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EVALUATING GOOD AND BAD NEWS DURING PRE AND POST FINANCIAL MELTDOWN: NIGERIAN STOCK MARKET EVIDENCE

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Abstract

The Nigerian stock market, prior to the 2007-09 global financial crisis witnessed growth but the market encountered sharp reversal from 2007 due to the global financial crisis. This study evaluates good and bad news on the Nigerian stock market with regards to the policy responses as a result of the meltdown. The study used the TGARCH, EGARCH and PGARCH models under three error distributional assumptions for data covering January 2010 to December 2016 using the All Share Index to generate the return series. Findings shows that good news impact return more than negative news of the same magnitude before the meltdown while bad news insignificantly impact return more than positive news after the meltdown. The study concludes that there is information asymmetry in the Nigerian stock market. Thus, it is recommended that on-line real time access to share price movement for investors should be introduced to improve liquidity level and enhance free flow of relevant securities information.

JEL Classification: C58, G14

Keywords: financial meltdown, news, stock market, GARCH, Error distribution

1. Introduction

The subprime mortgages transactions in the United States are part of the factors causing the financial crisis of 2008-2009. The crisis led to loss of confidence in the credit markets worldwide as a result of liquidation of banks and non-bank institutions worldwide (Farhi & Cintra, 2009; Prates & Cintra, 2010). The crisis spread to developing countries but it was originally anticipated that the impact on Africa would be insignificant because of the low level of Africa financial market integration into global financial markets, but the impact was very serious on Africa (Kaberuka, 2009; Osakwe, 2010). The crisis affected African countries through its impact on local stock markets and led to an increase in stock market volatility. From December 2007 and January 2010 the Nigerian, Kenyan, Zambian and Egyptian stock market

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index declined by 62%, 35%, 27% and 30% respectively. Between 2007 and 2008, the Namibian, Mauritius and Egyptian stock market lost about 55%, 41% and 36% of their market value respectively (Osakwe, 2010).

The Nigerian stock market, prior to the 2007-09 global financial crisis witnessed considerable growth in market capitalization from N764.9 billion in December 2002 (which was a 10% share of the total gross domestic product at current market prices) to N13.181 trillion (64% share of the total gross domestic product at current market prices) by December 2007 (CBN, 2014). In 2008, market capitalisation reduced by 45.8%, a sharp reversal of growth from 2007, when the market grew by 74.7%. The market turnover ratio dropped from 21.86% in 2008 to 13.26% in 2009, the decline in stock prices was attributed to the global financial crisis (Okereke-Onyiuke, 2009 & 2010).

The Nigerian stock market since inauguration has experienced a lot of hitches (e.g. paucity of tradable shares, corrupt practices, the global financial crises, etc.) which have delayed its operational competences. There has also been the debate concerning the volatility persistence of stock prices, the asymmetric properties and risk-return relationship of stock in the Nigerian stock market (Bekaert & Wu 2000; Karolyi, 2001; Olowe, 2009). Meanwhile, the Nigerian stock market experienced growth in market capitalization and All Share Index from 2001 till the second quarter of 2008. The market experienced serious decline in its indicators afterwards, due to the negative impact of the financial meltdown of 2007-2009.

The policy response and actions taken by the government and the Nigerian stock market authority to mitigate the effect of the meltdown of 2007-2009 include among others:

• The reduction of the transaction fees on the Nigerian stock market by 50%;

• 1% maximum share price loss limit on daily price movement and 5% Share price gain limit was imposed but was later put at 5% in October 2008 for either way. This has now been reviewed in the rule book afterwards;

• The strict enforcement of listing requirements with zero tolerance for infractions and subsequent de-listing of nineteen (19) inactive companies;

• Introduction of rules on share buy back with a limit of 15.0%.

In addition, the Nigerian stock exchange was rebranded and reformed into three (3) boards; the main board, premium board and the Alternative Securities Market (ASeM). The depository receipt, securities lending, unit trust listing, exchange traded fund are some of the initiatives of the Securities and Exchange Commission (SEC) and the Nigerian Stock Exchange (NSE) during and after the 2007-2009 meltdown.

The reform was to cushion the effect of the financial crisis of 2007-2009 on the investors' returns on the Nigerian Stock Exchange. Thus, there is the need to evaluate good and bad news on the market to enable stakeholders know whether there is the need to reverse some or all of the reform policy or better still, to consider other policy implementation that will enhance returns performance in the market, minimize risk and boost investors' return.

Therefore, the objective of this study is to evaluate the good and bad news in the Nigerian stock market in pre and post 2007-2009 financial meltdown. Studies prior to this were done before, during or after the financial meltdown (Atoi 2014; Bala & Asemota 2013; Emenike 2010; Olowe 2009; Hamadu & Ibiwoye 2010; Emenike & Aleke 2012; Ajayi & Nageri, 2016; among others). Thus, this study is significant

because the evaluation of the good or bad news is long overdue as a result of policy change during the 2007-2009 meltdown which affects the prices of shares in the Nigerian Stock Exchange. This study contributes to literature by showing the difference in good or bad news on the stock market return. The study also compares the stock market reaction to news during the pre and post meltdown as a result of policy responses and measures in the market during the meltdown of 2007-2009. The study offer recommendations to the stock market regulators and policy maker to enhance the performance of the stock market.

The scope of the study is to evaluate good and bad news in the pre and post financial meltdown, making Nigeria Stock Exchange the reference point, using the All Share Index (ASI). Weekly data of the ASI was used covering the period of January 2001 till December 2016, divided into pre-financial crisis period (January 2001 till March 2008) and the post financial crisis period.

Section II of the paper defines the reviews of relevant literature. Sections III and IV shows the methodology employed in the study and the discussion of findings respectively. Section V provides the summary of findings, conclusion, and recommendations.

2. Literature Review

This subsection reviews relevant literatures on the concept of leverage effect with relevant theories and review of empirical studies on leverage effect.

2.1. Conceptual Issues

Leverage effect is the relationship between stock returns and volatility (implied and realised), volatility rises during stock price reduction. Leverage effect occurs as a result of the change in market valuation of firm's equity in its capital structure, with an increase in leverage leading to an increase in stock price volatility (Figlewski & Wang, 2000). The cause of the 2007-2009 financial crisis was the market in mortgage-backed securities. An extensive increase in global liquidity which led to a drop in the price of credit and in turn led to an increase in demand and price of mortgages (Gorton, 2011).

One major important information of the 2007-2009 crisis are the useful forecast of when the bubble will burst and the consequence, for relevant and related securities connected to the mortgage-backed securities boom. The least predictable market to play an essential role in the subprime crisis was the stock market. Nevertheless, the stock market was very late in identifying news of the crisis (Gilson & Kraakman, 2014). The most reasonable answer is that the cost of obtaining and interpreting information about quoted stock prices was not stress-free for traders in the equities markets (Bartlett, 2010).

2.2. Theoretical Clarification

Leverage effect was attributed to Black (1976) in his original paper where daily data from 1964 to 1975 sample of 30 stocks was used. The study establish the relationship between volatility and stock returns. The portfolio level equivalents of

the estimates of leverage effect, is "summed market return" and the "market volatility estimate", obtained by the average of the additive returns and the volatility estimates respectively.

Black (1976) proposes two possible explanations for leverage effect: first is the "direct causation" effect. This is the causal effect from stock returns to volatility changes which means that decrease in firm's equity value cause negative return on its stock and increase leverage of the stock. Second is the "reverse causation" effect. This is the causal effect from volatility changes to stock returns as a result of changes in tastes and technology. The changes cause an increase in the uncertainty about the returns from investments. As a result of the increase in expected future volatility, stock prices decrease and the expected return from the stock increase in order to prompt investors to continue to hold the stock.

2.3. Empirical Review

According to Engle (1982), an adequate volatility model should sufficiently models heteroscadasticity in the disturbance term and captures the stylized fact (volatility clustering, Auto-Regressive Conditional Heteroscadasticity (ARCH) effect and asymmetry) inherent in stock return series. The famous volatility models used in most studies include Auto-Regressive Conditional Heteroscadasticity (ARCH) and its extensions, such as Integrated GARCH proposed by Engle and Bollerslev (1986), Generalized ARCH introduced by Bollerslev (1986), Schwert (1989), and Taylor (1986), Threshold GARCH first introduced by Glosten, Jaganathan, and Runkle (1993) known as GJR-GARCH modified by Zakoïan (1994), Exponential GARCH proposed by Nelson (1991), Power GARCH generalised by Ding, Engle and Granger (1993), GARCH-in-Mean model introduced by Engle, Lilien and Robins (1987), the standard deviation GARCH model introduced by Taylor (1986) and Schwert (1989), Fractionally Integrated GARCH model of Baillie, Bollerslev, and Mikkelsen (1996) among others (Atoi, 2014).

In Most cases, first-order GARCH models have extensively been proven to be adequate for modeling and forecasting financial time series (Adewale, Olufemi, & Oseko, 2016; Fasanya & Adekoya, 2017; Atoi, 2014; Ahmed & Suliman, 2011; Alberg, Shalit & Yosef, 2008; Bera & Higgins, 1993; Engle, 2001; Goudarzi, 2013 & 2014; Goudarzi & Ramanarayanan, 2011; Hamadu & Ibiwoye, 2010; Hansen & Lunde, 2004; Hsieh, 1991; Okpara & Nwezeaku, 2009; Olowe, 2009; Su, 2010; Zivot, 2009). For example, Hamadu and Ibiwoye (2010), examine the volatility of daily stock returns of Nigerian insurance stocks. The result of ARCH (1), GARCH (1, 1) TARCH (1, 1) and EGARCH (1, 1) shows that EGARCH is a better model than the other two models in modelling stock price returns evaluation and forecasting.

Okpara and Nwezeaku (2009) examined the effect of idiosyncratic risk and beta risk on returns of randomly selected fourty one (41) companies listed on the Nigerian stock exchange during the period of 1996-2005. The result of the EGARCH (1, 3) model shows less volatility persistence and establishes the existence of leverage effect in the Nigeria stock market. Olowe (2009) investigated the relationship between stock returns and volatility in Nigeria using EGARCH-in-mean model in the light of banking reforms, insurance reform, stock market crash and the global financial crisis. The result indicates that volatility is persistent, there is leverage effect and there is positive but insignificant relationship between stock return and risk.

Adewale et al. (2016) examined persistence of shock and news in Nigerian stock market, using monthly stock returns from January 1985 to December 2014. Result indicates higher volatility persistence during pre-break, and lower volatility persistence during post-break period with no evidence of asymmetry. Kuhe, (2018) investigates the volatility persistence in Nigerian stock market and findings posits that there exist high volatility persistence of shocks in the return series during July 1999 to June, 2017. Nevertheless, there exist significant reduction in volatility persistence in the face of structural breaks.

3. Methodology

This section discusses the method that was employed for the research work. It includes model specifications, sources and types of data, population and sample size, and method of data analysis to achieve the objectives.

3.1. Model Specification

Volatility model should sufficiently capture heteroscedasticity in the error term and also the volatility clustering, the Auto-Regressive Conditional Heteroscedasticity (ARCH) effect and the asymmetry in the series (Engle, 1982). Thus, the Auto-Regressive Conditional Heteroscedasticity (ARCH) and the model extension and variants were adopted for this research works.

3.1.1 Mean Equation

After checking for unit root and before estimating the ARCH models using the ASI return series, it is necessary to check for the presence of ARCH effects and volatility clustering in the residuals of the conditional return equation. The conditional return equation is estimated using the Ordinary Least Square (OLS) regression model as follows:

$$ASI_{rt} = C + \alpha ASI_{rt_{t-1}} + \varepsilon_{1t} \qquad 3.1$$

The equations 3.23 implies that the current ASI return series depends not only on previous values of ASI_{rt}, but also on the mean/constant (C) value of ASI_{rt} and the error term (ε_{1t}). The error term is tested for ARCH effect and volatility clustering and from which the conditional variance equation are derived for the ARCH models in this research.

3.1.1.1 A Priori Expectation of Mean Equation

The a priori expectation of the mean equation is that the error term should exhibit volatility clustering and ARCH effect at 5% significant level.

3.1.2 The ARCH Models

The conditional variance equation was modeled in a way that it incorporates the ARCH processes of ε_{1t}^2 with (p) lagged. The general form of the conditional variance, including (p) lag of the residuals is as follows:

$$\sigma_t^2 = C + \alpha_1 \varepsilon_{nt-1}^2 + \ldots\ldots\ldots\ldots + \alpha_1 \varepsilon_{nt-p}^2 \qquad 3.2$$

Equation (4) is what Engle (1982) referred to as the linear ARCH (p) model because of the inclusion of the (p) lags of the ε_{nt}^2 in the variance equation. Therefore an ARCH (1) model is

$$\sigma_t^2 = C + \alpha_1 \varepsilon_{nt-1}^2 \qquad 3.3$$

Equation 3.2 (ARCH (1) model) indicates that the next period's return variance (from the mean equation residual) only depends on last period's squared residual (shock in the return mean equation) so a crisis that caused a large residual would not have the sort of persistence that is observed after actual crises. The ARCH variant models that was used in this research to achieve the objectives are:

3.1.2.1 The Exponential GARCH Model

According to Brooks (2002), negative shock to financial time series may lead to increased volatility more than a positive shock of the same magnitude. In the case of equity returns, such asymmetries are typically attributed to leverage effects.

The Exponential GARCH (EGARCH) model was proposed by Nelson (1991) to model the above stated phenomenon. The model allows for asymmetric effects between positive and negative news on asset returns. The specification of the EGARCH model according to Nelson (1991) is:

$$log(\sigma_t^2) = \omega + \sum_{i=1}^{p} \alpha_i \left|\frac{\varepsilon_{t-i}}{\sigma_{t-i}}\right| + \sum_{k=1}^{r} \gamma_i \frac{\varepsilon_{t-k}}{\sigma_{t-k}} + \sum_{j=1}^{q} \beta_j log(\sigma_{t-i}^2) \qquad 3.4$$

when ε_{t-i} is good or positive news the total effect is measured by $(1 + \gamma_i)|\varepsilon_{t-i}|$ and when ε_{t-1} is bad or negative news the total effect is measured by $(1 - \gamma_i)|\varepsilon_{t-1}|$. The EGARCH covariance stationary is provided by $\sum_{i=1}^{q} \beta_j < 1$. Bad news can have a larger impact on volatility, and the value of γ_k is expected to be negative. The mean return equations and the return variance EGARCH model used in this research is as follows:

$$ASI_{rt} = C + \alpha_t ASI_{rt-1} + \varepsilon_{1t} \text{ Mean return equation for } ASI_{rt} \qquad 3.5$$

$$log(\sigma_t^2) = \omega + \alpha_i \left|\frac{\varepsilon_{t-1}}{\sigma_{t-i}}\right| + \gamma_i \frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \beta_j log(\sigma_{t-1}^2) \text{ Return variance equation EGARCH 3.6}$$

3.1.2.1.1 A Priori Expectation of EGARCH Model

The EGARCH model stipulates that to measure the impact of negative news on volatility persistence in return, $\gamma_i < 0$

3.1.2.2 The Threshold GARCH Model

The Threshold GARCH (TGARCH) model also known as the GJR-GARCH was introduced by Glosten, et al (1993) and the Threshold ARCH (TARCH) model proposed independently by Zakoïan (1994) allows for asymmetric effects between positive and negative news on asset returns. The general specification of the TGARCH/TARCH model is given as:

$$\sigma_t^2 = \omega + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^\gamma \gamma_i \varepsilon_{t-i}^2 d_{t-i} + \sum_{j=1}^q \beta_j \sigma_{t-i}^2 \qquad 3.7$$

where $\quad d_{t-i} = \begin{cases} 1 & if\ \varepsilon_{t-i} < 0 \\ 0, & if\ \varepsilon_{t-i} \geq 0 \end{cases}$.

In equation 3.12, depending on whether ε_{t-i} is above or below the threshold value (d_{t-1}) of zero, ε_{t-i} has different effects on the return variance σ_t^2: when ε_{t-i} is positive news, the total effect is given by $\alpha_i \varepsilon_{t-i}^2$ and when ε_{t-i} is negative news, the total effect is given by $(\sigma + \gamma_i)\varepsilon_{t-1}^2$. Therefore, it is expect that the value of γ_i is to be positive for bad news to have a larger impact on volatility. The mean return equation and the return variance TGARCH/TARCH model used in this research is as follows:

$$ASI_{rt} = C + \alpha_t ASI_{rt_{-1}} + \varepsilon_{1t} \text{ Mean return equation of } ASI_{rt} \qquad 3.8$$

$$\sigma_t^2 = \omega + \alpha_i \varepsilon_{t-1}^2 + \gamma_j \varepsilon_{t-1}^2 d_{t-1} + \beta_j \sigma_{t-1}^2 \text{ Return variance equation TGARCH/TARCH } 3.9$$

where $\quad d_{t-1}$ = 1 if $\varepsilon_{t-1}^2 < 0$ and d_{t-1} = 0 if $\varepsilon_{t-1}^2 > 0$.

3.1.2.2.1 A Priori Expectation of TGARCH Model

The TGARCH model stipulates that to measure the impact of negative news on volatility persistence in return, $\gamma_i > 0$.

3.1.2.3 The Power GARCH Model

The Power GARCH/Asymmetric Power ARCH (PGARCH/APARCH) was introduced by Ding et al (1993) also measures the impact of negative return news on the magnitude of volatility which is referred to as leverage effect. The general specification of the PGARCH/APARCH model is given as:

$$\sigma_t^\delta = \omega + \sum_{i=1}^{p} \alpha_i \left(|\varepsilon_{t-1}| - \gamma_i \varepsilon_{t-1}\right)^\delta + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^\delta \qquad \text{3.10}$$

where $\delta > 0$ and $-1 < \gamma_i < 1$. The effect of ε_{t-1} upon σ_t is through the function γ_i. If $\gamma_i = 0$, a positive news $\varepsilon_t > 0$ has a higher impact on volatility than negative news $\varepsilon_t < 0$. The mean return equation and the return variance PGARCH/APARCH model that was used in this research is as follows:

$$ASI_{rt} = C + \alpha_t ASI_{rt_{-1}} + \varepsilon_{1t} \quad \text{Mean return equation of } ASI_{rt} \quad \text{3.11}$$

$$\sigma_t^\delta = \omega + \alpha_i \left(|\varepsilon_{t-1}| - \gamma_i \varepsilon_{t-1}\right)^\delta + \beta_j \sigma_{t-j}^\delta \quad \text{Return variance equation PGARCH/APARCH}$$
$$\text{3.12}$$

3.1.2.3.1 A Priori Expectation of PGARCH Model

The PGARCH/APARCH model stipulates that to measure the impact of negative news on volatility persistence in return, $\gamma_i > 0$.

3.1.3 Distributional Assumptions

GARCH models are estimated using the Maximum Likelihood Estimation (MLE) process (Coffie, 2015) assumes that the error distribution is normal (Gaussian), though Nelson (1991) opined that the error exhibits non-normal distribution densities. Thus, to estimate the ARCH model, there is the need for the assumption of conditional distribution for the error terms.

In this study, three (3) conditional distributions for the standardized residuals of returns innovations; the Gaussian distribution, student's-t distribution, and the Generalised Error Distribution (GED) are used in the empirical analysis.

The Gaussian (normal) distribution is expressed as:

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \, e^{-(x-\mu)^2/\sigma^2} \qquad \text{3.13}$$

where μ is the mean value and σ^2 is the variance of the error from the return equation. The standard Gaussian distribution considers the mean value $(\mu) = 0$ and variance $(\sigma^2) = 1$.

The student's-t distribution is given as:

$$f(x) = \frac{\Gamma[\frac{v+1}{2}]}{\sqrt{v\pi[\frac{v}{2}](1+\frac{x^2}{v})^{\frac{v+1}{2}}}} \qquad \text{3.14}$$

where v is the degree of freedom ($v > 2$), if v tend to ∞, the student's-t distribution converges to the Gaussian distribution with an implied kurtosis of $k = \left(\frac{6}{v} - 4\right) + 3$ for all $v > 4$.

The Generalised Error Distribution (GED) is a symmetric distribution and platykurtic with the following density function:

$$f(x) = \frac{ve^{\frac{1}{2}|\frac{x}{\lambda}|}}{\lambda 2^{\frac{v+1}{v}} \Gamma 1/v} \qquad 3.15$$

where $\lambda = [\frac{2^{-2/v}\, \Gamma 1/v}{\Gamma 3/v}]^{1/2}$.

It includes the normal distribution if the parameter v has a value of two and when $v < 2$ indicates fat tail distribution.

3.1.4 Measurement of Variables and Nature of Data

The type of data used for this study is mainly secondary which are sourced through the Nigerian Stock Exchange. The research population is the Nigerian Stock Exchange, using the All Share Index return as the performance indicators and the return series is defined as:

$$ASI_{rt} = \frac{(ASI_t - ASI_{t-1})}{ASI_{t-1}} \qquad 3.16$$

where ASI_t is All Share Index at time t (particular/current week in this case) and ASI_{t-1} is All Share Index at time $t-1$ (current/particular week minus previous week).

The sample size was the weekly All Share Index for the period of 2001 till 2016 divided into pre and post financial meltdown. The period was chosen based on the event window (the 2008-2009 financial crisis) of the research.

The unit root test, the ARCH effect test and volatility clustering attribute of the All Share Index return were done and analysed. The descriptive statistics of the All Share Index return were explained to determine the suitability of using the data in GARCH variant models. Also, GARCH model and its extensions were estimated and analyzed which provided answers to the research questions.

4. Data Analysis and Discussion

This section presents the descriptive statistics of the data, including the volatility clustering feature and ARCH effect, the unit root test, the mean and variance equations. The ARCH variant models under various distributional assumptions are presented in order to answer the research questions and to achieve the objectives of the study.

The All share Index return series used in the study covers the period of Jan 2001 till Dec 2016 and it was divided into periods before and after the meltdown. The segmentation of the periods was determined using the period at which the return started going down as a result of the meltdown as the period before the meltdown while the period the return started picking up gradually as the period after the meltdown. The graphical representation is presented in Figure 4.1.
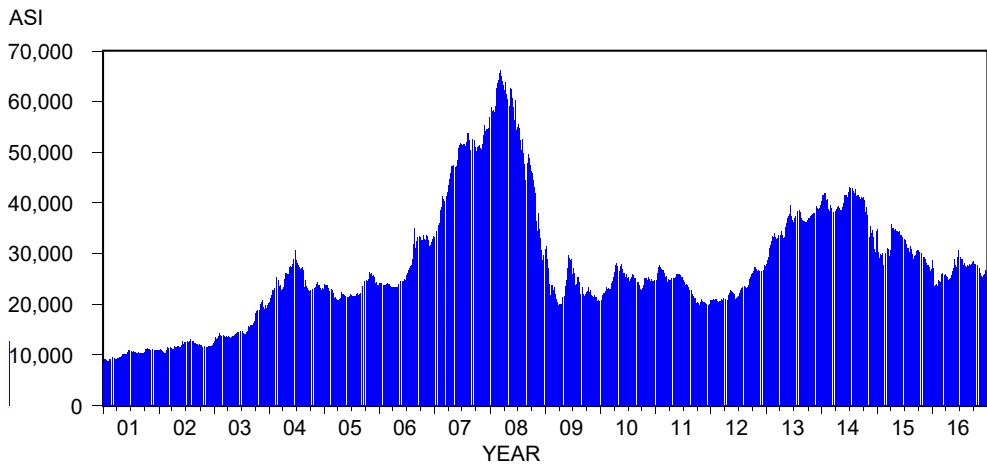
**Figure 4.1: Weekly All Share Index on the Nigerian Stock Exchange
(Jan 2001 - Dec 2016)**
Source: *Author's computations, 2018.*

Figure 4.1 indicates that the All Share Index on the Nigerian Stock Exchange increased from less than 10,000 points in Jan. 2001 to the peak at over 60,000 points in March 2008 and then started to decline to less than 20,000 points in April 2009. The index started to increase gradually by fluctuating between the 20,000 points and 30,000 points between April 2009 and Sept. 2011 and then to more than 40,000 points in April 2009. Therefore, between the period of March 2008 and April 2009 the Nigerian Stock Exchange All Share Index was affected by the global financial meltdown of 2008-2009 crisis and thus the pre meltdown period is Jan 2001 till March 2008 while the post meltdown period is April 2009 till Dec 2016.

4.1 Unit Root Tests

The All Share Index return series was tested to determine the order of integration using Augmented Dickey Fuller (ADF) and the Phillips-Perron unit root test statistics.

Table 4.1: ADF and PP Unit Root Test Result of All Share Index Return (2001-2016)

ASIR (2001-2016)	t-Statistics	P-Value	ASIR (2001-2016)	Adjusted t-Statistics	P-Value
ADF test statistics	-27.04330	0.0000	PP test statistics	-27.58421	0.0000
Critical values:			Critical values:		
1%	-3.437976		1%	-3.437976	
5%	-2.864796		5%	-2.864796	
10%	-2.568558		10%	-2.568558	

Source: *Author's computations, 2018.*

The unit root test results of the entire All Share Index return series covering from 2001 till 2016 indicates that the null hypothesis should be rejected as shown by the P-values of both the ADF and the Phillip-Perron statistics of 0.0000 respectively in table 4.1, which means that the series has no unit root (stationery series).

4.2 Descriptive Statistics

The summary statistics of the stationary All Share Index returns on the Nigerian Stock Exchange from 2001 till 2016 is presented in Figure 4.2.

Series: ASIR	
Sample 1/01/2001 12/26/2016	
Observations 834	
Mean	0.001887
Median	0.001439
Maximum	0.169002
Minimum	-0.132705
Std. Dev.	0.031369
Skewness	-0.065873
Kurtosis	6.789706
Jarque-Bera	499.6783
Probability	0.000000
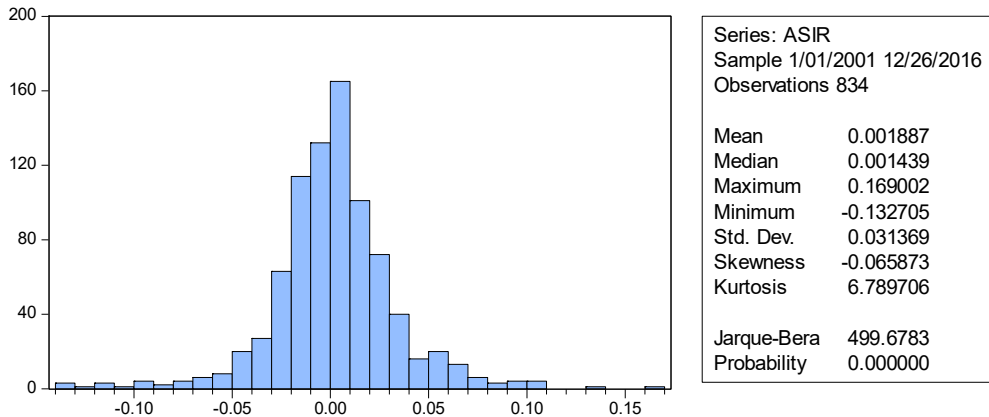
Figure 4.2: Descriptive Statistics of All Share Index Return (2001-2016)
Source: *Author's computation, 2018.*

Figure 4.2 reveals positive mean weekly returns of 0.001887 and the standard deviation which measures the riskiness of the return was 3.14%. The 21.5% difference between the minimum and maximum returns shows the level of price variability of return on the Nigerian Stock Exchange over the period. The skewness of -0.065873 is less than 0 (skewness of a normal distribution is 0) which shows that the stationary All Share Index returns on the Nigerian Stock Exchange from 2001 till 2016, on average, is negatively skewed relative to the normal distribution, indicating non-symmetric series. The kurtosis of 6.789706 is higher than 3 (kurtosis of a normal distribution is 3) which shows that the stationary All Share Index returns on the Nigerian Stock Exchange from 2001 till 2016, on average, is leptokurtic.

To support the skewness and kurtosis, the Jarque-Bera statistics (combination of skewness and kurtosis as asymptotic normality) with a value of 499.68 and a corresponding p-value of 0.0000, the null hypothesis of normal distribution cannot be accepted for the stationary All Share Index returns on the Nigerian Stock Exchange from 2001 till 2016.

4.3 Conditional Return/Mean Equation, ARCH Effect Test and Volatility Clustering

The conditional mean return equation of the All Share index return series is given by the OLS regression in equation (3.1) for the whole series. The test for the presence of ARCH effect and check for volatility clustering is also conducted on the residual of the conditional mean/return equations of the return series.

Table 4.2: Conditional Return/Mean Equation of All Share Index Return (2001-2016)

Dependent Variable: All Share Index return 2001-2016				
Variables	Coefficient	Standard Error	t-Statistic	P-Value
C	0.001671	0.001081	1.545181	0.1227
ASIR(-1)	0.068072	0.034435	1.976816	0.0484

Source: *Author's computations, 2018.*

Table 4.3: ARCH Effect Result of All Share Index Return (2001-2016)

Test Statistics	Value	P-Value
F-statistics	47.36208	0.0000
Observed R^2	44.91611	0.0000

Source: *Author's computations, 2018.*
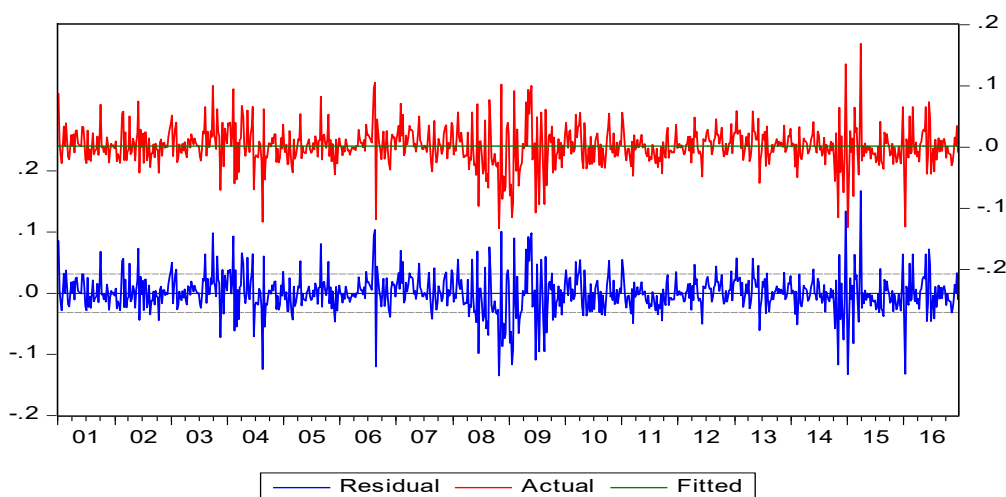
Figure 4.3: Volatility Clustering for Weekly All Share Index Return (Jan. 2001-Dec. 2016)
Source: *Author's computations, 2018.*

      The conditional return/mean equation result for the whole All Share Index return series is shown in Table 4.2. The ARCH effect test on the residual of the conditional return/mean equation of whole All Share Index return series is also shown in Table 4.3 with the F-Statistics and the observed R square values having corresponding P-values of 0.0000. This indicates that the null hypothesis is rejected meaning that there is ARCH effect in the residuals of the mean equation of All Share Index return series of 2001 till 2016 on the Nigerian Stock Exchange.

      In the same vein, the residual of the mean equation also exhibit volatility clustering as shown in Figure 4.3. Figure 4.3 shows that return series oscillates around the mean value (mean reverting) showing that volatility of stock returns is low for consecutive period till 3rd quarter of 2003 (low volatility followed by low volatility for a prolonged period) and volatility is high for another consecutive period till 3rd

quarter of 2004 (high volatility followed by high volatility for a prolonged period). This feature of low volatility followed by low volatility for a prolonged period and periods of high volatility followed by high volatility for a prolonged period is sustained throughout the period.

4.4 EGARCH, TGARCH and PGARCH Models under the Distributional Assumptions

The objective of this study investigates the leverage effect of All Share Index return in the Nigerian Stock Exchange. Three (3) GARCH model variants (TGARCH, EGARCH and PGARCH) in equations 3.5, 3.6, 3.8, 3.9, 3.11 and 3.12 was employed for this purpose. The best fit model to measure leverage on the Nigerian Stock Exchange was also determined using the information criterion values for the periods before and after the meltdown. The estimates of the GARCH volatility variants model are presented in Table 4.4 - 4.9 under the three (3) distributional assumptions for the periods before and after the meltdown.

Table 4.4: EGARCH Result for All Share Index Returns before the Meltdown

Parameters	Gausian Distribution		Student's-t Distribution		Generalised Error Distribution	
	Estimates	P-Value	Estimates	P-Value	Estimates	P-Value
ω	-3.600938	0.0001	-3.357485	0.0027	-3.449198	0.0071
α_i	0.425184	0.0000	0.464896	0.0004	0.447181	0.0016
β_j	0.554590	0.0000	0.589288	0.0001	0.579662	0.0006
γ_i	0.188268	0.0012	0.222173	0.0181	0.201432	0.0386
AIC	-4.510513		-4.617320		-4.613668	
SC	-4.447682		-4.544018		-4.540366	
HQ	-4.485569		-4.588219		-4.584567	

Source: *Author's computations, 2018.*

Table 4.4 is the EGARCH estimates of the All Share Index return on the Nigerian Stock Exchange before the meltdown. The values of γ_i under the three (3) distributional assumptions are positive and significant with the p-values of less than 5% under the three (3) distributional assumptions. Since the EGARCH model expect the value of $\gamma_i < 0$ and should be significant to measure the impact of negative news on volatility persistence in return. The result therefore, shows that the All Share Index return volatility responds more to positive (good) news than it respond to negative (bad) news of the same magnitude on the Nigerian Stock Exchange before the meltdown indicating the absence of leverage effect. The best fit estimates is the estimate of the student's-t distributional assumption as indicated by its lowest values of AIC, SIC and HQ selection criterions.

The TGARCH results of All Share Index return on the Nigerian Stock Exchange before the meltdown is shown in table 4.5. The values of γ_i under the three (3) distributional assumptions are negative. γ_i is not significant with p-values of more than 5% under the two (2) distributional assumptions (student's-t and generalized error distributions) but significant with p-values of less than 5% under Gaussian/normal distributional assumption. Since the TGARCH model stipulates that the value of $\gamma_i > 0$ and be significant to show that bad (negative) news impact

return volatility. The result therefore, implies that the All Share Index return volatility responds more to positive (good) news than it does to negative (bad) news of the same magnitude on the Nigerian Stock Exchange before the meltdown indicating no leverage effect. The best fit estimate is the estimate of student's-t distributional assumption as indicated by its lowest values of AIC, SIC and HQ selection criterions.

Table 4.5: TGARCH Result for All Share Index Returns before the Meltdown

Parameters	Gausian Distribution		Student's-t Distribution		Generalised Error Distribution	
	Estimates	P-Value	Estimates	P-Value	Estimates	P-Value
ω	0.000539	0.0000	0.000427	0.0002	0.000429	0.0001
α_i	0.508752	0.0025	0.684586	0.0202	0.590221	0.0344
β_j	-0.069307	0.2704	0.080761	0.5758	0.051166	0.7492
γ_i	-0.421652	0.0099	-0.583358	0.0497	-0.496082	0.0828
AIC	-4.511180		-4.617299		-4.611301	
SC	-4.448349		-4.543997		-4.537998	
HQ	-4.486236		-4.588198		-4.582199	

Source: *Author's computations, 2018.*

Table 4.6 is the PGARCH estimates of the All Share Index return on the Nigerian Stock Exchange before meltdown. The values of γ_i under the three (3) distributional assumptions are negative and significant with the p-values less than 5%. Since the PGARCH model expect the value of $\gamma_i > 0$ and be significant to measure the impact of negative news on volatility persistence in return. The result therefore, means that the All Share Index return volatility responds more to positive (good) news than it does to negative (bad) news of equal magnitude on the Nigerian Stock Exchange before the meltdown also showing that there was no leverage effect. The best fitted estimates are the estimates of student's-t distributional assumption as indicated by its lowest values of AIC, SIC and HQ selection criterions.

Table 4.6: PGARCH Result for All Share Index Returns before the Meltdown

Parameters	Gausian Distribution		Student's-t Distribution		Generalised Error Distribution	
	Estimates	P-Value	Estimates	P-Value	Estimates	P-Value
ω	0.017738	0.0000	0.013260	0.0034	0.013396	0.0076
α_i	0.275832	0.0000	0.296394	0.0008	0.283553	0.0025
β_j	0.098903	0.5644	0.275756	0.1398	0.258257	0.2279
γ_i	-0.594108	0.0000	-0.616583	0.0031	-0.587484	0.0093
AIC	-4.520745		-4.622894		-4.618755	
SC	-4.457914		-4.549591		-4.545452	
HQ	-4.495801		-4.593792		-4.589653	

Source: *Author's computations, 2018.*

Table 4.7 is the EGARCH estimates of the All Share Index return on the Nigerian Stock Exchange after the meltdown. The values of γ_i under the three (3) distributional assumptions are negative but not statistically significant with the p-values of more than 5% under the three (3) distributional assumptions. Since the EGARCH model expect the value of $\gamma_i < 0$ and should be significant to measure the impact of negative news on volatility persistence in return. The result therefore, shows that the All Share Index return volatility responds more to negative (bad) news than it respond to positive (good) news of the same magnitude on the Nigerian Stock Exchange after the meltdown but not significant. This shows that there is insignificant leverage effect. The best fit estimate is the estimate of the student's-t distributional assumption as indicated by its lowest values of AIC, SIC and HQ selection criterions.

Table 4.7: EGARCH Result for All Share Index Returns after the Meltdown

Parameters	Gaussian Distribution		Student's-t Distribution		Generalised Error Distribution	
	Estimates	P-Value	Estimates	P-Value	Estimates	P-Value
ω	-0.896216	0.0000	-1.029234	0.0008	-0.968353	0.0007
α_i	0.396051	0.0000	0.421471	0.0000	0.402033	0.0000
β_j	0.918586	0.0000	0.901778	0.0000	0.909339	0.0000
γ_i	-0.026341	0.5220	-0.033144	0.5654	-0.032853	0.5633
AIC	-4.419304		-4.461270		-4.461114	
SC	-4.359655		-4.391680		-4.391524	
HQ	-4.395687		-4.433716		-4.433560	

Source: *Author's computations, 2018.*

The TGARCH results of All Share Index return on the Nigerian Stock Exchange after the meltdown is shown in table 4.8. The values of γ_i under the three (3) distributional assumptions are positive and not statistically significant with the p-values of more than 5% under the three (3) distributional assumptions. Since the TGARCH model stipulates that the value of $\gamma_i > 0$ and be significant to show that bad (negative) news impact return volatility. The result therefore, implies that the All Share Index return volatility responds more to negative (bad) news than it does to positive (good) news of the same magnitude on the Nigerian Stock Exchange after the meltdown but not significant. This also indicates the presence of insignificant leverage effect. The best fitted estimates are the estimates of the generalized error distributional assumption as indicated by its lowest values of AIC, SIC and HQ selection criterions.

Table 4.8: TGARCH Result for All Share Index Returns after the Meltdown

Parameters	Gaussian Distribution		Student's-t Distribution		Generalised Error Distribution	
	Estimates	P-Value	Estimates	P-Value	Estimates	P-Value
ω	0.000076	0.0001	0.000082	0.0093	0.000078	0.0075
α_i	0.227709	0.0011	0.207216	0.0200	0.204319	0.0230
β_j	0.659695	0.0000	0.666262	0.0000	0.666659	0.0000
γ_i	0.057570	0.5081	0.078312	0.4977	0.078015	0.4946
AIC	-4.428428		-4.466387		-4.466420	
SC	-4.368779		-4.396797		-4.396830	
HQ	-4.404811		-4.438833		-4.438867	

Source: *Author's computations, 2018.*

Table 4.9 is the PGARCH estimates of the All Share Index return on the Nigerian Stock Exchange after meltdown. The values of γ_i under the three (3) distributional assumptions are positive and not statistically significant with the p-values of more than 5% under the three (3) distributional assumptions. Since the PGARCH model expect the value of $\gamma_i > 0$ and be significant to measure the impact of negative news on volatility persistence in return. The result therefore, means that the All Share Index return volatility responds more to negative (bad) news than it does to positive (good) news of equal magnitude on the Nigerian Stock Exchange after the meltdown but not significant. This shows that there exist insignificant leverage effect. The best fit estimate is that of the generalized error distributional assumption as indicated by its lowest values of AIC, SIC and HQ selection criterion.

Table 4.9: PGARCH Result for All Share Index Returns after the Meltdown

Parameters	Gausian Distribution		Student's-t Distribution		Generalised Error Distribution	
	Estimates	P-Value	Estimates	P-Value	Estimates	P-Value
ω	0.002437	0.0001	0.002703	0.0075	0.002562	0.0066
α_i	0.232733	0.0000	0.233793	0.0000	0.228678	0.0000
β_j	0.733187	0.0000	0.725635	0.0000	0.731003	0.0000
γ_i	0.031381	0.7800	0.037662	0.8017	0.047045	0.7610
AIC	-4.429468		-4.467155		-4.467240	
SC	-4.369820		-4.397565		-4.397650	
HQ	-4.405851		-4.439601		-4.439686	

Source: *Author's computations, 2018.*

In summary, the results of the EGARCH, TGARCH and PGARCH indicated that positive news impact return volatility on the Nigerian Stock Exchange more than negative news of the same magnitude before the meltdown while negative news insignificantly impact return volatility more than positive news on the Nigerian Stock Exchange after the meltdown. This result indicates the absence of leverage effect before the meltdown while there exists insignificant leverage effect after the meltdown.

The student's-t distributional assumption estimates was found to be the best fitted estimates under the three (3) models for period before the meltdown while the PGARCH model gives the best estimate for the period before the meltdown. The student's-t estimates was found to be the fitted estimates under the EGARCH after the meltdown while the generalized error distributional assumption estimates was the best fitted under the TGARCH and PGARCH after the meltdown with the PGARCH model providing the best estimate for the period after the meltdown.

Overall, the null hypothesis of no significant impact of good or bad news on return volatility in the Nigerian Stock Exchange is rejected; therefore, the All Share Index return on the Nigeria Stock Exchange respond to good news before the meltdown while the All Share Index return on the Nigeria Stock Exchange insignificantly respond to bad news after the meltdown.

4.5. Diagnostic Checking

The diagnostic check was conducted on the residuals of student's-t distributional assumption estimates under the PGARCH model for the period before the meltdown while the residuals of the generalized error distributional assumption estimate under the PGARCH model was check for model appropriateness (diagnostic check) for the period after the meltdown. The ARCH effect test and the serial correlation test results of the fitted PGARCH models are presented in Table 4.10 and 4.11.

Table 4.10: ARCH Effect Test Result of fitted PGARCH Models

Test Statistics	PGARCH 2001 - 2016		PGARCH before meltdown		PGARCH after meltdown	
	Student's-t Distribution		Student's-t Distribution		Generalised Error Distribution	
	Value	P-Value	Estimates	P-Value	Estimates	P-Value
F-statistics	0.021711	0.8829	0.426350	0.5142	0.065259	0.7985
Observed R^2	0.021762	0.8827	0.428152	0.5129	0.065576	0.7979

Source: *Author's computations, 2018.*

Table 4.10 is the ARCH effect test result of the fitted model residuals of the PGARCH models used for objective four. The p-values of the f-statistics and the observed R^2 are more than 5% significant level therefore the null hypothesis of no ARCH effect is accepted. This indicates that the fitted PGARCH models estimates under the selected distributional assumptions have no ARCH effect.

Table 4.11: Correlogram of Standardized Residual Square Test Results for Fitted Models

	PGARCH Model 2001 – 2016				PGARCH Model before meltdown				PGARCH Model after meltdown			
Lag	AC	PAC	Q-Stat	P	AC	PAC	Q-Stat	P	AC	PAC	Q-Stat	P
1	-0.005	-0.005	0.0219	0.882	0.034	0.034	0.4326	0.511	-0.013	-0.013	0.0662	0.797
2	0.04	0.04	1.3653	0.505	0.012	-0.013	0.4897	0.783	0.045	0.045	0.8897	0.641
3	-0.042	-0.041	2.8195	0.42	-0.018	-0.017	0.6105	0.894	-0.028	-0.027	1.2133	0.75
4	-0.05	-0.053	4.9597	0.291	-0.013	-0.012	0.675	0.954	-0.022	-0.024	1.4034	0.844
5	-0.031	-0.028	5.7491	0.331	0.021	0.022	0.85	0.974	-0.022	-0.02	1.5969	0.902
6	-0.051	-0.049	7.9466	0.242	-0.056	-0.058	2.0434	0.916	-0.022	-0.021	1.7977	0.937
7	0.097	0.095	15.837	0.027	0.05	0.054	2.9992	0.885	0.103	0.104	6.1816	0.519
8	-0.005	-0.005	15.86	0.044	0.031	0.026	3.368	0.909	-0.022	-0.02	6.3847	0.604
9	0.04	0.026	17.212	0.045	0.018	0.016	3.4875	0.942	0.011	-0.001	6.4334	0.696
10	0.011	0.014	17.316	0.068	-0.002	-0.003	3.4889	0.967	0.01	0.016	6.4754	0.774
11	-0.052	-0.05	19.649	0.05	-0.015	-0.009	3.5725	0.981	-0.11	-0.11	11.543	0.399
12	0.045	0.05	21.377	0.045	0	-0.004	3.5726	0.99	0.087	0.09	14.682	0.259
13	-0.004	0.013	21.394	0.065	0.026	0.031	3.8418	0.993	-0.046	-0.033	15.578	0.273
14	0.043	0.029	22.951	0.061	0.097	0.095	7.4895	0.914	0.049	0.025	16.595	0.278
15	0.023	0.028	23.42	0.076	0.051	0.044	8.4937	0.902	-0.01	0.001	16.634	0.341
16	-0.038	-0.046	24.629	0.077	-0.023	-0.026	8.7042	0.925	-0.059	-0.073	18.114	0.317
17	-0.028	-0.031	25.293	0.088	-0.051	-0.047	9.7223	0.915	-0.019	-0.018	18.26	0.373
18	-0.05	-0.029	27.438	0.071	-0.022	-0.017	9.9166	0.935	-0.055	-0.027	19.561	0.358

L, AC, PAC, Q-Stat and P indicate the lags, the autocorrelation function, the partial correlation function, the Ljung–Box Q–Statistic and the probability respectively.
Source: *Author's computations, 2018.*

The serial correlation test result is shown in Table 4.11 under the autocorrelation function, the partial correlation function, the Ljung–Box Q–Statistic and the probabilities with lag 1 to lag 18 for the residuals of the fitted PGARCH models. The probability values from lag 1 to 18 are all more than 5% significant level, suggesting that the null hypothesis of no serial correlation is accepted. Thus, the diagnostic test of ARCH effect and serial correlation of the fitted PGARCH model estimates and findings are good for policy consideration, implementation and professional practice.

In summary, the diagnostic check results of ARCH effect and serial correlation test indicated that the GARCH model and its variant do not have ARCH effect and no serial correlation in the residuals of the fitted model.

4.6. Discussion of Findings

The objective of this study investigates the impact of good or bad news on the All Share Index return volatility on the Nigerian Stock Exchange and the objective was achieved using three (3) GARCH model variants (TGARCH, EGARCH and PGARCH) in equations 3.5, 3.6, 3.8, 3.9, 3.11 and 3.12. Findings shows that All Share Index return volatility responds more to positive (good) news than it does to negative (bad) news of equal magnitude on the Nigerian Stock Exchange during the period before the meltdown as indicated by the estimates of EGARCH, TGARCH and PGARCH. The result is in contrast with Ahmed and Suliman (2011), Atoi (2014), Alagidede and Panagiotidis (2009), Emenike (2010), Goudarzi and Ramanarayanan (2011), Okpara and Nwezeaku (2009), Olowe (2009), Su (2010). Volatility responds more to negative (bad) news than it respond to positive (good) news of the same magnitude on the Nigerian Stock Exchange after the meltdown which is against the findings of Bekaert and Wu (2000), Coffie (2015), Emenike and Aleke (2012), Mun, Sundaram and Yin (2008), Uyaebo, Atoi and Usman (2015), but not significant.

Student's-t distributional assumptions estimates was found to give best result in tandem with the findings of (Atoi 2014) for the period before the meltdown while the generalized error distribution gives the best estimate after the meltdown. The APARCH model provides the overall best estimate for all the periods which is in agreement with Atoi 2014, Rahman, Rahman and Hossain (2013), but contrast the findings of Su (2010), Alberg, Shalit and Yosef (2008), Coffie (2015), Onwukwe, Bassey and Isaac (2011). In general the findings follows the assertion of Osarumwense (2015) that impact of good or bad news on return volatility do not only depend on the asymmetric model but also the choice of the error distribution matters.

5. Conclusion and recommendations

The results of the three (3) GARCH model variants (TGARCH, EGARCH and PGARCH) used for objective four indicates that All Share Index return volatility responds more to positive (good) news than it does to negative (bad) news of equal magnitude on the Nigerian Stock Exchange for the period before the meltdown while volatility responds more to negative (bad) news than it respond to positive (good) news of the same magnitude on the Nigerian Stock Exchange after the meltdown but not significant. The result also indicates that the PGARCH model is the best before and after the meltdown, student's-t distributional assumption is the best for

estimation for the period before the meltdown while the generalized error distribution provide the best estimate for period after the meltdown. The findings rejected the null hypothesis which stated that there is no significant impact of good or bad news on return volatility in the Nigerian Stock Exchange before and after the financial meltdown.

All the fitted models were tested for appropriateness (diagnostic test) to ascertain their desirability for policy consideration and implementation. The residual of the models were all found to have no ARCH effect and no serial correlation which are both desirables of a good fitted model. This means that the findings of this study are appropriate for policy consideration. However, the limitation of this study is that not all the GARCH model that measure news are employed, thus subsequent research should focus on other GARCH models not employed and compared with this finding.

It was therefore, concluded that return volatility on the Nigerian stock exchange responds more to good news before the meltdown of 2008-2009 while return volatility responds more to bad news after the meltdown. This has led to information asymmetry between investors and has made the information environment of the Nigerian stock market not conducive and unattractive for shrewd investors.

Grounded on the findings and conclusions drawn from this study and the need to strengthen and improve the Nigerian stock market, this study recommended that there is the need for on-line real time access to share price movement for investors and also minimise operational (dealing) bottleneck. This will not only improve the liquidity level and enhance free flow of relevant securities information on the Nigerian Stock Exchange but will also improve investor's confidence and discourage information imbalance in the market.

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DOES PUBLIC DEBT SERVICE EXPENDITURE CROWD-OUT ECONOMIC GROWTH? EMPIRICAL EVIDENCE FROM AN AFRICAN DEVELOPING COUNTRY

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Abstract
This paper contributes to the ongoing debate on the impact of public debt service on economic growth; and it provides an evidence-based approach to public policy formulation in Zimbabwe. The empirical analysis was performed by applying the autoregressive distributed lag (ARDL) technique to annual time-series data from 1970 to 2017. The study findings reveal that the impact of public debt service on economic growth in Zimbabwe is negative in the short run but positive in the long run. The results are suggestive of the existence of a crowding-out effect of public debt service in Zimbabwe in the short run and a crowding-in effect in the long run. In view of these findings, the government should consider fiscal and financial policies that promote a constant supply of long-term finance, long-term fixed investments, and extension of a government securities maturity structure so as to ensure sustainable short- and long-term public debt service expenditures. The study further recommends the strengthening of non-distortionary revenue mobilisation reforms to reduce market distortions and boost domestic investment.

JEL Classification: H62, H63, O47

Keywords: ARDL, economic growth, public debt service, Zimbabwe

1. Introduction

Sub-Saharan Africa (SSA) has experienced a pronounced rise in public debt since 2015, reaching a regional average of 57% of gross domestic product (GDP) at the end of 2017 (International Monetary Fund/IMF, 2018a). This new spike in public debt levels in the region is concerning as it is manifesting in high interest payments, which are diverting resources away from economic development enhancing outlays, such as public sector infrastructural development, research and development activities,

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health care and education provision (IMF, 2018a). Additionally, the upward trajectory in non-concessional public debt stocks in SSA can potentially make some economies susceptible to sudden increases in borrowing costs, particularly when they have considerable refinancing needs in future or have debts denominated in foreign currency (World Bank, 2019).

According to the IMF (2018b), six of the 35 low-income countries in sub-Saharan Africa (SSA) are in extreme public debt distress, Zimbabwe included. This is evidenced by difficulties experienced in servicing public debts, leading to arrears and continuous public debt restructuring frameworks (World Bank, 2019). These high levels of public debt in the region, mostly foreign debt, and an increased reliance on commercial loans, continue to make many low-income countries vulnerable to currency, interest rates, and refinancing risks (Devarajan, 2018; Gill and Karakülah, 2018a, 2018b). More so, the anticipated weaker growth in major emerging markets between 2019 and 2021, may slow global demand for metals, which could dampen growth prospects for low-income countries that depend on metals for government and export revenues, such as Zimbabwe (World Bank, 2018a).

Furthermore, an overall assessment of the IMF's Articles IV for SSA countries reveal that sixteen additional countries are categorised as being at high risk of public debt distress. The recent deterioration in public debt indicators suggest a compounding effect of the 2014 – 2016 global economic growth slowdown, exchange rate depreciation, slumps in global commodity prices, and materialisation of contingent liabilities arising from weak monitoring of state-owned enterprises (World Bank, 2018a; IMF, 2016: 25; IMF, 2015: 1, 6).

Zimbabwe is a net exporter of metals, mostly platinum, diamonds, gold, ferrochrome, as well as unprocessed tobacco – a condition which has raised the country's public debt vulnerabilities (Ministry of Finance/MOF, 2018; Reserve Bank of Zimbabwe "RBZ", 2018). Although Zimbabwe had a more diversified economy between 1980 and 1997, relative to other SSA countries, the country underwent severe economic meltdown that began in 1998 and lasted until 2008 (African Development Bank, 2018). Hence, similar to other SSA countries, Zimbabwe could not generate meaningful returns on investments through tax systems, resulting in failure to repay some of its contracted debts (IMF, 2017: 11). In light of the foregoing, the country began to contract new non-concessionary loans from emerging creditors, mostly China, to cover up its fiscal gap and to pay off some of its old debts – particularly its arrears to the IMF (African Development Bank, 2018). The new foreign debt and domestic debt rollovers worsened the country's public debt overhang condition, resulting in ever-increasing public debt service costs – that further weakened investment prospects and lowered annual economic growth rates (African Development Bank, 2018).

Furthermore, the sluggishness in economic performance in Zimbabwe since 2014, and the associated government debt build-up, have exacerbated the country's inability to pay its external obligations (RBZ, 2018; World Bank, 2018b). The implication of the non-payment of international arrears was economic isolation and indefinite suspension of the country from cheap international lines of credit (MOF, 2018; IMF, 2017). In addition to the unsustainable foreign public debt burden, Zimbabwe has, between 2013 and 2017, accumulated substantial domestic public debt, to the extent that domestic financing of the budget deficit has begun to thwart the activities of the private sector (RBZ, 2018; IMF, 2017: 7). The country's budget deficits have partly been financed through overdrafts at the central bank– which led to excessive money creation and intensified foreign currency shortages (MOF, 2018).

Despite such disturbing public debt levels and explosive government debt service costs in Zimbabwe, the country has received limited coverage on the public debt service-economic growth studies. This paper may be the first to test empirically the impact of public debt service on economic growth in Zimbabwe – a highly indebted country in SSA. The few available studies for Zimbabwe have only investigated the optimal growth-maximising public debt threshold (see Mupunga and Le Roux, 2015). Explicitly, the study differs from past studies on this subject in that: (i) it focuses on the public debt service-economic growth linkage – and not public debt and economic growth, as was the norm with most previous studies; and (ii) it utilises one of the more recent estimation techniques, the autoregressive distributed lag (ARDL) method, which has been credited for its favourable response to both large and small samples (Pesaran and Shin, 1999).

The rest of the paper is arranged as follows: Section 2 examines the patterns in public debt service and economic growth in Zimbabwe. Section 3 reviews theoretical and empirical literature on public debt service-economic growth relationship. Section 4 provides the methodological framework and the empirical analysis. Lastly, Section 5 draws some final conclusions and policy proposals.
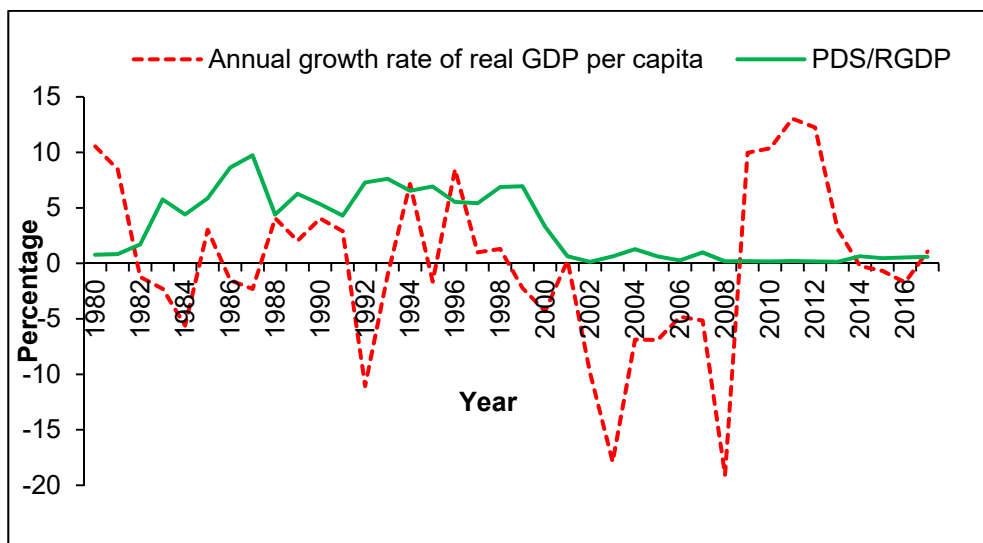
2. Public debt service and economic growth trends in Zimbabwe

From 1980 to 2017, the ratios of public debt and public debt service to GDP for Zimbabwe averaged 58.4% and 3.2%, respectively (World Bank, 2018b). During the period from 1998 to 2008, the Zimbabwean government was not actively honouring its financial commitments, which culminated in an accumulation of domestic and foreign payment arrears (IMF, 2011). Deteriorating foreign exchange inflows due to weak export competitiveness and massive capital flight were also a major cause of the country's incapability to pay its dues (IMF, 2011; 2009).

The recent debt sustainability analysis undertaken in 2019 by the World Bank confirms that Zimbabwe continues to be in severe public debt distress (World Bank, 2019: 202). All foreign public debt indicators breached their indicative thresholds, except public debt service to exports and to revenue ratios (see IMF, 2017). As of end-2017, the foreign public debt-to-GDP ratio was 53.1%, the public debt-to-revenue ratio was 198.6%, and the public debt-to-export ratio was 188.6% (IMF, 2017). The high public debt service costs in Zimbabwe compelled the government to speed up efforts to reengage the international community, with the immediate aim of resolving arrears with the IMF, the World Bank Group, and the African Development Bank (MOF, 2010). The government's reengagement plan involves clearing the country's foreign arrears to the above-mentioned three traditional creditors – using a mixture of strategies, such as drawing down of special drawing rights, and new loans from emerging creditors (IMF, 2017; MOF, 2010).

Furthermore, the country's limited access to international finances and widening fiscal deficits since 2013 has caused domestic public debt to increase rapidly, reaching 42.1% of GDP in 2017 (RBZ, 2018). Between 2009 and 2013, the stock of domestic public debt and the corresponding repayment costs were negligible (MOF, 2014). However, from 2014, the rise in central government domestic debt was driven primarily by the excessive issuance of treasury bills, unrestrained overdraft facility from the central bank, and the recapitalisation of both the Reserve Bank of Zimbabwe and selected public enterprises (MOF, 2018; IMF, 2017).

The active participation of the government in both domestic capital and foreign exchange markets exacerbated the scarcity of foreign currency and worsened the country's liquidity crisis – leading to credit rationing and high cost of capital (MOF, 2016). Despite the downward trajectory in government arrears on domestic public debt, the debt payments still constitute a large proportion of the government's recurrent expenditure bill, further worsening the public debt distress condition (MOF, 2018; World Bank, 2018b). Figure 1 shows the evolution of public debt service and the accompanying economic growth pattern in Zimbabwe from 1980 to 2017. Public debt service (PDS) is expressed as a percentage of real gross domestic product (RGDP), while economic growth is measured by the annual growth rate of real GDP per capita.

Figure 1: Public debt service and economic growth trends in Zimbabwe (1980-2017)
Source: Own processing based on World Bank (2018b) databank

Figure 1 shows that between 1980 and 2000, the government of Zimbabwe was still honouring its debt liabilities. The abrupt fall in public debt service costs in 2001, however, signify the country's inability to pay its debts rather than a fall in outstanding arrears. This is indicated in Figure 1 by a corresponding deterioration in economic performance. While the domestic public debt costs were gradually shrinking between 2001 and 2008, following hyperinflation and increased seigniorage revenue, the stock of the outstanding foreign public debt arrears was expanding due to non-payment (MOF, 2009). The incapacity to repay foreign debts by the Zimbabwean government was partly worsened by the deterioration in terms of trade and by the non-extension of debt relief initiatives to this country by the International Financial Institutions, the Paris Club and other creditors (IMF, 2016).

The noticeably low levels of public debt service payments in Figure 1 since 2001, relative to the high stock of public debt, amounting to US$17.7 billion in 2017, explains why the country remains suspended from world capital markets (MOF, 2018; IMF, 2016). Also, the current huge government debt arrears, amounting to $5.5 billion, both domestic and foreign, are making the country more vulnerable to fiscal shocks (African

Development Bank, 2018; MOF, 2018). The efforts to pay off domestic arrears are met with increased cash shortages and credit rationing to the private sector, suggesting that the country's domestic capital markets are still underdeveloped and undiversified.

Also visible in Figure 1 is the increase in government debt repayments after 2013. This is partly due to increased payments to the IMF and to the domestic suppliers, which were made possible by drawing down on special drawing rights, contraction of new loans and increased issuance of government securities (MOF, 2018; IMF, 2017).

3. Literature review

The literature linking public debt service and economic growth is domiciled on the debt overhang hypothesis (see Krugman, 1988; Sachs, 1989). The hypothesis postulates that a heavy debt burden means eminent increases in future taxes to finance the high debt service payments. The resultant high taxes lower the after-tax return on capital and reduce the incentive to invest – leading to depressed investment and lower economic growth rates (Hjertholm *et al.,* 1998; Krugman, 1988; Taylor, 1983). Hjertholm *et al.* (1998) argued further that high public debt servicing costs compel governments to engage in inflationary financing techniques, such as money printing and currency devaluation, to meet the excess demand for foreign currency created by debt servicing needs (see also Cohen, 1995; Borensztein, 1990; Fry, 1989). Similarly, if a country is committing a greater share of its foreign capital towards servicing foreign debts, then very few resources will remain available to finance fixed investment (Akram, 2015). This latter condition is known as the crowding-out effect.

Further, a public debt service burden prompts costly institutional and revenue reforms in a bid to seek either debt rescheduling or debt relief (see Serrieux and Sammy, 2001; 1999). The burden of public debt service financing is to shift public expenditure away from physical and social investments, such as health care and education, which then hampers economic growth (see, among others, Fosu, 2007; Mahdavi, 2004; Elbadawi *et al.*, 1997; Deshpande, 1997; Servén and Solimano, 1993; 1992, and Savvides, 1992).

The empirical literature on the link between public debt service and economic growth is scanty and the available studies have used the conventional estimation methods, such as the ordinary least squares (see among others, Week, 2000; Cohen, 1993 and Savvides, 1992). The results of Week (2000), Cohen (1993) and Savvides (1992) provide evidence supporting the debt overhang hypothesis.

Empirical studies by Jalles (2011), Sen *et al.* (2007), Hansen (2002; 2001) and Pattillo *et al.* (2002) applied the generalised method of moments (GMM) methodology to examine the link between public debt service and economic growth. While Sen *et al.* (2007) and Hansen (2002) found evidence supporting a negative relationship between the two variables, the results of Jalles (2011) and Pattillo *et al.* (2002) are consistent with the public debt service-economic growth neutrality hypothesis.

Sen *et al.* (2007), Fosu (2007) and Serieux and Sammy (2001) employed panel data models to test for the validity of the debt overhang hypothesis. Using Latin America and Asian countries, Sen *et al.* (2007) found that public debt service impedes economic growth in the studied countries. Employing Seemingly Unrelated Regression Models to 1975 – 1994 five-year panel data for 35 African countries, the author found that public debt service burden negatively affects economic growth. Also, the results of

Serieux and Sammy (2001), using a sample comprising low and lower-middle income countries, confirmed the negative impact of public debt service on economic growth in studied economies.

Finally, Pattillo *et al.* (2002) examined the link between public debt service and economic growth to 93 developing countries using a combination of ordinary least squares, the instrumental variable approach, fixed effects and GMM techniques. The authors found no evidence linking public debt service and economic growth in studied countries.

From the review of the literature, this study concludes that the link between public debt service and economic growth is not given. However, the study can broadly summarise that the limited available empirical literature provides alarming evidence supporting a negative relationship between public debt service and economic growth. However, of importance to note is that these studies have been overtaken by time and events, leaving their relevance, on the public debt service and economic growth dynamics, in today's economies, questionable.

4. Methodological framework and the empirical analysis

The impact of public debt service on economic growth is, in this paper, tested using the autoregressive distributed lag (ARDL) technique (see Pesaran and Shin, 1999; Pesaran *et al.,* 2001). Compared to other previous studies on the subject, the chosen methodology in this paper allows for the simultaneous estimation of short- and long-run parameters (Pesaran and Shin, 1999). The short-run impact is captured by the coefficients of the first differenced variables in the error correction model (ECM). The ARDL model used in this study is based on Kharusi and Ada (2018), Ncanywa and Masoga (2018) and Akram (2017) and is specified as follows:

$$
\Delta y_t = \hbar_0 + \sum_{i=1}^{n} \hbar_{1i}\Delta y_{t-i} + \sum_{i=0}^{n} \hbar_{2i}\Delta PDS_{t-i} + \sum_{i=0}^{n} \hbar_{3i}\Delta INV_{t-i} + \sum_{i=0}^{n} \hbar_{4i}\Delta LBR_{t-i}
$$

$$
+ \sum_{i=0}^{n} \hbar_{5i}\Delta FB_{t-i} + \sum_{i=0}^{n} \hbar_{6i}\Delta TOP_{t-i} + \sum_{i=0}^{n} \hbar_{7i}\Delta SAV_{t-i} + \sum_{i=0}^{n} \hbar_{8i}\Delta TOT_{t-i}
$$

$$
+ \Theta_1 y_{t-1} + \Theta_2 PDS_{t-1} + \Theta_3 INV_{t-1} + \Theta_4 LBR_{t-1} + \Theta_5 FB_{t-1} + \Theta_6 TOP_{t-1}
$$

$$
+ \Theta_7 SAV_{t-1} + \Theta_8 TOT_{t-1} + \mu_{1t} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1)
$$

where y is the annual growth rate of real GDP per-capita, proxy for economic growth; PDS is public debt service as a percentage of GDP; INV is gross fixed capital formation as a percentage of GDP; LBR is economically active population aged between 15 and 64 years as a percentage of total working age population; FB is fiscal balance as a percentage of GDP; TOP is trade openness as a percentage of GDP; SAV is gross domestic savings as a percentage of GDP; TOT is trade balance as a percentage of GDP; $\hbar_0$ is a constant; $\hbar_1 - \hbar_8$ and $\Theta_1 - \Theta_8$ are short-run and long-run regression coefficients, respectively; Δ is the difference operator; n is the lag length; μ_{1t} is the white-noise error term and t is the time period.

The associated ECM expression for Equation 1 is presented as follows:

$$\Delta y_t = \hbar_0 + \sum_{i=1}^{n} \hbar_{1i}\Delta y_{t-i} + \sum_{i=0}^{n} \hbar_{2i}\Delta PDS_{t-i} + \sum_{i=0}^{n} \hbar_{3i}\Delta INV_{t-i} + \sum_{i=0}^{n} \hbar_{4i}\Delta LBR_{t-i}$$

$$+ \sum_{i=0}^{n} \hbar_{5i}\Delta FB_{t-i} + \sum_{i=0}^{n} \hbar_{6i}\Delta TOP_{t-i} + \sum_{i=0}^{n} \hbar_{7i}\Delta SAV_{t-i} + \sum_{i=0}^{n} \hbar_{8i}\Delta TOT_{t-i}$$

$$+ \delta_1 ECM_{t-1} + \mu_{2t} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (2)$$

where δ_1 is coefficient of the ECM_{t-1}; ECM_{t-1} is the one period lagged error-correction term; and all other variables and parameters are as defined in Equation 1.

The analysis in this study uses annual time-series data covering the period from 1970 to 2017. The data was obtained from the World Bank Development Indicators (World Bank, 2018b). Prior to the empirical analysis, the variables were tested for stationarity using the Perron (1997) (PPURoot) and the Dickey-Fuller Generalised Least Square (DF-GLS) unit root tests. The purpose of undertaking stationarity tests was to establish the order of integration in the series. The results of stationarity checks are displayed in Tables 1 and 2.

Table 1. Unit root test results for the variables in levels

Variable	PPURoot		DF-GLS	
	No trend	*Trend*	*No trend*	*Trend*
y	-6.169***	-6.429***	-3.656***	-4.201***
PDS	-4.532	-4.515	-1.681*	-1.809
INV	-3.516	-3.517	-2.480**	-2.605
LBR	-3.586	-3.691	-0.120	-3.187**
FB	-4.259	-3.515	-2.626***	-2.127
TOP	-3.781	-4.000	-1.244	-2.205
SAV	-5.217*	-4.889	-0.879	-1.996
TOT	-3.451	-3.225	-1.244	-2.062

*Notes: *, ** and *** denote the rejection of non-stationarity at 10%, 5% and 1% significant levels, respectively.*
Source: authors' computation by using Microfit 5.0 software

Table 2. Unit root test results for the variables in first differences

Variable	PPURoot		DF-GLS	
	No trend	*Trend*	*No trend*	*Trend*
y	-	-	-	-
PDS	-8.187***	-8.575***	-	-7.316***
INV	-5.660**	-5.408*	-	-5.933***
LBR	-5.163*	-5.448*	-4.390***	-
FB	-6.327***	-6.725***	-	-5.482***
TOP	-9.393***	-9.558***	-7.291***	-8.327***
SAV	-	-10.555***	-9.737***	-9.954***
TOT	-7.608***	-7.525***	-6.563***	-6.648***

*Notes: *, ** and *** denote the rejection of non-stationarity at 10%, 5% and 1% significant levels, respectively.*
Source: authors' computation by using Microfit 5.0 software

The results presented in Tables 1 and 2 show that all regression variables are either integrated of order zero [*I(0)*] or one [*I(1)*], using both unit-root tests. The paper, therefore, concludes that all the variables are stationary either in levels or in first difference, hence the ARDL approach can be satisfactorily applied. Therefore, the paper proceeds to conduct the bounds test for the null hypothesis of no co-integration; that is, $\Theta_1 = \Theta_2 = \Theta_3 = \Theta_4 = \Theta_5 = \Theta_6 = \Theta_7 = \Theta_8$, against the alternative hypothesis that $\Theta_1 \neq \Theta_2 \neq \Theta_3 \neq \Theta_4 \neq \Theta_5 \neq \Theta_6 \neq \Theta_7 \neq \Theta_8$. The bounds F-statistic test results are presented in Table 3.

Table 3. Bounds F-statistic test results

Dependent variable	Function				F-statistic	Cointegration status
y	F(y|PDS,INV,LBR,FB,TOP,SAV,TOT)				3.284*	Cointegrated
	Asymptotic critical values					
Pesaran *et al.*	**1%**		**5%**		**10%**	
(2001: 300)	*I(0)*	*I(1)*	*I(0)*	*I(1)*	*I(0)*	*I(1)*
Table CI(iii) Case III	2.96	4.26	2.32	3.50	2.03	3.13

*Note: * denotes significance at 10%.*
Source: authors' computation by using Microfit 5.0 software

The cointegration results reported in Table 3 show that the calculated F-statistic exceeds the upper bound critical value at 10% significance level, portraying the existence of a long-run relationship among the variables in the model. The AIC and the BIC optimal lag-length selection techniques were employed and the BIC-based ARDL (1, 3, 0, 0, 2, 1, 2, 0) model was chosen as it was more parsimonious than the AIC-based model. The long-run and short-run estimates of the selected model are summarised in Tables 4 and 5, respectively.

Table 4. Long-run regression coefficients – Dependent variable: y

Regressor	Coefficient	Standard error	T-ratio	Probability
C	60.655*	31.612	1.919	0.065
PDS	0.694**	0.256	2.713	0.011
INV	0.476**	0.228	2.092	0.046
LBR	-0.682*	0.373	-1.830	0.078
FB	-0.750**	0.345	-2.174	0.038
TOP	-0.149	0.100	-1.498	0.145
SAV	-0.141**	0.053	-2.643	0.013
TOT	0.198	0.325	0.611	0.546

*Notes: ** and * signify statistical significance at the 5% and 10%, respectively.*
Source: authors' computation by using Microfit 5.0 software

Table 5. Short-run regression coefficients – Dependent variable: Δy

Regressor	Coefficient	Standard error	T-ratio	Probability
ΔPDS	-0.095*	0.053	-1.779	0.085
ΔPDS1	-0.060***	0.021	-2.923	0.006
ΔPDS2	-0.656	0.612	-1.073	0.291
ΔINV	0.439*	0.227	1.936	0.062
ΔLBR	-0.629*	0.365	-1.722	0.095
ΔFB	-0.146**	0.060	-2.451	0.021
ΔFB1	-0.572*	0.288	-1.985	0.056
ΔTOP	-0.357**	0.138	-2.595	0.014
ΔSAV	0.023	0.219	0.106	0.916
ΔSAV1	0.479*	0.241	1.992	0.055
ΔTOT	0.183	0.305	0.600	0.552
ECM (-1)	-0.622***	0.110	-5.657	0.000
R-Squared: 0.749	R-bar-squared: 0.548	F-statistic: 3.235 [0.003]	DW-statistic: 2.149	

Notes: ***, ** and * signify statistical significance at the 1%, 5% and 10%, respectively.
Source: authors' computation by using Microfit 5.0 software

The empirical results presented in Tables 4 and 5 reveal that public debt service (PDS) has a positive impact on economic growth (y) in the long run. However, a negative and statistically significant relationship was established in the short run. The results imply that public debt payments crowd-out economic growth in Zimbabwe only in the short run, as signified by the negative coefficients of ΔPDS and ΔPDS1. This means that the negative impact of an increase in public debt service servicing in Zimbabwe is not only felt in the present period but has spill over effects to the next period, in the short run. On the contrary, the long-run results suggest that a rise in public debt service leads to an increase in economic growth in Zimbabwe. This finding is unexpected in this study and it contradicts the theoretical and empirical underpinnings on this subject – particularly the debt overhang hypothesis (see Baldacci and Kumar, 2010; Agénor and Montiel, 2008; Patenio and Tan-cruz, 2007). From 2000, Zimbabwe was not meaningfully servicing its domestic and foreign public debts; hence, the study expected public debt service to have a neutral effect on economic growth (see World Bank, 2018b; IMF, 2010).

Long-run and short-run results for other regression variables show that: (i) investment (INV) is positive and statistically significant in both the long run and short run; labour (LBR) and fiscal balance (FB, ΔFB, ΔFB1) are negative and statistically significant in both the long run and short run; trade openness (TOP) is insignificant in the long run, although, in the short run, the coefficient of trade openness is negative and statistically significant; savings (SAV) is negative and has a statistically significant impact on economic growth in Zimbabwe in the long run, while in the short run, a positively significant impact was confirmed; and terms of trade (TOT) is insignificant in both the long run and the short run. The negative and significant coefficient of the error correction term lagged once (ECM_{t-1}) further approves the presence of a stable long-run relationship among the variables. These results suggest that when there is disequilibrium in the economy, about 62% of the adjustment towards the long-run equilibrium is accomplished per year.
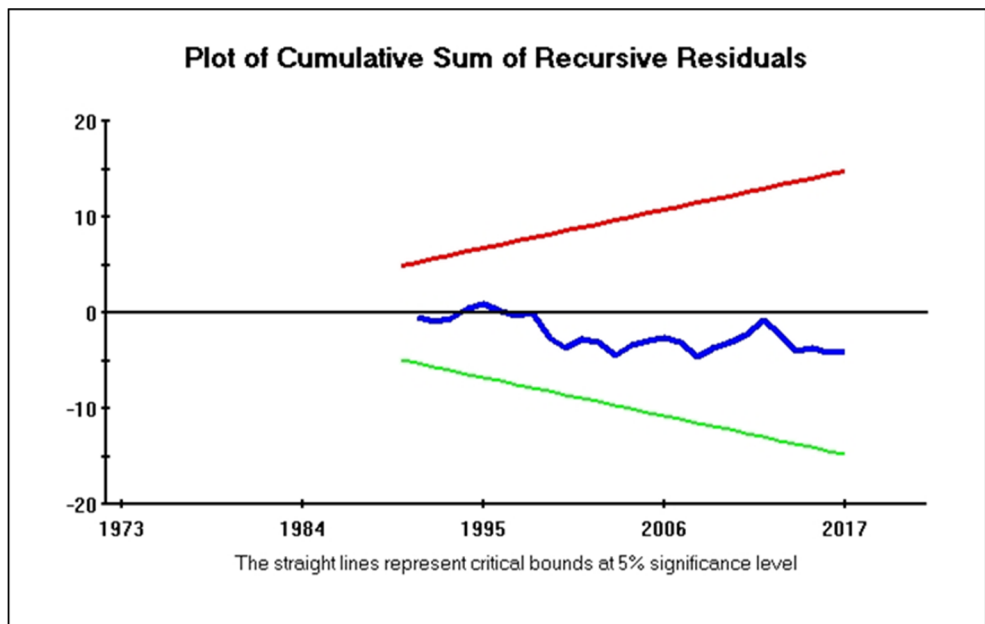
The model passes all diagnostic tests for serial correlation, functional form, normality and heteroscedasticity performed as shown by the results displayed in Table 6.

Table 6. ARDL-ECM model diagnostic tests

| LM Test Statistic	Results
Serial Correlation: CHSQ(1)	0.923[0.337]
Functional Form: CHSQ(1)	0.413[0.520]
Normality: CHSQ (2)	0.922[0.631]
Heteroscedasticity: CHSQ(1)	2.024[0.155]

Source: authors' computation by using Microfit 5.0 software

The stability of the model used in this study is tested by plotting the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMQ) and the results are displayed in Figures 2 and 3.

Figure 2
Source: authors' computation by using Microfit 5.0 software

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level
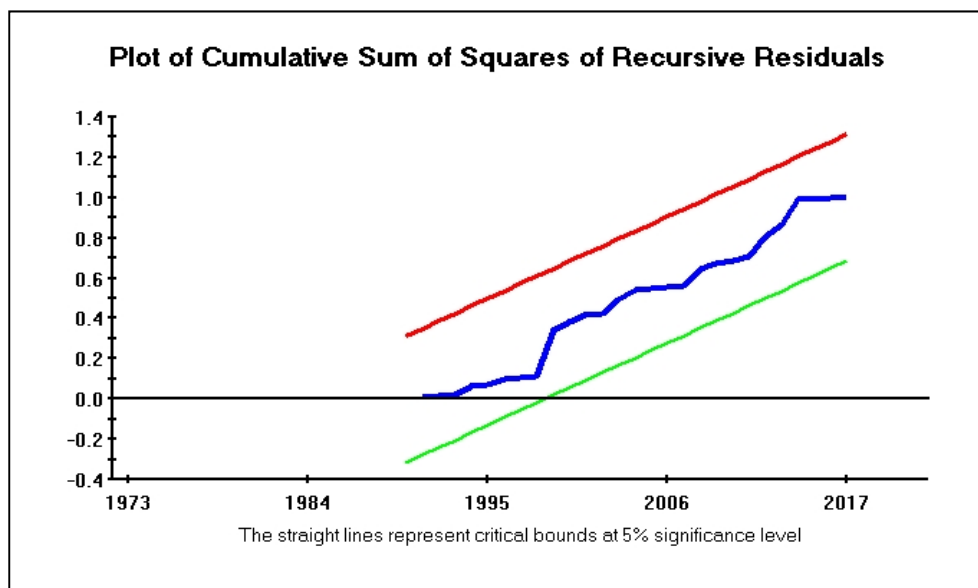
Figure 3
Source: authors' computation by using Microfit 5.0 software

An inspection of the CUSUM and the CUSUMSQ graphs (see Figures 2 and 3) shows that there is model stability; and that at 5% significance level there is no evidence of a systematic change in the coefficients over the study period.

5. Discussions of results and implications

Government debt repayment difficulties have affected many developing countries, particularly African and South American countries (Fosu, 2007). In literature, however, there is a large cross-country variation regarding the impact of public debt service on economic growth. Early theoretical submissions by Sachs (1989), Krugman (1988) and Diamond (1965) support the view that public debt service and economic growth are negatively related. Later, the foregoing hypothesis has been supported by the writing of Clements *et al.* (2003), Pattillo *et al*. (2002), Weeks (2000), and Elbadawi *et al.* (1997), among others.

The channels through which public debt service adversely impacts on economic growth are future tax uncertainties and financial resource outflows to creditors – leading to debt-induced liquidity constraints (see Kalemli-Özcan *et al.,* 2017; Cohen, 1995; Taylor, 1993). Thus, public debt service represents a shift of the budget away from critical productive and social sectors. There is also another branch of theoretical literature that purports the relationship between public debt service and economic growth to be non-existent – the Ricardian Equivalence Hypothesis (see Barro, 1989; 1974).

Regarding empirical evidence on the impact of public debt service on economic growth, the bulk of the studies have been done between 1995 and 2006.

The studies were largely meant to test the effectiveness of public debt relief initiatives on economic growth. Since then, few empirical works have been done on the subject (see, for example, Akram, 2015; Balcilar, 2012; Fosu, 2007).

In view of the above considerations, it can be concluded that the discussion on public debt service and economic growth remains unsettled. Whereas the theoretical literature predominantly supports a negative relationship between public debt service and economic growth, the available empirical findings on the subject are mixed and at best inconclusive. Therefore, this study adds to the existing literature on the topic by applying one of the recently developed econometric techniques, the ARDL method.

This study revealed that the impact of public debt service on economic growth in Zimbabwe is time-variant – negative in the short run but positive in the long run. The results are suggestive of the existence of a crowding-out effect of public debt service on economic growth in Zimbabwe in the short run but a crowding-in effect in the long run. Based on the findings and the foregoing discussions, the study concludes that the impact of public debt service on economic growth is not given but varies across countries and is time-variant. The study findings are expected to bring the debate on this subject close to its conclusion.

6. Conclusions and policy proposals

This paper analysed the impact of public debt service on economic growth in Zimbabwe for the period 1970 – 2017. Public debt servicing problems in Zimbabwe have reached alarming levels where the country is refinancing existing debt through issuing new debt or contracting new loans to obtain foreign exchange. Following long periods of protracted arrears, Zimbabwe's credit worthiness has diminished, resulting in the drying up of cheap foreign finances. The cut-off in the flow of developmental finances and balance of payment support to this country has compounded the public debt servicing problems.

Therefore, this paper tests the crowding-out or crowding-in effect of public debt service on economic growth in Zimbabwe using an autoregressive distributed lag cointegration approach. The main outcome that emerged from this study is that public debt service has a negative relationship with economic growth in the short run in Zimbabwe. However, public debt service was found to have a positive relationship with economic growth in the long run. The results are suggestive of the existence of a crowding-out effect of public debt service on economic growth in Zimbabwe in the short run and crowding-in effect in the long run. In view of these findings, it means that in order to stimulate economic growth in Zimbabwe, the government is encouraged to adopt policies that reduce the existing debt burden until it reaches sustainable levels. This can be achieved by broadening the country's tax base through economic diversification, improving the administration of taxes, and strengthening government debt and foreign exchange reserve management capacity. The latter includes comprehensive recording of public debt data and debt exposure.

Collectively, the study strongly recommends the government of Zimbabwe to solicit for grants from its bilateral and multilateral development partners and to increase the concessionality of new borrowing. In future, the government is recommended to consider the establishment of a "Debt Repayment Fund" where returns from investments and other revenues are deposited for purposes of servicing debt. The study results

also suggest that the implementation of austerity measures to clear current debt arrears be followed with sound economic policies. These economic policies should improve prospects for investment by promulgating sound regulatory frameworks and deepening access to credit.

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CORPORATE TAX AVOIDANCE PRACTICES: AN EMPIRICAL EVIDENCE FROM NIGERIAN FIRMS

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Abstract
This study examined the existence of corporate tax avoidance practices among the public listed firms in Nigeria. Secondary data were obtained from annual published reports from selected Nigerian firms listed in Nigeria stock exchange from 2006 to 2017. Panel Data analysis technique was used to analyse the effect of independent variables (Thin capitalization, Leverage, Firms Size, Transfer Pricing, and Intangible Assets) on dependent variable (Corporate Tax Avoidance). The result showed that thin capitalisation, firm size, profitability, leverages, intangible assets, and transfer pricing are significantly related with corporate tax avoidance. Thin capitalisation, profitability and transfer pricing are the primary driver of corporate tax avoidance. It is concluded that there are several corporate tax avoidance practices employed by Nigerian firms to aggressively reduce their corporate tax liabilities in Nigeria.

JEL Classification : H26, G31, H29, L25, L11, E22

Keywords: Tax Avoidance, Thin capitalization, Leverage, Firms Size, Transfer Pricing, Intangible Assets

1. Introduction

Construction of better road networks, effective and efficient telecommunication, electricity and water supply which are the responsibilities of government which ultimately are benefited by corporate organisation. Therefore government needs to be compensated in form of payment of corporate taxes by corporate organisation for the service rendered in order to fulfil their fiscal responsibilities. Corporate tax is referred to tax paid to the government from the income of corporate organisation (Adegbite, 2015). According to Adegbite, Fasina and Araoye (2019) one of the greatest problems facing this tax system is the problem of tax compliance. Tax

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compliance may be seen in terms of tax avoidance which is being referred to as the active means by which the taxpayer seeks to reduce or remove altogether its liability to tax without actually breaking the law, and it is regarded as a legal measure of reducing tax liability. The practice of tax avoidance involves capitalizing on the advantage of the loopholes and available gaps in tax reform in order to reduce corporate tax considerably (Eugene & Abigail, 2016).Corporate tax avoidance has drastically reduced revenue to be accrued to the government. This invariably translated to immeasurable loss of corporate tax revenue to the government which has exposed the government to fiscal irresponsibility. The attributed reason for the low report of tax liabilities of the quoted firms are based on the transfer pricing rules, and the practice of tax haven. The increase of corporate tax avoidance opportunities is also linked with the complexity of transactions which involves operation in the tax havens zone (Otusanya, 2011).

Government's revenues are lower when multinational enterprises avoid paying corporate income taxes through shifting their profits to tax havens. To estimate the scale of profit shifting it was observed that the higher the share of investment from offshore financial centres, the lower is the reported rate of return on inward foreign direct investment which eventually reduces corporate tax. (Janský and Palanský (2017). There are limited literature that examined the effect of firm's thin capitalisation, transfer pricing, income shifting, and Multinationality on the corporate tax avoidance practices in the Nigerian context. Most of the existing literature employed primary data to examine the effect thin capitalisation on Corporate Tax Avoidance. This paper therefore contributes to existing knowledge by using secondary data to assess the extent to which Nigerian firms retain income in an organisation as the expense of the government. This study adopted the assertion of Otusanya, (2011) to examine the effect of thin capitalization, leverage, firms size, transfer pricing, and intangible assets on corporate tax avoidance. Thus, it is significantly important to gain an understanding to the key motivating factors and methods employed by the firms to minimise their company tax.

This paper is organized as follows: In the next section we provide a description of the background literature. Section 3 describes the data and presents the tools/methodologies used in this study. Section 4 describes the results of the research, while in the last section we discuss the findings and draw the conclusions of the study.

2. Literature Review

2.1 Tax Compliance and Corporate Tax Avoidance

Tax compliance has been defined as reporting of tax liability to the relevant authority in compliance with applicable tax laws, regulation and court decision (Jackson & Milliron, 1986). It has also been defined as a process in which taxpayers file all the required tax returns by declaring all income accurately and paying the exact tax liability using applicable tax laws and regulation (Palil & Mustapha, 2011). However, tax compliance can be in two forms; administrative and judicious compliance. Administrative compliance refers to compliance with the applicable tax laws as stipulated in the relevant regulations whereas judicious compliance refers to the accuracy in

filling the tax return forms (Chow, 2004). Compliance can be through enforcement by relevant authorities or through voluntary willingness of the taxpayers (Kastlunger, Lozza, Kirchler, & Schabmann, 2013). The tax compliance enforcement is through powers conferred on the relevant authorities to force the taxpayers to pay while voluntary means by morality of the taxpayers to pay tax willingly. Thus, voluntary tax compliance has been defined as filling and reporting of tax returns, correct self-assessment of tax due and payment of taxes before or on the due date without enforcement (Silvani & Baer, 1997).

Corporate tax avoidance which is defined as the payment of low cash taxes in naira of pre-tax earnings of corporate entities (Hanlon and Heitzman, 2010). Tax minimisation, tax avoidance and tax evasion can be considered along a spectrum of activity. At the most egregious end, tax evasion refers to taxpayers deliberately and dishonestly breaking the law to avoid paying tax. Next to tax evasion is a large grey area, in which taxpayers construct contrived schemes or exploit loopholes to reduce their tax liability. This is known as tax avoidance. Some tax avoidance activity might technically comply with the law but be contrary to its spirit and purpose. Other tax avoidance activity may in fact cross the line of what is legal but will require detailed investigation (and possibly litigation) to determine this. Tax avoidance can be particularly harmful because it is far more difficult for tax administrations to take action against (compared to tax evasion). This is because, by definition, such behaviour occupies a legal grey area. As a result, it is often seen by the public as going unpoliced.

If ordinary taxpayers lose confidence in the system because they see tax avoidance going unaddressed, there is likely to be a reduction in voluntary compliance. Under the Nigeria tax system, taxpayers are required to self-assess their tax obligations, rather than the Federal Inland revenue service board reviewing every transaction or event that may have tax consequences. Voluntary compliance is the cornerstone of this system and is more readily achieved when taxpayers have confidence that the tax system is fair and is being evenly applied. Further, if multinationals are artificially reducing their tax bills, governments are also likely to collect less revenue. A significant source of tax base erosion globally is profit shifting. As a result, taxpayers not engaging in profit shifting shoulder a greater share of the tax burden (than they otherwise would) and face a competitive disadvantage. Government's revenues are lower when multinational enterprises avoid paying corporate income taxes through shifting their profits to tax havens. To estimate the scale of profit shifting it was observed that the higher the share of investment from offshore financial centres, the lower is the reported rate of return on inward foreign direct investment. (Janský and Palanský (2017). Nigerian quoted firms use their level of tax understanding and loopholes legally to minimise corporate taxes (Eugene & Abigail, 2016). A quoted Nigerian firm's average tax rate to reflect a mix operation in a high and low rate of corporate tax payment.

2.2 Empirical Review of Associated Literature

Kim, Li, and Zhang (2011) provided evidence on an effective tax planning and corporate tax avoidance by firms, it was indicated that tax incentives has effect on corporate tax payable to the government by Nigerian quoted firms.

According to Johnson and Soenen (2003), size of company, earning, return on company assets, company leverages and advertisement expenditure are related with the long run performance of the company. It was also observed that the executives and firms have a significant effect on the level of company tax avoidance due to the direct influence on the tax responsibility given to the top management of the organisation. Alalade (2004) concluded that culture and the behaviour of the top management have a positive influence on the taxpayers' avoidance because of the loopholes from the tax law. Furthermore, it was further reported that there is a significant relationship between tax aggressiveness of firms and their financial reporting aggressiveness, most especially firms that participate in earnings management of taxable profit and financial profit simultaneously in the financial reporting.

Adegbite *et al* (2019) examined the effect of tax compliance on personal income tax return in Oyo state. Primary data were collected through standardized questionnaire that were administered to staff of Oyo State Board of Internal Revenue and other taxpayers through random sampling. Data collected were analysed using descriptive statistics, chi- square and Multivariate Analysis of Variance and Covariance (MANOVA). The outcome of the study showed that there is a positive effect of Tax Compliance on PIT. An increase in the level of Tax Compliance result to an increment in the level of Personal Income Tax returns. The level of compliance in payment of PIT would have been higher if tax delinquency which is an act of tax malpractice either by the taxpayers or the tax officials which have adverse effect on the administration of tax is eradicated or reduced. The study recommended that there should be adequate and continuous tax education for a better understanding of tax issues, which will be utilized effectively to formulate successful tax compliance strategies. However, this study examined the effect of tax compliance on personal income tax return not on corporate tax avoidance, therefore the results may not be generalized in wider perspectives.

Akinleye, Olaoye and Fajuyagbe (2018) examined the effects of transfer-pricing regulation and compliance on tax administration in Nigeria. The paper used a descriptive survey research design. Questionnaire was used as the research instrument for data collection. Logit regression, Pearson product moment correlation, variance inflation factor (VIF) and white heteroskedasticity test were employed to analyse the sourced data. The study revealed that transfer- pricing regulation had a tendency to significantly influence tax administration. This study implied further that transfer pricing and its compliance has the capacity to improve the effectiveness and efficiency of tax administration in Nigeria. Hence, it was concluded that there is poor administration of transfer- pricing tax policy in Nigeria. The study recommended that Federal Inland Revenue Service should put in place not only transfer- pricing laws but adequate machinery in terms of human and technological capital coupled with sensitization on the applicability of the existing transfer- pricing tax policy in Nigeria. However, this study examined the effects of transfer- pricing regulation and compliance on tax administration not on corporate tax avoidance. It was also employed primary source of data in its analysis. Therefore, the results cannot be generalised in wider perspective.

Babatunde (2018) focused on the long run corporate tax avoidance of listed firms in Nigeria with a view to examine the ability of listed firms to pay low amount of cash taxes in naira of pre-tax earnings over a long run period of twelve

years. A sample of 19 listed firms were selected based on purposive sampling technique from the list of NSE 30 listed firms on the Nigeria stock exchange. The long-run cash effective tax rate developed by Dyreng, Hanlon, and Maydew (2008) to measure long run tax avoidance was adopted. The study found that there is variation across the firms in tax avoidance at long run with some firms achieving a lower amount of cash taxes in naira of pre-tax earnings compared to others. The study concluded that firms in the consumer sector pay more taxes than financial service sector though financial service sector firms declare more profit before tax than the consumer sector firms. The study recommended than financial service sector firms should contribute more to education tax in Nigeria.

Taylor and Richardson (2012) investigated the international corporate tax avoidance practices of publicly listed Australian firms. A hand collected sample of 203 publicly listed Australian firms over the 2006- 2009 period are selected from the population of the listed firms. Using OLS estimation techniques to analyse the data, the results indicated that there are several practices Australian firms use to aggressively reduce their tax liabilities. These practices include thin capitalization, transfer pricing, income shifting, multi-nationalism, and tax haven utilization as they are significantly associated with tax avoidance. They found that thin capitalization and transfer pricing are major drivers of tax avoidance whereas, income shifting, and tax haven utilization are less important. Furthermore, their finding revealed that tax havens are likely to be used together with thin capitalization and transfer pricing to maximise international tax avoidance opportunities via increased complexity of transactions carried out through tax havens.

Adegbite (2015) empirically analysed the effect of corporate tax on revenue profile in Nigeria and also examines the impact of corporate tax revenue on economic growth in Nigeria. Secondary data were obtained from Central Bank of Nigeria Statistical Bulletin from 1993 to 2013. Multiple regressions analysis were employed to analyse the relationship between the dependent variable (Gross Domestic Product (GDP)) and independent variables (company income tax, value added tax, petroleum profit tax and inflation). It is therefore concluded that corporate income tax has positive significant impact on revenue profile in Nigeria which directly enhanced growth in Nigeria. Government derives revenue from corporate tax in discharging their obligation by providing funding for infrastructure, education and public health this invariably enhanced economic growth in Nigeria. The study recommended that government should reduce corporate tax rate rather than eliminate corporate tax in Nigeria, lower corporation tax will increase the demand for labour which in turn raises wages and increases consumption. Therefore, a reduction in the corporation tax rate will reduce the incentives to shift profits out, protecting the Corporation Tax base. But the study is about revenue generation not on corporate tax avoidance.

Dyreng et al. (2008) investigated the extent to which some firms can avoid corporate taxes over a long -run period of ten years and determined how predictive one year tax rates are for longrun tax avoidance in U.S for the period 1995 to 2004. They developed and described a new measure of longrun corporate tax avoidance which they labelled as longrun cash effective tax rate. Sample of 2,077 listed firms were selected from 2,439 firms based on positive reported earnings before tax. Descriptive statistics and OLS estimation technique were used to estimate the data. They found that there is considerable crosssectional variation in tax

avoidance among the firms and some of the firms have ability to pay low cash taxes of their pretax earnings than others. They also found that annual cash effective tax rates are not very good predictors of longrun cash effective tax rates and, thus, are not accurate proxies for longrun tax avoidance. While there is some evidence of persistence in annual cash effective tax rates, the persistence is asymmetric.

On the evidence given from the above empirical studies, the gaps identified are scope, methodology and conceptual gap. This is because all the studies seen and reviewed are conducted in Nigeria with different scope, methodology and concepts, and the findings may not be generalized in wider perspectives. From the empirical literature reviewed, it is obvious that there are no studies specifically on the corporate tax avoidance and firms in Nigeria. The existing literature is limited to tax compliance only which did not extended to corporate tax avoidance. Thus, this study is unique and intends to contribute to knowledge by investigating the existence of corporate tax avoidance practices among the public listed firms in Nigeria.

3. Methodology

Secondary data were used in this study. The data were obtained from annual reports accounts of twenty (20) Nigerian firms listed in Nigeria stock exchange from 2006 to 2017. Panel Data analysis technique was used to analyse the effect of independent variables (Thin capitalization, Leverage, Firms Size, Transfer Pricing, and Intangible Assets) on dependent variable (Corporate Tax Avoidance).

Model Specification

Corporate Tax Avoidance is the explained variable in this model, while the explanatory variables are Thin capitalization, Leverage, Firms Size, Transfer Pricing, and Intangible Assets. Twenty (20) Nigerian firms listed in Nigeria stock exchange were purposefully selected from 2006 to 2017. These years were chosen because it were these years Nigeria experiences global economic recession which is being significant to the corporate taxpayers and more important to the level of revenue generated by the government.

$$CORPORATAX = f(TCAPIT_{it}, SSZ_{it} + $$
$$\alpha \quad PROFT_{it}, LEVERAG_{it}, INTER_{it} \ TRANSFP_{it} + u) \qquad (1)$$

$$CORRPORATAX = \alpha_o + \alpha_1 TCAPIT_{it} + \alpha_2 SSZ_{it} + \alpha_3 PROFT_{it} + \alpha_4 LEVERAG_{it} + $$
$$\alpha_5 INTER_{it} + \alpha_6 TRANSFP_{it} + \varepsilon \qquad (2)$$

where:

CORPORATAX = Corporate Tax Avoidance (long run income tax expense divided by pre-tax accounting income over the period OR pre-tax accounting income less taxable income (where taxable income is computed as income tax expense divided by the statutory corporate tax rate of 30%)

TCAPIT	=	Thin Capitalisation (a dummy variable of 1 if the firm has Subsidiary greater than one, otherwise it is 0)	
SSZ	=	Firm Size (the natural logarithm of total assets)	
PROFT	=	Profitability (pre-tax income divided by sales.)	
LEVERAG	=	Leverages (debt divided by total assets)	
INTER	=	Intangible Asset (net property, plant and equipment divided by lagged total assets)	
TRANSFP	=	Transfer Pricing (the transfer pricing index of the firm based on the sum of eight different transfer pricing items divided by eight)	
I	=	Firms 1 through 20	
T	=	Financial Years 2006 to 2017	
ε	=	Error term	

4. Results and Discussion

Table 1: Descriptive statistics

Variables	N	Mean	Std. Dev	Min	Max
CORPORATAX	240	0.188	0.345	0	1
TCAPIT	240	0.423	0.365	.251	0.243
SSZ	240	0.132	0.349	6.113	12.112
PROFT	240	0.160	0.410	0.324	.431
LEVERAG	240	0.286	0.236	0.221	.212
INTER	240	0.142	0.527	.241	.434
TRANSFP	240	0.255	0.134	.121	0.34

Source: Researchers' Computation (2019)

Table 1 details the descriptive statistics of the dependent variable (CORPORATAX) and Independent variables (TCAP, SIZE, PRO, LEV, INT and TP). The dependent variable (CORPORATAX) has a mean (standard deviation) of 0.188 (0.345). These data indicated acceptable level of corporate tax avoidance attributes. The TCAPIT has a mean (standard deviation) of 0.423 (0.365). This also indicated that the selected quoted firms have not breached the required capitalisation provision since the value has not exceeded the threshold value of 1. If the TCAPIT value range from 0 to 1.486 it indicates that there is substantial diversity in the assets, interest bearing liability of the sampled quoted firm.

The second independent variable TCAPIT, LEVERAG and TRANSFP have a mean (standard deviation) of 0.255 (0.134), 0.286 (0.236) and 0.246 (0.349) respectively. The SSZ, PRO and INTER of the firm have a mean (slandered deviation) of 0.132 (0.349), 0.160 (0.410) and 0.142 (0.527). This above-mentioned variable has indicated that on the average of 13.2% the quoted firms in our selected sample have a subsidiary incorporated in a tax heaven area. The mean, standard deviation, median, and range of the independent are presented in Table1. Finally, an acceptable range of variation is observed for all variables, and there is a reasonable level of consistency between the means and medians, reflecting normality of distributions.

Table 2: Pooled effect Model on effect of thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance

Dependent variable	Independent variables	Coefficient	Standard error	t	P>/t/	(95% conf. Interval)	
CORPORA TAX	TCAPIT	.2820000	.0750270	3.76	0.013	-2.52e+07	8.12e+07
	SSZ	4.754967	1.172513	4.06	0.000	2.426589	7.083344
	PROFT	.7353560	.1844856	3.99	0.006	-.401879	1.872591
	LEVERAG	.4474251	.1152563	3.89	0.011	.1310381	.7638122
	INTER	.0725316	.0120886	6.00	0.001	-.2621605	.4072238
	TRANSFP	2.588032	1.036428	2.50	0.014	.5298904	4.646173
	CONSTANT	16.021911	2.243349	7.13	0.000	-5.81e+07	4.61e+07
R-squared = 0.7103		Adj R-squared = 0.6045			Prob > F = 0.0000		
					F(6, 93) = 157.32		

Source: Researcher's Computation

Table 2 showed the effect of thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance. 1% increase in Thin capitalisation (TCAPIT) increases corporate tax avoidance (CORPORATAX) by 0.28%, it shows that there is a positive significant effect of TCAPIT on CORPORATAX (β= .2820000, t = 0.013 < 0.05). 1% increase in SSZ increases CORPORATAX by 0.47%, it shows that there is a positive significant effect of SSZ on CORPORATAX (β= .0203016, t = 0.000 < 0.05). 1% increase in PROFT increases CORPORATAX by 0.735%, it shows that there is a positive significant effect of PROFT on CORPORATAX (β = .0763049, t = 0.001 < 0.05). Also, 1% increase in LEVERAG increases CORPORATAX by 0.441%, it shows that there is a positive significant effect of LEVERAG on CORPORATAX (β = -.0413753, t = 0.011 < 0.05).1% increase in intangible assets (INTER) increases CORPORATAX by 0.725 %, it shows that there is a positive significant effect of intangible assets on CORPORATAX (β = .258, t = 0.001 < 0.05).1% increase in transfer pricing (TRASFP) increases CORPORATAX by 0.049%, it shows that there is a positive significant effect of transfer pricing on CORPORATAX(β = -.0942741, t = 0.000 < 0.05).

Given the coefficient of determination (R^2) as 0.7103 which is 71% supported by high value of adjusted R^2 as 60%, it presumes that the independent variables incorporated into this model have been able to explain the effect of CORPORATAX to 60 %. That is, there is a significant effect of independent variables (Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing) on corporate tax avoidance. The F Probability statistic also confirms the significance of this model. The adjusted R^2 of 0.6377 indicates that about 64 % of total variation in the dependent variable is accounted for by the explanatory variables at level of 0.05 level of significance.

Random effect needs to be tested because of the doubt that may arise with pooled result. Table 3 showed the effect of Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance. 1% increase in thin capitalisation (TCAPIT) increases corporate tax avoidance (CORPORATAX) by 0.28%, it shows that there is a positive significant effect of TCAPIT on CORPORATAX (β= 2.80e+07 t = 0.000 < 0.05). 1% increase

in SSZ increases CORPORATAX by 0.52%, it shows that there is a positive significant effect of SSZ on CORPORATAX (β= 5.215767, t = 0.000 < 0.05). 1% increase in PROFT increases CORPORATAX by 0.275%, it shows that there is a positive significant effect of PROFT on CORPORATAX (β = .2751591, t = 0.002 < 0.05). Also, 1% increase in LEVERAG increases CORPORATAX by 0.421%, it shows that there is a positive significant effect of LEVERAG on CORPORATAX (β = .4211378, t = 0.004 < 0.05).1% increase in intangible assets (INTER) increases CORPORATAX by 0.11 %, it shows that there is a positive significant effect of intangible assets on CORPORATAX (β = .0117284, t = 0.001 < 0.05).1% increase in transfer pricing (TRASFP) increases CORPORATAX by 0.16%, it shows that there is a positive significant effect of transfer pricing on CORPORATAX(β = .2501176, t = 0.007 < 0.05).

Table 3: Effect of Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance using Random effect model

Dependent variable	Independent variables	Coefficient	Standard error	T	P>/t/	(95% conf. Interval)	
CORPORA TAX	TCAPIT	.2820007	.0361740	7.80	0.000	-.0367922	.0473078
	SSZ	.5215767	.1052308	4.96	0.000	-.0136342	.0526918
	PROFT	.2751591	.0781701	3.52	0.002	-.0289531	.1727598
	LEVERAG	.4211378	.1429258	2.95	0.004	-.1309993	.0394872
	INTER	.0117284	.0025845	4.54	0.001	-.1028935	.5549898
	TRANSFP	.2501176	.0931238	2.69	0.007	-.302077	.4020496
	CONSTANT	.2876366	.0334983	8.59	0.000	7.932452	19.74354
R-sq: within = 0.7197 between = 0.9541 overall = 0.9095	sigma_u | 53084919 sigma_e | 1.012e+08 rho | .21575038 (fraction of variance due to u_i)				Wald chi2 (6) = 623.30		
						Prob > chi2 = 0.0000	

Source: Researchers' Computation

Table 4 showed the effect of thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance. 1% increase in thin capitalisation (TCAPIT) increases corporate tax avoidance (CORPORATAX) by 0.28%, it shows that there is a positive significant effect of TCAPIT on CORPORATAX (β= .2820007, t = 0.000 < 0.05). 1% increase in SSZ increases CORPORATAX by 0.524%, it shows that there is a positive significant effect of SSZ on CORPORATAX (β= .5242953, t = 0.000 < 0.05). 1% increase in PROFT increases CORPORATAX by 0.451%, it shows that there is a positive significant effect of PROFT on CORPORATAX (β = .4515670, t = 0.002 < 0.05). Also, 1% increase in LEVERAG increases CORPORATAX by 0.353%, it shows that there is a positive significant effect of LEVERAG on CORPORATAX (β = .3533903, t = 0.004 < 0.05).1% increase in intangible assets (INTER) increases CORPORATAX by 0.055 %, it shows that there is a positive significant effect of

intangible assets on CORPORATAX (β = .0550808, t = 0.009 < 0.05).1% increase in transfer pricing (TRASFP) increases CORPORATAX by 0.022%, it shows that there is a positive significant effect of transfer pricing on CORPORATAX(β = . 0222192, t = 0.018 < 0.05).

Table 4: Effect of Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance using Fixed effect model

| Dependent variable	Independent variables	Coefficient	Standard error	T	P>/T/	(95% conf. Interval)	
CORPORAT AX	TCAPIT	.2820007	.0361702	7.80	0.000	-.0367922	.0473078
	SSZ	.5242953	**.1036839**	5.06	0.000	-.0163196	.0506943
	PROFT	.4515670	**.0941035**	4.80	0.003	-.0297371	.1794669
	LEVERAG	.3533903	.1408153	2.51	0.014	-.1338697	.0363124
	INTER	.0550808	.0165632	3.33	0.009	-.7871915	.3435201
	TRANSFP	.0222192	**.0091437**	2.43	0.018	.0743813	1.000795
	CONSTANT	**6.665677**	**2.840766**	2.35	0.022	7.992576	23.28138
R-sq: within = 0.7263 between = 0.9472 overall = 0.9037		Prob > F = 0.0000		sigma_u | 99655624 sigma_e | 1.012e+08 rho | .49226311 (fraction of variance due to u_i)			

Source: Researchers' Computation

Table 5: Hausman test on the Effect of Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance

Dependent variables	Independent variables	Coefficient (b)	Coefficient (B)	(b-B) Difference	Sqrt (diag (v-b-v-B)) S.E
CORPORATAX	TCAPIT	.2820007	.2820007	-	-
	SSZ	.5215767	.5242953	-.0271856	.171732
	PROFT	.2751591	.4515670	.7267261	-
	LEVERAG	.4211378	.3533903	.0677475	.0235739
	INTER	.0117284	.0550808	.0668092	-
	TRANSFP	.2501176	.0222192	.2792563	.1646783
b = consistent under Ho and Ha;	B = inconsistent under Ha, efficient under Ho	Test: Ho: difference in coefficients not systematic chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 4.51 Prob>chi2 = 0.4789 (V_b-V_B is not positive definite)			

Source: Researchers' Computation

To decide between fixed or random effects, Hausman test was conducted where the null hypothesis is that the preferred model is random affects vs. the alternative the fixed effects (Green, 2008). It basically tests whether the unique

errors (*ui*) are correlated with the regressors, the null hypothesis is they are not. If Chi2< 0 is greater than 0.05 (i.e. significant), random effects should be considered, therefore the null hypothesis is accepted.
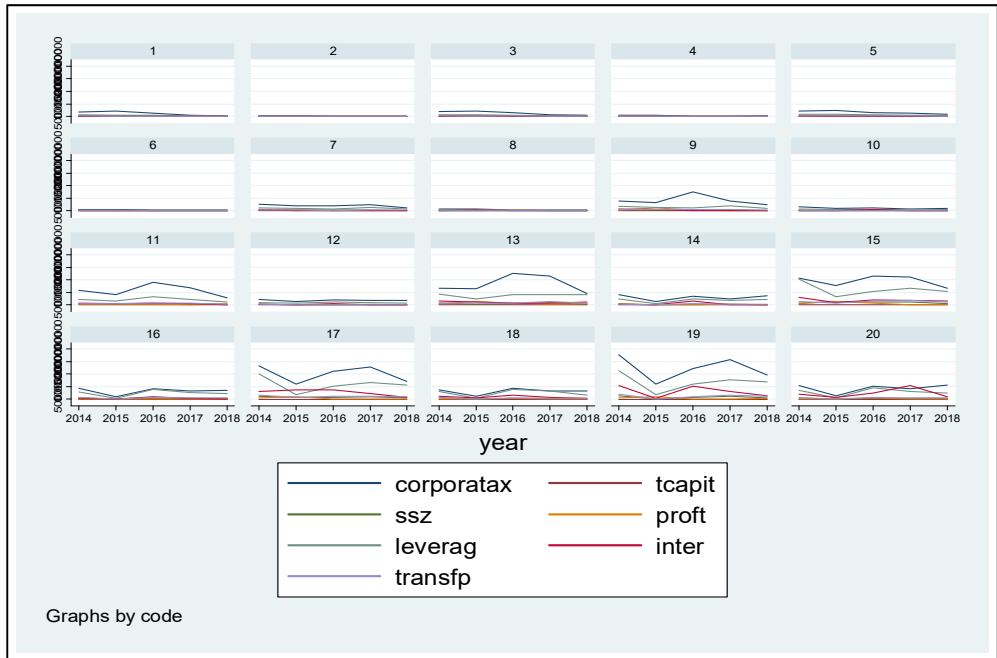
Fig. 1. Panel Analysis plots on the effect of Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on Corporate tax avoidance.

Source: Authors' Draft (2019)

Correlation Results

Table 5. The relationship among Thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing on corporate tax avoidance

	CORPORATAX	TCAPIT	SSZ	PROFT	LEVERAG	INTER	TRANSFP
CORPORATAX	1.0000						
TCAPIT	0.0258	1.0000					
SSZ	0.0264*	-0.0548	1.0000				
PROFT	0.0809*	0.0056	0.5381*	1.0000			
LEVERAG	0.0494*	-0.0591	0.0696*	0.3667*	1.0000		
INTER	0.0424*	-0.0156	0.7243*	0.3229*	0.7823*	1.0000	
TRANSFP	0.0330*	-0.0733	0.0255*	0.4148*	0.9385*	0.7452*	1.0000

Source: Researchers' Computation

The correlation result of Pearson pairwise in the table 5 showed that there is a positive significant correlation between CORPORATAX and TCAPIT, SSZ, PROFT, LEVERAG, INTER and TRANSFP. Corporate tax avoidance had positive significant relationship with SSZ, PROFT, LEVERAG, INTER and TRANSFP (0.0264*, 0.0809*, 0.0494*, 0.0424* and 0.0330* respectively). The results confirmed that CORPORATAX is positively and significantly linked with the company profitability, leverage and transfer pricing. This predicted that company utilised Thin capitalization, Leverage, Firms Size, Transfer Pricing, and Intangible Assets to circumvent payment of corporate tax in Nigerian firms. Also, most of the quoted firms tactically setting an artificial inter-company transfer prices in order to facilitate corporate tax avoidance.

5. Discussion of findings

The results from the analysis indicated that corporate tax avoidance is positively associated with firm size, leverages, Intangible asset, and Transfer pricing. This supported the view of Sinn, (1990): Chan, Troutman and Bryan (2000): Noor Sharoja Sapiei and Kasipillai (2013). They advocated that firms emphasize on corporate tax avoidance activities through thin capitalisation, firm size, profitability, leverages, intangible asset and transfer pricing. Transfer pricing involves the use of tax haven which is being incorporated with multinational entities. Transfer pricing has been used to shift profits from countries with a high tax burden to those countries with a relatively low tax burden by using prices that are not at arm's length. Firms also structure their prices and make intra- firms transaction in order to facilitate corporate tax avoidance. Most of the firms are tactically setting artificial intercompany price transfer. Additionally, it is also noted importantly that the nature of transaction that exist in recent years is turning the firms tax liability into profit which is an indication of risk related to thin capitalisation. This result is supported by Pearson (2005). This is further manifested by a decline in the operational tax rates to increase in number of firms reporting a zero or nominal corporate tax liability.

Firms also resorted to the use of leverage as a means of shifting income to an affiliate in a low tax jurisdiction in order to reduce tax liability. Leverage shows the composition/proportion of debt in the structure of firm financing activities. A firm is considered to be highly levered or geared, if the composition of debt in the firm financing structure is more than equity, and lowly levered if otherwise.

6. Conclusion

This study examined the existence of corporate tax avoidance practices among the public listed firms in Nigeria. Secondary data were obtained from annual published reports of selected Nigerian firms listed in Nigeria stock exchange from 2006 to 2017. The panel data analysis results showed that firm size, leverages, Intangible asset, Transfer pricing are associated positively and significantly with corporate tax avoidance.

In conclusion, thin capitalisation, firm size, profitability, leverages, intangible assets and transfer pricing are significantly related with corporate tax avoidance. With the significance level, it is deduced that thin capitalisation, profitability and transfer pricing are the primary drivers of corporate tax avoidance which obviously employed by corporate organisation in order to tactfully, diplomatically and legally circumvent payment of corporate tax. This traslated that there are several corporate tax avoidance practices employed by Nigerian firms to aggressively reduce their corporate tax liabilities in the country. We find out that Nigerian listed firms use a number of corporate tax avoidance practices to aggresively lessen their tax liability. Specifically, we find that thin capitalisation, firm size,leverages, intangible assets and transfer pricing are significantly related with corporated tax avoidance. It is therefore recommended that government should establish corporate tax avoidance monitoring mechanisms which may assist in limiting the tax avoidance related activities and bring the entities into tax net.

This paper is subjected to several limitation, the first limitation is that the sample is drawn from publicly listed firms in Nigeria. Because of data unavailability, the paper could not make inclusive firms that are not listed in the Nigeria stock exchange market. The second limitation is that the return on tax data are reconstuctive to various corporate tax avoidance measures based on the avaliable financial statement data.

The findings are based on scientific literature and the case study examined, therefore further research is recommended to broaden the knowledge on this topic. The future development of the topic could be conducted using banking sector as a case study in order to get not only qualitative, but quantitative results as well. In addition to this, the impact of transfer pricing on effective tax rate among mutinational companies can also be examined because of limited studies and contemporary nature of it.

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THE RELATIONSHIP BETWEEN SELECTED MARKET ORIENTATION DIMENSIONS AND ORGANIZATIONAL PERFORMANCE WITHIN UNIVERSITIES IN SOUTH AFRICA

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Abstract

The association of market orientation and organisation performance has been the focal point of several studies that confirmed a positive relationship between the constructs. However, there is a lack of evidence in studies examining this issue within universities of technology (UoTs) in South Africa. Hence, the study was undertaken with the main objective of conducting an analysis on the dimensions of MARKOR scale of market orientation in the prediction of university performance within UoTs in South Africa. Both the resource based view theory and the dynamic capacity theory were identified as the foundation of the study. Considering the situational factors and the institutions' environment, a non-probability sampling procedure was chosen. A convenience sample of 507 full-time employed academics within the six UoTs in South Africa, participated in a cross-sectional survey through a self-administered structured questionnaire. The factor analysis procedure resulted in the extraction of three primary dimensions, namely market information generation, market information dissemination and responsiveness. A conceptual research model was tested using confirmatory factor analysis. Through multiple regression analysis, the results show that market information generation, market information dissemination and responsiveness are significant predictors of university performance. The findings contribute to an enhanced comprehension of the dimensions of MARKOR scale towards predicting university performance among UoTs in South Africa. The study provides possible recommendations and extends immensely the existing knowledge among researched concepts when measuring organisational performance.

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1. Introduction

Contrary to the conservative image of the higher education institutions (HEIs) sector globally, universities have begun to show an increasing interest in marketing. The latest developments within the HE sector have encouraged university management to realise the potential of market forces logic in becoming an integral part of the academic world (Hayrimen-Alestalo and Peltola, 2006). This resulted due to restructuring and improvements in technology and society; demands of the labour market are continually changing, which is why the South African HE environment has been changing (Janse van Rensburg et.al , 2017). This transformation of the HE sector places an excessive amount of pressure on universities, as it is necessary for them to be effective and efficient in their day-to-day operations.

The current research is the first to study the relationship between components of market orientation and university performance within Universities of Technology (UoTs) in South Africa. UoTs in South Africa are the focus of the study, notwithstanding the fact that, characteristic of a business operating environment, they have also undergone radical transformation over the past decades. In the process, UoTs have learned a great deal about operating in a business-like manner and, in fact, are businesses in the ordinary sense, as they have to compete for resources with other universities. In that vein, UoTs provide a good pedestal for this study, as they, increasingly, are becoming an economy of knowledge in which information is used to improve productivity and seek competitive advantage.

The concept of marketing was rehabilitated under a new name: market orientation (Van Raaij, 2001). Na,et.al (2019) refer to market orientation as a management thought that overcomes theoretical limitations of marketing concepts .Invariably, the concept of market orientation has been approached from two perspectives: market orientation as behavioral (Kohli and Jaworski, 1990) and market orientation as cultural (Narver and Slater, 1990). These initial efforts by Kohli and Jaworski (1990) and Narver and Slater (1990) began a concentrated effort that led to the formation of a specialised literature that has developed around this new perspective in the marketing field. Subsequently, the present market orientation literature is based on the research work of Narver and Slater (1990) as well as of Kohli and Jarworski (1990), which in essence imposed a new perspective on the marketing concept.

The association of market orientation and organisation performance has been the focal point of several studies that confirmed a positive relationship between the construct. As a significant contributor to a firm's long-term success, market orientation has expanded as a major antecedent of organisational performance (Gheysari, et.al 2012). Years of research have concluded that market-oriented companies perform better than companies that are less market oriented. In fact, much of the research investigating the market orientation concept suggests that firms that have better market knowledge and are often more creative and innovative overall, which should lead to better overall long-term performance (Pleshko and Herens, 2000). To this end, a market orientation philosophy helps firms adopt the most effective and efficient activities for creating superior value for buyers and thus continuous superior performance for the business (Narver and Slater 1990).

In this paper, market orientation is defined as the ability of the organisation to generate, disseminate and use superior information about customers and competitors (Kohli and Jaworski, 1990). From this perspective, MARKOR scales have been developed to measure market orientation and tested with positive results (Jaworski and Kohli, 1993; Kohli, et.al, 1993). In addition, these measurement scales focused on the firm's activities and behaviours regarding customer needs, competitive information, market intelligence and the sharing of such knowledge across organisational functions (Siguaw et al., 1998). In Kohli and Jaworski's (1990) works, the concept of market orientation is used as the implementation of the marketing concept within the organisation. Thus, an organisation's success will depend largely on its ability to continuously generate intelligence about its customers' need and disseminate the information generated with a view to responding satisfactorily to the customers' needs (Hamadu,et al. 2011). This study adopts the dimensions of Kohli and Jaworski (1990) MARKOR scale (i.e. market information generation, market information dissemination and responsiveness) to analyse the potential impact of market orientation on university performance in South Africa from an academic stance.

2. Problem statement

Although the effect of market orientation on firms' performance has been widely recognised, few studies explored the relationship between market orientation and university performance. Thus, there is a definite paucity in studies examining this issue, especially within UoTs in South Africa. Research pertaining to market orientation in HEIs in South Africa seems to be deficient, therefore, an empirical gap in research exists within a South African university context to explore the influencing MARKOR dimensions that impact on university performance. In view of this lack of research evidence in the field of market orientation studies within HEIs, a study identifying the components of market orientation adoption is vital in a South African HEI context. Furthermore, this lack of published knowledge in South Africa may suggest that the impact of market orientation on university performance has been overlooked.

The aim of this paper is to fill part of the gap and open a window of research to understand better the processes and factors involved in the operationalisation of market orientation. To the researcher's knowledge, no previous study has explored the applicability of the MARKOR scale within the HEI sphere, particularly in South Africa. This study attempts to add to the body of previous research by exploring the perceptions of academics on the predictive value of MARKOR scale dimensions on university performance. It is also interesting to examine the extent to which MARKOR dimensions can influence performance of UoTs

3. Literature review

3.1 Theoretical framework

Whilst market orientation has been a subject for many organisations, various theories, underlying its existence and prominence within contemporary marketing have been reported in the literature. Within the domain of market orientation,

universities are also subjected to competitive advantages and accompanying threats. Hence, the resource-based theory (RBT) may also come into into play among universities, taking into account the presence of private, public advantaged and disadvantaged education institutions, institutions especially with the private HE domain in South Africa. Hunt and Morgan (1995) suggest that market-oriented institutions can achieve a position of competitive advantage and long-run performance and sustainability through adopting RBT. Kuosmanen and Kuosmanen (2009:235) affirm that "[s]ustainability is nowadays generally accepted as one of the key success factors in the long-term business strategy of the firm".

Furthermore, of recent, theorists have made a number of inroads in understanding market orientation, which has been collectively labelled dynamic capabilities theory (DCT). DCT emphasises that marketplaces are dynamic, rather than simple in terms of heterogeneity with regard to institutions' resource endowments (Morgan, et al. 2009). The DCT theory explores the capabilities by which an institution's resources are acquired and deployed in ways that match the firm's market environment, which explains inter-institution performance variances (Eisenhardt and Martin, 2000; Makadok,2001).

Against this backdrop, the adoption of both theories as the theoretical bedrock may be useful in addressing market orientation and university performance among UoTs within a South African context.

3.2 MARKOR dimensions

According to Kohli and Jaworski, (1990), the behavioural perspective is concerned with the implementation of the marketing concept and concentrates on three organisational activities, namely generating market intelligence, the dissemination and transfer of market intelligence throughout the firm and an organisation's degree of responsiveness to market intelligence. This conceptualisation of the market orientation construct suggests a clear focus on information-related behaviour (Helfert,et.al,2001; Kirca,et al.2005; Ng,2016; Glaveli and Geormas, 2018).

3.2.1 Market intelligence generation

Market intelligence generation is the starting point of a market-oriented university. Market intelligence generation is a broader concept than customers' verbalised needs and preferences and includes:

- gathering and analysing information regarding customer's current and future needs,
- monitoring and analysing exogenous factors (such as competition, government, technology and other environmental forces), and
- gathering and monitoring of market intelligence through formal and informal means (Kohli and Jaworski, 1990; Zebal, 2003).

3.2.2 Market intelligence dissemination

For an institution to adapt to market needs, market intelligence generated must be communicated and disseminated to relevant departments and individuals in the institution (Harris and Ogbonna, 1999). To this end, the market intelligence dissemination process entails two distinct aspects, namely:

- sharing existing and anticipated information throughout the organisation, and
- ensuring effective use of disseminated information, which is a two-way process comprising of lateral and horizontal communication (Kohli and Jaworski, 1990).

3.2.3 Responsiveness

The last dimension of the MARKOR framework proposed by Kohli and Jaworski (1990) emphasises the responsiveness of the firms to the market intelligence generated and disseminated. Responsiveness to market intelligence refers to the ability of the organisation to respond to generated and disseminated market information and is divided into two types of activities, namely response design (such as using market intelligence to develop plans) and plan execution (Harris and Ogbonna, 1999).

3.2.4 University performance

Performance measurement compares actual performance with what has been planned and provides feedback so that future planning could be much more accurate (McNair,et al. 1990). The feedback emanating from performance measures can then ensure that the vision from the highest level of management is converted sufficiently into strategies and objectives (Naidoo,2002). Consequently, employees are better able to deal with strategies and objectives and feedback for planning is enhanced and the whole institution becomes more focused and market-oriented (Khuwaja,et.al, 2017). Although public HEIs in South Africa enjoy considerable statutory autonomy, they are required to provide an account to the government through the Minister of Education according to accepted practice (RSA 2007). In addition, HEIs in South Africa are obliged to submit annual reports on their performance while meeting the expectations of a range of stakeholders in an increasingly turbulent market environment. The Regulations for Annual Reporting by HEIs published in 2007 under the Higher Education Act, 2007, guided this process and complied with the King 111 Report on Governance in respect of the framework for reporting.

4. Conceptual framework and hypotheses

A conceptual framework is suggested where the three MARKOR dimensions are treated as predictors (independent variables) and university performance as an outcome (dependent variable). Figure 1 shows the conceptual model depicting the conceptual framework and its associated relationships.
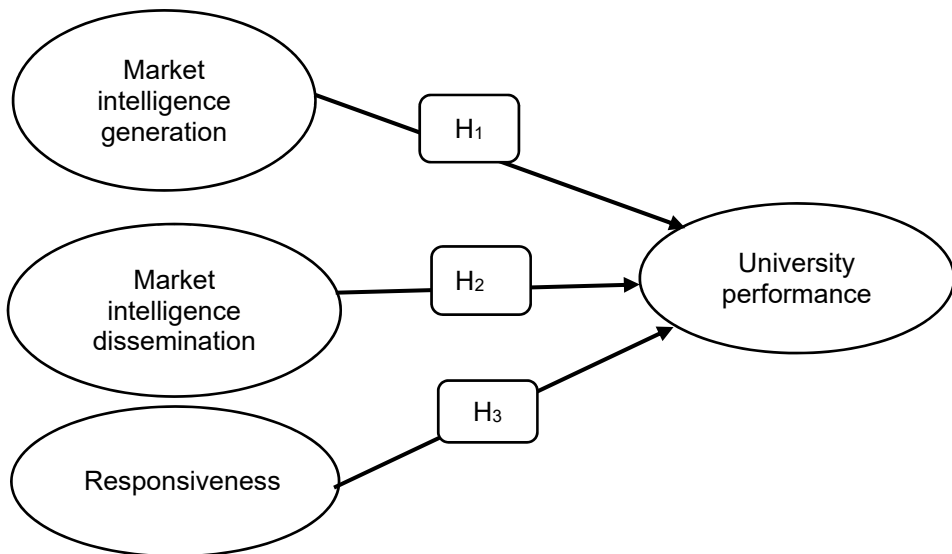
Figure 1: Conceptual Framework

Arising from the conceptual framework, the following hypotheses were formulated:

H_1:   There is a positive relationship between market intelligence generation and university performance.

H_2:   There is a positive relationship between market intelligence dissemination and university performance.

H_3:   There is a positive relationship between responsiveness and university performance.

5. Methodology and design of research

The research design of this study was a basic applied research approach seeking predictive relationships within the studied variables. The methodology of this research is embedded within a post-positivism and applied quantitative research paradigm adopting a cross-sectional survey. The quantitative approach is viewed as systematic and structured, aimed at obtaining information from respondents in a direct, open manner (Du Plessis and Rousseau, 2007).

5.1 Population, sample and participant

The target population was restricted to academics who were selected conveniently based on availability. In order to achieve the stated study purpose, a non-probability convenience sampling procedure was pursued to recruit full-time academics from the six participating UoTs in South Africa.

5.2 Instrumentation and data collection

Based on the research undertaken by Zebal (2003), MARKOR instrument was modified to fit the context contained by the three main dimensions to capture market orientation levels. University performance was measured by 6 context specific items which were identified from previous studies by Ma and Todorovic (2011).The instruments were based on five-point Likert scales with one denoting strongly disagree to five denoting strongly agree. Further, demographic data were included in the survey (gender, age of academics etc.).

The researcher distributed 540 questionnaires with the aid of lead staff members within the six participating institutions to obtain maximum participation of respondents for data collection. Of these distributed questionnaires, only 507 questionnaires were useful in the final analysis of the results after eliminating 33 questionnaires that were not fully completed.

6. Results

6.1. Sample composition

An analysis of the demographic profile of respondents shows that there were more male academics (57%; n=287) in the sample compared to female academics (43%; n=220). In terms of the age groups, the largest group (34%; n=172) was composed of respondents whose ages ranged from 30 to 39 years, followed by (32%; n=160) respondents whose ages ranged from 40 to 49 years. This was followed by (16%, n=81) respondents whose ages ranged from 50 to 59, less than 30 years of age (13%; n=66) and, lastly, respondents who were 60 years and above (5%; n=28).

6.2. Pre-analysis Tests

Coefficient alpha and composite reliabilities (CR) were computed to test the reliability of the measurement scales. Coefficient values and composite reliabilities >0.70 are considered sufficient to conclude internal consistency of the proposed dimensions (Nunnally and Bernstein, 1994). Table 3 shows that both the Cronbach alpha and CR values for each construct met the recommended threshold value of >0.70 and were found to be reliable.

Moreover, validity assessments were undertaken. Content validity was ascertained through a thorough literature review and pilot testing of the measuring instrument prior to the main survey with 41 marketing academics who did not form part of the main survey, which is consistent with Malhotra (2010).

All the AVE estimates in Table 1 are higher than the threshold of 0.50 and thus indicate sufficient accuracy in contributing to construct validity for the various construct measures as suggested by Pallant (2010).

Anderson and Gerbing (1988) recommend factor loadings for convergent validity should be >0.5. As indicated in Table 1, the factor loadings are all above the recommended value, ranging from 0.674 to 0.845. This indicates an acceptable individual item convergence in the validity of all scale items.

Discriminant validity was assessed by comparing the average variance extracted (AVE) values for each construct with the squared correlations between the respective constructs. Since none of the shared variances exceeded the AVE values (Table 3) discriminant validity was confirmed (Yoshida and James, 2010).

Table 1: Reliability and accuracy statistics

Research construct		Cronbach's test		CR	AVE	Shared variance (SV)	Factor loadings
		Item-total	α Value				
Market intelligence dissemination (MID)	MID_1	.740	.890	.89	.54	.34	.768
	MID_2	.749					.722
	MID_3	.742					.717
	MID_4	.731					.693
	MID_5	.697					.749
	MID_6	.770					.757
	MID_7	.776					.723
Market intelligence generation (MIG)	MIG_1	.621	.803	.81	.51	.31	.765
	MIG_2	.759					.681
	MIG_3	.842					.662
	MIG_4	.801					.745
Responsiveness (RES)	RES_1	.695	.806	.83	.56	.34	.729
	RES_2	.701					.802
	RES_3	.691					.723
University performance (UP)	UNP_1	.741	.90	.91	.62	.34	.791
	UNP_2	.796					.835
	UNP_3	.703					.759
	UNP_4	.796					.845
	UNP_5	.764					.805
	UNP_6	.628					.674

6.3. Exploratory factor analysis

Exploratory factor analysis (EFA) was initially conducted to affirm the adoption of the factor structure of the measuring instrument. The individual results for the dimensions of the MARKOR instruments are reported in Table 2.

Table 2: Results for Exploratory Factor Analysis of MARKOR

Constructs	Bartlett's tests of sphericity[1] Sig	KMO[2] (sampling adequacy)	% of variance[3]	Eigen-values[4]	No of items
Market orientation dimensions(MARKOR)					
Market intelligence dissemination	.000	0.889	64.05	3.941	7
Market intelligence generation				2.661	4
Responsiveness				2.364	3

6.4. Confirmatory factor analysis

Building from the EFA, confirmatory factor analysis (CFA) was conducted using the AMOS programme to check whether the model satisfactorily fits the data. The following goodness-of-fit measures were considered as a guide to an acceptable model fit: chi-square/degree of freedom (< 3.0), incremental fit index (IFI) >0.90, Tucker- Lewis index (TLI) >0.90, comparative fit index (CFI) >0.90, goodness of fit index (GFI)>0.90 and standard root mean square error of approximation (RMSEA) <0.08 (Hu and Bentler, 1999). The overall fit of the model shown in Table 3 was acceptable as it met the required threshold for fit measures.

Table 3: Goodness-of-fit Statistics

Fit indices	CFA
Chi square/degree of freedom CMIN 382.344(157) df at 0.000	2.435
Incremental fit index (IFI)	0.963
Tucker- Lewis index (TLI)	0.955
Comparative fit index (CFI)	0.962
Goodness of fit index (GFI)	0.929
Root mean square error of approximation (RMSEA)	0.053

6.5. Correlation coefficients

Spearman's non-parametric correlations between the constructs were undertaken and the results are reported in Table 4. Moderate to strong correlations were found between MID and MIG (r=.557; p<0.01), MID and RES (r=.566; p<0.01), MID and UP (r=.585; p<0.01), MIG and RES (r=.518; p<0.01), MIG and UP (r=.489; p<0.01) and between RES and UP (r=.584; p<0.01).

Table 4: Correlations between Constructs

Construct	MID	MIG	RES	UP	MEAN	STD
MID	1.000	.557**	.566**	.585**	3.59	0.84
MIG	.557**	1.00	.518**	.489**	3.61	0.83
RES	.566**	.518**	1.00	.584**	3.46	0.86
UP	.585**	.489**	.584**	1.00	4.52	1.39

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

6.6. Regression analysis

Furthermore, multiple regression analysis was used to model the causal effect and estimate the marginal contribution of market intelligence generation, market intelligence dissemination and responsiveness on the performance of the UoTs in South Africa. To this end, collinearity statistics, namely the variance inflation factor (VIF) and tolerance values were computed in order to assess multicollinearity in the data set. Variables that have VIF values >10 and tolerance values <0.10 indicate multicollinearity problems (Pallant, 2010). As shown in Table 5, none of the independent variables had VIF values >10 and tolerance value <0.10, confirming the absence of multicollinearity in the data.

To examine the influence of market orientation dimensions on university performance levels, regression analysis was performed with university performance as the dependent variable (outcome) and MIG, MID and RES as independent variables (predictors). The overall regression was significant ($F = 28.16$; $p < .001$; p<.05). All three variables (MIG, MID and RES) were significant in predicting university performance. Table 5 lists the standardised coefficients of each independent variable. The R-square value indicated that approximately 45 percent of the variance in university performance levels with market orientation was primarily due to the academic perceptions of the MIG, MID and RES provided by the university.

Table 5: Regression Analysis: MARKOR with University Performance

Independent variables: MARKOR dimensions. Dependent variable: University performance	Unstandardised coefficients		Standardised coefficients	t-value	Sig	Collinearity statistics	
	B	Std. error	Beta			Tol	VIF
MIG H1	.139	.044	.139	3.330	.001*	.630	1.59
MID H2	.321	.045	.321	7.419	.000**	.584	1.71
RES H3	.333	.042	.330	7.846	.000**	.620	1.61

*R= .670. R^2=.449. Adjusted R^2 =.445. F=136.412. * Significant at p<0.05 ** Significant at p<0.01. Tol=tolerance value. VIF = Variance inflation factor.*

7. Discussion

With respect to descriptive statistics, Table 4 indicates that all mean scores returned for all the constructs were above the score of three on the Likert scale, suggesting that academics recognise the significance of these constructs within their institution. In addition, the standard deviations are also very similar across the constructs relative to the means. This finding supports the view of Asomaning and Abdulai (2015) that these results can only be made possible if the institution was primarily involved in generating and gathering information about their existing and prospective customers and incorporate this information in developing marketing and production strategies.

Market intelligence generation dimension, (eigenvalue=1.312), consists of four variables accounting for 3.645 percent of the total variance. Consistent with hypothesis one (H1), results computed and shown in Table 5 (β =.139; t = 3.330; p < 0.001) indicate that there is a significant positive relationship between market intelligence generation and university performance. While this dimension relates to how organisations acquire market information in order to share and respond, it is expressed in previous research as a good idea to collect information from customers (Narver and Slater 1990; Ruekert 1992). Likewise, Hou (2008), also attest that if information is collected at university level, it is likely that novelty and meaningfulness of new value options will align with stakeholders' expectations.

Market intelligence dissemination dimension (eigenvalue=15.829) consists of 11 items contributing a percentage variance of 44.053 of the total variances. Hypothesis 2 postulated a positive relationship between market intelligence dissemination and university performance. The standard coefficients shown in Table 5 (β =.321; t = 7.419; p >0.001) confirmed the H2 and thus provided an affirmative response to Abuzid and Abbas (2017) assertion that improved university performance is a consequence of higher levels of market intelligence dissemination.

The sharing of information by departments as well as among various departments results in development of activities to meet customer needs (Felgueira and Rodrigues, 2015). Deshpande et al. (1993) assert that strengthening the inter-cooperation of different departments leads to satisfactorily meeting the continuing needs and wants of customers. Other researchers, such as Hou (2008), propose that such an intervention/ approach will further foster an open decision-making process to gather a wide range of expertise and experience.

Lastly, the responsiveness to market intelligence dimension (eigenvalue = 2.364) comprises three items accounting for 16.888 percentage of the total variance and relates to organisations' actions to respond to their markets (Akonkwa, 2013). As can be seen from Table 5, the results computed (β =.330; t= 7.846; p >0.001) provide evidence to support the third hypothesis, which posited that there would be a positive relationship between responsiveness and university performance. Responding to changes taking place in HEIs will have an effect on generating further information (Abidemi,et al.,2017). Responsiveness also requires the application of marketing tools and techniques to elicit favourable market response (Mokoena, 2015).

The study contributes a new direction in the research on market orientation by opening up a debate on the importance of market orientation practices in the development and improvement of university performance despite inherent barriers in higher education institutions

8. Conclusion and recommendations

This study provides a theoretical and practical basis to extend research on further application of market orientation in academia, especially in cases where academics find their institutions to be unrelated to performance. It further confirms that market orientation, through its three behavioural components measured through the MARKOR scale, significantly impacts university performance based on the aforementioned in the study. The academics' opinions suggest that information generation, dissemination and responsiveness to intelligence are critical for the superior performance of UoTs in South Africa. To deal with the new environmental uncertainty, a university needs to develop a culture that is relevant and responsive to the external environment as well. So far, there has been an implicit assumption that market orientation is appropriate in the establishment of superior university performance. The three MARKOR dimensions, which showed satisfactory reliability could be used as an analytical tool for the prediction of the university performance levels' quality. These dimensions could be used to identify problem areas and provide guidance for future improvement of university performances. Overall, these dimensions of MARKOR may assist university managers in preparing strategies for improvement of their university performance. Furthermore, to empower management and staff with market intelligence, universities must have systems in place for intelligence generation and dissemination and distribution of this information. The task of top management, in this regard, is to install the market-oriented culture through strategy making and implementation at all levels.

The study was confined to full-time academics and responses were based on individual perceptions and cross-sectional measures leading to a degree of bias in the responses obtained. Therefore, the sample warrants caution in respect of generalising the results beyond the population investigated. It is suggested that academic and non-academics' perceptions towards market orientation levels and university performance could be obtained periodically in order to find ways to improve the implementation levels of marketing orientation. Further research in the area of market orientation and university performance should be undertaken over time, perhaps a longitudinal study across the academics and non-academics within the entire university. In addition, further tests of the psychometric properties of the scale could be verified with larger sample sizes. Another limitation concerns the use of a single method of data collection. All the data in the study were collected quantitatively, which led to the common method bias inherent to quantitative methods. Thus, it is recommended that future studies could try to incorporate a qualitative design to mitigate against this bias.

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