859	4.694	0.00	Supported
H4	Entrepreneurial O. *Environmental T->Export P.	1.0316	0.5358	1.9253	0.027	Supported
H5	Reconfiguring C. *Environmental T- >Export P.	-0.9358	0.2993	3.1263	0.001	Supported

***p<0.001;**p<0.05

Table 3 summarizes the result of reflective measured constructs (Entrepreneurial orientation, Environmental Turbulence, Reconfiguring Capability and Export Performance) by showing the original outer weight estimates, the t values and the corresponding significance level marked in asterisks as well as the p values with the result of the mediating effect. Hypothesis 1 predicted that entrepreneurial orientation is significantly related to export performance, the finding on the relationship (β=0.2145, t=2.7278, P=0.003) supported the relationship. While hypothesis 2 predicted reconfiguring capability is significantly related to export performance, the estimates of PLS-SEM bootstrapping with 201 cases indicated (β=0.4033, t=-4.6938, p= 0.00) support for the relationship. Hypothesis 3 also predicted that environmental turbulence is significantly related with export performance, the finding of the study indicated support (β=0.2742, t=3.222, P=0.000) for the relationship. Similarly, hypothesis 4 predicted that environmental turbulence moderate the relationship

between entrepreneurial orientation and export performance the finding of the study supported (β=1.0316, t=1.9253, P=0.027) the relationship. In the same vein hypothesis 5 predicted that environmental turbulence moderate the relationship between reconfiguring capability and export performance, the outcome of the bootstrapping PLS-SEM (β=-0.9358, t-3.1263, P 0.001) support the relationship.

The R^2 value in this study is 0.48 which indicates that the predictive variables (entrepreneurial orientation, reconfiguring capability and environmental turbulence) explained 48% of the variance in endogenous variable (export performance) which is considered moderate (Hair, Ringle, & Sarstedt, 2011). In addition to the assessment of R^2 values of all endogenous variables, this study also evaluates effect size. Table 4 shows the effect of exogenous latent variable on endogenous latent variables through the means of changes in the R-squared (Chin, 1998).

Table 4: The Effect sizes of the latent Variable

Variables	Included	Excluded	F. squared	Effect size
Export P.				
Entrepreneurial O.	0.484	0.443	0.0795	Small
Reconfiguring C.	0.484	0.377	0.2074	Medium
Environmental T.	0.484	0.431	0.1027	Small

Table 4 above depicts the effect sizes of the latent variables as small, medium and small respectively. In addition to evaluating effect sizes and magnitude of R^2 values as a criterion for predictive accuracy. This study employed cross validated redundancy as supplementary assessment of goodness -of-fit (Duarte & Raposo, 2010). A research model with Q^2 statistics (s) greater than Zero is considered to have predictive relevance (Henseler et al, 2009). Table 5 depicts the cross validated redundancy for export performance (endogenous variables).

Table 5: Cross Validated Redundancy

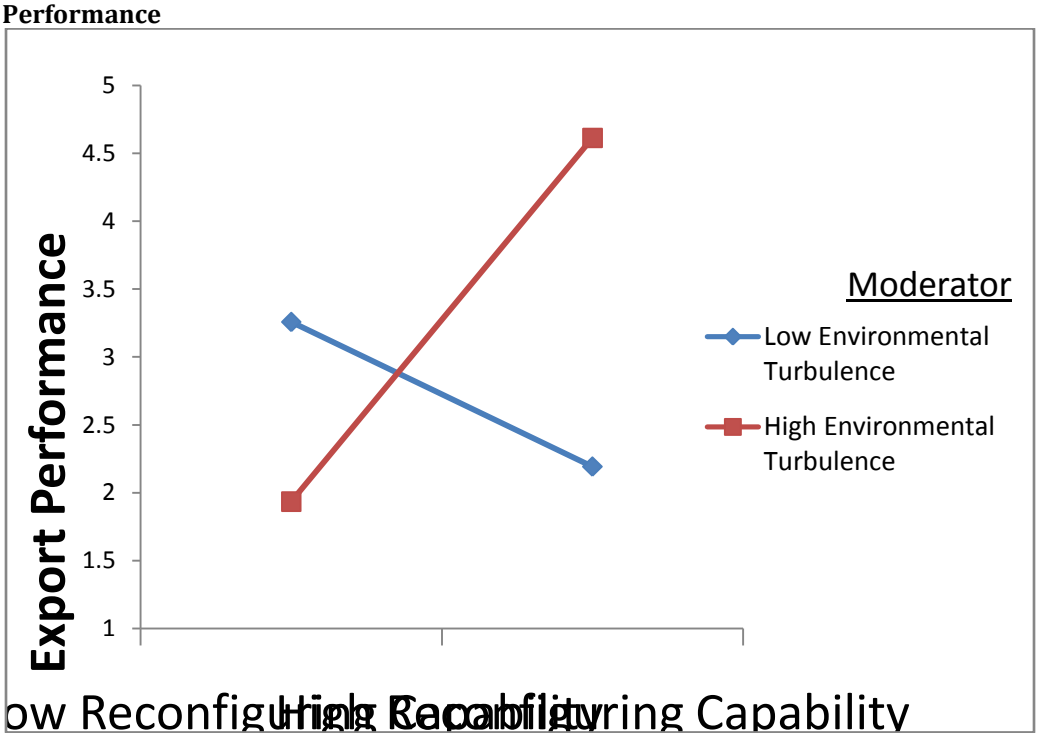
Total	SSO	SSE	1-SSE/SSO
Export Performance	1809	1337.942	0.2604

As shown in the Table 5, the cross- validation redundancy measure Q2 for the endogenous latent variable is above zero, this suggests predictive relevance of the study model (Henseler & Ringle, 2009). Following the procedure recommended by Aiken and West (1993) and Dawson and Richter (2006), information from path coefficient was used to plot the moderating effect of environmental turbulence on the relationship between reconfiguring capability and export performance. The figure 2 below shows the interaction effect of reconfiguring capability and environmental turbulence on export performance. The moderating effect of environmental turbulence on the relationship between reconfiguring capability and export performance is shown. It shows a stronger positive relationship between entrepreneurial orientation and export performance for a firm with high environmental turbulence than for a firm with low environmental turbulence.

Discussion: The finding of this study indicated statistically significant relationship between entrepreneurial orientation and export performance. This is consistent with some earlier studies (Baker & Sinkula, 2009; Balabanis & Katsikea, 2003; Boso et al., 2012; Calantone et al., 2006; Cavusgil, 1984; Lechner & Gudmundsson, 2014; Wiklund & Shepherd, 2003; Zahra & Covin, 1995) which suggested relationship exists between entrepreneurial orientation and firm/export performance. The argument for the statistically significant relationship between export performance and EO was based on first prime mover advantage of EO (Zahra & Covin, 1995). Pro-activeness, innovativeness and risk taking were expected to facilitate a firm to transform its economic performance (Naman & Slevin, 1993). In addition, complex, uncertain and turbulent nature of export market environment was expected to encourage and provide better opportunity for better success (Balabanis and Katsikea, 2003). The result of hypothesized relationship between reconfiguring capability and export performance is also consistent with the available prior studies (Jantunen et al., 2005). This study complements existing studies and the outcome suggests it is not only sufficient for SMEs to adopt an entrepreneurial behavior but more importantly its ability to create new asset configuration that have

effect on export performance. The study specifically provide pragmatic support for dynamic capability view of the firm, emphasizes the ability to orchestrate change and organize efficiently in order to take advantage of new opportunities (Jantunen et al., 2005; Teece et al., 1997). The finding of this study implies that international organization capability is not only important for established companies and born-global but also more important for SMEs operating in foreign market. The Moderation of environmental turbulence on the relationship between entrepreneurial orientation and export performance is also consistent with the prior literature (Cadogan, 2009; Boso et al., 2012; Yeoh & Jeong, 1995; Lumpkin & Dess, 2001; Covin & Slevin, 1989; Wilklund & Shepherd; Boso et al., 2012; Sundqvist, Kylaheiko, Kuivalainen & Cadogan, 2012), that environmental turbulence is a potential contingent factor that could influence the effectiveness of the usage of the strategic orientations (Lumpkin & Dess, 2001). The significant moderating effect of environmental turbulence on the relationship between reconfiguring capability and export performance is consistent with the view that reconfiguring capability is most valuable when the external environment is changing. Teece et al. (1997) buttressed this view by describing reconfiguring capability as the firm's ability to address rapidly changing environment.

Figure 2: Interaction Effect of reconfiguring capability and Environmental Turbulence on Export Performance



5. Conclusion

This study makes contribution to the literature of SMEs' export performance in international entrepreneurship and strategy research by examining the impact of the firm's reconfiguring capabilities and entrepreneurial strategic orientation under environmental turbulence on export performance. To the best knowledge of these researchers, this effect has not been empirically investigated previously in this manner. Even though there have been studies on the relationship between strategic orientations and export performance (Cadogan, Kuivalainen & Sundqvist, 2009; Cadogan et al., 2001; Cadogan, Sundqvist, Puumalainen & Salminen, 2012; Knight & Cavusgil, 2004). This study in particular complements existing studies. The outcome suggests that it is not only strategic entrepreneurial and export marketing behavior but more importantly the ability to create new asset configuration that have an effect on export performance of SMEs. One of the major contributions of this study is to use reconfiguration to provide a view into slogan of innovation within SMEs. This study refers to the ability to manage resources and structure as reconfiguring

capability (Karim and Mitchel, 2004). Therefore, firms with advanced reconfiguring capabilities bundled with strategic orientations might be expected to seize opportunity through new resources combination and well organized process and structures. The contribution of this study also extends resources based view (RBV) as an appropriate theoretical perspective for emerging market by providing evidence for export performance of SMEs. In this study EO is considered as resources which have potentials to enhance export performance.

Furthermore, the moderating effect of the relationship was statistically significant for entrepreneurial orientation, reconfiguring capability with export performance for exporting SMEs in high turbulent environment than for exporting SMEs in low turbulent environment. This suggests that, SMEs' exporter could derive greater benefit in investing in research into reducing cost, better efficient distributing system, innovative products, good technologies and all activities that can improve and drive export market and thereby increase sales and growth. Moreover, under environmental turbulence, this study provides support for the usage of entrepreneurial orientation and reconfiguring capability, the finding depicts that RC and EO would be more valuable when there is environmental turbulence and could become less effective when there is stability in the environment. Hence, SMEs should invest more in research and development to offset environmental turbulence which would yield better performance than the competitor that has not taken the same measure.

Recommendations: Based on the findings of this study, the following course of actions are suggested; First, SMEs who pays relatively more emphasis on profitability, growth and satisfaction could invest more in reconfiguring their assets. Such export manager of SMEs should emphasize reconfiguration of capabilities development and market penetration in their exporting activities (Abiodun & Rosli, 2014; Jantunen et al., 2005). Second, Government agencies and stakeholders in exporting SMEs, particularly in the context of the sample in this study should leverage renewal strategy on incentives giving to SMEs and reconfigure contribution in the following dimensions; revamping all old Industrial Development Centre and establish new ones (IDCs); establishing SMEs clusters ; upgrading rural urban road. Government in attempt to develop and reconfigure capabilities should introduce entrepreneurial studies; emphasize science, practical and technological studies at all level of educational system. There should be education department to be responsible for public enlightenment and training of exporting entrepreneurial SMEs most especially on required technological and marketing skills to enable them to have appropriate linkage to source raw materials, plant machines and spare parts that would give rise to standard products that can penetrate to the global market. Third, exporting SMEs managers could consider risk taking decision in turbulent environment as it improves performance (Calantone, Garcia & Dröge, 2003). SMES should be pro-active, innovative, risk seeking posture to mitigate the uncertainty of turbulent environment (Cadogan et al., 2009). Fourth, this study was conducted within one of developing countries, Nigeria, there would be serious implication in making general inference from this explorative study and caution must be taken in concluding that the outcomes of the study are valid for all entrepreneurial exporting SMEs in general. As such, the findings should be validated at different setting to find whether the findings apply to SMEs exporters in different countries and emerging markets. Fifth, this investigation focuses on the elements of reconfiguring capabilities as one of the processes of dynamic capabilities, however, scholar like Zollo and Winter (2002) perceived dynamic capabilities as a set of complicated processes and operating routines that reflects a learned and stable pattern other than narrow description of how SMEs should be reconfigured. Further study could therefore consider thorough reflection of learning and stability during deletion, recombination and general consolidation's reconfiguring processes. Sixth, the measures of reconfiguring capabilities 'items that were adopted from Jantunen et al. (2005) are too broad about the industry and market change as it narrowly focused on SMEs. Future research could develop more refined measures of reconfiguring capabilities by considering specific aspects such as resources reconfiguration and resources recombination.

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Macroeconomic Determinants of Liquidity of the Bond Market in Africa: Case Study of South Africa

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Abstract: The importance of the bond market to the financial system and broader economy of a country cannot be underestimated. Thus this study seeks to establish the determinants of liquidity in the South African bond market using monthly data covering the period 1995 to 2009, employing the Johansen cointegration test and the Vector Error Correction Model. Empirical results reveal that there is a long-term relationship between the selected macroeconomic variables and bond market liquidity in South Africa. Based on the empirical results, it is recommended that authorities should keep inflation at low and stables levels as well as a stable currency. Of great importance in the study is the role played by foreign investors in the bond market. The positive impact of the foreign investor participation on the bond market liquidity in South Africa suggests that authorities should remove restrictions on foreign investor activities to enhance liquidity in this important market.

Keywords: *Bond Market Liquidity, Johansen cointegration, Vector Error Correction Model, South Africa*

1. Introduction

Liquidity has become an important element for the healthy functioning of the bond market. The market for government securities dominates the securities market in most African countries and thus plays an important role in providing a basis for a robust and efficient financial system as a whole. This sector contributes mostly to the transformation of savings into investment, disseminating information, managing risk, and supporting activities in other securities (Chabchitrchaidol & Panyanukul, 2005). In addition, the yield curve which is a leading indicator of business cycle (as it provides the vital guide to the future behaviour of inflation and interest rates) has its genesis in the government bond market. However, one major constraint in this market is the issue of liquidity. There are many ways in which liquidity is defined in the literature. Gravelle (1998) defines liquidity as being "the ease with which large-size transactions can be effected without impacting market prices". Borio (2000) on the other hand describes a liquid market as one where "…transactions can take place rapidly and with little impact on price". However, the Committee on the Global Financial System (CGFS) (1999) shows that the concept of liquidity can be further elaborated in a number of dimensions. These include tightness, depth/size, resiliency, and immediacy. Despite the different definitions of liquidity, its importance to the bond market cannot be underestimated. Illiquidity in this important market is likely to cause massive price volatility and complicate the open market operations of the central bank. This arises as the transmission mechanism of monetary policy which allows the central bank to infer inflation and interest rate expectations of market participants, and contribute to the promotion of economic growth, by facilitating more efficient pricing of borrowing and lending is obscured (Mminele, 2009). In addition, the Asian Development Bank (ADB, 2005) suggests that outright purchases and repurchases of securities are important instruments of monetary policy. If market liquidity is not sufficient, central banks might not be able to provide or absorb the necessary amount of funds smoothly through their open market operations. This could produce unintended effects such as excessive price volatility. Therefore bond market liquidity provides encouragement to the tools of financial mediation, making these tools very essential as they are related to market pricing, effective borrowing and investment practises.

It is important to note that the South African bond market is relatively efficient compared to most African bond markets as indicated by the 2009 Fitch ratings. In addition, there are a number of factors which qualifies the South African bond market relative to other African bond markets. Firstly, Hove (2008) argues that Bond Exchange of South Africa (BESA) has not had any liquidation default and no claims have been made on the Guarantee Fund in its history. Secondly, Jones (2007) shows that BESA did not close its market during market disruptions such as the Russian and Asian problems in 1998 as well as the 11 September 2001 tragedy.

Thirdly, the South African bond market has a turnover ratio equivalent to other mature markets. BESA's 2007 market performance report shows that turnover on the bond exchange reached a record R13.8 trillion, with R13 trillion occurring in government bonds. Thus, this paper seeks to investigate the determinants of liquidity in this market as this might provide some useful insights for other African countries where the bond market is still in its infancy considering that the bond market is another source of domestic financial resource mobilisation. In addition to the carry-over for other African economies, identifying the determinants of liquidity will help policy makers to focus on this segment of the economy in order to further enhance its efficiency by avoiding price volatility, encouraging macroeconomic stability and achieving long-term economic growth. The paper is organised as follows: Section II focuses on the overview of the South African bond market; Section III literature review; Section IV discusses the theoretical framework and econometric methodology used to carry out the study; Section V presents the empirical results from with Section VI discussing the concluding remarks.

Overview of the South African Bond Market: The South African bond market has undergone major developments since its inception. This has resulted in enhanced efficiency and safety in the market thus attracting investors to it. Due to the developments in the market, it is described (Ambrosi, 2009) as one of the leading emerging bond markets in the world. Ambrosi (2009) further indicates that the South African bond market when measured in terms of debt issued comprises but a fraction of the world's debt markets combined, yet it constitutes the lion's share of the African debt market. It boasts of a level of sophistication and efficiency that matches those of many of the bigger debt markets in the developed world. The South African bond market compares favourably to other emerging market economies in terms of outstanding bonds as shown in table 1.

Table 1: Size of Domestic bond markets at the end of 2010 (Billions of US dollars)

Country	Amounts Outstanding By sector and residence of Issuer			Changes in Stocks	
	2008	2009	2010	2009	2010
Australia	639.6	874.9	1043.6	42.2	48.5
Denmark	591.1	691.2	659.9	95.0	17.8
Germany	2592.8	2806.7	2615.9	107.4	10.2
Switzerland	259.0	259.5	291.0	-9.5	5.6
United Kingdom	1219.3	1548.8	1647.0	182.5	148.4
South Africa	93.8	140.4	189.0	6.4	10.0
Mexico	319.5	362.8	429.0	30.8	44.6
Argentina	66.2	57.3	58.9	-5.3	3.2
Malaysia	172.7	189.3	239.9	14.2	28.9
South Korea	863.5	1066.1	1111.0	118.5	16.5
Finland	88.5	93.2	87.4	2.4	0.5
Indonesia	70.7	97.7	93.4	13.7	-8.9
Czech Republic	65.2	80.3	74.2	12.1	-4.6

Source: Bank of International Settlements (2011)

Table 1 indicates that the size of the bond market in South Africa is relatively large compared to some of the emerging countries (Czech Republic & Indonesia) though it is still small as compared to those of other developed countries. The South African authorities have adopted a number of initiatives to increase trading volume so as to promote market liquidity. Firstly, the appointment of primary dealers/ market makers by the government in 1998 who are involved in quoting firm prices (bid and offer) in certain government bonds improved transparency and overcame shortcomings which were inherent in the tap issue method, in which the Reserve Bank was issuing bonds on behalf of the government[3]. This system was flawed since the Reserve Bank in its market making role was always a net seller and the process at times conflicted with the Reserve

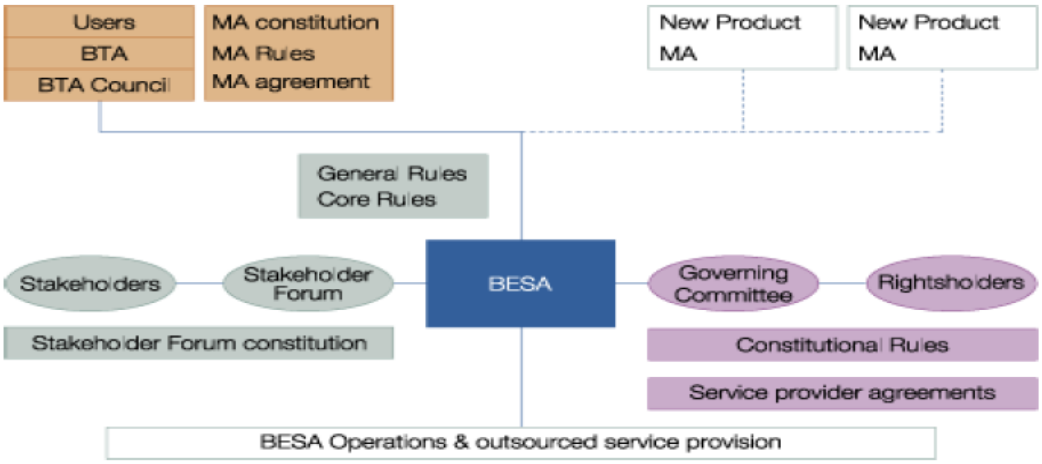
[3]It must be noted however that this market making role of the central bank at the initial stages of the development of the bond market facilitated the transfer of this function to commercial banks at a later stage and improved liquidity in the market.

Bank's monetary policy function. Secondly, BESA also facilitated the development of an active repo market, which has made a major contribution to the secondary market. It is argued that traders have used repos to fund their positions, hedge short positions in the capital markets, facilitate settlement and employ cash for the short-term between investment decisions. Thirdly, the Exchange developed a system in terms of which firm bid and offer prices and traded prices are entered into a central price discovery screen which is available to all the Exchange's users. This has further improved liquidity by promoting price dissemination (Greubel, 2008).

The development of the South African bond market has mirrored developments in economic development as well as other financial markets (equity and futures). This is consistent with Adelegan (2009), who suggest that the growth in the bond market and equity market have contributed to the growth of the futures market in South Africa by facilitating the introduction of a number of equity and bond market related instruments. This shows that a well-developed financial system with all financial markets operating promote economic growth as each segment plays its role in terms of mitigating risks, resource mobilization and efficient allocation of scarce resources resulting in sustainable economic growth.

Market Structure and Organisation: The market structure of the South African bond market has been another important factor contributing to the liquidity of its bond market. BESA offers a secure and efficient dealing environment for the products for which it was created. These are rand denominated debt securities mainly bonds as well as money market securities (issued by government, public enterprises and the corporate sector) and derivatives. However, its main product is central government bond (Faure, 2007). BESA is structured in a way to create a clear distinction between users (issuers and members of the market associations), rights holders (affiliated to shareholders) and stakeholders (the SARB, the regulators, the investment community and the Debt Issuer's Association (DIA)). Jointly, stakeholders form part of the stakeholder forum, whose aim is to make sure that BESA and the market associations fulfil their license requirements and that the market functions effectively in terms of good market practice (BESA, 2007). Figure 2:1 shows the structure of BESA as of 2008.

Figure 1: Market Structure



Key:
BTA-Bond Trader's Association
MA- Market Association
Source: Hove (2008)

Market associations are groups of users that contract with BESA for a package of tailor made services. This means that users of the exchange benefit from the ability to choose how to trade and with whom, as well as how they wish to influence and develop the market (Hove, 2008:43).The market associations are divided into three main categories and are governed by their own rules which are compliant and consistent with the core rules of BESA. These categories are:

- The Bond Traders Associations (BTA), formed by bond traders to represent the welfare of the trading community in South Africa.
- The Derivatives Traders Association (DTA): for the interests and views of firms registered to trade BESA-listed derivative instruments.
- The Debt Issuers Association (DIA): to guide and steer transformation within the markets by dealing with both operational and strategic issues (Hove, 2008).

Trading and Settlement: In the South African bond market deal execution takes place via two trading systems. According to Faure (2007) these are:

- Telephone-screen trading. With this system, market makers place indication rates on information vendor (IV) screens such as Reuters Monitor Service and deals are negotiated and consummated over the phone. This is therefore a quote-driven market in which market makers quote buying and selling rates.
- Screen-telephone trading. In this system the interdealer brokers quote firm rates on IV screens, and the telephone is used by members of the exchange to take (buy) or give (sell) that is to confirm the transaction with the interdealer broker.

Deals by members of BESA are reported to BESA and confirmed via the electronic system called BTB which is the trade capturing system. This system is also designed to be a price discovery system. Prior to the current system, the floor trading method also called open-outcry trading was the method in use up to 1998 (Faure, 2007). As for settlement, bond deals through BESA are conducted on a netted and T+3 rolling settlement systems. The institutions involved in clearing and settlement are a clearing house (STRATE), a central securities depository (STRATE) and a settlement agent system. The Exchange offers protection from settlement failure and tainted scrip risk through its Guaranteed Fund, and members' compulsory fidelity cover provides protection against fraud/ theft perpetrated by employees of a member firm (Faure, 2007).

The regulatory framework in South Africa has been another major important ingredient towards the development of the bond market. The South African bond market has experienced major changes in its regulation. This includes the move from Over the Counter (OTC) markets to exchange-traded market. Exchange driven-market eliminates or lessens a number of risks inherent in OTC markets. These risks include counterparty risk, settlement risk, broker-dealer fraud risk and tainted scrip risk[4]. The elimination or lessening of risk goes hand-in-hand with efficiency of trading. Faure (2008:92) attests that the elimination or lessening of risk and efficiency of trading maybe subsumed under "*a secure and efficient dealing environment*". Faure goes on to point out that such an environment attracts more participants, both local and foreign, which leads to higher turnover, thus higher liquidity and ultimately to efficient price discovery, and possibly lower transaction costs.

Central to BESA operations, has been its regulatory and supervisory obligations. These obligations were met by the Market Regulation Division (MRD), which was established in 2004 as a totally ring-fenced division separate from BESA's commercial operations. However, with the acquisition of BESA, the MRD has been integrated into the Surveillance Division and the Clearing and Settlement Division of the JSE (BESA, 2010).BESA has ensured that the rules of the exchange are G_{30}-compliant and continuously strives to formulate its rules against international best practice (BESA, 2005:14). This has improved the efficiency and effectiveness of the market and hence liquidity. This has also encouraged both local and foreign investors to participate in the bond market.

[4] Counterparty risk is reduced as the investor deals with a broker-dealer who is under constant surveillance; Settlement risk refers to deals being settled efficiently by the exchange through a deal booking system, BTB here in South Africa; Broker-dealer fraud risk is reduced because of surveillance and tainted scrip risk is eliminated in a dematerialised environment.

2. Literature Review

A number of studies have been carried out to establish the determinants of liquidity in bond markets. However, the conclusions vary from market to market. According to Borio (2000) the increasing interest in liquidity stems from the need for an efficient financial system. Choudhry (2010) describes liquidity as an important factor underpinning the smooth functioning of the financial system and conditioning the daily activities of economic agents, including pricing, trading and risk management. Das et al. (2003) describes the importance of liquidity to markets as oxygen is to humans as it is only noticeable by its absence. The need to establish the determinants of bond market liquidity has attracted a number of empirical studies. Of the available studies, Chabchitrchaidol and Panyanukul (2005) looked at the key determinants of liquidity in the Thai bond market, measured by bid-ask spreads on government bonds. Empirical results using EGARCH estimation revealed that a rise in the volatility of bond yields leads to a larger bid-ask spread. The authors concluded that volatility is negatively related to bond market liquidity.

On another study Garcia (1989) argue that monthly stance of the Federal Reserve Bank can affect liquidity by altering the terms of margin borrowing and alleviating the borrowing constrains of dealers. The author found that monetary expansions are associated with increased liquidity during crisis periods. This was consistent with Fujimoto (2004) who also discovered that monetary variables are significant drivers of securities market liquidity. This suggests therefore that monetary policy has an impact on bond market liquidity. Goyenko, Subrahmanyam and Ukhov (2011) looked at the term structure of bond market liquidity of the US from November 1967 to December 2005 using Vector Autoregression analysis on illiquidity of three maturity ranges, thus short, medium and long. Empirical results indicated that on-the-run and off-the-run illiquidity has different time series determinants. On-the-run illiquidity across all maturities is largely affected by volatility. On the other hand off-the-run illiquidity is driven by inflation, monetary policy surprises, bond returns and volatility. Overall, off-the-run illiquidity is affected by a larger set of economic variables. Their results were consistent with the idea that the effect of macroeconomic variables on dealer costs is most relevant in the less liquid off-the-run sector.

Das et al. (2003) suggest that there are three types of news shocks common to bond markets. These are intra-day calendar effects, public information effects and GARCH effects. Nevertheless, Das *et al.* points out that unlike stock and corporate bond markets, the government bond market is driven mainly by public information or macroeconomic news events. Consistent with Das et al. (2003), He and Nasser (1999) states that macroeconomic variable determines liquidity in bond markets. According to He and Nasser (1999), investors have become concerned with overall trends than with individual company fundamentals. Since both stocks and bonds are investment alternatives that compete for the investor's funds, the funds flow from one market to another due to a change in market situation and macroeconomic factors. He and Nasser (1999) pointed out that a number of studies have reported a negative relationship between long-term government bond rate and the stock prices in the US and UK. Davis (1999) concurs with He and Nasser (1999) and revealed movements of the economy and/or of interest rates as of overriding importance in the purchase of fixed-income securities. A rise in interest rates, due for instance, to monetary policy tightening may lead to a financial crisis, with liquidity collapses in security markets. In addition, in the presence of uncertainty, adverse surprises may trigger shifts in confidence, affecting markets and institutions more than appears, thus introducing the potential for a liquidity crisis.

Mukherjee and Atsuyuki (1995) propose that there is a positive relationship between exchange rates and stock prices. Exchange rate fluctuation is regarded as a critical factor for the foreign investor in the security market. The secondary security market liquidity increases when foreign currency appreciates. However, exchange rate fluctuation increases the exchange rate risk of the investment when foreign investors transfer their investment back to their mother countries. In South Africa, exchange rate fluctuation has a major impact on the secondary bond market liquidity considering that foreign investors play an active role in bond trading. Further, He and Nasser (1999) shows that economic prospects have increasingly affected the world's capital markets. It is suggested that inflationary pressures appear to play a key role in pushing up bond yields. Rutledge (1995) shows that growth in the world economy in the past caused intensive competition for capital, giving investors attractive alternatives to fixed-income instruments. However once inflation become more visible, the nominal risk-free rate was raised as interest rates rose. This affected the bond market

negatively as bond prices fell due to high yields required by the investors. The same authors also goes on to point out that the fear of inflation has made many bond managers to shorten the duration of their portfolio and seek relative safety in the short to intermediate term sectors which in turn may also affect liquidity.

Chabchitrchaidol and Panyanukul (2005) suggest that adverse selection problems do impact on bond market liquidity as well. The authors suggest that adverse selection problems arise when informed traders who possess private information on the value of an asset not currently reflected in prices, are in the market. Such traders will want to trade only if the current ask price they face is below or the bid price above the fundamental value of the asset. There are two hypotheses under the adverse selection theory. Under the first hypothesis, suggested by Easley and O'hara (1992), higher trading volume will be a signal of the presence of informed traders and will result in increased spreads and hence a decrease on bond market liquidity. In this scenario, increased trading volume will be a signal to market makers that an information event has occurred. As uninformed traders, dealers specifically, always lose when dealing with informed traders, they have to recoup the losses from other investors by charging a larger bid-ask spread. Thus an unusual number of trades will result in the dealer widening the spread. According to this hypothesis therefore, higher trading volume will lead to higher spreads, thus reducing liquidity in the bond market. Under the second hypothesis, proposed by Harris and Raviv (1993), higher trading volume reveals an increase in liquidity, signalling higher overall market liquidity. In this case dealers will interpret that a volume shock is due to a change in the demands of "liquidity" traders such as through mutual fund redemption, and would not be expected to decrease liquidity and have little to no effect on bid-ask spread.
However, Chabchitrchaidol and Panyanukul (2005) argue that existing models of adverse selection of the type discussed above have mainly looked at liquidity in equity markets, partly due to the fact that data is more easily available due to the nature of exchange-traded markets. As discussed, adverse selection models are based on the assumption that some investors have superior information on the payoff of the asset than others. However, this is unlikely to be the case for government bonds where cash flows are perfectly known (Lee et al., 1993). Even though it is unclear which of the two scenarios of adverse selection theory is appropriate for our case, it is clear that both volatility and trading volume are two of the main factors which determine spreads and hence liquidity in bond markets. The above literature shows that establishing the determinants of liquidity in the bond market has attracted academic attention. However much of the studies have been undertaken in developed countries and less have been done in developing countries due to underdevelopment of developing countries financial markets. This makes it interesting to examine the determinants of liquidity in the case of South Africa. This will enable us to identify policy variables that policy makers can focus upon to further deepen liquidity in this important segment of the market.

3. Theoretical Framework and Model Specification

Measuring Bond Market Liquidity: There is no consensus regarding the measure of liquidity in financial markets. However, the major proxies of liquidity are the bid-ask spread, trading volume, volatility, frequency, bond trading turnover, quote size, benchmark yield curve, average normal market size and number of market makers (CGFS, 1999). The choice of a liquidity measure depends on the development of the market. Two measures of liquidity, the volume of bonds traded and the bid-ask spread will be discussed in this section.

Liquidity Proxies: Trading volume is regarded by Abdourahmane and Tonny (2002) as the best measure in measuring breath. It is illustrated as follows:

$$V = \sum P_i + Q_i \qquad 1$$

Where: V = Rand Volume traded
P_i = Prices of the ith instrument traded during a specified period
Q_i = quantity

It is argued that markets that are deep are able to foster breath since larger orders can be divided into several smaller orders to minimize the impact of transaction prices. Abdourahmane and Tonny (2002) also point out that trading volume is traditionally used to measure the existence of numerous market participants and transactions. The other measure which is commonly used in the literature is the bid-ask spread.

Abdourahmane and Tonny (2002) shows that the bid-ask spread is the absolute difference between bid and ask prices or it can be as a percentage. This is shown as follows:

$$BAS = (P_A - P_B) \quad 2$$

Where: BAS= bid-ask spread

P_A = the ask price

P_B = the bid price

According to Abdourahmane and Tonny (2002), ceteris paribus, the larger the trades that can be concluded at a quoted spread, the more depth and breadth the market have. However this measure of liquidity falls under the transaction costs measures. It is more appropriate in the case when determining the determinants of liquidity from a market microstructure perspective. The study will thus utilise the volume measure. This is consistent with Khama (2007) who advance a number of reasons as to why volume can be a better measure of liquidity in emerging markets. Amongst the reasons is the issue of bond trading not being frequent. This can be due to few players in the market unlike in the stock market. Also to capture data on bid-ask spread is complex. This makes the bid-ask spread suspect as there are few players which thus reduce competition. This therefore makes the bid-ask spread unreliable.

Model Specification: The study will focus only on the government bonds traded on the South African secondary bond market, because South African corporate and state enterprises bonds are not active in the secondary bond market. In addition, looking at government bonds when measuring liquidity is what is regarded as ideal. Choudhry (2010) proposes that any investigation into market liquidity should focus first on government bonds since with corporate bonds a number of other issues such as credit risk which is unrelated to liquidity may influence the results. This is consistent with Kamara (1994) who concluded that government bonds are fundamentally identical and credit-risk-free and thus could help focus on liquidity issues.

Restricted Vector Autoregression Model: In examining the determinants of liquidity in the South African bond market the study utilised the restricted Vector Autoregression model (VAR). This is due to the fact that the variables of analysis are simultaneously related. VAR models have proved to be a convenient method of summarizing the dynamic relationships among variables in such circumstances, since once estimated they can be used to simulate the response over time of any variable in the set to either an 'own' disturbance or a disturbance to any variable in the system (Ramaswamy & Slok 1998). The VAR approach recognizes explicitly the simultaneity between bond market liquidity and its determinants (Benston & Hagerman, 1974; Subrahmanyam, 1994), hence the need to treat each variable symmetrically and allow feedbacks among them. Restricted VAR models have also been found to be most suitable in capturing the feedback relationships among macroeconomic variables. Moreover, restricted VAR analysis is superior to a single equation approach for capturing the long-run equilibrium of variables while it incorporates an error correction mechanism to track the short run dynamics among the variables (Feasel, Kim & Smith, 2001). More importantly, the structural version of the reduced-form VAR (which separates the influence of shocks from those of structure to capture the interactions among the variables of interest) is employed in the study. This method explicitly calculates the disturbances by inverting an estimated structural VAR of the relationship among the contemporaneous VAR residuals. The VAR model for the study is discussed as follows:

Assuming that X_t is the nx1 vector of variables, the intra-impulse transmission process of which is to be captured by the study, the dimension of X_t (that is n) is 7, given the seven variables of the analysis. Using matrix algebra notations, an7-variable structural dynamic economic model for the study can be stated as:

$$BX_t = \mu + \Gamma X_{t-1} + \varepsilon_t \quad 2$$

Where B is the matrix of variable coefficients

X_t is the 7 x 1 vector of observations at time t of the variables of the study that is vector X is defined as

$$X_t = (SQR(VOL)_t, CPI_t, REP_t, EX_t, SMI_t, FIP_t, Dummy)$$

Also, μ is the vector of constants

Γ is a matrix polynomial of appropriate dimension

ε_t is a diagonal matrix of *structural innovations* that has zero means, constant variance, and are individually serially uncorrelated, i.e.

$$\varepsilon_t \sim (0, \sum) \quad 3$$

The ordering of the variables used in the study follows that discussed by Goyenko et al. (2011) in which variables are in the order in which they influence the other variables. Policy variables are placed first followed by macroeconomic variables since while financial markets respond to monetary policy, monetary policy is relatively exogenous to the financial system. The view of placing monetary policy instruments before financial variables are supported by Thorbecke (1997) and Chordia, Sarkar and Subrahmanyam (2003).

Estimation Techniques: The first step in our analysis is to test for stationarity of our variables. Gujarati (2003) suggest that a stationary stochastic process implies that the mean and variance are constant overtime, and the covariance between two periods depends only on the lag between the two time periods and not the actual time at which the covariance is computed. This implies therefore that a non-stationary time series will have a varying mean or varying variance or both. The statistical and time series properties of the data set were first carried out using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) to test for unit root. The ADF is given by the following equation:

$$\Delta y_t = a_0 + \gamma y_{t-1} + a_2 t + \sum_{i=1}^{p} \beta_i \Delta y_{t-1} + u_t \quad (4)$$

The equation shows that: $\Delta Y_t = Y_t - Y_{t-1}$; $\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}$etc. The test proceeds by testing the significance of the coefficient of Yt-1.The augmenting is done to remove possible autocorrelation among error terms. In the event that the calculated values are greater than the critical values, we reject the null and state that the variable is stationary. However, Mallik and Chowdhury (2001) and Ahmed and Mortaza (2005) point out that the PP test can properly distinguish between stationary and non-stationary time series with high degree of autocorrelation and presence of structural break.

The test regression for the Phillips-Perron test is the AR(1) process given as:

$$\Delta y_{t-1} = \alpha_0 + \gamma y_{t-1} + e_t \quad (5)$$

As there is likely to be serial correlation in our explanatory variables, the PP test corrects for higher order serial correlation by adding lagged differenced terms on the right-hand side, this test makes a correction to the t statistic of the coefficient γ from the AR(1) regression to account for the serial correlation in e_t.

Having established the order of integration and stationarity of our variables, cointegration tests were undertaken. The Johansen cointegration test was employed in the study. The Johansen procedure produces two statistics, the likelihood ratio test based on maximal eigenvalue of the stochastic matrix and the test based on trace of the stochastic matrix. These statistics are then used to determine the number of cointegrating vectors. The test is based around an examination of the π matrix, where π can be interpreted as a long-run coefficient matrix. The test for cointegration between the variables is calculated by looking at the rank of the π matrix via its eigenvalues. π can be defined as the product of two matrices:

$$\pi = \alpha\beta' \quad (6)$$

The matrix β gives the cointegrating vectors, while α gives the amount of each cointegrating vector entering each equation of the VECM, also known as the 'adjustment parameter'.

Having established the number of cointegrating vectors, we proceeded with the estimation of the VECM. The VECM applies maximum likelihood estimation to VAR to simultaneously determine the long-run and short-run determinants of the dependent variable in the model.

This approach takes into account the short-term adjustments of the variables as well as the speed of adjustment of the coefficients. It therefore measures the speed at which the volume of bonds traded will revert to their equilibrium following a short term shock to it. In addition, this approach is appropriate for macroeconomics and financial data as it distinguishes between stationary variables with momentary effects and non-stationary variables with undeviating effects (Brooks, 2008).

The VECM specification has the following form:

$$\Delta y_t = \Pi y_{t-1} + \sum_{t=i}^{k} \Gamma_i \Delta y_{t-1} + \varepsilon_{kt} \quad (7)$$

Where y_t =($y_1 + y_{2t}$ ....) is the 7×1 vector, Δy_t are all $I(0), \Gamma_i$ are the 7×7 coefficient matrices and ε_{kt} are normally and independently distributed error terms.

Data and Definition of Variables: The study utilised monthly time series secondary data on government bonds with maturity of more than one year from 1995- 2009 (180 observations). For macroeconomic data (CPI, Repo rate, Stock Market Index and Foreign Investor participation) the main sources of data are the South African Reserve Bank (SARB) online statistical queries, Bond Exchange of South Africa's (BESA) online publications, Department of Trade and Industry's (DTI) Economic Statistics publications and Statistics South Africa online query. Volume *SQR(VOL*) represents the measure measures of liquidity. An increase in volume of bonds traded is an indication of liquidity in the market. *CPI* represents monthly inflation as measured by the Consumer Price Index (*CPI*). A rise in the level of inflation which forces the monetary authorities to increase the repo rate will increase yields and hence cause price of bonds to fall. This is likely to decrease bond market liquidity. It is thus negatively related to bond market liquidity. *REP* represents the South African Reserve Bank (SARB) monthly repo rate, a tool which is currently used by the South African Reserve bank in monetary policy. An increase in the repo rate (contractionary monetary policy) results in high yields and hence low bond prices thus reducing bond appetite hence reduced liquidity. We thus expect a negative relationship between REP and volume of bonds traded. *EX* represents exchange rate volatility. It is measured as the deviation from the average of four weekly exchange rate of the US dollar in terms of the rand. Exchange rate volatility leads to uncertainty in the foreign exchange market. This adds to risk premium to the forward market transactions and these uncertainties adversely affect the foreign participation in domestic bond markets and hence the development of the benchmark yield curve. The exchange rate is of importance in the case of South Africa since foreign buyers are active participants in our bond market. We expect a negative relationship between EX and volume of bonds traded. *SIM* is the monthly Johannesburg All share stock market Index. Theoretically, shares are another form of investment which competes for the same investor's funds. An investment in shares may mean disinvestment from bonds hence reduced liquidity. *FIP* represents net foreign buyers of bonds on BESA. An increase in Foreign Investor Participation (*FIP*) results in the broadening of the investor base and enhanced liquidity in the secondary bond market. We thus expect a positive relationship between FIP and bond market liquidity. The study will also incorporate a dummy variable to capture the impact of the global financial crisis on the bond market liquidity in South Africa. It will assume a value of 0 prior to May 2007 and a value of 1 from June 2007. It will be expected to have a negative effect on bond market liquidity.

4. Econometric Procedure and Results

Unit Root Tests Results: Time series properties of the data were carefully evaluated through the Augmented Dickey Fuller (ADF) and Phillip-Peron (PP) tests. The results are reported in table 2.

Table 2: Unit Root tests (Level Series)

	Augmented Dickey Fuller Test (ADF)		Phillips-Peron (PP)	
Series	**Constant**	**Constant and Trend**	**Constant**	**Constant and Trend**
Vol	-0.002986	-0.970015	-0.733840	-1.324218
CPI	-0.001788	-0.970015	-0.875225*	-0.851235
SMI	0.125282	-1.51625	-0.223969	-1.883499
FIP	-0.034536	-0.396052	-0.547456	-0.451967
EX	-0.103459	-0.103143	-1.960873	-1.875754
REP	-0.040503	-0.299520	-0.040503	-0.299520

Notes:

i. *** (0.01 level of significance), ** (0.05 level of significance) and *(0,1 level of significance.
ii. Maximum Bandwidth for the PP test has been decided on the basis of Newey-West (1994)
iii. The ADF and PP tests are based on the null hypothesis of unit roots.

Source: *Author's Computation using Eviews 7 Econometric Package*

Table 3: Unit Root test (First Difference Series)

Series	Augmented Dickey Fuller Test (ADF) Constant	Constant and Trend	Phillips-Peron (PP) Constant	Constant and Trend	Decision
ΔVol	-14.99727***	-15.00365***	-19.72108***	-19.72031***	I(1)
ΔCPI	-7.542908***	-7.534760***	-7.601983***	-7.591804***	I(1)
ΔSMI	-12.29702***	-12.32784***	-12.61948***	-12.63192***	I(1)
ΔFIP	-14.07829***	-14.09080***	-18.47758***	-18.49781***	I(1)
ΔEX	-9.071762***	-9.086775***	-9.038862***	-9.142365***	I(1)
ΔREP	-4.459287***	-4.441802***	-8.703764***	-8.681126***	I(1)

Notes:

i. *** (0.01 level of significance), ** (0.05 level of significance) and *(0,1 level of significance.

ii. Δ is the first difference symbol

Source: *Author's Computation using Eviews 7 Econometric Package*

Table 2 and 3 indicates that all variables were regarded as non-stationary at their levels at 5% level. The variables were tested for stationarity at first differences (Table 3). The results indicated that all variables are stationary. The results confirmed therefore that differencing once was all that was required to bring these variables to stationarity at all levels of significance. This suggests that our variables are integrated of order one ***I(1)***. Having established the order of integration and time series properties of the variables, cointegration tests were conducted. The optimal lag order was determined empirically. The results are reported in table 4.

Table 4: Lag Selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4686.177	NA	2.27e+28	82.31889	82.46290	82.37733
1	-3948.172	66.58531*	5.02e+23*	70.00302	71.01109*	70.41214*
2	-3880.151	120.5291	1.83e+22	69.44124	71.31337	70.20103
3	-3840.199	1385.377	5.51e+22	69.37192*	72.10812	70.48239
4	-3814.874	39.54267	6.81e+22	69.55920	73.15946	71.02034
5	-3783.873	45.14192	7.74e+22	69.64690	74.11122	71.45872
6	-3746.432	50.57882	8.03e+22	69.62161	74.95000	71.78410
7	-3715.716	38.25941	9.63e+22	69.71432	75.90677	72.22749
8	-3675.057	46.36587	1.00e+23	69.63258	76.68909	72.49642

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Based on several criteria (AIC, SIC, FPE, LR and HQ), a lag order of 1, which produced a stable VECM, was selected. The Johansen test proved evidence of three cointegrating vectors.

Table 5: Johansen cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.7532	226.58	159.52	71.371	52.362	0.0002
At most 1 *	0.6136	155.21	125.61	48.505	46.231	0.0281
At most 2 *	0.5511	106.71	95.753	40.854	40.077	0.0408
At most 3	0.4278	65.857	69.818	28.476	33.876	0.1924
At most 4	0.3248	37.381	47.856	20.032	27.584	0.3389

At most 5	0.1818	17.348	29.7970	10.236	21.131	0.7221
At most 6	0.1224	7.1120	15.4947	6.6591	14.264	0.5302
At most 7	0.0088	0.4529	3.84146	0.4529	3.8414	0.5009

Notes:

i. Both Trace test and Max-Eigen Statistic indicate 3 Cointegrating equations at 0.05 level of significance.

ii. * denotes rejection of the null hypothesis at 0.05 level of significance

iii. The series of estimation are sqr(vol), vol(x), cpi, rep, smi, fip.

iv. Critical values are from Mackinnon-Haug-Michelis (1999).

v. The results are based on the assumption of a constant linear trend in the data with optimal lag length 2.

Source: Author's Computation using Eviews 7 Econometric Package

The Johansen cointegration test indicates that there are three cointegrating equations. This thus suggests that there is a long-term relationship between the variables of interest. Having established cointegration, a Vector Error Correction Model (VECM) normalised on the volume of bonds traded was estimated and the long run regression results are provided below:

$$VOL_t = -167.1515 - 69.91792CPI - 63.77442REP + 122.4371EX - 0.00071SMI + 0.000426FIP - 0.000380Dummy$$

	(14.2160)	(14.9744)	(17.4211)	(0.00306)	(0.00039)	(0.00011)
	[-4.91826]	[-4.25889]	[7.02808]	[-0.26132]	[3.08380]	[-3.32269]

Notes:

( ) standard errors

[ ] t-statistics

The empirical results show that all macroeconomic variables (except stock market index) are significant in the long-run. CPI is significant and correctly signed. This is consistent with the apriori expectations. An increase in the inflation rate results in the central bank increasing the repo rate to reduce inflationary pressures. An increase in the repo rate will thus lead to an increase in the risk-free rate and hence a decrease in the bond price since there is a negative relationship between bond price and yield. This is likely to result in a reduction in the volume of bonds traded in the secondary bond market as bonds will not be a "lucrative" investment. This is consistent with He and Nasser (1999), Andritzky et al. (2007) and George and Longstaff (1993). The exchange rate (EX) is correctly signed and significant. This again conforms to the apriori expectations. The appreciation of the ZAR against the US dollar will mean an increase in bond returns. The foreign investor participation (FIP) variable again is significant and positively signed. An increase in the number of foreign investors means an increase in the number of participants in the bond market and hence liquidity. This can be attributed to the role played by foreign investors in the South African bond market as they are net buyers of bonds.

The stock market index (SMI) even though insignificant, is negatively related to the volume of bonds traded. This is consistent with theory and empirical evidence as pointed by He and Nasser (1999). Theoretically bonds and stocks are regarded as securities which investors can invest in. Given that there is a budget constraint, an increase in funds allocated to bonds means a reduction in funds allocated to equities. The repo rate (REP) is significant and correctly signed. The negative impact of the repo rate on market bond liquidity can be best interpreted with reference to institutional investors who are very sensitive to changes in the inter-bank rate, which determines the return on short-term investment. Many of the investors are mutual funds and investment companies who must invest their limited funds in the securities for the best use. When the repo rate increases, the short-term investment become more attractive than bonds, institutional investors would invest more funds in short-term investment instead of bonds. Thus, the investors would purchase fewer bonds when the repo rate is high. The results on the dummy variable are also consistent with the apriori expectations. The empirical results reveal a statistical significant negative relationship between the measure of the crisis and bond market liquidity in South Africa. This suggests that the global financial crisis had a negative impact on the liquidity in the bond market in South Africa. Having established the presence of cointegration, the VECM was estimated to determine the speed of adjustment as well as well as the interaction between the variables in the short-term. The results are illustrated in table 6.

Table 6: The Vector Error Correction Model

Error Correction:	SQR(VOL)	D(VOLX)	D(CPI)	D(REP)	D(EX)	D(SMI)	D(FIP)	D(Dummy)
CointEq1	-0.3798	-0.0033	-0.0014	-0.0013	0.0009	-0.2263	105.64	0.0221
	(0.1234)	(0.0013)	(0.0009)	(0.0005)	(0.0005)	(2.2298)	(66.94)	(0.0324)
	[-1.059]	[-2.495]	[-1.599]	[-2.664]	[1.9125]	[-0.1015]	[1.578]	[0.6820]

The VECM indicates that the speed of adjustment of the volume variable is 38%. This shows that in the case of disequilibrium, about 38% of it is corrected within a month. The short-term relationship between variables was also illustrated by means of the correlation matrix shown in Table 4.

Table 7: Correlation matrix

	SQR (VOL)	CPI	REP	EX	SMI	FIP	Dummy
VOLUME	1.0000						
CPI	-0.1228	1.0000					
REP	-0.0031	0.2589	1.0000				
EX	-0.2134	-0.4510	-0.2118	1.0000			
SMI	-0.2937	0.0435	-0.3524	-0.2545	1.0000		
FIP	0.8938	-0.1254	0.2553	-0.0586	0.2321	1.0000	
Dummy	-0.1250	0.2345	0.3254	0.1245	-0.2135	-0.2134	1.0000

Source: *Author's Computation using EVIEWS 7 Econometric Software*

Table 7 presents the contemporaneous relations between innovations in the variables. It is evident that innovations in the REP are negatively related with liquidity of the South African bond market as measured volume of bonds traded. This is consistent with results of Goyenko et al. (2011). The same applies to CPI, EX and SMI which drain liquidity in the bond market as indicated in the correlation matrix. The negative correlation between EX and Volume points to the negative effects of exchange rate volatility. On the other hand, shocks on FIP are positively correlated with liquidity in the South African bond market. In consonance with theoretical expectations, the correlation between VOL and FIP which is the highest supports Shanaka (2010)'s propositions that foreign investors do play an important role in enhancing liquidity in secondary bond markets.

Impulse Response: The impulse response functions were conducted to analyse the short-term interaction between the variables. The impulse responses show the dynamic response of each variable to a one-period standard deviation shock to the innovations of each variable. The interpretation of the impulse response function does take into account the use of the first differencing of the variables as well as the vector error correction estimates. Thus, a one-time shock to the first difference in a variable is a permanent shock to the level of that variable. The results are reported in the appendix. Of particular interest in this study is the dynamic response of Volume (SQR (VOL)) of bonds traded to themselves and to innovations in each macroeconomic variable. The response of SQR(VOL) to REP is consistent with the apriori expectation as innovations associated with an increase in the repo rate decreases the volume of bonds traded in the fourth period and remain below the base line. The same applies to innovations in CPI which negatively impacts the liquidity of the bond market. Innovations in FIP results in a mixed response in bond market liquidity. On the other hand the results indicate that the shock from the crisis was significant within the first month, however it died down within three months after the shock. This is consistent with the South African experience in which the bond market boomed at the height of the crisis though initially it constrained liquidity in the market.

Variance Decomposition: The variance decomposition was also constructed to analyse the short-term interaction between the variables. Brooks (2008) argues that variance decompositions give the proportion of the movement in the dependent variables that are due to their own shocks, versus shocks to the other variables. A shock to the i^{th} variable will directly affect that variable and will be transmitted to all of the other variables in the system through the dynamic structure of the VAR. The results are reported in table 8.

Table 8: Variance Decomposition

Period	S.E.	VOL	CPI	REP	EX	SMI	FIP	Dummy
1	243274.9	88.79173	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
5	466966.6	76.14309	3.724590	2.665595	0.230561	0.843141	0.758702	0.144287
10	645046.0	75.52186	4.314766	2.692886	0.292055	0.517940	0.419962	0.083101
15	784358.4	75.47185	4.461891	2.643943	0.318842	0.394271	0.288390	0.057006
20	902507.4	75.42723	4.538723	2.630433	0.334355	0.332058	0.221644	0.043280
24	986902.4	75.40366	4.578295	2.624119	0.342146	0.300484	0.187867	0.036339

As indicated in table 8, the variance decomposition of the volume of bonds traded were constructed with a 24 month horizon using Choleski decomposition method in order to identify the most effective instrument to use in targeting each variable of interest. This helps in separating innovations of the endogenous variables into portions that can be attributed to their own innovations and to innovations from other variables. Results indicates that the predominant sources of variations in the volume of bonds traded of between 89 per cent and 75 per cent of the forecast errors is own shocks. Innovations in CPI and REP are other important sources of forecast error variance in SQR(VOL) as far as macroeconomic factors are concerned. Consumer Price Index (CPI) on the other hand increases from the short-term, through the medium and long-term. FIP, SMI EX and the dummy variable are relatively insignificant throughout the twenty four months. The results suggest that own shock explains the greater part of the variability of bond market liquidity as measured by the volume of bonds traded.

VEC Granger Causality/ Block Exogenity Wald Test: The interest of this section is to examine the causal relationships between the volume of bonds traded and foreign investor participation, CPI and the repo rate. The results are presented in table 9.

Table 9: VEC Granger Causality Tests Results

Dependent variable: Volume of Bonds Traded			
Excluded	**Chi-sq**	**Df**	**Prob.**
FIPB	4.090821	2	0.0293
EX	5.530427	2	0.0170
REPO_RATE	4.345690	2	0.0413
All	6.695495	6	0.0099

Of great importance in the study was to analyse the causal relationship between the volume of bonds traded and the selected variables. The results suggest that there is evidence of a unidirectional causality from foreign investor participation, the exchange rate and the repo rate. These results are in consonance with the previous estimations. Jointly also the results are significant too. This emphasises the importance of macroeconomic stability in South Africa to enhance liquidity in the South African bond market.

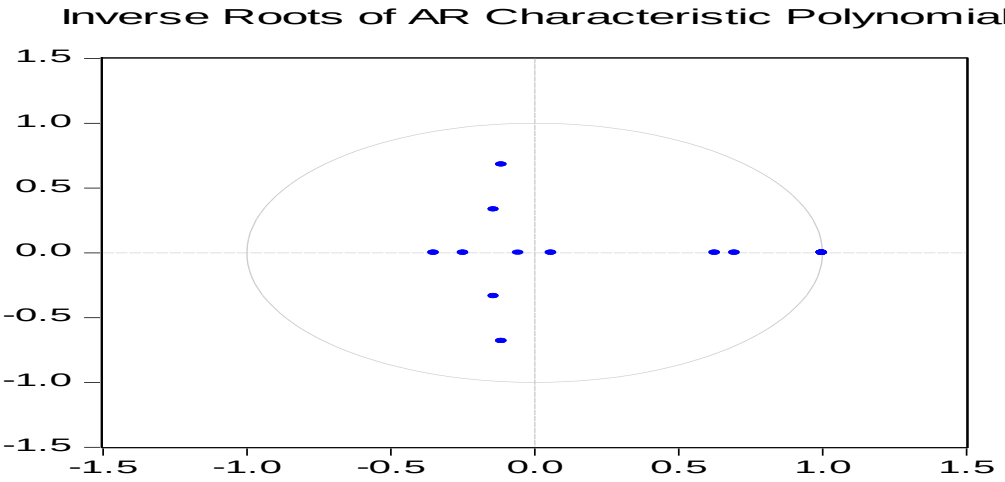
VAR Diagnostic Checks: The model employed in the study was subjected to rigorous tests to further examine the validity of the results. The results are reported in table 10 and Figure 1.

Table 10: Diagnostics Tests

Test	Test statistic	p-Value	Conclusion
Jarque-Bera	18.55907	0.1520	Residuals are normally distributed
Breusch-Godfrey	0.815606	0.6651	Residuals are not Serially Correlated.
ARCH LM	71.37372	0.2461	Residuals are Homoscedastic

Table 10 indicates that the model does not suffer from non-normality. Therefore the null hypothesis of normality cannot be rejected. The null hypothesis of no serial correlation could not also be rejected. The result of the White Heteroskedasticity (no cross terms) p-value is 0.1415 implying that the null of homoskedastic residuals cannot be rejected. The AR Roots graph in figure 1 indicates that all roots lie inside the unit circle which indicates that our restricted VAR is stable.

Figure 1: Diagnostic Tests for the Stability of the VEC Model



5. Conclusion

The study analysed the determinants of liquidity in the South African bond market employing the Johansen cointegration test and the VECM model. The empirical results suggest that volume of bonds traded is negatively related to innovations in inflation, repo rate, exchange rate volatility and the stock market index. On the other hand the volume of bonds traded was seen to be positively related to an increase in foreign investor participation. These results were consistent with theoretical predictions as well as prior empirical analysis (Goyenko et al., 2011; He and Nasser, 1999). In terms of policy choice, authorities should keep inflation at low and stable levels as well as maintain a stable currency. These will boost bond market liquidity. Removing restrictions on foreign investor activities should be encouraged as their activities do have a positive effect on bond market liquidity. The negative relationship between the stock market index and volume of bonds suggest that the bond market as an investment is affected by developments in the stock market. Policy makers must therefore be aware of the implications of policy measures that promote one market at the expense of the other depending on the stage of development of the financial market and the structure of the economy.

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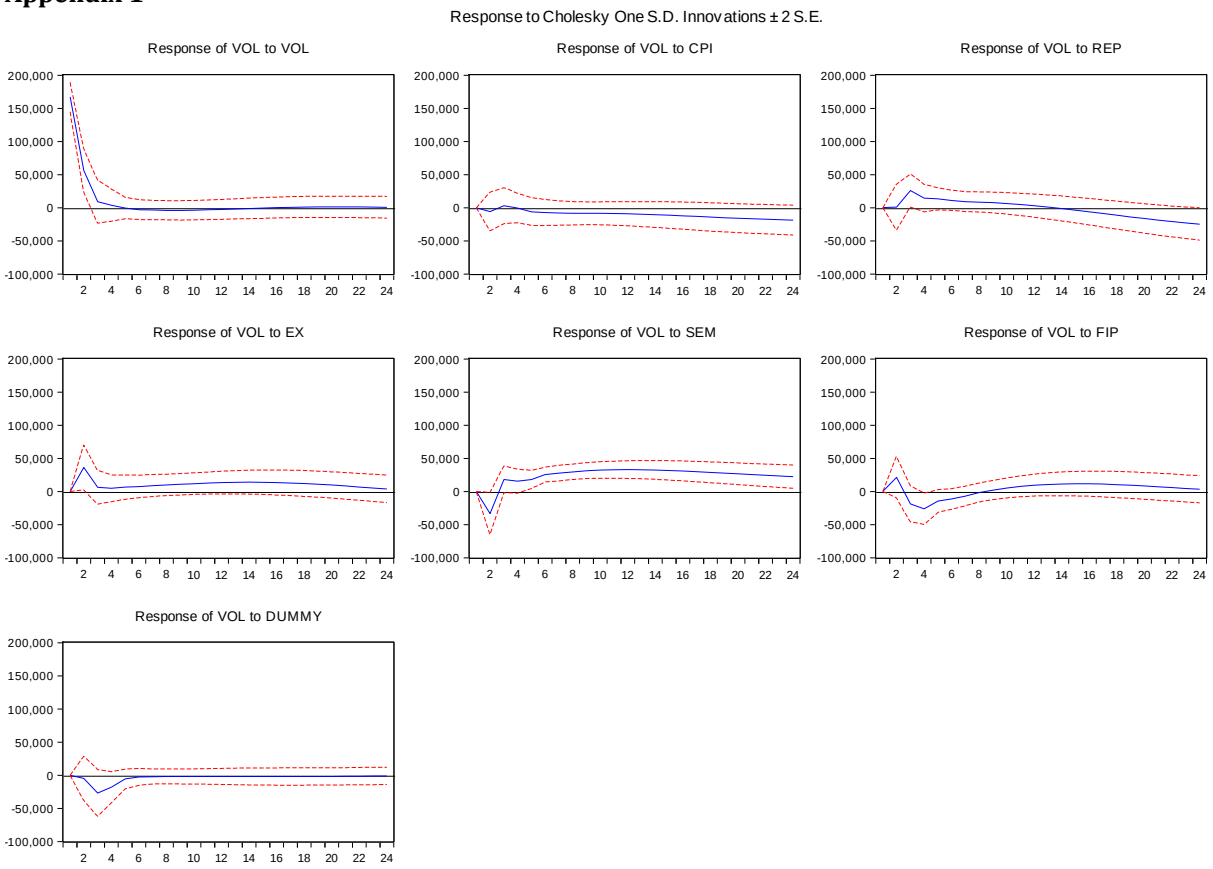
Appendix 1



The Influence of Working Capital and Organization on the Financial Performance of Small-Sized Enterprises in Jayapura City

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Abstract: This study aims to identify and analyze the influence of working capital and organization, on the financial performance of Small-sized enterprise in Jayapura City. Data collection methods used were observation, interviews, and questionnaires. Data were analyzed by applying SEM (structural equation modeling analysis method by making use of Amos Software. The results showed that the factors of working capital factor affect the financial performance of small-sized enterprise in Jayapura. Then the organization factor does not affect the financial performance of small-sized enterprise in Jayapura.

Keyword: *Working capital, Organization, Financial Performance*

1. Introduction

Considering the significant of studying small enterprises, it is necessary to know the level of company's performance through strategic perspective approach. By knowing the level of company's performance, it can be used as a guide for those who will participate in supporting small enterprises. This could be seen from an internal capability of each company group and the role of aid that has been given (based on internal conditions owned by each company), so that the description of what internal and external factors that are most dominant in managing small business development, especially in Jayapura city can be seen clearly. In addition, in the course of business undergone by a small company, it cannot be separated from the result of the policies and programs of government aid. But the Government's policy made indirectly has resulted in conditions that encourage to grow larger. This can be proven by many large companies that affiliate with small enterprises, especially small industrial goods so that small enterprises can run more efficiently. In the current competitive situation like this, an entrepreneur must be able to formulate internal strengths in business strategy by performing a combination of the opportunities and threats of the external environment. Until now it seems the conditions in small companies still have weaknesses in determining business strategic and tactic (Stifung & Sutaryo-Rachman 1991: 88).

Tambunan (2002: 19) states that the performance of small and medium enterprises in Indonesia is still low. This is due tothe weakness of management, marketing, capital, technology and human resources owned by those small enterprises. While some expressed the opinion that the factors causing the lack of success of small enterprises is the in ability of the management, weaknesses in decision making, lack of experience, lack of financial oversight and the weakness in marketing (Scarborrough & Zimmerer, 1993:38) In addition, in the courseof business undergone by a small company, it cannot be separated from the result of the policies and programs of government aid. But the Government's policy made indirectly has resulted in conditions that encourage to grow larger. With the rapid economic growth and current business developments, as well as the opening of a free market situation. With the number of items offered and increasingly intense competition, the company is required to be innovative in improving management and production as well as the structure of financial wisdom, than the government took measures to open up opportunities for businesses in certain circumstances it can also be an opportunity or instead can be a threat to small companies.

Seeing the importance of small businesses assess this, it is necessary to know the level of performance of the company through a strategic perspective approach. By knowing the level of performance of the company, it can be used as a guide for those who will participate in supporting small businesses. This can be seen internal capability of each group company and the magnitude of the role of aid that has been given (with the internal conditions of each owned), so that it can be seen picture of internal factors are most dominant in the handling of small business development, especially that there is in the city of Jayapura. Each company has a goal to be achieved. This goal is particularly important for the survival of the company in the future. The company would not be made for a period of one month or one year. For the sake of survival, then each company trying

to acquire and allocate limited resources to achieve its objectives. This allocation process must be done in a manner that is efficient and effective, meaning that any resource that is sacrificed is expected to provide financial and non-financial incentives in the future (Cost <benefit). The purpose of the financial indicators such as earnings, cash flow and growth. While the purpose of the non-financial indicators in the form of image in the eyes of the public, consumers, competitors, governments, employees and other stakeholders, bergaining position in the competition as well as political and non-financial matters more. In the corporate finance theory, companies that survive are the companies that create and distribute products and services at the lowest price.

Every effort must begin by giving a complete picture of the efforts that will be undertaken. With a complete picture of the efforts that will be undertaken to smooth and reduce failures. The level of business success or failure can be demonstrated by their financial performance. Other factors that may affect financial performance is the work culture, entrepreneurship and business capacity. The success of the business can be regarded as precision use of internal factors, namely skilled businessman, entrepreneur that include subordinates in the decision, the owner does not double as a manager. Skills and sufficient knowledge of subordinates in the field of business, ease of funding and strong management teams. Factors management capabilities to bring the company into prospective is also an important factor, even the capability of the management group and the strength coaches from outside (government) and the availability of funding is also the thing that makes the company successful. If the company succeeds, it means having a high performance (Bruno et al., 1987: 73).

The opinion indicates that the company's success are common and often associated with the decision-making process. The decision-making process a lot of coloring on factors engineering and business skills, the ability to anticipate business, help increase the knowledge and skills of outsiders and timeliness in processing business opportunities at the management level. Based on the description given on the background of the problems presented earlier, the main problem the research wants to find a solution and the answer can be formulated as follows:

- Does working capital factor affect the financial performance of small – sized enterprises in Jayapura city?
- Does the organizational factor affect the financial performance of small – sized enterprises in Jayapura city ?

Based on the background of the study and the statements of the problem that have been described above, the overall objectives of this research are:

- To analyze and examine the effect of working capital on financial performance of small – sized enterprises in Jayapura city.
- To analyze and examine the effect of organizational factor on the financial performance of small-sized enterprises in Jayapura city.

2. Literature Review

Pablo(2003) divides the company valuation method into (1) a method based on balance sheet. (2) A method based on the income statement that is a multiple or a relative valuation, PER, sales and Price / EBITDA. (3) A method based on the goodwill that is the classical method. Performance measurement mechanism frequently used is financial ratio to look at the effectiveness and efficiency of the use of capital and according to Ruru (1995: 15). There are at least three reasons underlying the developing countries that recently considered the importance of the existence of UKM (SMEs/small and medium enterprises) and the flow of income (profit) generated by the operating companies, provide funds for future investment and give the company the ability to pay short and long term loans. This will result in higher profitability for the company.

Baronet & St-Pierre (2004) stated a positive relationship. Several researchers have looked at the relation between innovation and performance and its imp act on the competitive advantage (Verhees &Meulenberg, 2004). The result of Chung & Shin (2003) showed that Korean capital markets reflect macroeconomic variables such as production index, exchange rate, trade balance and the supply of money. Cheng (1996) found that there is a relationship between these factors and the capital market factors and economic forces

both on the stock market in the UK and US. Pakpahan argued, as he defined the ability to compete is competing measured by the cost of production. The lower per unit cost of production of a product is then it is said to have the competitiveness of the products produced. Resource Based View of The firm (RBV) combines the company's internal analysis with external analysis of the industry and competitive environment. RBV can explain managerial technology. By applying RBV approach, the company will be able to identify objectively determinant in their competitive advantage. This is similar to the research conducted by the researcher of this study. The similarity deals with the quality and ability to compete. Performance measurement mechanism that is often used is the financial ratio to look at the effectiveness and efficiency of capital use and according Ruru (1995: 15) ROI (Return On Investment) is one of the effective management tool in evaluating the business value and at the same performance-ratio manajemen.Rasio the is Return on assets (ROA) and return on equity (ROE), both the instruments giving different results, because the ROA reflects the overall efficiency and effectiveness of the use of assets / wealth of the company to generate profits, while ROE describes the ability to create profits by using the whole capital itself. Based on the results of these underlying differences in doing research that separates the measuring instrument ROA and ROE in researching corporate performance company.

Banz (1981), find stocks of small companies as measured by the market value of equity would have adjusted earnings higher systematic risk than companies with large capitalization.Basu (1983), found in the NSYE, stocks with a Price Earning Ratio of high yield higher revenues than stocks with low earnings Price Ratio.Ely and Robinson (1989), concluded inflation as macroeconomic indicators negatively correlated with stock prices. In the era of high inflation caused stock prices to decline. Despite having the same pattern but the impact of inflation on stock has a different effect. Benu (2002), found:1. The change should be carried out by actually giving primary attention to the little people through operational programs are real and capable of inducing productive economic activities at the level of the community while fostering the entrepreneurial spirit. There is no denying that build community economy requires political commitment (political will),2. Some empirical studies show that the general problems faced by Small and Medium Enterprises and Cooperative are: lack of access to resources and capital permbiayaan, limited mastery of technology and information, market access limitations, the limitations of the organization and management.

Muthusamy and Palanisamy (2004), menyatkan that organizations that build competitive advantage must create and improve their ability in terms of: (a) create new knowledge (2) transfer at any level and parts of the organization. The organization must be constant learning of: (a) The external environment (b) internal environment to creatively manage the opportunities and threats in the future from the standpoint of current business conditions. Bresser and Millonig (2003), argues that the institutional environment will affect the competitive advantage. Changes in the internal structure also affects the competitive advantage. Ireland and Hitt (1999), argues Effective strategic leadership practices can help firms Enhance performance while competing in turbulent and unpredictable environments. (strategic leadership practices that effectively help companies achieve performance even in a competition in a dynamic environment and unpredictable). So it can be concluded that the policies of the organization will have an impact on financial performance and competitiveness of enterprises. Organizations as internal elements will provide the ability for leaders or employers and employees to act efficiently and always strive to maintain and improve their competitiveness in order to continue to survive.

3. Methodology

This study is trying to test the effect of the correlation between human resource management, production, marketing, finance, government policy organization, competitors on the performance of the company in improving the competitiveness of small enterprise in Jayapura city. This study used correlation analysis

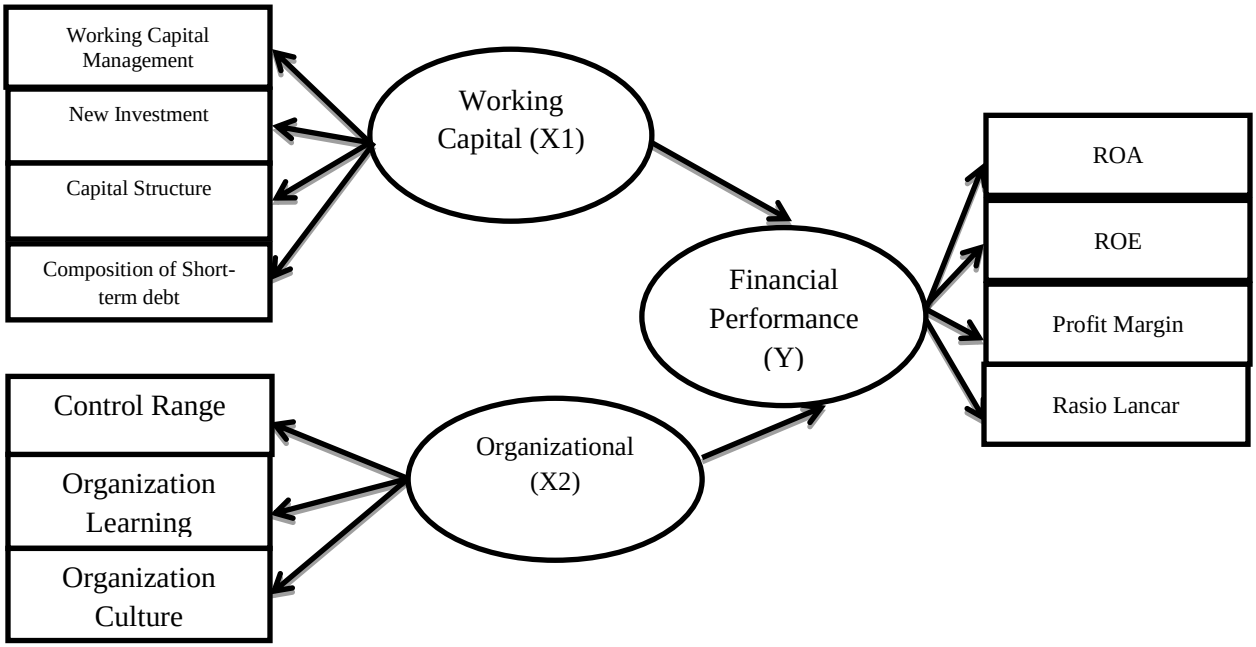
Hypotheses are as follows:

- Working Capital factor affects the financial performance of small enterprises in Jayapura city.
- Organizational factor affects the financial performance of small enterprises in Jayapura city.

The analysis method used is SEM using AMOS software. This study used Structural equation modeling (SEM), using the program Amos ver, it can explain the interrelationships among compound relationship

simultaneously and the ability to assess the relationship comprehensively and led the research design changing from exploratory research into explanatory one (Hair., 1992).

Figure 1: Conceptual Framework



4. Results and Discussion

Affect Working Capital Factors the financial performance

For the test results influence factors of working capital to the financial performance factors are presented in Figure.1

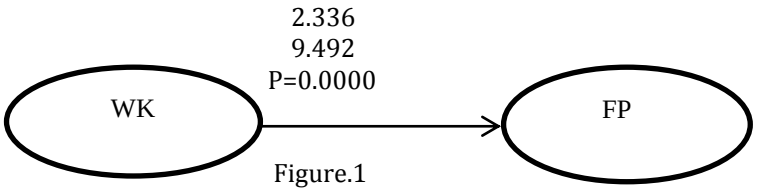
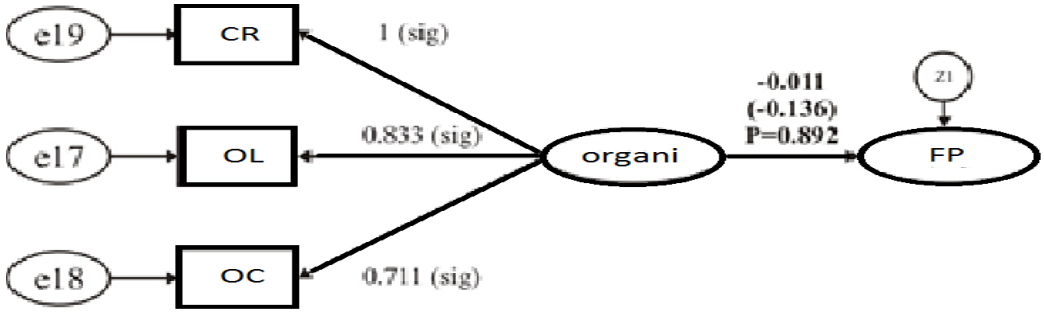


Figure.1

Influence Working Capital factors to the Financial performance

The analysis showed that the working capital factors directly influence firm performance factors. It is powered by a probability value of 0.000 (0%) and the value of the critical ratio (t-test) of 9.492 A probability value is below 5% For the results of testing the influence of organizational factors on the financial performance presented in Figure. 2

Figure 2: Influence Factor Against Organization Financial Performance



The analysis showed that organizational factors do not directly affect financial performance. It is powered by a probability value of 0.892 (89.2%) and the value of the critical ratio (t-test) of -0136. This probability value above 5%.

Table 1: Direct Effect

No	Direct Effect	Critical ratio	Probability	Note
1	Working capital factor → financial performance	9.492	0.000	Affected
2	Organizational factor → financial performance	-0.136	0.892	Not affected

Source: Analysis Results

Working capital factor is measured by four indicators. Those indicators are first, working capital management. It is the amount of working capital divided by total assets. The second is new investment. It is additional new investments on average per year. The third indicator of capital structure is debt divided by assets, and the fourth indicator is composition of short-term debt. It is the short-term debt divided by total debt. Based on these four indicators, the research findings showed that working capital affects the financial performance of small sized enterprises in Jayapura city. These results confirm research from Paminto (2005), he found that partially, the relationship between financial capability with business performance shows the path coefficient 0,363 with a significant level of 0.004, so that the significant effect of financial capability is acceptable. These results indicate if the financial capability has improved the performance of its business will also increase, and vice versa if not more effective financial management, the business performance will menurun.Beberapa research that supports, among others Zanariah (1999) found that the capital structure has a significant influence on ROE. The results also indicate indicators appropriate financial capability to predict the performance of the business. Helferd (1995: 257) concludes that there are three (3) major decision in financial management to create shareholder value, namely: (1) investment decisions, (2) operating decisions, and (3) spending decisions. Thirdly this decision will affect the financial performance.

Organizational factor is measured using three indicators. The first is control range. It is an effective ability of leaders to control their employees. The second is the organization learning. It is the organization's will to always learn from failure. The third indicator is the organizational culture. It is the enterprise adoption of quality oriented values. Based on those indicators, the research findings showed that the organization has no effect on the financial performance of small sized enterprises in Jayapura city. These results indicate that control range, organizational learning and organizational culture do not have an impact on financial performance. Small enterprises also have cultural organization that does not develop properly so it does not affect the financial performance directly.

5. Conclusion and Recommendations

- It is expected that the government of Jayapura city is able to do empowerment of new entrepreneurship in which the direction is focused on trained and developed business practitionerdirection of the target offenders who nurtured and developed, so that the growth of new entrepreneurship will be able to increase labor and reduce unemployment. The assistance program in the form of training provided by the government of Jayapura city should be planned carefully to the needs in field of business without targeting on quantity but rather on the quality of the training itself.
- It is expected that small -sized enterprises in Jayapura city improve more efficiency and productivity that are done so that the selling price is relatively low while still maintaining product quality even with better quality, so that it is able to compete with the capabilities owned by company owner and it is followed by the owner's ability to do innovation of products produced by small-sized enterprises.
- It is expected that small businesses in Jayapura city are able to develop capabilities in the field of informal education such as training for company owners and employees because having better knowledge combined with existing experience will produce better performance and increase

competitiveness. Employers need to be provided expertise in the fields of management, marketing, finance and technology to face more competitive competition..

- It is expected that the government of Jayapura city makes it easy for small - sized enterprises in obtaining capital structure that is used so that the performance of small businesses in Jayapura city will be able to be superior and to develop, because it has a stronger capital structure. Small-Size enterprises should always improve their own management capabilities, along with the growth of its business. They should be well-prepared in planning position rolling position to avoid industrial doubt the industry.
- Having been proved that factor working capital affect the financial performance, therefore, the managers of small-size enterprises should pay more attention to these factors on the financial performance. .
- Advanced research aimed to examine this area is suggested to expand population and sample in the area and the type of its business. The indicators provide an important role as indicators of the construct or latent variables should also be expanded.

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Examining Moral Reasoning and Transactional Leadership behaviour in the Nigerian Public Sector

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Abstract: The relationship between moral reasoning and leadership style has received considerable attention for decades, however this has been not fully explicated as different leadership styles elist different ethical values. What constitutes moral behaviour is conflicting and subjective. This study examines public leaders' degree of moral judgment associated with leadership styles in a public sector organization. To test the hypothesized relationship, data were collected using questionnaire survey distributed to 550 workers out which 300 were found worthy to be used. The Defining Issues Test (DIT2) and the Multifactor leadership questionnaire (MLQ X5) were completed by leaders and subordinates respectively. The PLS path analysis of the structural model indicates significant statistical relationship between cognitive moral development (CMD) and transactional leadership style (TSL) (β= -0.214, P< 0.012). However, we argue that cognitive moral development is amiable to the individual qualities of the leader that might necessitate the application of particular leadership style and behaviour. We also found collaboration evidence that leaders high in cognitive moral development are perceived more as transformational leaders by their subordinates. Finally, we suggest that the dichotomies between moral reasoning and leadership style are hinged more on individual leadership values and motivational beliefs.

Keywords: *Moral reasoning, Transactional leadership, Public Sector*

1. Introduction

This paper addresses the linkages between moral reasoning and transactional leadership style, suggesting that public leaders' degree of moral development arouses different motivational values and style of leadership (Burns, 1978). This relationship has attracted the attention of scholars and practitioners for ages. Today, viable and credible organizations have embraced the ethical reasoning and behaviour mantra for higher productivity. and effectiveness (Avolio & Gardner, 2005). The role of leaders in motivating and inspiring subordinates is well documented (Avolio, Bass & Jung, 1999). Leadership capacity in influencing or enhancing the ethical reasoning of subordinates is not in doubt, thus Leadership is mirrored through a person's morals and values, because the awareness of his beliefs and values motivates and acts as his moral conviction and reference point in decision making (Kouzes & Posner, 2006). We examine the relationship between moral reasoning and transactional leadership style in order to give an insight or broaden the knowledge of its potentials as a factor that may have influence on the type of leadership style in use by an organization. the importance of ethical dilemmas in organizations and the world at large manifests in the growing body of literature on conflicts and dilemmas which impacts greatly on decision making.

Today, the perception is now more of a reality that the ethical decline in the public sector is on the rise with high consequences both for the sector and its leadership (Balogun, 1997). Kohlberg's cognitive, moral development theory remains the bedrock of most research on ethical reasoning applied to assess the stage of reasoning of managers (Fleming, Chow & Su, 2010; Adams & Dalfour, 2005). Individuals rationalize their decisions based on normative ethical theories (Dibie, 2007), and the dominant ones are ethical egoism, utilitarianism, deontology, the ethics of care, rights theory and justice theory (Derry & Green, 1987). Aristotle (384-322) and Plato (380 BC) both gave an insight into features of justice for man and state, advocating for virtues and moral well being of others. The public sector, especially civil service as a concept connotes a permanent body of officials responsible for the execution of programs and policies of government (Balogun, 1997), who are staff of various ministries or departments under the executive arm of government (Beh, 2011). Ethics as a concept means standards of what is right or wrong motives and its consequences (Brown, Trevino & Harrrison, 2005), a set of values and norms that relates to human conduct as appropriate or inappropriate (Sorkaa, 2003) and in the public service achieving a private gain to the detriment of the citizenry is a good example of unethical conduct (Chinua, 1983).

Ethics equally is a matter of value judgment on professional and occupational beliefs and morality (Barnett & Brown, 1994), which are the normative values underpinning the public sector, these are ethical values that upholds the fabric of efficiency and service delivery within the sector (Barling & Kevin, 2000). Therefore, effective and efficient management of resources and accountability is a global phenomenon, especially in a developing economy as Nigeria (Collier & Vincent, 2014). Research has attributed the leadership crisis and failure in the Nigeria public sector to a lack of ethical practices and behaviour among the leaders (Achebe, 1983). Although most of the values usually linked to ethics in the public, are usually examined independent of the broader issue of leadership (Turner, Kaspesun, Matson, McCarthy, Correl, Christensen & Schiller, 2003), and the major objective of this study is to empirically examine the influence of moral cognition development on transactional leadership behaviour in the Nigerian public sector. Thus, there is the need to further understand this relationship and how it impacts on style and ability of leaders to nurture public organizations of integrity that enhances trust of the subordinates and the entire citizenry through the application of ethical practices and moral leadership behaviour.

Transactional leadership Style: A variety of definitions exist in literature on leadership study, leadership is described as a group of people performing one activity or the other to achieve a common purpose (Yukl, 1999; Judge & Piccolo, 2004). Over the years, many other definitions were added, the fact remains that leadership is a two-way approach that involves the leader and the subordinate (Jurkiewiez, 2005). Leadership has equally been described as the capacity to influence followers or subordinates towards a mission or vision (Hope & Ronald, 2005), and this could happen within an organization formally or informally. However, for a leader to achieve formal influence on subordinates, he must be in a position of authority (Reiman, 1990), and informal influence takes place when an individual gets a responsibility. Transactional leadership is about performance based on what leaders and subordinates gives to each other (Bass, 1985). Proponents of transactional leadership and its ethicality argue that it spells out rules, while using reward and discipline (Kuhnert & Lewis, 1987; Kanungo, 2001). Literature have evidenced that transformational leadership behavior is significantly positively related to follower's satisfaction (Yaun & Lee, 2011), behavior (Bass, 1988), performing above the limit and general effectiveness (Turner et al., 2003). while the later or transactional leadership style is a performance based on outcomes and laissez-faire has been consistently correlated negatively with performance outcome associated with subordinates (Kirkbride, 2006; Yaun & Lee, 2011). Transformational leaders could also become unethical when they pursue vested interest rather than collective interests (Yukl, 1998), on the other hand, transactional leadership has some components of transformational leadership, both represent different behavioral pattern of leadership (Fletcher & Amold, 2011). The Transactional leadership style remains the prelude to other leadership styles as leadership is about exchange, expectation and reciprocity which connote what leaders and subordinates give to each other.

Cognitive Moral Development and Transactional leadership: There are three stages of Moral reasoning, the first being preconventional morality connoting unquestioned and uncritical compliance to authority and rules. The second being conventional or maintaining norms and role obligations while the third is the post conventional morality taking a more utilitarian approach and common good (Kohlberg, 1969). Ethics are more than rules and regulations about what could be regarded as morally correct action or wrong action based on motive of an action and its consequences. It connotes the sum totality or characteristic of a given profession. Ethics could be regarded as part of the larger society as it is not only concerned with individual behaviour and moral judgment, but with all the enabling institutions and policies of leadership processes. Ethical judgment is an acceptable solution to an ethical dilemma or between conflicting systems, values, beliefs which requires that a leader must make a decision to follow in achieving a set objective (Fraedrich & Ferrell, 1992). It is important to note that each decision made by a leader is usually based on one criterion or the other, therefore ethical reasoning and ethical decisions sometimes are based on more than one ethical theory or ethical principle. For example, scholars are of the view that different ethical content will naturally invoke a different ethical reasoning approach as in cases of coercion and control; this normally will invoke the act utilitarianism ethical reasoning (Bass, 1985; Fletcher & Amold, 2011).
Kohlberg (1969) remains a reference point whenever moral judgment level is being considered, his theory of cognition (CMD), buttress the stages or processes of moral reasoning. People develop or move from the lowest to the highest stage, which is the post conventional stage, Moreover, ethical reasoning is based on individual capacity to develop to the highest level (Fritzsche & Becker, 1984; Fradrick, Thoma & Ferrell,

1994). While those, at the pre-conventional stage occupy themselves with what is right due largely to fear of punishment (stage1), or a sort of give and take (stage2), individuals at the conventional stage, do what is right based on expectation of others(stage3), By stage(4) individuals are principle minded and decides what is right due to their cherished values and standards irrespective of divergent views, at stage (5) individuals are concerned with justice, rights and faire play, while at stage (6) which is more of a theory than practicable as at now. However, Kohlberg's theory has been simplified into a manageable form (Rest, Narvaez, Bebeau, & Thoma, 1999), while retaining the core elements of the former theory. Leaders with a higher moral reasoning are admired by subordinates (Cooper, 2004). Based on motivational values, leaders usually rationalize moral decisions on certain beliefs likely to influence the observer's desire to emulate such modelled individual behaviour (Dorfman, 1996; Eckhardt, 2002; Dunn, 2006).

Ethics and Public administration: A healthy or viable civil service in this study means as earlier conceptualized the capacity to honor obligations and discharge responsibilities or functions transparently in an ethical manner through the application of ethical decision making in work situations (Dunn, 2006). On the other hand, the public's expectations are twofold (Goodling, 2003), one that the government through its officials will manage and utilize public resources for general well being of the citizenry and secondly that the official's behaviour should be above board. Moral reasoning is pivotal or the heartbeat of legitimate government in achieving and delivering the dividends of democracy to the citizenry. It was argued that ethical conditions for civil servants have been with us for long and actually came with democracy. The importance of ethics in public administration cannot be overemphasized. Moral reasoning is a fundamental element in a democracy, even the secular and the religious attests to the essence of ethical leadership for effective and efficient administration (Reiman, 1990). Citizens are right to expect efficient and effective social services from the government in areas of health-care, education system and general security of life and property as this goes a long way to foster public trust (Cooper, 2004).

Research has evidenced that public trust and confidence increases when elected and appointed leaders make ethical decisions and exhibit ethical behaviors that promote the interest and well being of the entire citizenry. Public sector leaders are influential in the formulation and implementation of public policies and programs of the government as a result of the tremendous influence they exert, public leader's decisions and actions carry a lot of weight (Dugan & Komives, 2007). However, if public officials are made up men and women of high morals, integrity, operating at a higher stage of ethical reasoning and behavioral character, the rate of ethical decline and loss of trust in the public sector will be drastically reduced or eradicated, as the public resources will henceforth be properly and judiciously managed for the benefit of the citizenry. Moreover, contingent reward is favorably disposed to ethical leadership (Kanungo, 2001), as it provides both leaders and subordinates morally sound base for mutual aspirations. In practice, both types of normative ethical theories are used, but people tend to have a propensity for one paradigm over another, what happens is rationalization and justification as one paradigm guides the philosophical purpose, psychology gives more insight into human cognition and behavioral patterns that ultimately affect ethical decision making, and prevents self-centeredness. Thus, it is posited that moral reasoning relates to transactional leadership style
Hypothesis 11: There is a correlation between cognitive moral development and transactional leadership style.

2. Methodology

A quantitative approach was adopted to examine the influence of moral reasoning on transactional leadership style in the Nigerian public sector, using employees of the Kebbi State public service as the target population, while the population frame was obtained from the State's Civil Service Commission Kebbi that controls the various ministries in the state. Kebbi State is in the North- Western part of Nigeria and it was primarily selected for this study because her enviable size as one of the most populated within the geopolitical area in the country, having an estimated population of about 10 million people out of the total estimated Nigerian population of 140 million, therefore, Kebbi State represents a viable zone in Nigeria's public sector organization. The study adopted a stratified random sampling method due to the diversity of ministries mandate and the likely diversity equally in style of leadership and individual belief system. The essence is to gain more insight into the perception of employees on leadership styles. Four ministries were randomly selected from the ten ministries that were not affected by the recent mergers and equally are the

core ministries with the largest population based on statistical report (2013). The total of employees of the four ministries is 14,337. Using the simplified Sampling table by Krejcie and Morgan (1970), a total sample size of 375 is deemed adequate for the study. However, the researcher decided to even it up to 300, the reason is to enhance a large response rate due to poor research culture.

Instrument for data collection was the survey questionnaire to achieve the desired objectives. This is in respect to the nature of the formulated hypotheses in this study. For cognitive, moral development (CMD), the DIT-2 questionnaire, which is in two parts containing the instructions and stories of ethical, social problems, as well as questions on ethical issues raised was used. The transactional leadership style was measured using the MLQ X5 (Avolio, Zhu, Koh & Bhatia, 2004). The instrument was divided into three sections, namely: Demographic factors, ethical reasoning, and the transactional leadership style. Respondents were required to answer questions on ethical reasoning/value orientation (CMD) using a 5 Likert-type scale adopted from a series of ethical dilemmas/value estimates and scenarios developed by eminent scholars (e.g., Schartz, Verkasalo, Antonovsky & Sagio, 1997; Triandis & Gelfand, 1998). The Partial Least Square – Structural Equation Modelling (PLS-SEM) software (Ringle, Sartedt & Straub, 2002), was used for the analysis of the collected data in this study. In addition, Statistical Package for Social Sciences (SPSS) was used for the descriptive analyses of the respondents. In order to measure the significance of linear bivariate between the Cognitive Moral Development (CMD) and transactional leadership. A regression analysis was used to meet the objective of the research (Coakes, 2005). The choice of PLS-SEM in this study is based on the fact that PLS suits complexities of models, due largely to its flexibility in development and validation of models (Akter et al., 2011). Therefore, PLS was chosen to establish the construct, measurement and structural models of this study.

Measurement Model: The measurement model was evaluated by assessing the convergent validity, which is measured by loading, the average variance extracted (AVE) and the composite reliability (CR) result. The result revealed good items loading above the recommended threshold (0.5) by (Hair, Black, Babin, Anderson & Tatham, 2006). Also, the result of the average variance extracted (AVE) indicates a value of 0.519 for transitional leadership style, but no value for Cognitive Moral Development (CMD), because it was measured by a single item (P-score value of the respondents). Concerning the composite reliability result which measures the internal consistency the measurement instrument, the analysis found a value of 0.811 for transactional leadership style. The values of the composite reliability are greater than the threshold value of 0.7 recommended by (Hair, Ringle & Sarastedt, 2011), which indicated an internal consistency of the instrument. In addition, the finding revealed an R-square value of 0.447 indicating that 20% variance in transactional leadership style was explained by the cognitive moral reasoning (CMD). The summary of the measurement model in this study is presented in Table 1 below.

3. Results

Table 1: Summary of measurement model Result

Constructs	Items	Loading	AVE	CR	R-Square
CMD	P-Score	1.000	Single term	Single term	
TSL	TSMBA4	0.690018	0.519	0.811	0.447
	TSMBP2	0.814527			
	TSMBP3	0.697929			
	TSMBP4	0.671236			

The analysis of the demographic profile of the respondents revealed that the largest proportion representing 72.7% of the respondents is from the ministry of education. The major percentage, 46.0% have between 1 - 5 years working experience, 36.0% have between 6 - 10 years working experience, 16.3% has between 11 - 15 years of working experience, only 1.7% of the respondents have more than 16 years of service experience. On the hand, 67.0% of the respondents are male, while 33.0% are female. More so, the majority of the respondents are Muslims 66.7%, 25.3 are Christians, while 8.0% are in the group of other religions. Concerning the age of the populations, 32.0% range between 30 – 39 years, 36.7% are between 20 – 29 years of age, 17.3% are between 40 – 49 years of age, while 14.0% are more than 50 years of age. Furthermore,

29.3% of the respondents are officers in senior executive of their respective organizations, 43.0% made up the chief executive, while supervisors are 14.3, and the remaining 13.3% are at a non-supervisory officer grade position. In the aspect of the respondents' educational qualification, 42.0% of the respondents have master degree, 18.0 % have a bachelor degree, 37.3% are doctoral degree holders, while the remaining 2.1% have diploma qualifications. The result of the demographic analysis is presented in Table 2 of this study.

Table 2: Respondents demographic features

Constructs	Items	Frequency	Percentage (%)
Ministry	Ministry of Education	218	72.7
	Ministry of works and housing	53	17.7
	Ministry of health	15	5.0
	Ministry of finance	14	4.7
Work Experience	1-5 years	138	46.0
	6-10 years	108	36.0
	11-15 years	49	16.3
	16 and above	5	1.7
Gender	Male	201	67.0
	Female	99	33.0
Religion	Muslim	200	66.7
	Christian	76	25.3
	Others	24	8.0
Age Group	20-29 years	110	36.7
	30-39 years	96	32.0
	40-49 years	52	17.3
	50 and above	42	14.0
Position & Responsibility	Chief executive officer	129	43.0
	Senior executive officer	88	29.3
	Suppervisory grade	43	14.3
	Non suppervisory grade	40	13.3
Highest Qualification	Doctoral degree	112	37.3
	Masters degree	126	42.0
	Undergraduate degree	54	18.0
	Diploma level	8	2.7

Descriptive Analysis of the Respondents Cognitive Moral Development: This study used *Defining Issues Test* (DIT-2) by (Rest, Narveaz, Thoma & Bebeau, 1999), which focuses on the schema used by individual in solving ethical issues and which determine the respondent's stage of moral reasoning. The result shows that the major proportion, 151 of the respondents are at the preconventional stage of moral reasoning, 48 are in the conventional stages while those at the postcoventional stages of moral reasoning are 101. Table 3 presents the summary of the moral reasoning level of the respondents.

Table: 3 Respondents Mean DIT P-Score by Moral Reasoning Stages/schemas (N=300)

Cognitive Reasoning Stages	Frequency	Percentages	Minimum	Maximum	Mean	Std. Deviation
Preconventional	151	50.3	0.00	36.67	14.393	8.214
Conventional	48	16.0	30.00	40.00	35.069	3.369
PostConventional	101	33.7	43.33	73.33	53.171	5.743

Discriminate validity determines the uniqueness of the concept under examination in the study's model (Hair et al., 2011) by comparing the square root of the average variance extracted, with the co relational values of each latent variable in the model. The result indicated that the AVE value of each construct is greater than its correlation with any other constructs in the model which shows that discriminant validity was achieved. Table 4 presents the results.

Table 4: Discriminant Validity Result

	CMD	TSL
CMD	Single Item	
TSL	-0.057	0.730

Source: survey 2015.

Structural Model: In testing the stated research hypotheses in this study, the structural model was assessed through the PLS path analysis. The result of the standard path coefficients (β), standard error, P-value, and the decision taken on the hypotheses found that there is statistical significant relationship between cognitive moral development (CMD) and transactional leadership style (TSL) (β = -0.214, P= < 0.12) in the Nigerian public sector.

Table 4: Hypothesis Testing

Path Coefficients	Beta	Std Error	T-Value	P-Value	Decision
CMD -> TSL	-0.214	0.051	4.199***	0.012	**Supported**

Discussion: This study gave an insight into cognitive moral development and transactional leadership styles and observed significant statistical relationships between them. Thus, it contributed to the ethical foundation of leadership dimensions with contingent reward being perceived as a moral procedure in leader and subordinate relationship. Most studies investigating transactional leadership, morality and ethics are usually done by assessing only behavioral items. Transformational leadership style on the other hand has always had a positive outcome on followers behaviour more that transactional leadership style, which is in line with other findings (e.g., Brown, Trevino & Harrison, 2005; Judge & Piccolo, 2004). Moreover, adopting the application of the (MLQ-5X), (Bass, & Avolio, 2000), which is not an all encompassing of morality measure for both leadership styles tends to inhibit true pictures of research findings. Contingent reward is equally linked to transformational leadership in most empirical studies (Judge & Piccolo, 2004), and provides core management ingredients for mutual benefits. However, theoretical arguments of moral base of transactional leadership are not supported by the results of the present research which rends credence to empirical evidence that higher moral development is related to better use of ethical leadership (Bass & Steidlmeier, 1999).

4. Conclusion

Interestingly, the findings of this study corroborated and are consistent with some previous studies which indicated some statistical relationships between cognitive moral development and leadership style. Contingent reward is associated with both transactional and transformational leadership styles (Bass, 1985 and Bass & Steiddlmeier, 1999), and this study has established and confirmed what was predicted to buttress the postulations, while earlier studies indicated a positive relationship at least with transformational leadership. Transactional leadership is both pragmatic and rational for leaders and subordinates thereby

complementing transformational leadership that appeals to an individual's belief and emotions. It is indicated that contingent reward is equally ethical as it is morally based leadership style, whereby, terms are spelt out before a given task and negotiated properly by both parties. It connotes fairness, security to organizations and followers. However, there is the need to further explore the dichotomy puzzles between cognitive moral development and transactional leadership processes. This entails challenging some existing theories and the development of new research design.

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The Effect of Organizational Communication towards Employees' Performance of the Badan Pendidikan Dan Pelatihan in Makassar City

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Abstract: Effective communication in organization is important to regulate the role of organization, coordination, controlling and evaluation from leader to staff and staff to leader, and miscommunication in information can lead to wrong-decision making and ineffective. This research is aimed to explain the importance of communication and its effect in organization by using the methodology of a simple linear regression. Two-way communication model (vertical and horizontal) proved to be effective within this organization based on the findings in this study. This model helped in reaching effective organization like well-established organization atmosphere, excellent employee performance and job finishing punctuality. The importance of communication in the organization is undisputable consequence. Organizational communication allows the company to obtain a valuable result which is unachievable by any standalone individuals. It is then understood that without cooperation from individuals in the organization, the organizational goal is not achievable. The weakness of this study appeared in the government sector due to the small scope held only in Badan Pendidikan dan Pelatihan office.

Keywords: *Organizational communication and employees' performance*

1. Introduction

Background: Achieving goals in an organization or institution might be made possible by forcing massive effort acted by those involved in the organization. An institution, both government and private, must set an organization driven by a group of people who play an active role to achieve the objectives of the organization or institution. Achieving the objectives of organization or institution is strongly influenced by the performance of an individual. In other words, if the employees perform well, it might contribute a positive performance to the organization. When employees are able to communicate to each other, the organization can run in accordance with the functions. In one organization, the communication process between members of the organization is applied in various systems. Hence, the communication within an organization has two important functions, allowing those involved in the Organization to share necessary information and defining member of organizations from those who are not. Employees' performance is an economical source and power-driven requiring technical and organizational skills to arrive in excellent results, meaning that the results obtained are processed through various balanced input. The energy deployed effectively without wasting any second will be more efficient in the achievement of the objectives.

Therefore, the performance of employees becomes a standard measurement of success in performing the given task for civil servants. And when it began to decline, finding a contributing factor should be attempted. One of the major causes is a wrong decision policy taken by the superior. Though these decisions have been discussed during the communication process among the members and the leader, it appears to be ineffective to cope with the existing problems that unfortunately affect the performance of its employees. Thus, finding solution is strongly advisable. Satisfactory results of the listed problems at *Badan Pendidikan dan Pelatihan* in Makassar city have not been identified. The development of Employee's performance at *Badan Pendidikan dan Pelatihan* in Makassar city can be easily recognized from several aspects, for example an achievement in the employee work efficiency including adequate working hours and punctuality as well as budget efficiency. This development of the performance was also supported by adequate working condition seen from the output and standardization of work that has been optimally applied without any delays to the main task. The other thing is the uniformity in educational background of every employee affects the completion of tasks on time. Based on the explanation above, the author is interested in reviewing this issue becomes a title: "The Effect of Organizational Communication towards Employees' Performance of the *Badan Pendidikan dan Pelatihan* In Makassar City

Identification of the Problems: From the background of the issue above, the author identifies the problem as follows:

- What is the description of the organizational communication at *Badan Pendidikan dan Pelatihan* in Makassar city?
- How is the description of the performance level of employees at *Badan Pendidikan dan Pelatihan* in Makassar city?
- How is the effect of Organizational communication towards employees' performance at *Badan Pendidikan dan Pelatihan* in Makassar city?

Objective of Writing: The goals of this research are:

- To know the description of the Organizational communication at *Badan Pendidikan dan Pelatihan* in Makassar City
- To know the description of the performance level of employees at *Badan Pendidikan dan Pelatihan* in Makassar City
- To know the effect of Organizational communication towards employees' performance at *Badan Pendidikan dan Pelatihan* in Makassar city?

2. Theoretical Framework

The definition of Organizational communication: Communication is a process of sharing information between individuals within a common system. Not only with the symbols and signals but also with behaviors or action. Various definitions of communication are asserted to limit the meaning of communication. Opinions from the experts concerning the communication are presented as follows:

- According to Redding and Sanborn in Arni (2008:65), organizational communication is the sending and receiving of information in complex organizations. Included in the field of international communication, human relations, relationship management, communication union of superiors to subordinates, communication from subordinates to superiors.
- According to Zelko and Danse in Arni (2008:66) Organizational communication is the interdependence system that includes internal and external communication. Internal communication is communication within the organizational itself. Such as communication from subordinates to superiors, communications from superiors to subordinates, as well as the communication to the same level as their fellow employees. While the external communication is communication that is done to the environment outside from the organization, such as the communication in the sales of the production's result, advertising creation and relations with the general public.

The purpose of Organizational Communication: A communication process is a series of activities to get understanding of one another. A successful communication happens when a series of sources (communicator) to the receiver (recipient) occurs.

The definition of Performance: Performance is a level of achievement of specific task or job implementation. The performance of organization is the accumulation of all organization units' performance (summation of everyone's performance). The performance is a result of the quality and quantity of work achieved by one employee in the performance of his duties in accordance with the responsibilities given to him. The research team of Development of Accountability System for Performance Government (2000: 8) gives the definition of the performance, i.e. "performance is the degree of effectiveness and efficiency and ability in the achievement of the objectives by the management and the divisions that exist within an organization". According to the Indonesian dictionary (2002:570) "Performance is defined as something that is achieved, achievement and demonstrated ability to work."

According to Prabu (2002: 67) states that Performance is the result of the quality and quantity of work achieved by an employee in carrying out their duties in accordance with the responsibilities assigned to him. Sulistiyani (2003:223) asserts that a person's performance is a combination of ability, effort and opportunity that can be judged from his work". Whereas Hasibuan (2007:34) suggests that the performance is a result of work which is accomplished by person in carrying out the duties charged to him based on the skills,

experience and time commitment. Irham Fahmi (2010:2) says that performance is the result obtained by an organization that is profit oriented and nonprofit oriented which produced during the period time. Meanwhile, according to Soeprihanto (2000:7) says that the performance of an employee is essentially the work of a person during a certain period in comparison with the various possibilities, such as standards, targets/goals or criteria have been determined in advance and agreed upon together. Certainly in terms of assessment, still consider the variety of situations and conditions that affect the achievement of the work.

3. Methodology

Time and Place of the Research: The location of this research is in Badan *Pendidikan dan Pelatihan* in Makassar City which is located on Jl.Sultan Alauddin with 3 months study: February until May 2013.

Method of Data Collection: In this research, data collection was carried out through:

- Questionnaire, Data collecting dealing with the performance of employees by asking them to complete covered questions. The answer in the question form has been carefully selected and prepared by the researcher, so respondents simply choose an alternative answer to suit the circumstances. The multiple choice form was set for this questionnaire and the details of the question are provided with several alternative answers, A, B, C, and D.
- Interview, Data collecting by direct – questioning to the Leader and staff who have deep understanding about the data needed.
- Observation, Data collecting techniques done through direct observation of the situation, about the activities that relate to the activity of employees.

Types and Source of the Data

Types of the Data: This research was qualitative and quantitative data
Source of the Data: The source of the data in this research was the subject of the acquired data (Arikunto, 2003:114). In order to support the writing activities to be done properly and as expected, required data should be objective and relevant.

- Primary Data, i.e. data obtained directly from the source, observed and recorded for the first time (Marzuki, 2002: 55). Primary is the raw data and has not yet been processed from questionnaires, interviews and observation.
- Secondary Data, i.e. data from the documents, collected both from the targeted institution and other relevance documents to this research.

Method for Analyzing Data: In writing of this research, the researcher used the descriptive and qualitative method. Those methods are the way to collect the data which contains the descriptions, exposure of an object according to the required criteria.
Then this method can be used with simple linear regression using the formula:

$Y = a+bx$

Where is: Y = Performance
a = Constant (Fixed Value)
x = Communicational Organization

Population and Sample

Population: Population is the total number of objects that are examined. The population of this research is all the 44 employees in Badan Pendidikan dan *Pelatihan* in Makassar city.

Sample: Sample is half of the population becoming object of the research. According to Arikunto (2003: 87), when the population is less than 100, the total number should be the sample. Thus, all 44 employees in this research are becoming the sample.
Operational Definition of Variables: The operational variables are defined:

Organizational Communication is a process of exchanging information between individuals through a common system (customary) either with a symbols, signals and behaviors or actions. The indicators as follows:

- Effective downward communication is the communication which flows from higher authority hierarchy to the lower hierarchy and through a range of channels of command.
- Effective Upward Communication is communication that goes from subordinates to superiors or from lower organization to the higher organization.
- Effective Horizontal Communication is the Communication that occurs between members of the organization that have the same level in an organization.

Performance is the result of the quality and quantity of work achieved by an employee in carrying out their duties in accordance with the responsibilities assigned to him. The indicators are as follows:

- The quality of work based on established standards. Quality of work is measured by the indicators of accuracy, thoroughness, skill and success of the work.
- The quantity of work is the balance of working output and working hours. The major concern does not focus on the regular output but merely the time needed.
- Punctuality; punctuality in completing the task, in presence, in recess, and in time-to-go-home.

4. Findings and Discussion

Presentation and Data Analysis

Characteristics of Respondent: Respondent is a group of people who are being the sample during the process of collecting research data. The respondents in this research were 44 employees at Agency's Office of *Badan Penelitian dan Pelatihan* in Makassar City**.** The composition of the respondents is based on sample data and sex with 24 male or 54.54% and 20 female or 45.46 % as shown in table 2 below:

Table 1: The composition of the respondent based on the sex

Sex	Total	Percentage (%)
Male	24	54.54 %
Female	20	45.46 %
Total	44	100

Source: Primary data processed by 2013

Based on the data from the institution, if categorized by level of education, the percentage of senior high school consist of 27.72%, undergraduate 43.18%, postgraduate 27.27%, and PhD 2.27%, as shown in table 2 below:

Table 2: The composition of the respondent based on the education level

Education	Total	Percentage
Senior High School	12	27.27
S1	19	43.18
S2	12	27.27
S3	1	2.27
Total	44	100

Source : Primary data processed by 2013

Description of the research variables: Description of Organizational communication and Performance Variables Organizational communication is a process of exchanging information between individual through a common system (customary) either with a symbol of symbols, signals and behaviors or actions.

Table 3: The overview of organizational communication in Badan Pendidikan dan Pelatihan in Makassar City

No	Interval	A Choice Answer	Frequency	%
1	4.00-3.54	Often	22	50.00
2	3.46-2.54	Always	17	38.00
3	2.46-1.54	Sometimes	5	11.00
4	1.50-1.00	Never	-	
		Total	44	100

Data source : the result of data processing 2013

From the table above, the answer of the respondent to the organizational communication are 22 or 50% of the respondents stated often, 17 respondents or 38% stated always, 5 respondents or 11% stated sometimes.

Table 4: The description of the performance's variables

No	Interval	A Choice Answer	Frequency	%
1	4.00-3.54	Often	8	18
2	3.46-2.54	Always	23	52
3	2.46-1.54	Sometimes	13	29
4	1.50-1.00	Never	-	
		Total	44	100

Based on the table 4 above, the employee's performance in the Office of *Badan Pendidikan dan Pelatihan* in Makassar City is in middle category with 23 respondents or 52%. This can theoretically seen from the time spent in completing the task. This indicates that the employee's performance of *Badan Pendidikan dan Pelatihan* in Makassar City must be improved.

$n = 44$ $\quad \sum x^2 = 74562$
$\sum x = 1782$ $\quad \sum y^2 = 75974$
$\sum y = 1806$ $\quad \sum xy = 74864$

Based on the data in the calculation table, to find out the degree of the relationship between X and Y, coefficient of correlation with equation formula is used :

$$r = \frac{n(\sum xy) - (xy)}{\sqrt{n(\sum x^2) - (\sum x) - n(\sum y^2) - (\sum y)^2}}$$

$$= \frac{44(74864) - (1782)(1806)}{\sqrt{44(74562) - (1782)^2 - 44(75974) - (1806)^2}}$$

$$= \frac{3{,}294{,}016 - 3{,}218{,}292}{\sqrt{(3{,}280{,}728 - 3{,}175{,}524) - (3{,}342{,}856 - 3{,}261{,}636)}}$$

$$= \frac{75{,}724}{\sqrt{105{,}204 - 81{,}220}}$$

$$= \frac{75{,}724}{\sqrt{23{,}984}}$$

$$= \frac{75{,}724}{154.86}$$

$$= 0.49$$

The calculation above shows that the coefficient of correlation between organizational communication (X) and Employee's performance (Y) is r=0.49, it means that there is a positive relationship between variable X and variable Y. Table 5 below interprets the correlation of coefficients:

Table 5: The coefficient of correlation and its function

Interval of coefficients	The level of influence
0.00- 0.199	Very Low
0.20- 0.399	Low
0.40- 0.559	Medium
0.60- 0.799	Strong
0.80- 1.000	Very Strong

Source: Coefficient of correlation Table

Then to analyze how much the influence of organizational communication towards the employee, the coefficient of determination (kd) with the formula is used:

$$\begin{aligned} \text{kd} &= r \times 100\% \\ &= 0.49^2 \times 100\% \\ &= 24\% \end{aligned}$$

The result of calculation shows that every changes in the performance of employees was affected by the organizational communication, kd = 24%, the residue is influenced by others are influenced by family, organization, and social environment. Based on the table and the previous calculation, it can be interpreted that the correlation between X and Y belong to the medium relationship 0.49%. To indicate whether the correlation coefficient (r) has a close relationship (significant) or not, hypothesis test needs to be done. Hypothesis testing to find out how strong the relationship or influence independent variable (X) and the dependent variable (Y) is, t-test is used with the formula:

$$\begin{aligned} \text{t} &= \frac{r^{2\sqrt{n-2}}}{\sqrt{1-r^2}} \\ &= \frac{0.49^{2\sqrt{44-2}}}{\sqrt{1-0.49^2}} \\ &= \frac{(0.24)(6.48)}{\sqrt{1-0.24}} \\ &= \frac{1.55}{0.87} \\ &= 1.78 \end{aligned}$$

If t count is bigger than t table on certain X, then the specific hypothesis is accepted by dk = n-2. In this calculation the t count = 6,477 whereas the t table is 1,682 for significant level of 0.05 and t = table 2,698 for significant levels of 0.01, means that t count is bigger than t table then the hypothesis is accepted with dk = 44-2 = 42 To see the influence of organizational communication on employee's performance, use the following formula:
Y = a + b x

But to find out the value of the regression coefficient, the calculated formula is:

$$\begin{aligned} b &= \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2} \\ &= \frac{44(74{,}864) - (1782)(1806)}{44(74{,}562) - (1782)^2} \\ &= \frac{(3{,}294{,}016) - (3{,}218{,}292)}{(3{,}280{,}728) - (3{,}175{,}524)} \\ &= \frac{75{,}724}{105{,}204} \\ &= 0.71 \end{aligned}$$

If b shows positive fuel of 0.09, the influence of organizational communication towards performance of the employees is existed. To find out the value of Y, a constant value (intercept) needs to be sought by using this following formula:

$$a = \frac{(\sum y)(\sum x^2) - (\sum x)(\sum xy)}{n(\sum x^2) - (\sum x)^2}$$
$$= \frac{(1806)(74{,}562) - (1782)(74{,}864)}{44(74{,}562) - (1782)^2}$$
$$= \frac{(134{,}658{,}972 - 133{,}407{,}648)}{(3{,}280{,}728 - 3{,}175{,}524)}$$
$$= \frac{1{,}251{,}324}{105{,}204}$$
$$= 11.89$$

Therefore, the application of the formula to determine the influence of organizational communication towards employees' performance is:

Y = a + b x
= 11.89 + 0.71

From the above calculation, the results show positive signs on the coefficients of regression (b = 0.71) means there is an increase in the value of X, then the performance of employees will also increase and the relationship between them is the medium, showed r = 0.49. Change in employees' performance levels can be affected by changes in the level of organizational communications i.e. amounting to kd = 24%. The calculation of correlation, regression and the organizational communication should always be owned by every employee, because it will improve the performance of the employees.

Discussion: Organizational communication is the important thing that should be owned by an employee, it is one of the factors that can improve the performance of employees at *Badan Pendidikan dan Pelatihan Kerja* in Makassar City. The more frequent communication in an organization, the better the performance will be.

Based on the obtained hypothesis testing results, an influence among organizational communication variables to employees' performance in Badan Pendidikan dan Pelatihan in Makassar City was discovered, where t test and test result t count > t table was applied. This means that the hypothesis in this study stated an influence of organizational communication to the performance of employees at Badan Pendidikan dan Pelatihan in Makassar City is acceptable.

The contribution of the organizational communication towards performance variable can be seen from the value of the determinant of the coefficient obtained by 24%. Thus, the influence of organizational communication towards employees' performance is 11.89%. Others are influenced by various factors which are not examined in this research. It can be seen that if organizational communication of employees increases, positive employees' performance will certainly follow. The organizational communication affect the employees' performance and this situation can be seen from the result of linear regression calculation adjusted for 0.877. Therefore, organizational communication factors must exist and needs to be sustained because good organization communication will improve the performance of employees. Organizational communication applied in organizations/institution is one of the efforts to improve the performance of employees.

5. Conclusion and Recommendations

Based on the explanation on the results of the research and the discussion, conclusions can be expressed as follows:

- Based on the research that has been done on the description of organizational communication in *Badan Pendidikan dan Pelatihan* in Makassar City, this institution is in good category and affects employees' performance. It can be seen from effective bottom communication, effective upward communication and effective horizontal communication.

- Description of the level of performance in *Badan Pendidikan dan Pelatihan* in the Makassar City is satisfying, because the effect of organizational communication towards employees' performance was found, and this can be seen from the quality, quantity and timeliness.
- The effect of organizational communication in *Badan Pendidikan dan Pelatihan* in Makassar City is in the medium level based on the evident from the results of hypothesis testing.

The importance of communication in the organization is undisputable consequence**.** Organizational communication allows the company to obtain a valuable result which is unachievable by any standalone individuals. It is then understood that without cooperation from individuals in the organization, the organizational goal is not achievable. Within this context, communication is playing a very critical role to develop cooperation between individuals in the organization, and in such that it will increase the employee's performance. Good organizational communication may put the organization in the position to achieve the objective through activities which are planned, coordinated and evaluated by pursuing for good communication between employees and superiors. Good communication can produce better employee's performance. The objective of the research is to understand the effect of organizational communication on employee performance Leadership at *Badan Pendidikan dan Pelatihan* in Makassar City.

Recommendations: Based on the above conclusions, suggestions are recommended as follows:

- For Leader: It is expected to the Leader of *Badan Pendidikan dan Pelatihan* in Makassar City to be more active in organizational communication in order to build a good partnership to subordinates.
- For Employees: It is expected to all employees at *Badan Pendidikan dan Pelatihan* in Makassar city to be more active in organizational communication in carrying out his duties as well as to maintain the level of performance of employees' capabilities.

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