ICAF-IMDS 2020
2ND ICAN-MALAYSIA INTERNATIONAL CONFERENCE ON ACCOUNTING AND FINANCE
24-27 FEBRUARY 2020 | KUCHING, MALAYSIA, BORNEO

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THE INSTITUTE OF CHARTERED ACCOUNTANTS OF NIGERIA MALAYSIA DISTRICT SOCIETY

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The ICAN Malaysia District Society organised the 2nd ICAN Malaysia International Conference on Accounting and Finance (ICAF-IMDS) Kuching 2020, Sarawak, Malaysia Borneo, which deals with the **Fourth Industrial Revolution and the Accounting Profession: A sunrise or a sunset**.

The success recorded at the maiden edition of 2019 attracts government and private sector funding and sponsorship support of the 2nd ICAN Malaysia International Accountants Conference. The Sponsors (Business Event Sarawak Ministry of Tourism, Art, Culture, Youth and Sports Sarawak, Sarawak Convention Bureau, Keystone Bank Limited Nigeria), and the Strategic Partners (Universiti Teknologi MARA Accounting Research Institute and Universiti Teknologi MARA Sarawak, Imperial Hotel Kuching, Digital Economic Hub, Sarawak Pepper Board, Sarawak Cultural Village, and TKPM Rampangi Botanical Garden) boost the participation and attendance of international and local researchers, professionals and academicians at the ICAF-IMDS Kuching 2020.

ICAF-IMDS Kuching 2020 is a step in the right direction to (a) review emerging developments of technology on financial accounting, management accounting, public sector accounting, auditing, taxation, corporate finance, forensic accounting, economics, entrepreneurship, risk management, and corporate governance in impacting the governance, people and environment; (b) have a common viewpoint on the prospects of accounting, finance and business as significant producers of useful information for various decision making by different interest groups; and (c) ensure effective alliances between theory and practice of accounting as theoretical and practical presentations are made and discussed on various emerging accountancy, finance and business issues.

This year's Conference replicates a productive event with experts and researchers encompassing the importance of accounting, technology, education, labour, safety and security, and other specialities concerning the fourth industrial revolution and entrepreneurship, judging from several papers presented and reviewed.

Lastly, the Editorial Board Kuching 2020 expresses its profound appreciation to all the sponsors, session chairs, presenters, reviewers, participants, the various Committees, and the management and staff of Imperial Hotel Kuching, Sarawak, Malaysia Borneo for their contributions to the success of the Conference.

We look forward to meeting you in ICAF-IMDS 2021 in Kedah, Malaysia.

Thank you.

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Influence of Capital Structure on Profitability: Empirical evidence from Listed Nigerian Non-Financial Firms

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Abstract

Sound and effective capital structure are essential for sustainable growth and development. This research work investigates the impact of capital structure on the financial performance of firms in Nigeria. A total of one hundred and six (106) non-financial firms listed on the Nigerian Stock Exchange between 2012 and 2016 were used as a sample. Panel data for the selected firms were generated and analysed using a fixed-effect model for estimation. The dependent variable for the study was profitability which was measured as Return on Assets (ROA). The independent variables, on the other hand, are a total debt to the total asset (TD), total long term debt to the total asset (LTD), and short term debt to a total asset (STD) used independently. Sales Growth, Firm growth and Firm Age are used as control variables. Results indicated a significant negative relationship between Total Debt to Asset and short term debt with return on assets (ROA). On the other hand, an insignificant relationship between long term debt and return on assets

Keywords: Capital structure, firm performance, long term debt, profitability, return on assets.

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1. INTRODUCTION

In today’s dynamic and competitive business environment, decisions on capital structure (CS) play a vital function in the firm's daily operations. CS decision influences nearly all the activities in the firm. The issue of CS started to generate significant interest in accounting and finance, ever since the publication of the seminal paper of Modigliani and Miller (1958). Modigliani and Miller (1958) formulated a proposition that in a perfect capital market free of taxes, transaction cost and other frictions, CS was irrelevant in ascertaining firm value. This proposition, popularly known as the MM model, led to several research on CS, with researchers examining the robustness of the model.

Following the 1958 and 1963 Modigliani and Miller publications, a series of theories have been propounded by scholars to elaborate on firms’ optimal CS. The most popular theories include; the agency theory, the trade-off theory, and the pecking order theory. Optimal CS is essential to a firm's success in short- and long-term growth realities. It provides that firms maintain sufficient capital in both favourable and unfavourable conditions.

According to Abu-Rub (2012), CS decision changes correspondingly to the proportion of financial risk related to each firm's financing choices and the connection between return and risk. Generally, firms seek to adopt a financing structure that will guarantee less cost to maximise shareholder wealth. However, equity financing and debt financing (short-term and long-term debt) are the primary sources of financing firms’ operations. They have distinct incentive features and distinct influences on firms’ profitability. The role of debt financing (short-term, long-term and total debt financing) in firms’ profitability is one of the primary objectives of contemporary research.

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Immature debt and equity market are the Nigerian capital market structure; almost all firms' debt financing is significantly short-term debt (Nwude, Idam, Bamidele & Sergius, 2016). Consequently, most of the firms in the country depended more on specialised financial institutions or other commercial banks to provide them with most of the external funds. Therefore the need to investigate the influence of debt financing (total debt, short term, and long term debt) on Nigeria firms' profitability becomes a necessary action since they have distinct return and risk features. This comparison is suitable to be included in the measures of capital structure owing to different results they typically disclosed in instances of an inappropriate funding decision by the firm.

This study investigates the influence of total debt long term and short term debt financing on the profitability of non-financial firms listed in the Nigerian stock exchange market. More often than not, the reported research work has taken a single measurement of debt structure concerning the profitability of Nigerian firms. However, a handful of studies find that total debt, long term and short term debt ratios are the proper measurements of debt ratio in an emerging market like Nigeria owing to fund mismatch compelled by the scarcity of long term debt (Nwude et al. 2016). Circumstance whereby the fund for long term investment operations are from short term debt financing, such operations are inclined to default as repayment of principal and payment of interest may be required when the returns (cash inflow) from the investment may not be readily available. Empirical investigations by Nwude et al. (2016) shows that Nigerian firms predominantly use short-term debt financing. According to Lucey and Zhang (2011), the reason for the high ratio of short debt in firms' capital structure is that there is feeble legal and financial institutions structure in the emerging economy; this compels the creditors to use short term debt financing as a means of control, monitor and discipline borrowers' activities.

Based on the preceding, the influence of debt finance on the return on assets of Nigeria listed firms argued by Nwude et al. (2016) is that the Nigerian business environment has weak financial and legal institutions. A remarkable difference between the capital structures in Nigerian firms and firms in developed countries (for example, United States and Switzerland) was that Nigeria firms presumably prefer short term debt financing with a substantially lower ratio of long term debt. The implication is that Nigerian firms rely heavily on short term debt financing choice rather than long term debt finance, and this, to an extent, might limit the explanatory power of the capital structure theories in Nigeria. From the above, it is thus vital to understand how debt financing has impacted firms profitability in Nigeria in recent times. This research aims to provide a view to firm management in Nigeria about the connectivity between debt structure and profitability.

2. LITERATURE REVIEW

Modigliani and Miller introduced the Relevancy/Irrelevance model of capital structure in 1958. They formulated a proposition that a firm could not adjust the value of its outstanding securities by adjusting the ratio of its capital structure element (Debt and Equity). Modigliani and Miller (1963) made a new proposition by introducing taxes into their earlier model. The implication is that their earlier model of 1958 is suitable under excellent and flawless capital market conditions; thus, the worth of any firm is not dependent on its financing decision. Nevertheless, those assumptions could not hold in the real world. However, when those assumptions were relaxed, capital structure decisions became a significant factor determining a firm's profitability and value (Sheikh and Wang 2010). That is the reason why the Modigliani and Miller Relevancy/Irrelevance model capital structure proposition face challenges for being strictly theoretical (Danso&Adomako, 2014). These challenges led to several capital structure theories by different scholars and researchers.

The pecking order theory considered three financing sources: retained earnings, debt, and equity as the available firm financing source in order of priority. It was, however, articulated clearly by Myers and Majluf (1984). On the other hand, the trade-off theory is assumed to be prominent and the oldest theory relating to firms' financing choices. The original version came into being after the Modigliani-Miller proposition in 1963. Kraus and Litzenberger (1973) established the classical form of the theory that optimal debt level follows a trade-off between tax advantages of debt and insolvency costs. Kraus and Litzenberger (1973) stated that in a complete and flawless capital market, the firms' market worth is not dependent on its capital structure.

Agency theory explains the conflict of interest arising from the separation of ownership from management (Berle & Means 1932). Berle and Means (1932) established that the separation of principal (ownership) and control gives the agent (managers) the chance to chase their interest against the owners' interest. Agency Cost theory maintains that the optimal capital structure is determined by agency cost, which results from the conflict of interest between firm stakeholders. The work of Modigliani and Miller subsequently led to the development of several theories on CS through an empirical of investigation optimal CS. Optimum CS is the ratio of total debt to the total asset at book value that influences both riskiness and profitability of the firm (Bos & Fetherson 1993). The divergence of ideas between scholars could be due to the influence of debt financing on profitability. While some scholars found

a positive relationship between debt financing and profitability, some also disclosed negative, while some provided mixed results.

Abor (2005) uses ROE (return on equity) to measure the performance of listed firms in Ghana concerning debt ratio; the result indicates a positive relationship between ROE and short-term debt ratio. Baum, Schafer and Talayera (2006) also disclosed a positive influence, arguing that debt financing positively influences the firms' achievement. Margrates and Psillaki (2010) and many other researchers also found a positive influence.

On the contrary, Mohammad and Jaafer (2012) use ROE to measure the performance of 39 firms listed on the Amman stock exchange. The result indicates a negative association between total, long-term, and short-term debt with ROE. Kebewar (2013) disclosed that debt negatively influenced the profitability of French firms from 1999 to 2006. Onaolapo and Kajol. (2010); Nwude et al. (2016), Hassan, Faisal, and Muhammad (2016), and many other researchers also argue that the relationship between debt financing and profitability is positive.

Besides the positive and the negative influence of debt financing on firm profitability, some empirical result also produces mixed results. The research work of Cheng, Liu and Chien (2010) that investigated 650 firms in China produced a positive relationship at the debt ratio between 53.97% - 70.48%, while when the debt ratio exceeded 70.48%, the relationship negative became negative. Dwilaksono, H. (2010) studied the effect of STD (short-term debt) and LTD (long-term debt) on the profitability of Mining industrial firms listed on the Indonesian stock exchange between 2003-2007 and found a positive relationship in STD and a negative relationship in LTD with profitability. Li Meng, Wang and Zhou (2008); Agarawal and Zhao (2007) also disclosed mixed results in their research work.

3. METHODOLOGY

3.1 Population and sample selection

The study's sample size was that the entire 115 non-financial firms listed on NSE (Nigeria stock exchange) were selected for this study. However, the study excluded nine (9) firms that do not have complete records or exist between 1st January 2012 and 31st December 2016. After excluding those firms, 106 firms were used for the analysis. Information regarding the individual firm's data was obtained through the firm's annual report audited by a statutory auditor and published by the Nigeria security and exchange commission.

In presenting the results, the main focus of the dependent variable will be on profitability (for this study, profitability is the return on asset (ROA). Return on assets (ROA) is the financial ratio that shows the percentages of profit that a company earns concerning its overall resources (total assets). ROA gives an idea of how efficient management uses its assets to generate earnings. On the other hand, the independent variables (TD, LTD & STD) were used independently. Some firm characteristics (FA, FG & SG) were used as control variables. Firm Age indicates the opportunity and strength of the firm in dealing with the business over a long period. A firm's growth has predicting power for future firm returns. In contrast, sales growth is generally associated with firm profitability and sensitivity to inflation and local currency exchange rate. However, the independent variables (capital structure) and control variables are indicated in Table 4.1 below, as supported by different scholars cited in the reference column.

Table 1. Variables definition and measurement

	Variables		**Code**	**Measurement**	**Reference**
Profitability	Return on Assets		ROA	Net Income / Total Assets	Nwude et al. (2016) Hassan et al. (2016)
Capital structure	Debt ratio	Total debt	TDR	Total debt / Total Assets	Nwude et al. (2016) Hassan et al. (2016)
		Long-term debt	LTDR	Total long-term debt/ Total Assets	Nwude et al. (2016) Hassan et al. (2016)
		Short-term debt	STDR	Total short-term debt/ Total Assets	Nwude et al. (2016) Hassan et al. (2016)

Control variables	Firm Age	FA	Number of years since incorporation	Agyei&Owusu (2014).Nwude et al. (2016)
	Firm growth	FG	Percentage change in total assets (At – At-1 / At-1)%	Nwude et al. (2016)
	Sales growth	SG	Percentage change in total sales (At – At-1 / At-1)%	Nwude et al. (2016) Hassan et al. (2016)

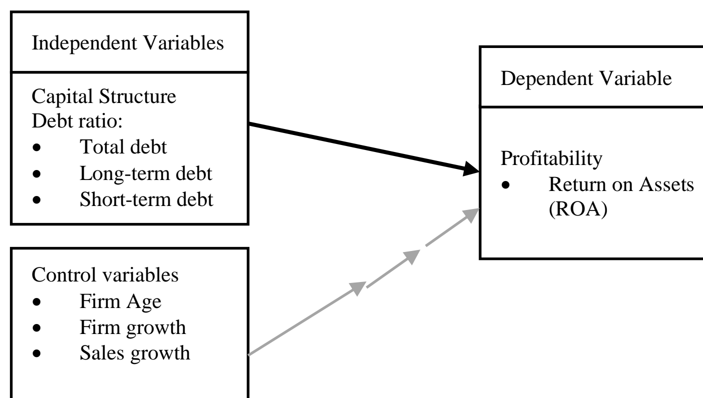
3.2 Model Specification of Model

This study adopted a model used by Nwude et al. (2016) with slight modification by using growth measurement in place of firm size. The firm's profitability (ROA) measurement was regressed separately with each of the proxies of CS, control variables and other bonding factors that may influence the performance of the firms not included in the equation model. These analytical experiments will furnish the researcher with justifiable and straightforward results.

$Y = \beta 0 + \beta 1Xit + \beta 2Zit + \mu$….. (1) Where: Y = dependent Variable; β0 = Constant (intercept) of Y; Xit = Independent Variables; Zit = Control Variables; β1 and β2 = Coefficient of IV (independent variable) and CV (control variables); μ = Stochastic (Random) variables.

The empirical equation models, estimated in this research work, were proxies as follows:
ROA = Return on Asset; TDR = Total Debt Ratio; LTDR = Long-term Debt Ratio;
STDR = Short-term Debt Ratio; FA= Firm Age; FG= Firm Growth; SG=Sales Growth
Model 1: $ROA = \beta 0 + \beta 1TDRit + \beta 2FAit + \beta 3FGit + \beta 4SGit + \mu$
Model 2: $ROA = \beta 0 + \beta 1LTDRit + \beta 2FAit + \beta 3FGit + \beta 4SGit + \mu$
Model 3: $ROA = \beta 0 + \beta 1STDRit + \beta 2FAit + \beta 3FGit + \beta 4SGit + \mu$

Figure 1: A research framework



4. EMPIRICAL RESULTS

4.1 Descriptive statistics

Descriptive statistics were used to describe the trend of the variables used in the study in summary. The table shows the mean, the median, the minimum, the maximum, the standard deviation, the skewness and the kurtosis of the dependent and independent variables in the study. An outlier issue was solved by winsorising all the continuous variables at 5% top and bottom before the computation. Dixon (1980) suggested that winsorisation of data gives more stables results than trimmed means.

According to Tabachnick and Fidell (2007), Pallant (2011) and Griffin and Steinbrecher (2013), outliers can be described as those variables with skewness values above the range of ± 3.3 and kurtosis above ± 10 range. The result presented in Table 2 regarding skewness and kurtosis indicated that all the variables are within the acceptable range.

Table 2. Descriptive analysis of the variables (2012-2016)

	Variable	Mean	Median	Min	Max	Std. deviation	Skewness	Kurtosis
Dependent variable	ROA	0.026	0.034	-0.207	0.206	0.096	-0.590	3.562
Independent variables	TDR	0.560	0.554	0.182	0.986	0.222	0.164	2.227
	LTDR	0.164	0.123	0.00	0.476	0.145	0.830	2.594
	STDR	0.388	0.360	0.082	0.820	0.206	0.509	2.428
Control variables	FA	31.042	32	5	59	16.699	0.071	1.907
	FG	7.916	4.58	-20.93	54.28	17.844	0.902	3.704
	SG	3.074	2.372	-49.439	63.775	26.041	0.274	3.438

Note: TDR=Total debt ratio (Total debt/Total Assets), LTDR=Long-term debt ratio (Total long term debt/Total Assets), STDR= Short term debt ratio (Total short-term debt/Total Assets), FA=Firm age (Number of years since incorporation), FG =Firm growth (Percentage change in total assets), SG=Sales growth (Percentage change in total sales)

From Table 2, ROA (return on assets) ranges from -0.207 to 0.206 with a mean of 0.026 and a standard deviation of 0.096. TDR ranges from 0.182 to 0.986, with a mean value of 0.560 and a standard deviation of 0.14. LTDR ranges from 0.00 to 0.476, with a mean value of 0.164 and a standard deviation of 0.145. The results indicate that some sampled firms have no long-term debt in their debt ratio. STDR ranges from 0.082 to 0.820, with a mean value of 0.388 and a standard deviation of 0.206. It shows that all the sampled firm has an element of short term debt, some with over 80% short term debt. Firm age (FA) ranges from 5years to 59years with a 31years mean value and a standard deviation of 17 years. Firm growth (FG) ranges from -20.93 to 54.28, with an average value of 7.916. A standard deviation of 17.844 Sales growth (SG) rages from -49.439 to 63.775 with a 3.074 mean value and a standard deviation of 26.041.

Furthermore, the study also used variance inflated factors to detect critical multicollinearity (see table 4.2). The general rule of thumb commonly used in empirical literature for determining the presence of critical multicollinearity is VIF≥10 or 1/VIF≤0.1 (see Gujarati 2004; Hair, Black, Babin, Anderson, &Talham 2006). As indicated in Table 3, the result shows that the VIF values are below 10, and the tolerance value is higher than 0.1.

Table 3. VIF and Tolerance value for independent variables

Variable	**VIF**	**1/VIF**
FG	1.09	0.9146
TDR	1.09	0.9171
SG	1.07	0.9321
FA	1.07	0.9339
Mean VIF	1.08	

Table 4. Correlation matrix of dependent and independent variables

	ROA	**TDR**	**LTDR**	**STDR**	**FA**	**FG**	**SG**
ROA	1						
TDR	-0.3109	1					
LTDR	-0.1755	0.4189	1				
STDR	-0.1619	0.7483	-0.2547	1			
FA	-0.0001	0.2464	-0.0459	0.294	1		
FG	0.3724	0.1221	-0.0067	0.1498	-0.0424	1	
SG	0.2611	-0.0385	-0.0128	-0.0105	-0.0238	0.251	1

All the independent variables are below the threshold value of 0.90, as Pallant (2011) suggested. Table 3 reveals that all the debt ratio proxies via; TDR, LTDR, and STDR are negatively correlated with ROA. Firm characteristics proxies via; FG and SG are positively correlated with ROA, while firm age (FA) was negatively correlated with ROA. However, the correlation matrix above quantifies the relationship between two variables but ignores dependent and explanatory variables. The regression model goes beyond the correlation matrix by adding prediction capabilities and provides estimates of values of the dependent variables from the values of independent variables. Therefore, the study conducted a diagnostic test to determine the appropriate regression model and base our relationship and prediction analysis on the result of the regression model used.

4.2 Regression results

4.2.1 Model specification test

The required model specification tests were conducted to determine the appropriate estimation technique. First, the Breusch and PanganLagragian multiplier test for random effects was conducted after running the ordinary least square regression model. The null hypothesis is random effects, while the alternate hypothesis is ordinary least square (OLS). The result returned a chi-square value of 179.81 and a corresponding probability-value of 0.0000. The result indicated that the null hypothesis could not be rejected since the probability value is less than 0.05. (Baltagi, 2005). Secondly, the Hausman test for fixed effect was conducted to select between random effect and fixed-effect model. The Hausman test results showed a chi-square value of 22.40 and a corresponding probability-value of 0.000. The result indicated that the null hypothesis could not be rejected since the probability value is less than 0.05 (Baltagi 2005).

Next, the Heterokedasticity test was conducted to know if the disturbances appearing in the population regression are homoskedasticity and has a constant serial correlation through the random individual effects (see Hsiao, 2003; Baltagi, Byoung, &Seuck, 2010). The Breuch-Pagan/Cook-weisber test for heteroscedasticity showed a chi-square value of 16.93 with a significant probability value of 0.0020. Therefore, this study failed to accept the null hypothesis that there is constant variance, indicating the presence of heteroscedasticity, accept the alternate hypothesis of the presence of general heteroskedasticity.

4.2.2 Result of empirical analysis

Table 5 summarises the TDR model estimations. As betokened by the outputs of model 1, and in line with H1, the central IV (independent variables) – i.e. total debt ratio (TDR), is negatively and significantly influence the DV (dependent variable) - i.e. financial profitability (ROA) at a significance level of ten per cent (10%). The gradient coefficient of the total debt ratio variable (-0.11229; p 0.064) indicates that the higher the total debt ratio in the sample firms, the lower the profitability (ROA). The control variable, firm age, is harmful. Significant influence on the DV (ROA) at a significance of 1%, whereas firm growth (FG) and sales growth (SG) have a significant and positive influence on the DV at a significance level of 1%.

Table 5. Summary of Regression result for TDR

ROA	**Coef.**	**Std. Err.**	**t value**	**P>|t|**	**Significant**
TDR	-0.11229	0.06008	-1.87	0.064	-ve sig
FA	-0.00143	0.00053	-2.71	0.008	-ve sig
FG	0.00091	0.00023	3.96	0.000	+ve sig
SG	0.00044	0.00014	3.12	0.002	+ve sig
_cons	0.12429	0.03215	3.87	0.000	
sigma_u	0.072473				
sigma_e	0.057674				
Rho	0.612256	(fraction	of varia	nce due t	o u_i)
Prob> chi2		=	0.0000		
R-squared		=	0.1495		

Note: TDR=Total debt ratio (Total debt/Total Assets), LTDR=Long-term debt ratio (Total long term debt/Total Assets), STDR = Short term debt ratio (Total short-term debt/Total Assets), FA=Firm age (Number of years since incorporation), FG = Firm growth (Percentage change in total assets), SG=Sales growth (Percentage change in total sales)

Further, the results of model 2 estimation are presented in Table 5. As disclosed by the outputs of the complete model 2, contrary to H1, the IV – i.e. long total debt ratio (LTDR), was positive but did not significantly influence the DV (ROA). The gradient coefficient of the long-term debt ratio variable (0.01117; p 0.832) indicates that the sample firms' long-term debt ratio has no significant influence on profitability (ROA). On the other hand, the control variables produced the same result as in model 1.

Table 6: Summary of Regression result for LTDR

ROA	**Coef.**	**Std. Err.**	**t value**	**P>|t|**	**Significant**
LTDR	0.0111704	0.0525468	0.21	0.832	Not sig
FA	-0.0016074	0.0006176	-2.6	0.011	-ve sig
FG	0.0007659	0.0002158	3.55	0.001	+ve sig
SG	0.0004628	0.0001347	3.43	0.001	+ve sig
_cons	0.0660925	0.0230234	2.87	0.005	

sigma_u	0.077884				
sigma_e	0.058985				
Rho	0.635502	(fraction	of vari	ance due t	o u_i)
Prob> chi2		=	0.0000		
R-squared		=	0.1104		

Table 7 summarises the STDR model estimations. As disclosed by the results of the complete model 3, and consistent with H1, the IV – i.e. STDR, is negatively and significantly influence the DV (ROA) at a significance level of one per cent (10%). The gradient coefficient of the total debt ratio variable (-0.10847; p 0.070) indicates that the higher the STD ratio in the sample firms, the lower the profitability (ROA). On the other hand, the control variables produced the same result as in model 1.

Table 7. Summary of Regression result for STDR

ROA	Coef.	Std. Err.	t value	P>|t|	Significant
STDR	-0.1084736	0.0593114	-1.83	0.070	-ve sig
FA	-0.0013603	0.0005204	-2.61	0.010	-ve sig
FG	0.0009138	0.0002284	4	0.000	+ve sig
SG	0.0004577	0.000134	3.42	0.001	+ve sig
_cons	0.101169	0.0209198	4.84	0.000	
sigma_u	0.076208				
sigma_e	0.057943				
Rho	0.633676				
Prob> chi2		=	0.0000		
R-squared		=	0.1415		

Rho: fraction of variance due to u_i

Overall, the empirical outcome revealed that debt ratios negatively influence firm performance (ROA) in financial profitability. According to the agency theory assumption, firms with a lesser debt ratio look more profitable than those with a higher debt ratio. Specifically, profitable firms' principal (owners) and agent (managers) should use equity financing and retained earnings efficiently, thereby reducing agency costs and staying independent of external debt financiers. This research work complements those of previous studies from other countries in the emerging economy and firm contexts, e.g. Goddard, Tavakoli, and Wilson (2005), Abor (2007), Sheikh and Wang (2011), Salim and Yadav (2012) and Darush and Peter (2015).

Table 8. Summary of overall Regression result

ROA	Significant	ROA	Significant	ROA	Significant
TDR	-ve sig	LTDR	Not sig	STDR	-ve sig
FA	-ve sig	FA	-ve sig	FA	-ve sig
FG	+ve sig	FG	+ve sig	FG	+ve sig
SG	+ve sig	SG	+ve sig	SG	+ve sig
_cons		_cons		_cons	
Prob> chi2	0.0000	Prob> chi2	0.0000	Prob> chi2	0.0000
R-squared	0.1495	R-squared	0.1104	R-squared	0.1415

5. CONCLUSION

CS decision making is essential for the financial profitability of a firm. Debts financing and Equity financing are the primary financing firms' operation sources. Choosing the right proportion of debt and equity in CSratio will assist in raising the firm's financial profitability. Generally, it is assumed that debt allows firms to finance operations that they would not be able to do otherwise; however, it also raises the firm's overall risk. Nevertheless, there are small divergences of argument about the influence of debt financing on financial profitability. The literature disclosed distinct outcomes under distinct circumstances. This research work reveals a noticeable negatively relationship between TD (total debt) and profitability, STD and profitability. Thus, the more the

proportion of debt in capital structure, the less the financial profitability. The results are consistent with Osuji and Odita (2012) and acquiesce with the Pecking order theory.

Debt financing looks highly costly due to some macroeconomic factors and financial crises. Thus, raising the proportion of debt financing in CS will consequently produce lower financial profitability. It can be noticed that profitability positively relates to control variables (firm growth and sales growth). The outcome of this research work acquiesces with the studies of Mohammad and Jaafer (2012), Kebewar (2013) and Darush and Peter (2015). While the result on firm age is negatively related to the profitability is consistent with Osuji and Odita (2012).

Recommendations

This study's results indicated a negative relationship between debt financing and financial profitability, meaning that increasing debt ratio, especially STD, in capital structure will reduce financial profitability. Therefore, it is recommended that firms prefer LTD, which does not significantly influence profitability. The period of this research work encloses the years of economic recession in Nigeria(2015-2016), which affected firms' performance over time. That provides that there is still a chance for improvement. The Nigeria Bureau of Statistics reported toward the end of 2017 that Nigeria is out of recession. Therefore, future research should consider increasing the scope of the study to make the results more reliable.

The study excluded firms in the financial institution sector due to the nature of services rendered by the financial institution, which is quite different from the other sectors. Also, the study does not represent unlisted firms, the study focuses on firms listed on the Nigeria stock exchange market, and the findings may not be generalizable to all firms in Nigeria. Further studies could consider small and medium enterprises (SMEs) in Nigeria. This study could be considered an addition to knowledge and a series of studies and existing literature conducted in Nigeria and globally in capital structure and firm performance. It is expected to add substance to the dearth of literature as the study elucidates the debt ratio on firms' financial performance in Nigeria.

As a developing country, Nigeria aims to attract more foreign investors, better access Nigerian firms to financing, have less cost of capital, better consideration for all the firm's stakeholders, and better firm performance to enhance the country's economic growth and development. Sound and effective capital market practice must be implemented across all Nigerian firm financing sources.

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The effect of Intellectual Capital Disclosure on the Market Value of Listed Companies in Nigeria

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Abstract

This research examines the intellectual capital (IC) disclosure effect on the market value of the companies listed on the Nigerian Stock Exchange mainboard. The hypothesis for the study is formulated using the signalling theory. Using content analysis of sampled 30 most capitalised companies, the study generates IC disclosure scores from annual reports. IC is surrogated with customer capital, protected capital, human capital, innovation capital and process capital. At the same time, corporate market value is proxied with a market capitalization in the study. Using the ordinary least square method, this study longitudinally examined the connection between market capitalization and IC disclosure quality using data between the 2016 and 2018 financial years. The result shows that the listed companies' corporate market value and the overall IC disclosure are significantly and positively correlated. The study recommends that managers disclose adequate information on IC because it influences investors decisions and activities at the capital market.

Keywords: Voluntary disclosure, intellectual capital, corporate market value, Nigeria

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1. INTRODUCTION

Science and technology have brought some innovation into organization processes, which have changed their procedures due to intangible assets embedded in IC characteristics. Efficiency utilization and subsequent disclosure of IC information in companies' annual reports have become a common research area globally among academia and practitioners in the field of accounting (e.g., Mangena, Pike, & Li, 2010; Mouritsen, Bukh, & Marr, 2004; Orens, Aerts, & Lybaert, 2009). The importance of IC, which fails to meet the recognition yardsticks of international accounting frameworks and standards (M'Pherson & Pike, 2001), cannot be overemphasized because its non-inclusion in mainstream financial statements as either asset or capital has led to huge differences between book value and corporate market (e.g., Stewart, 1991; Public, 2000).

Further, scholars such as Bounfour (2003), Bontis (1996), Edvinsson and Malone (1997) have identified relational capital, structural capital, and human capital as the three components of IC. Relational capital refers to an organization's internal and external social relationships, an intangible asset. Structural capital covers the methods, processes, structure of the intellectual property, brands, and other essential things that the company possesses but do not reflect its financial statement (Bounfour, 2003; Bontis, 1996; Stewart, 1997). Included in human capital, according to Edvinsson and Malone (1997); Roos, Roos, Dragonetti, and Edvinsson (1997) and Stewart (1997), are the intellectual abilities, skills, experience, and competence of each employee.

Although one can easily understand relational and human capital constituents, structural capital elements are ambiguous. After critically examining the extant literature on structural capital and the Nigerian economic environment, this paper divides structural capital into three components: process capital (Hsu & Fang, 2009; Stewart, 1997), protected capital or intellectual capital (e.g., Brooking, 1996; Edvinsson & Malone, 1997; Lynn, 1998) and innovation capital (Bontis, Dragonetti, Jacobsen, & Roos, 1999; Joia, 2000). This study will be a novel

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scientific framework for research in IC accounting. The belief is that Innovation capital directly affects a company's culture and capacity to bring out new knowledge (Chang, 2007; Joia, 2000). Process capital includes operation processes, collaborative culture, specific methods, workflow, information technology systems in a company (Hsu & Fang, 2009). Intellectual property is the legal way to protect the infrastructural assets; this is why intellectual assets are referred to as protected capital if legally protected.

Besides, stakeholders are worried about corporate value because it affects present business decisions and the future assessment of firms' investment and financing decisions (Keeney & Keeney, 2009). Market capitalization is suitable for estimating corporate market value (e.g., Abdolmohammadi, 2005; Anam, Fatima, & Majdi, 2011). It is free from manipulating those charged with corporate management; hence, it is reliable. Meanwhile, Abhayawansa and Abeysekera (2008) posit that disclosing intellectual capital can improve firms' market value. It will enhance information symmetry between investors and managers, guarantee the capital market's efficiency, and facilitate better corporate governance practice (Abeysekera, 2008). As a result, it will guide users towards its future direction, signalling theory opines (Morris, 1987). The theory states that annual reports' information content signals the companies' future direction. Therefore, this explains the association between corporate value and intellectual capital reporting. The management of an entity with good value will endeavour to indicate this information in its annual reports by disclosing more IC information. The market could capture information (Anam et al., 2011).

From the preceding, the current study will extend the literature on intellectual capital disclosure to sub-Saharan Africa, particularly Nigeria; it will investigate the effect of IC disclosure and its components: process capital disclosure, human capital disclosure, innovation capital disclosure, and protected capital disclosure on market capitalization proxy for market value. To the best of the researchers' knowledge, this is the pioneer study to consider such a relationship as previous studies have considered the trend of IC disclosure (Haji & Mubaraq, 2012; Mahamad & Salman, 2011) and the impact of VAIC on traditional accounting measures (Salman, Mansor, Babatunde, & Tayib, 2012; Uadiale & Uwuigbe, 2011) in the context of Nigeria economy.

The study's remaining part is structured as follows: Section two discusses the literature review, theoretical framework, and hypotheses development. Section three discusses the research methodology. Meanwhile, section four presents the result of data analysis, and section five concludes the study.

2. LITERATURE REVIEW

2.1 Theoretical Framework

IC Literature has adopted different theories to explain the value relevance of IC information among market participants. One of the most celebrated theories of voluntary disclosure is the signalling theory. Signalling theory suggests that the problem of information asymmetry could be minimized if the party possessing most information could give relevant stakeholders signals (An, Davey, & Eggleton, 2011). The theory proposes that corporate entities with better performance or high-quality companies would like to distinguish themselves from low-performing or low-quality companies by sending signals to the market through voluntary disclosure and minimizing information inequality (Watson, Shrives, & Marston, 2002).

Signalling theory argues that entities with better quality could signal their potential to the market; thus, investors re-estimate its value and then make decisions that will favour the company better (Whiting & Miller, 2008). In the same vein, the company anticipates securing more investment in the investors' favour. The costs of raising capital will reduce. Other studies, such as Oliveira, Rodrigues, and Craig (2006), argue that corporate entities will be better motivated and encouraged to disclose IC related information if the market responds positively to the information disclosure. However, the reporting format and emphasis could vary depending on companies.

2.2 Literature on market capitalization and IC disclosure

Research on the influence of disclosure and corporate value has received considerable attention among academia and some notable practitioners in recent times. The signalling theory explains the relationship since it assumed the information contents of IC would change the opinion of the market participants regarding the present as well as the future performance of the business organizations (e.g., Gamerschlag, 2013; Ousama, Fatima, & Hafiz, 2011; Sang & Taylor, 2014; Vafaei, Taylor, & Ahmed, 2011). Recently, Sang and Taylor (2014) examined IC value relevance and its components in the share price of 160 companies listed in the Australian capital market within five years. Data collected from the sampled firm was analyzed using fixed-effects (FEs) Panel regression analysis.

The study finds that IC (structural capital and human) and the sampled companies' share prices are significantly related.

Also, Gamerschlag (2013) investigates the impact of human capital disclosure on the corporate value of the 130 largest quoted German companies from 2005 to 2009 using content analysis. The study utilizes a disclosure index to estimate HCD. It employs share price and equity return as proxies for market value. Also, it introduces year and industry dummies as control variables. The study surrogates HCD by four items, which include: HCRTOT refers to the amount of human capital disclosed, HCRQC refers to the quantity of "qualification/competence" information disclosed, HCRMC refers to the quantity of "motivation/commitment" information disclosed, while HCRPS refers to the quantity of "personnel" issues (the number of keywords available in the report analyzed) disclosure.

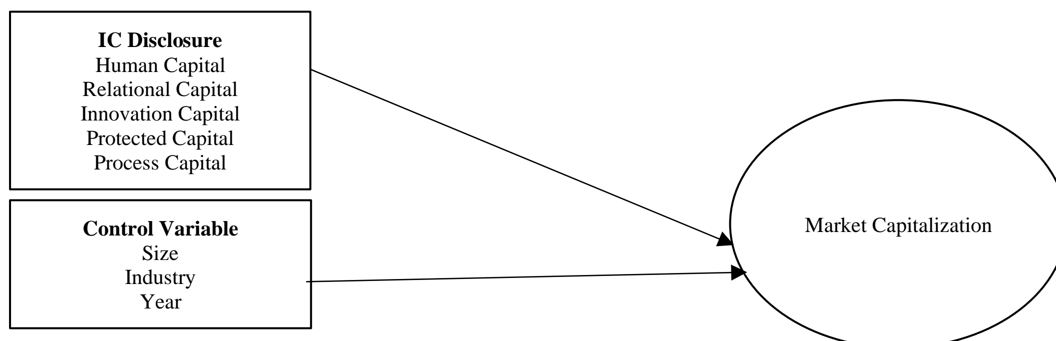
Besides, Ousama et al. (2011) examine the value relevant to Malaysian listed companies' IC information disclosure. The study utilizes a survey instrument to generate data from both the preparers and users of financial statements. It employs human capital, internal capital, and external capital as surrogates for IC. The questionnaire was administered among CFO and accountants of selected companies, loan officers, and broker institutions. ANOVA, t-test, and descriptive statistics are used for data analysis. The study reveals that IC's information content is perceived as value-relevant to both preparers and users though at different degrees. Vafaei et al. (2011) examine the extent of IC disclosure's value relevance among companies in the capital markets. It is a cross-national and comparative study in which 220 companies are sampled from 4 countries: Singapore (50), Hong Kong (49), Australia (63), and Britain (58). Word count of the companies' annual reports for in the content of companies' annual reports for each of four components (HC, SC, RC, and general terms) and a disclosure index are used to measure IC disclosure. The finding suggests that industry-specific and country-specific factors positively affect share price (value relevance) and IC disclosure. The study finds that IC disclosure gives market participants information on value relevance in the non-traditional industrial sector and Britain and Australia alone.

Swartz, Swartz, and Firer (2006) examine the JSE Securities Exchange (SA) using Ohlson's 1995 valuation model in the same vein. The study finds that IC reporting and market capitalization are significantly related. Also, Abdolmohammadi (2005) studied a sample of Fortune 500 in the USA, utilized aggregate value for ICD and documented that the information content of annual reports concerning IC affects corporate market capitalization significantly. Similarly, Vafaei et al. (2011) measure the ICD value relevance of the sample companies in Australia, Britain, Singapore, and Hong Kong. The above shows that IC is not peculiar to some countries and could be studied across companies. Also, the findings might be influenced by the economic jurisdiction of the study. Thus, it would be interesting to explore the phenomenon in the Nigerian economy.

2.3 Conceptual Framework

Relying on theoretical underpinning and establishing an association between market capitalization and voluntary disclosure, this study proposes the following conceptual framework. The dependent variable is measured as market capitalization. In contrast, the independent variable is IC disclosure made of relational capital disclosure, innovation capital disclosure, structural capital disclosure, human capital disclosure, and protective capital disclosure. Also included in the framework are control variables, which are considered relevant in explaining the dependent variables. These are the size of the companies and industry affiliation.

Figure 1: Conceptual framework of the study



2.4 Hypotheses development

Based on the underpinning theory and the existing empirical studies, this section presents this study's hypothesis. The research question is, does IC disclosure significantly affect a firm's market capitalisation based on signalling theory? Several scholars have investigated the relationship between market capitalization and IC disclosure. Abdolmohammadi (2005) and Anam et al. (2011), for instance, discover that market capitalization is significantly and positively influenced by IC disclosure. Similarly, Taliyang et al. (2014) examine the impact of IC disclosure on market capitalization in 185 Malaysian listed companies. They also find that Malaysian listed companies' market capitalization is significantly influenced by IC disclosure. Based on the above findings, the present study tests the hypothesis below:

Hypothesis 1: Nigerian listed companies' market capitalization is significantly and positively affected by IC disclosure.

3. METHODOLOGY

Due to their market capitalization on the NSE floor, 30 Nigerian listed companies were sampled for this study. The companies consistently fell within the 30 most capitalized companies from 2016-to 2018. Though their positions changed, they still meet the criteria. The study utilized data mainly from secondary sources because the core of the data needed for analysis was adequately and authoritatively extracted from the sample companies' annual reports and accounts and other relevant publications issued by the Nigerian Stock Exchange (NSE).

3.1 Theoretical Framework

Based on the review of previous studies, this study employs content analysis to form a checklist after familiarisation with the IC disclosure pattern. The 49 IC items are selected, comprising six innovation capital items, nine process capital, sixteen human capital, thirteen relational capital items, and five protected capital. The items in each of the categories are presented in Table 1.

Table 1: Checklist list of IC Disclosure Items

A	**Human Capital**	**C**	**Customer/Relational Capital**
1	Number of Employees	1	List of Customers
2	Employee satisfaction	2	Customer satisfaction
3	Employee retention	3	Customers loyalty
4	Compensation to employees	4	Customer Appreciation
5	Engagements with employees	5	Customer retention
6	Recruitment from the local communities	6	Customer service/support
7	Disability recruitment policy (number)	7	Customer feedback system
8	Employee Know-how	8	Distribution channels
9	Education Background	9	Customer Market Share
10	Employee succession planning program	10	Company awards
11	Work-related knowledge	11	Company image/ reputation
12	Knowledge sharing	12	Customer training & education
13	Employee health and safety	13	Diffusion & networking
14	Employee Expertise	**D**	**Innovation Capital**
15	Training and development	1	Innovation
16	Cultural Diversity	2	Research and Development
B	**Process Capital**	3	Brands
1	Corporate Culture	4	Knowledge-based
2	Information Systems (Technology)	5	Research collaboration
3	Financial Relations	6	Goodwill
4	Business Collaboration	**E**	**Protected Capital**
5	Favourable contracts	1	Patent
6	Organization flexibility	2	Copyright
7	Organization structure	3	Trademarks
8	Organization learning	4	Licenses
9	Quality management	5	Commercial rights

A four Likert scale (0-3) was used to score IC disclosure quality (e.g., Abeysekera, 2008; Guthrie et al., 2006). Following Anifowose, Abdul Rashid, and Annuar (2017) and Haji and Ghazali (2012), an item disclosed in Nigerian Naira was scored a value of 3; an item disclosed numerically was scored 2. An item disclosed in the form of narratives was scored 1, while an item, which did not feature the annual report, was allotted 0. Therefore, the total scores for overall disclosure and each of the components (TXS) were computed as the proportion of actual score (AXS) to maximum possible score (MXS) (i.e., 3X 49 =147). The TXS of a company is obtained by:

TXS = AXS / MXS

Recently, there have been worries regarding the reliability and validity of scores in IC disclosure (Dumay & Cai, 2014) because the approach has inherent problems. The scoring approach used in this study involves a two-stage checklist to avoid such problems. The study did a pilot scoring of the top ten listed companies for familiarity reasons. Then, the author scored the annual reports of the sample companies independently. Their scores were then compared, and they jointly rescored areas where they differed from correcting their differences.

3.2 Data Analysis Methods

In order to identify anomalies in the series, the analysis began by describing the data. Pearson Correlation Matrix was done to detect multicollinearity among independent variables (e.g., Field, 2013; Hinton et al., 2004). Due to the nature of data and finding from these preliminary analyses, the study estimated the parameters with the ordinary least square method (e.g., Field, 2013; Hinton et al., 2004). Therefore, stochastic models were used for making estimations as presented:

1. Eqn1 2. $$MKcap_{it} = \gamma_0 + \gamma_2 \sum_{i=1}^{5} TICD_{it} + \gamma_3 Industry_{it} + \gamma_4 Size_{it} + \gamma_5 Year_{it} + \varepsilon_{it}$$ 3.

Eqn2 $$MKcap_{it} = \delta_0 + \delta_2 HC_{it} + \delta_3 EC_{it} + \delta_4 INC_{it} + \delta_5 PC_{it} + \delta_6 PRC_{it} + \delta_7 Industry_{it} + \delta_8 Size_{it} + \delta_9 Year_{it} + \varepsilon_{it}$$

The total impact of IC disclosure and its components on market capitalization is estimated using equation one and equation 2, respectively. Presented in Table 2 are definitions, measurements, and sources of acronyms used in the models.

Table 2: Details of Variables

Symbol	Definition	Measurement	Sources
Log_MK	Natural log of market capitalization	Product of year-end stock price and number of shares ranking for dividend	NSE Website
HC	Weighted human capital disclosure	The ratio of actual to the maximum possible score of HC	Annual report
EC	Weighted Relational capital disclosure	The ratio of actual to a maximum possible score of RC	Annual report
INC	Weighted Innovation capital disclosure	The ratio of actual to a maximum possible score of INC	Annual report
PC	Weighted Process capital disclosure	The ratio of actual to a maximum possible score of PC	Annual report
PRC	Weighted Protected capital disclosure	The ratio of actual to a maximum possible score of PRC	Annual report
TICD	Weighted Overall Intellectual capital disclosure	The ratio of actual score to maximum possible score Overall IC	Annual report
Industry	Categories Companies along financial and non-financial line	1 for a financial firm and 0 for non-financial	NSE Website/Annual reports
Size	Size of the sampled companies	Log of total assets	NSE Website/ Annual reports
Year	Year Dummy	Dummy variable for a year of study	

4. RESULTS AND FINDINGS

4.1 Descriptive Statistics

The analysis begins with a data description to establish their suitability for different estimations. The descriptive statistics results reveal that the companies average disclosed about 43.6% of the overall disclosure items. Human capital was most disclosed among the five components, with an average of 46.3% of the expected disclosure. This is closely followed by process capital with a mean of 45.3%, while protected capital has the least disclosure. The results also show that all the variables' median values fall between their means and maximum values. This indicates normality, proving the variable to mesokurtic shapes in their probability distributions. The variables are moderately customarily distributed based on skewness and kurtosis criteria (e.g., Field, 2013; Wooldridge, 2010). It can be drawn from the above that the parameters could be estimated with the ordinary least square method.

Table 3: Result of Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Ob
LOG_MK	11.30	11.250	13.104	9.780	0.675	0.455	3.783	90
TICD	0.436	0.422	0.687	0.238	0.098	0.324	2.642	90
SIZE	10.58	10.627	11.740	7.280	0.809	-1.445	6.938	90
HC	0.463	0.458	0.625	0.250	0.091	-0.216	2.486	90
EC	0.443	0.410	0.795	0.051	0.164	0.197	2.577	90
PC	0.453	0.444	0.778	0.148	0.116	0.386	3.417	90
PRC	0.340	0.333	0.600	0.067	0.087	0.323	5.548	90
INC	0.408	0.389	0.889	0.000	0.148	0.827	4.783	90

4.2 Summary of Pearson Correlations Coefficient Matrix

Table 3 presents the results of the correlation matrix. The results indicate that perfect multicollinearity was absent among the variables because all these figures are acceptable based on the submissions of Field (2013) and Gujarati and Porter (2009). Except in TICD and its constituents, which are not regressed together in the same model, the pair's correlation coefficient is lower than 0.5. This signifies the non-awfulness or non-presence of collinearity problems among the independent variables. A correlation analysis is considered to investigate the relationship among dependent and independent variables, and Table III presents the finding. One could deduce that market capitalization is positively significantly correlated with all intellectual capital components. It could provide a better basis for further analysis using the regression estimation method.

Table 4: Coefficient of Correlation Result

	Log_MK	TICD	HC	EC	PC	InC	PrC	Size
Log_MK	1							
TICD	.436**	1						
HC	.226*	.885**	1					
EC	.454**	.912**	.716**	1				
PC	.351**	.906**	.755**	.767**	1			
InC	.431**	.662**	.413**	.532**	.597**	1		
PrC	.261*	.459**	.383**	.276**	.447**	.288**	1	
Size	.418**	.235*	.151	.230*	.278**	.179	.054	1

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

4.3 Regression Result of ICD and Market Capitalization

The present study's primary aim is to find out the Intellectual Capital Disclosure (ICD) impact on Nigerian listed companies' corporate market value. The hypothesized correlation was tested with the aggregated model (i.e., equation). The results of model1 indicate that Nigerian listed companies' market capitalization is significantly and positively affected by overall disclosure. The possible implication is that more disclosure would enhance the market value. This result supports previous studies such as Anam et al. (2011) and Abdolmohammadi (2005). However, from individual components' perspectives, Nigerian listed companies' market value is significantly positively influenced by innovation, external, and protected capital. The results also unexpectedly reveal that market capitalization's corporate market value measure is significantly and negatively influenced by process capital and human capital. Besides, the firm's size significantly affects corporate value, supporting Anam et al. (2011).

Besides, both the year effect and industry effect significantly negatively impact corporate market value during the period under study in the two models. It could be said that industry and year are not necessary for the IC disclosure in Nigeria. The overall variation in market value is explained by IC disclosure to 71.2% on the aggregate and 83.2% on the individual component model, as revealed by the adjusted R-square. In contrast, F-statistic reveals the model (F-statistic, 44.54, $P<0.01$ for model 1 and F-statistics, 49.58, $P<0.01$ for model II). with a value of 44.

The detailed summaries of the estimation are presented in Table IV. It seems the autocorrelation is not a severe problem with DW values from both models, which is approaching 1, as suggested by earlier studies (e.g., Field, 2013; Wooldridge, 2010).

Table 5: Intellectual capital disclosure and market capitalization

	Model 1				Model 2			
Variable	Coefficient	Std. Error	t-Stat	Prob.	Coefficient	Std. Error	t-Stat	Prob.
TICD	1.935	0.245	7.915	0.000				
HC					-0.854	0.209	-4.094	0.000
EC					1.825	0.300	6.087	0.000
INC					0.589	0.086	6.861	0.000
PRC					1.216	0.111	10.967	0.000
PC					-0.549	0.244	-2.251	0.027
SIZE	0.496	0.068	7.291	0.000	0.391	0.043	9.135	0.000
FIN	-0.395	0.030	-13.197	0.000	-0.315	0.032	-9.753	0.000
YEAR1	-0.114	0.014	-8.415	0.000	-0.075	0.010	-7.521	0.000
YEAR2	-0.091	0.003	-26.764	0.000	-0.053	0.004	-13.174	0.000
C	5.125	0.615	8.333	0.000	6.242	0.426	14.666	0.000
R^2	0.729				0.850			
Adj.R^2	0.712				0.832			
F-value	44.543				49.589			
Prob.	0.000				0.000			
DW	0.936				0.997			

5. CONCLUSION AND RECOMMENDATIONS

The study has investigated the potential effect of ICD on corporate market value surrogated by market capitalization, measured by the number of shares ranking for divided and product of end year share price. The study employed content analysis for the top 30 Nigerian listed companies' annual reports from 2016 to 2018. IC was classified as innovation capital, human capital, protected capital, process capital, and external capital. Overall, IC disclosure and innovation, external capital, and protected capital disclosure significantly and positively influenced Nigerian listed companies' market value. The more these are disclosed, the better the companies' market value is. Contrary to expectation, human and process capital disclosure negatively affected market value, suggesting that Nigeria investors do not necessarily value these components.

Practically, one would expect "the people in charge of governance" to pay attention to IC information disclosure in financial reports because investors are conscious of IC information. However, this is subject to certain limitations, which future studies could instigate to extend the present research. Since this study used 30 top listed companies NSE, its findings cannot be generalized to cover smaller companies. Further research is needed to empirically determine if the results are generalizable to all listed companies, regardless of their sizes.

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The influence of Socioeconomic Factors on control of corruption in the Digital Era: Evidence from ASEAN Region

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Abstract

Corruption is a global problem and occurs in many places within the government. Socioeconomic factors such as human capital, government expenditure, and GDPC (Gross Domestic Product per Capita) are essentially social and economic development determinants. Lack of control of corruption (CoC) leads to high-income disparity, crime, chaos, national integrity, poor economic performance, and low living standards. On the contrary, the excellent control of corruption leads to improved income equality, social cohesion, macroeconomic performance, and a higher standard of living. This study assesses the role of Socioeconomic factors as a measurement for fighting against corruption in ASEAN (Association of Southeast Asian Nations) countries. This study reinforces the existing literature on the effect of Socioeconomic factors in promoting CoC. Using panel data of ASEAN countries over 33 years from 1984 to 2016, this study analyzed the data utilizing panel autoregressive distributed lags (ARDL). The finding of this study shows that the error correction is statistically significant. In the long run, the discovery under the PMG method indicates that socioeconomic such as GDPC is significant and has a negative impact on CoC. At the same time, Human Capital is significant and has a positive effect on CoC. On the other hand, government expenditure is significant and has a negative impact on CoC.

Keywords: Socioeconomic, human capital, GDPC, government expenditure, ASEAN, control of corruption

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1. INTRODUCTION

The Association of Southeast Asian Nations (ASEAN) is a regional intergovernmental organization comprising ten Southeast Asian countries formed in 1967 (Secretariat, 2016). This integration's prime objective was to promote intergovernmental cooperation and facilitate economic, political, security, military, educational, and sociocultural integration among its members and other Asian states (Kivimäki,2001; Emmers,2003). The unique characteristics of ASEAN are diverse culture, rich natural resources, a high percentage of young population, an enormous market for foreign direct investment, and high usage of Information and Communication Technology (ICT), it leads to growth has to transform ASEAN into a leading economic region (Benny, 2016). The formation of this ASEAN aims, among others, to liberalize trade and investment, widen market opportunity, strengthen the competitive edge, enhance the exchange of skilled labour, and support the accomplishment of the sustainable development goals (SDG) (Secretariat, 2016; Soesastro, 2007). As a single market and production base, it is also envisioned that the ASEAN can become a highly competitive region, with equitable economic development, and fully integrated into the global economy (Soesastro, 2007; Secretariat, 2015).

The prospects for higher-level integration success are acceptable. The established ASEAN is also faced with disparaging issues such as ineffective governance, high-income disparity levels, and corruption (Mongid & Tahir, 2011). In the ASEAN context, governance constitutes processes underpinning traditions and institutions by which authority in a country is exercised. Due to its diverse culture, tradition, and religion, it is expected that the

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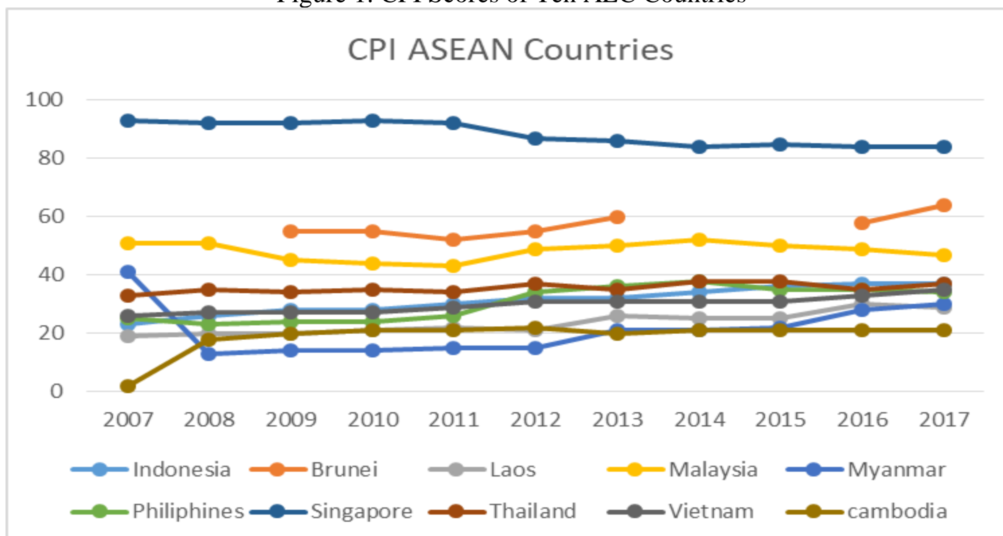
successful integration of governance will take a longer time than expected. Another common challenge faced by most ASEAN countries is poverty reduction. While a developed member nation such as Singapore boasts a high gross domestic product (GDP) per capita income of $51,000, a much "poorer" member like Cambodia is only tagging a low per capita income of $900 (Theworldbank, 2019). The Asia Global Institute, in its report in 2013, concluded that corruption is one of the most pressing issues confronting the ASEAN(Asiaglobalinstitute, 2016). In a simple layman's definition, corruption constitutes a form of dishonesty, abuse of power, or even criminal activity undertaken by a person, organization, or even a government who is entrusted with position or authority. The negative impact of corruption is its ability to negate any nation's economic and political stability. Accordingly, corruption must be fought at all costs if AEC's regional economic integration effectively. Therefore, all member nations must strategically and structurally establish anti-corruption programs.

Prior studies on corruption have mainly used the Corruption Perception Index (CPI) to measure the country's corruption (Habib & Zurawicki, 2002; Seligson, 2002; Davis & Ruhe, 2003). The perceived high level of corruption in the ASEAN is evidenced by the relatively weak corruption perception index (CPI) score within the last ten years (2007 – 2017). Figure1 summarizes the CPI Scores of ten ASEAN countries. Of the ten ASEAN member countries, only three nations, namely Singapore, Brunei, and Malaysia, have achieved an average score of more than fifty (50) CPI scores. The remaining seven countries are still struggling with issues of perceived corruption. In 2017 the CPI of two ASEAN countries, i.e., Cambodia and Lao PDR, was in the bottom twenty globally with scores less than 30 points.

Figure 1. CPI Scores of Ten AEC Countries



On the first note, this paper contributes to the existing literature by examining the socioeconomic role of CoC on ASEAN and understanding the encouraging and hindering factors that may influence the development and growth of the ASEAN region. The rest of the paper is organized as follows; Section 1 introduces the study. Section 2 is on the Methodology, while Section 3 is on the Conceptual Framework. In Section 4, the result is presented, and finally, Section 5 is about the conclusion.

1.1 Problem Statement, Research Objective, and Research Questions

According to North and Thomas (1973), the growth difference in cross countries is due to the discrepancy of institution or governance. The author also defined that "*Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction*" (North, 1990; p.10). Prior literature argued that is the Quality of Government (QoG) is an essential determinant for the economic and social development of a country (Busse and Gröning (2009) Kraay and Tawara (2010). Çule and Fulton (2013) state that high QoG significantly promotes the business environment. The economy focuses on the law's compliance, an adequate bureaucracy, and efficient control of corruption, eventually enhancing economic performance. Thus, QoG facilitates developing well-functioning property rights and the market's perfection that enhance accrue the best potential outcome from economic development factors. This notion of a strong linkage between various dimensions of country-level governance and economic performance is also supported by other relevant studies, e.g., Knack and Keefer, 1995; Mauro, 1995; Svensson, 1998; Acemoglu et al., 2001, 2002; Rodrik et al., 2002; Gradstein, 2008; Dollar and Kraay, 2003. Therefore, it is argued that ensuring an effective investor protection

system is one of the driving factors for economic performance. This is very apparent that many high-income countries, e.g., Sweden, Switzerland, New Zealand, Austria, Singapore, and so on, enjoy the sound QoG. In contrast, many developing countries like Indonesia, Myanmar, Afghanistan, and Lao PDR suffer from poor governance. Therefore, theoretical and anecdotal evidence endorses the importance of the QoG for economic development and a high standard of living.

Finally, the third category is the socioeconomics factor, which can determine the QoG. Socio-economic factors include education, poverty, investment, income, health, and expenditure. Socioeconomics is an endeavour to reform economics, most notably to replace the homo oeconomicus paradigm from the dominant position in economics at least into the 1980s (Stern, 1993; Dimension, 1988; Coughlin, 1999). However, Mauro (1995) found that corruption decreases investment, and as a result, it decreases the rate of growth. It also reduces expenditure on education (Mauro, 1998). According to (Tanzi 1998), corruption can improve poverty by decreasing poor people's potential income. Tanzi (1998) found that corruption brought society and changed the government's role by stopping enforcing contracts and protecting property rights. Tanzi (1998) also found that corruption improves government running and reduces government income. Prior research investigated the link between CoC's socioeconomic factors (Maeda & Ziegfeld, 2015; Brown & Shackman, 2007). They stated that developing countries with less-educated People tend to have a higher level of corruption than rich countries with well-educated people. Also, Economic growth increases corruption in the short run but reduces corruption in the long run. Research by Mauro (1995), Tanzi and Davoodi (1998); Johnston (1998); Gupta et al. (2002), and Uslaner (2008) found that corruption harms society by inequalities in income and social status. Previous studies related to socioeconomic factors tend to focus on government (Cardoso, 1980; Hill, 1994; Uzochukwu & Onwujekwe, 2004). Whereas, the role of socioeconomic factors to improve QoG and control of corruption on country level is hardly researched.

In summary, the digital era has a specific role in influencing corruption in the light of asymmetric information theory. Likewise, socioeconomic factors can determine the CoC. To the best of researchers' knowledge, no study focuses on scrutinizing the role of socio-economic factors on CoC, especially in ASEAN countries context. Accordingly, the following research objectives and research questions are covered.

This study aims to examine the influence of socio-economic factors on CoC in ASEAN countries. As the main objective of this study. While the specific aim of this study is:

1. To examine the relationship between socioeconomic factors and control of corruption.
2. To examine the relationship between the Human Capital factor and control of corruption
3. To examine the relationship between the Government Expenditure factor and control of corruption
4. To examine the relationship between GDPC factor and control of corruption

As mentioned in the research background, socioeconomic factors are related to CoC. Based on the discussion of the literature review, the following research questions were achieved in this study:

1. Is there any relationship between Socioeconomic factors and CoC?
2. Is there any relationship between Human Capital and CoC?
3. Is there any relationship between Government Expenditure and CoC?
4. Is there any relationship between GDPC and CoC?

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Corruption is a well-known problem in public and private governments (Heidenheimer et al., 1970; Chowdhury et al., 2018; Miller, 2016; Banerjee et al., 2012). Corruption refers to "behaviour which deviates from the normal duties of a public role because of private-regarding (family, close private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding Influences" (Nye,1967 p.4). Nye (1967) classified fraud into the behaviour as bribery (use of reward to pervert the judgment of the person in a position of trust); nepotism (bestowal of patronage because of ascriptive relation rather than merit); and misappropriation (illegal appropriation of public resources for private-regarding used).

Many factors contribute to corruption. Kaufmann et al. (2011); and Tanzi and Davoodi (1998) argue that some corruption sources are public works, state procurement, and privatization. If those activities do not provide transparency, it will build corruption, primarily if the organization or institution does not provide the necessary safeguards against corruption (Kaufmann, 1998; Tanzi, 1998). Also, the tax system and the auditing of organization tax services in a country are sources of corruption. Other corruption factors are historical factors,

geographic influences, and the government's size and scope (Goel & Nelson, 2010). Another source of corruption in developing countries indicates higher corruption, according to (Treisman 2000), the GDP per capita, which explains the corruption index. The CoC is another variable examined in this study. The CoC measures how public and private power are exercised for private gain. Tarnoff (2009) stated that the CoC measure includes petty and grand corruption in the public and private sectors. The CoC also measures the strength and effectiveness of the policy of the nations and institutional framework to mitigate corruption.

The definition of socioeconomics is a social science, which measures how economic activity affects and is formed by the social process (Baker, 2014). According to Business Dictionary (2018), socioeconomic is a "field of study that examines social and economic factors to understand better how the combination of both influences something." Socioeconomics links to education, finance, economic growth, GDP growth, population, health, and other social issues.

Some prior research argues that "corruption disproportionately harms the socioeconomically disadvantaged, as it exacerbates existing inequalities (Mauro, 1995; Tanzi & Davoodi, 1998; Johnston, 1998; Gupta et al., 2002; Uslaner, 2008). Furthermore, developing countries with less-educated people tend to have a higher level of corruption than rich countries with well-educated people (Maeda & Ziegfeld, 2015). Also, prior research confirms that corruption is negatively related to economic growth (Mauro, 1995). However, economic growth, democratic accountability, and the rule of law all impact corruption but not the other way around (Brown & Shackman, 2007). According to Brown and Shackman (2007), Economic growth increases corruption in the short run but reduces corruption in the long run. Maeda and Ziegfeld (2015) found that a lack of education and money countries observe enormous corruption than rich countries with educated people. Thus, this phenomenon only happens in developed countries. Generally, the statistical relationship is low in developing countries and sometimes vice versa. It means developed countries "those who are most harmed by corruption, the socioeconomically disadvantaged, will tend to perceived higher levels of corruption" (Maeda & Ziegfeld, 2015). As for that, the following hypotheses are developed:

H1: ***There is a relationship between the Socio-economic Index and control of corruption***
H1a: ***There is a relationship between Human Capital and the control of corruption***
H1b: ***There is a relationship between Government Expenditure and control of corruption***
H1c: ***There is a relationship between GDPC and control of corruption***

3. CONCEPTUAL FRAMEWORK

Figure 2. Model 1. Socioeconomic Index on CoC

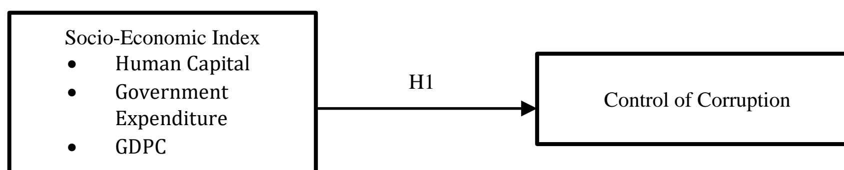
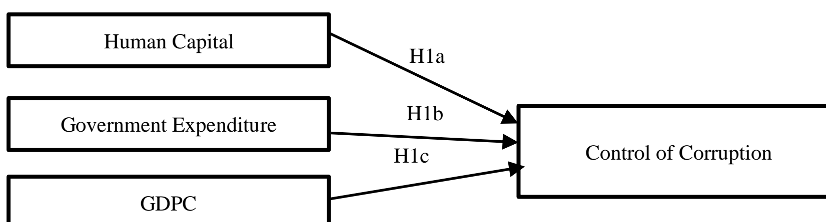


Figure 3. Model 1. Socioeconomic Indicators on CoC



About the above theory, the following empirical framework is developed:

$$CoC_{it} = HC + Gove + GDPC \ldots\ldots\ldots\ldots\ldots (1)$$
$$CoC_{it} = \beta_0 + Glob_{it} + gove_{it} + gdpc_{it} + hc_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

In equation 1, CoC denotes the socioeconomic index over time and across countries, β_0 indicates intercept, $GlOB_{it,}$ reflects Globalization over time and across countries, and finally, ε_{it} Indicates error terms or explained

observations. In equation 2, CoC denote the dimension of Socioeconomic include HC (Human Capital), GOVE (Government Expenditure) and GDPC (Gross Domestic Product per Capita), and finally, ε_{it} Indicates error terms or explained observations.

4. METHODOLOGY

This study intends to conduct on ASEAN countries. Eight countries will be selected as a study scope for this study's purpose, including Malaysia, Indonesia, Brunei Darussalam, Singapore, Thailand, Vietnam, Cambodia, and the Philippines. Some reasons why ASEAN, as the sample of this research, have to grapple with poverty reduction issues. High poverty may cause by the low level of quality governance. As a result, it leads to high corruption. Hence, the poor scores for 8 out of 10 ASEAN countries implicate the need to address ways to reduce income inequality and the need for ASEAN to develop strategies to build a good governance level. This research will analyze the impact of ICT development on governance and corruption by using 8 ASEAN countries in 1984 – 2016.

As indicated earlier, this study will adopt the macroeconomic approach using a publicly available panel and time-series data from reputable agencies. Quality of Governance (QoG) measurement will be sourced from ICRG (International Country Risk Guide) of the Quality of Government Institute, Gothenburg University, Sweden. Data on Control of Corruption (CoC) will be taken from the WGI (Worldwide Governance Indicators). Meanwhile, data on ICT Development, Globalization, Socioeconomic factors are obtained from World Development Indicators (WDI) of the World Bank.

This research applies a panel autoregressive distributive lag model (ARDL) analysis. This method applies because of the flexibility of the assumption of this study and the nature of the small data size. For example, in the data's existence of a unit-root problem, panel static methods such as fixed effect, random effect, pooled OLS are unsuitable. Furthermore, a dynamic method such as GMM is criticized when assessing long panel time-series data. However, a panel dynamic method like ARDL (p,q) has exciting structures. The ARDL method is suitable for long panel time-series data and mixed order of integration of either I(1) or 0(1). There are three types of panel ARDL models: the mean group (MG), the pooled mean group (PMG), and the dynamic fixed effect (DFE). All types of ARDL run under maximum likelihood estimations (MLE).

The first-panel ARDL called MG prediction was introduced by Pesaran and Smith (1995). This prototype estimated the long-run parameters by taking an average of the long-run co-efficient of each cross-section. This prototype predicts different regressions for each country. It then examines the parameters with unweighting means of the individual countries' prediction coefficients without restriction. Therefore, the MG method allows coefficients to be heterogeneous in the long and short runs.

The second method is the PMG estimator developed by Pesaran et al. (1999). It shows the autoregressive distributed lag (ARDL) version of the error correction framework with the co-integration test adjustment. This method allows short-run coefficients, heterogeneous long-run adjustment to the equilibrium, and homogeneous long-term coefficients across countries. In contrast, we test the validity, consistency, and efficiency to check the PMG method's robustness. The estimated parameter of the long-run error correction term should be negative. The error-correction term residual should be negative. The residual of the error-correction PMG method should be serially uncorrelated. However, these conditions can be fulfilled by including the ARDL (p,q) lags for the dependent (p) and independent variables (q).

The third method is the DFE estimator. This method has some similar structures to the PMG method in terms of the co-integrating factors' coefficient to be homogenous across all panels in the long run. However, unlike the PMG estimator, the method of DFE also restricts the speed of adjustment coefficient and the short-run coefficient to be homogenous. Furthermore, this prediction provides panel-specific intercepts. It permits for intragroup correlation in measuring standard error with a cluster option. However, according to Kao and Chiang (2000), an estimator of DFE suffers from simultaneous equation bias endogeneity between the error term and the lagged dependent variable. Finally, under the assumption of long-run slope homogeneity, PMG's estimator appreciates efficiency over DFE and MG prediction Pesaran et al. (1999). The selected ASEAN region follows a homogeneous nature; therefore, PMG would be the appropriate estimation.

5. RESULTS AND DISCUSSION

5.1 Unit Root Analysis

The unit root test is executed to examine a series of interests to conclude the integration's separate order. It is also necessary to note that no variable over integration order I(1) to avoid false results Pesaran and Pesaran (1997). Furthermore, it is essential to check the variables to choose a suitable econometric model. The result of panel unit-root tests is presented in Table 1. Im et al. (2003) in Table 1 clearly shows that the test accepts the null hypothesis of unit-root presence in the respective variables. As a result, this study's variables are stationary at the first difference level, which authenticates the ARDL (p,q) approach to analyze data. The result from the dynamic analysis using panel ARDL (p,q) framework is presented in Table 2. The ARDL method clarifies the authenticity of the relationship between Socioeconomic and CoC in selected ASEAN countries. We reflect on the three methods of the ARDL framework: PMG, MG, and DFE. The coefficient on the error-correction term is required to be negative and not less than -2.

Table 1. Panel Unit-root Analysis

	Level	1st difference
Variables	IPS	IPS
CoC	-1.8175	-4.4060
SEC	NA	NA
Gove	-2.4212	-6.7721
LGDPC	0.1068	-3.9105
HC	-1.7096	-2.5844

5.2 Socioeconomic Index on CoC

Table 22 shows that this coefficient's error correction is -0.537*** and statistically significant at the 1% level. In the long run, the finding under the PMG method indicates that socioeconomics has a positive and significant impact on CoC.

Table 2. Socioeconomic index on CoC

	PMG		MG		DFE	
Variables	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run
Error Correction		-0.537***		-0.669***		-0.461***
		(0.0904)		(0.0800)		(0.145)
Socioeconomic Index		-2.924		-3.156		-0.532
		(2.706)		(2.883)		(0.373)
Socioeconomic Index	-0.231**		-2.317		-0.817	
	(0.116)		(1.971)		(0.538)	
Constant		-0.154		3.595		0.413
		(0.450)		(3.612)		(0.410)
Observations	58	58	58	58	58	58

10%*, 5%** and 1%***

5.3 Socioeconomic Indicators on CoC

Table 3 shows the error correction that this coefficient is -0.429*** and statistically significant at the 1% level. In the long run, the finding under the PMG method indicates that Socioeconomic such as Gross Domestic Product per Capita statistically significant at the 1% level, Human Capital statistically significant at the 1% level, and Government expenditure statistically significant at the 5% level has a positive and significant impact on CoC.

Table 3. Socioeconomic indicators on CoC

	PMG		MG		DFE	
Variables	Long Run	Short Run	Long Run	Short Run	Long Run	Short Run
Error Correction		-0.429*		-1.026***		-0.769***
		(0.257)		(0.226)		(0.173)
GPDPC		0.143		0.410		-1.002
		(1.611)		(2.787)		(2.299)
Human Capital		-0.219		-5.142		1.230
		(34.12)		(19.84)		(2.358)
Gov Expenditure		-0.0472		-0.0504		-0.0247
		(0.0440)		(0.0474)		(0.0240)
GPDPC	-7.782***		-2.250		-3.414**	-7.782***
	(1.938)		(1.438)		(1.368)	(1.938)
Human Capital	3.577***		4.837		1.654*	3.577***
	(1.106)		(3.267)		(0.963)	(1.106)

Gov Expenditure	-0.0320**		0.00181		-0.0487***	-0.0320**
	(0.0131)		(0.00634)		(0.0177)	(0.0131)
Constant		30.03		4.449		23.51**
		(18.64)		(10.77)		(9.357)
Observations	58	58	58	58	58	58

10%*, 5%** and 1%***

This funding support previous research. Brown and Shackman (2007) stated that economic growth (GDPC), government expenditure, democratic accountability, and the rule of law all impact corruption but not the other way around. According to (Brown & Shackman, 2007), Economic growth increases corruption in the short run but reduces corruption in the long run. Maeda and Ziegfeld (2015) found that a lack of education and money tends to observe enormous corruption than wealthy and educated people. Thus, this phenomenon only happens in a developed country in ASEAN case seven nations are still developing countries, only Singapore and Brunei are developed countries and Malaysia middle income country. The developing countries, the statistical relationship is low and sometimes runs vice versa. It means developed countries "those who are most harmed by corruption, the socioeconomically disadvantaged, will tend to perceived higher levels of corruption" (Maeda & Ziegfeld, 2015).

Specifically, the result showed that the Socioeconomic index negatively correlates with CoC. It means the ASEAN country's socioeconomic has a negative and significant relationship impact CoC. The monotonic relationship between socioeconomic and CoC are not moving in the same direction. In terms of GDPC, the result shows that GDPC has a negative and significant correlation with CoC. On the other hand, the result shows that Human Capital has a positive and significant relationship with CoC. It means the better human capital in a country, the better the control of corruption. Finally, the result shows that Government Expenditure has a negative and significant relationship with CoC.

6. CONCLUSION

This paper has examined how socioeconomic factors influence the control of Corruption in the ASEAN region. By using three types of panel ARDL framework: MG, PMG, and DFE, the finding shows that the Socioeconomic index has a negative and significant on the Control of Corruption in the long run. This paper contributes to the theory and practice of macroeconomy by highlighting how Socio-Economic factors impact the Control of Corruption. The authors recognize the limitations of the present study and suggest that these limitations can be viewed as opportunities for future work and reflections. First, this research only measures the ASEAN region and limited independent variables. Future studies should attempt to replicate this research in different settings and regions. The empirical findings in this research are influenced by the ASEAN region, particularly the Control of Corruption initiatives.

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Financial Development, Foreign Direct Investment and Trade Openness Impact in the Economic Growth of Nigeria

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Abstract

This study examines the impact of finance on economic growth in the Nigerian economy from 1970 to 2018. The autoregressive distributed lag (ARDL) model was employed to establish the relationship between the dependent and independent variables. The bounds test results indicated a long-run relationship among the variables analysed in the study. The key variables that enhance the economy's growth are financial development and trade openness, while foreign direct investment stymied growth. This study's findings have implications for policymakers, especially regarding the African Continental Free Trade Area (AfCFTA) agreement, which is about to commence. The results suggest that financial development and trade openness are critical inputs for sustainable economic growth. Even though the FDI is also vital, more emphasis should be on improving the political environment. Afterwards, the desired FDI will flow and stimulate growth.

Keywords: Financial development, FDI, trade openness, growth

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1. INTRODUCTION

The finance-growth relationship has been at the centre of exogenous and endogenous economic growth models (Barro and Sala-i-Martin, 1992). Undoubtedly finance and growth are related in theoretical terms, as established by Levine (2005). A positive relationship between financial development and economic growth is possible because of finance's contribution towards capita allocation improvement, cost reduction, better lending to households and firms, and better return on investment. More significant financial development means that financial instruments and intermediaries will reduce information and transaction costs in a nutshell. The empirical literature has focused on the relationship between financial development and economic growth. The relationship between both exhibit a positive relationship as more developed financial markets would boost economic growth (Goldsmith, 1969; King and Levine, 1993a, 1993b; Beck et al., 2000; Levine et al., 2000; Bassanini et al., 2001; Leahy et al., 2001). The positive link seems to hold in developed, emerging, and developing economies. Although emerging and developing economies attract FDI, available data from the United Nations Conference on Trade and Development (UNCTAD) indicates that FDI is from developed countries. However, their proportion of FDI outflow is not declining over time (UNCTAD 2012).

The FDI outflow increases steadily on the part of the developing and emerging countries' ratio. The reason might be that firms like to invest in countries with a similar development level to their home country. Therefore, in a situation where political stability is not sustainable, coupled with inadequate development levels, the impact of FDI might not be felt on growth. Likewise, developed countries prefer to invest in other developed countries. The reason is that the developed country's firms can change their operation compared to the developing and emerging firms. However, the primary source of FDI in developing and emerging countries is from developing countries.
Trade openness expedites the economy's growth when there is more financial development due to the effects emanating from the impact of international trade on the aggregate macroeconomic performance of an economy.

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Thus, it could have a positive or negative impact on economic growth. On the one hand, trade openness may lead to advancement in macroeconomic efficiency by giving access to new raw materials and products, low-cost, intermediate goods, large market size, and latest technologies (Herwartz and Walle, 2014). Efficiency improvement could either be at the firm or the aggregate economy level or both, which will enhance the use of funds channelled by domestic financial intermediaries. Therefore, trade openness could invigorate the positive impact of financial development on economic growth.

On the other hand, trade openness might lessen the impact of finance on growth and, consequently, aggregate economic performance if international trade hinders local industries (Young, 1991). By implication, this will negatively affect the relationship between economic growth and financial growth. At the outset, the likely effect of trade openness on economic growth is not because it depends on how an economy performs in international trade. The finance growth nexus is likely to be strengthened in economies that perform reasonably well in international trade.

This study examines the effects of financial development, FDI, and trade openness on Nigeria's economic growth while using government expenditure and political stability as control variables in the model. Available literature indicated that financial development affects economic growth (Uddin et al., 2013; Akinsola and Odhiambo, 2017; Mireku et al., 2017; Adeniyi et al., 2015; Ductor and Grechyna, 2015; Odhiambo, 2018; Abubakar et al., 2015; Samargandi and Kutan, 2016; Ben et al., 2014). Abubakar et al. (2015) observe that private credit increases economic growth in a study conducted on the Economic Community of West African States (ECOWAS). The Samargandi and Kutan (2016) survey reaffirmed Abubakar et al. (2015), indicating that credit flow positively affects growth in some BRICS countries, especially China and India. In Nigeria, Adeniyi et al. (2015) agree that financial development impacts economic growth.

Muhammad and Khan (2019) have confirmed that FDI inflows impact economic growth on the FDI impact on economic growth. The period of political uncertainty during the Arab Spring turmoil distorted FDI inflow in MENA countries, undermining its impact on growth (Abdel-Latif, 2019). The situation in MENA countries influences developed country firms to prefer to invest in states that have similar economic and political development. Akinlo (2004) notes that in Nigeria, FDI and financial development are not growth-enhancing because of capital flight, but export stimulates economic growth. The African Continental Free Trade Agreement (AfCFTA) is an opportunity for Nigeria to benefit and boost its economic growth. Keho (2017) suggests that trade openness is essential for economic development, mostly in developing countries, by making available goods and services that were not within reach. Also, it creates the opportunity for a market competition known as the trade-led growth hypothesis.

The other sections of this study are divided into three; the second is the data source and methodology. The third section covers the data analysis, and the fourth section presents the concluding remark.

2. DATA SOURCES AND METHODOLOGICAL FRAMEWORK

The data used in this study are GDP per capita at constant 2010. FDI equals domestic credit to the private sector by the bank as the percentage of GDP, FDI means foreign direct investment, net inflows % of GDP, TOP is implying the summation of export and import of goods and services % of GDP, GOV standing for general government consumption expenditure % of GDP and PST, which is durable meaning the consistency of government regime. All data are sourced from the World Bank (2019) World Development Indicators, except stable from the centre of systemic peace (2019). The model to be estimated is specified as follows:

$$GDP_t = \alpha_0 + \sum_{i=1}^{n} \beta_1 FD_{t-i} + \beta_2 FDI_{t-1} + \beta_3 TOP_{t-1} + \beta_4 GOV_{t-1} + \beta_5 PST_{t-1} + \varepsilon_t \quad (1)$$

where GDP is the proxy of economic growth, as the dependent variable, FD, FDI, TOP, GOV, and PST are the independent variables.

3. METHODOLOGICAL FRAMEWORK

To avoid spurious results, it is essential to decide the stationary on the set of observations at the beginning of the time series method. When the series is stationary, it implies that the mean and variance are constant. This study utilises the augmented Dickey-Fuller unit root test (ADF test) (Dickey and Fuller, 1981) and the Phillips and Perron unit root test (PP test) (Phillips and Perron, 1988). The ADF and PP test significant setback is that they do

not take cognisance of the influence of structural break in the series. Basically, because of policy changes and regime changes, structural change may be available in time series. Significantly, the frequent regime changes in Nigeria. Perron (1989, 1997) contributed that if the structural break is there in the set of observations, but the econometric model does not identify, the results may be inaccurate of not rejecting the nonstationary hypothesis. Thus, the Perron (1989) unit root test of an unknown break date is employed in this study.

After the static properties of the time series set of variables are investigated, the long-run cointegrating relationship between the variables will be examined. The study applies the autoregressive distributed lag (ARDL) model to explore the long-run cointegrating relationship. This method can be applied if the variables are either I (0) or I (1) but not I (2). According to the variables used in this study, equation (1) form of the ARDL can be written as follows:

$$\Delta GDP_t = \varphi_0 + \sum_{z=1}^{p} \varphi_{1z}\,\Delta GDP_{t-z} + \sum_{z=1}^{p} \varphi_{2z}\,\Delta FD_{t-z} + \sum_{z=1}^{p} \varphi_{3z}\,\Delta FDI_{t-z} + \sum_{z=1}^{p} \varphi_{4z}\,\Delta TOP_{t-z} + \sum_{z=1}^{p} \varphi_{5z}\,\Delta GOV_{t-z} + \sum_{z=1}^{p} \varphi_{6z}\,\Delta PST_{t-z} + \lambda_1 GDP_{t-1} + \lambda_2 FD_{t-1} + \lambda_3 FDI_{t-1} + \lambda_4 TOP_{t-1} + \lambda_5 GOV_{t-1} + \lambda_6 PST_{t-1}\mu_t$$

The first difference operator is the coefficient φ_iz denotes the short-run elasticities, i=1,…,6. The coefficient λ_i, i=1,…, 6 denotes the long-run elasticities. μ_t indicates the standard white noise. Equation (2) can alternatively be written in the matrix form, as in equation (3) below:

$$(1-A)\begin{bmatrix}\Delta GDP\\ \Delta FD\\ \Delta FDI\\ \Delta TOP\\ \Delta GOV\\ \Delta PST\end{bmatrix} = \begin{bmatrix}\varphi_1\\ \varphi_2\\ \varphi_3\\ \varphi_4\\ \varphi_5\\ \varphi_6\end{bmatrix} + \sum_{z=1}^{p}(1-A)\begin{bmatrix}\Delta GDP\\ \Delta FD\\ \Delta FDI\\ \Delta TOP\\ \Delta GOV\\ \Delta PST\end{bmatrix} \times \begin{bmatrix}\varphi_{11} & \varphi_{12} & \varphi_{13} & \varphi_{14} & \varphi_{15} & \varphi_{16}\\ \varphi_{21} & \varphi_{22} & \varphi_{23} & \varphi_{24} & \varphi_{25} & \varphi_{26}\\ \varphi_{31} & \varphi_{32} & \varphi_{33} & \varphi_{34} & \varphi_{35} & \varphi_{36}\\ \varphi_{41} & \varphi_{42} & \varphi_{43} & \varphi_{44} & \varphi_{45} & \varphi_{46}\\ \varphi_{51} & \varphi_{52} & \varphi_{44} & \varphi_{54} & \varphi_{55} & \varphi_{56}\\ \varphi_{61} & \varphi_{62} & \varphi_{54} & \varphi_{65} & \varphi_{65} & \varphi_{66}\end{bmatrix} + \begin{bmatrix}GDP\\ FD\\ FDI\\ TOP\\ GOV\\ PST\end{bmatrix}_{t-1} \times \begin{bmatrix}\lambda_{11} & \lambda_{12} & \lambda_{13} & \lambda_{14} & \lambda_{15} & \lambda_{16}\\ \lambda_{21} & \lambda_{22} & \lambda_{23} & \lambda_{24} & \lambda_{25} & \lambda_{26}\\ \lambda_{31} & \lambda_{32} & \lambda_{33} & \lambda_{34} & \lambda_{35} & \lambda_{36}\\ \lambda_{41} & \lambda_{42} & \lambda_{43} & \lambda_{44} & \lambda_{45} & \lambda_{46}\\ \lambda_{51} & \lambda_{52} & \lambda_{53} & \lambda_{54} & \lambda_{55} & \lambda_{56}\\ \lambda_{61} & \lambda_{62} & \lambda_{63} & \lambda_{64} & \lambda_{56} & \lambda_{66}\end{bmatrix} + \begin{bmatrix}\mu\\ \mu\\ \mu\\ \mu\\ \mu\\ \mu\end{bmatrix}_t \quad (3)$$

To explore the cointegration relationship, the null hypothesis for the long run can be expressed as H_0: λ_11 to λ_66 = 0. The alternative hypothesis is H_1: λ_11 to λ_66 ≠ 0. The null hypothesis for the short run can be expressed as H_0: φ_11 to φ_66= 0, while the alternative hypothesis is H_1: φ_11 to φ_66 ≠ 0. The error correction term is obtained in the ARDL through a linear transformation. The critical value formulated by Pesaran et al. (2001) is utilised to accept the null hypothesis. Suppose f statistics are higher than the upper bound of the critical value. In that case, it implies the long-run cointegration relationship among the variables. A diagnostic analysis was carried out to ensure the application of correct statistical methods to the model. The stability tests, like the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) developed by Brown et al. (1975), according to the recursive regression residuals, were employed.

Table 1. Descriptive Statistics

	GDP	FD	FDI	TOP	GOV	PST
Mean	7.477	2.118	0.917	3.408	2.262	1.646
Median	7.491	2.088	0.959	3.540	2.304	1.792
Maximum	7.849	3.103	1.916	3.976	2.887	2.773
Minimum	7.189	1.351	0.229	2.212	1.531	0.000
Std. Dev.	0.221	0.406	0.398	0.471	0.420	0.846
Skewness	0.141	0.492	0.267	-1.128	-0.190	-0.697
Kurtosis	1.593	2.597	2.694	3.441	1.535	2.385
Jarque-Bera	4.206	2.307	0.771	10.790	4.677	4.745
Probability	0.122	0.315	0.680	0.005	0.096	0.093

4. DATA ANALYSIS AND DISCUSSION

Table 1 gives the descriptive statistics of the variables used in the study. The Jarque-Bera (JB) test rejected the null hypothesis of no normality in TOP, GOV, and PST. However, the mean and median revealed that the variables are normally distributed. The volatility of the variables is less as the absolute standard deviation is below unity. The kurtosis coefficient of TOP is 3.441, indicating it is asymmetric. Interestingly, the mean and median indicated that all the variables are normally distributed.

Table 2 presents the model's correlation results, indicating that GDP with FD and TOP is significantly related. Similarly, FD with TOP is correlated. It implies that FD and TOP are important growth variables in Nigeria as their association is positive with GDP. FDI with PST is correlated, but their relationship is not significant to GDP, indicating it might not stimulate Nigeria's growth.

Table 2. Correlation results

Variables	GDP	FD	FDI	TOP	GOV	PST
GDP	**1.000**					
FD	0.618*	**1.000**				
	(0.000)					
FDI	-0.152	-0.022	**1.000**			
	(0.296)	(0.879)				
TOP	0.280**	0.300*	0.495*	**1.000**		
	(0.052)	(0.036)	(0.000)			
GOV	-0.102	-0.225	-0.051	-0.154	**1.000**	
	(0.487)	(0.120)	(0.730)	(0.290)		
PST	0.192	0.012	0.483*	0.321*	-0.028	**1.000**
	(0.186)	(0.933)	(0.000)	(0.024)	(0.847)	

Note: *, and ** indicate significance level at 1, 5 and 10% respectively. Values in ( ) represent the p-values

The results of the stationary of the variables are presented in Table 3. It revealed that none of the variables is integrated into the order I (2). This is the prerequisite for the ARDL approach. For both ADF and PP unit root tests, the order of integration is I (1) for all variables. As none of the variables is integrated at the order I (2), it is convenient for the bounds approach to be employed. The traditional unit root tests ignored the identification of break dates. The Perron unit root test considers this with a break. The break date of GDP is 1980, which witness the early collapse of necessary infrastructure and total reliance on oil with complete neglect of agriculture.

Table 3. Unit Root Test Results

	At level			First difference		
Variables	ADF	PP	P	ADF	PP	P
GDP	-0.334	0.589	-4.806 (T_B: 1980)	-3.195*	-5.358*	-6.000* (T_B: 1983)
FD	0.248	0.571	-4.420 (T_B: 1980)	-7.022*	-7.347*	-5.528** (T_B: 1980)
FDI	-1.200	-1.160	-4.176 (T_B: 1988)	-11.122*	11.440*	11.976* (T_B: 1989)
TOP	-0.223	-0.223	-3.533 (T_B: 1980)	-7.584*	-7.584*	-8.437* (T_B: 1986)
GOV	-0.948	-0.982	-4.012 (T_B: 1986)	-7.692*	-7.684*	-9.698 (T_B: 1994)
PST	-1.448	-1.207	-3.815 (T_B: 1977)	7.248*	-9.339*	-7.951* (T_B: 1998)

Note: *, ** and *** indicate significance level at 1, 5 and 10%, respectively T_B represent the break year of the Perron (1989) unit root test.

The optimal lag order selection criteria are lag four according to AIC criteria as in Table 4. The results of the bounds test are presented in Table 5. It revealed long-run cointegration between GDP, FD, FDI, TOP, GOV, and PST. The F-statistics is (3.587), higher than the upper critical bounds value of at the 10 % significance level of Pesaran et al. (2001).

Table 4. Optimal Lags Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC
1	53.489	272.371*	2.45e-08*	-0.511	1.176*
2	79.479	36.963	4.18e-08	-0.066	3.066
3	118.296	44.855	4.67e-08	-0.191	4.386
4	169.756	45.742	3.92e-08	-0.878*	5.144

Note: * indicates the optimal lag order selected by the criterion, LR Sequential modified LR test statistic at 5% level each, FPE final predictor error, AIC Aikaike information criterion, SC Schwarz information criterion, HQ Hannan-Quinn information criterion.

Table 5. Bounds test cointegration results

Model to estimate	Calculated F-statistic	
GDP = F (FD, FDI, TOP, GOV, PST)	3.587	
	K=5, N=45	
Significance level	I (0)	1 (1)
1%	3.41	4.68
5%	2.62	3.79
10%	2.26	3.35

The estimated ARDL model results are presented and reported in Table 5. As vividly seen in the long-run analysis, FD and TOP enhance GDP. This confirms the correlation results as these variables are associated positively and significantly with GDP. This means the domestic financial markets by the financial instruments and intermediaries promote good financial resources in Nigeria. Whereas in the short run, the main drivers of GDP are TOP and PST, while FDI stymied GDP. This agrees with Akinlo (2004) that there may be a capital flight in Nigeria, making FDI not impact economic growth. Notably, the error correction term is significant, which means that in the event of a short-run shock, Nigeria's economy will gradually return to equilibrium at the speed of 13%.

Finally, after interpreting the empirical investigation results, the test of validity and stability of the ARDL model used in the study is considered. It showed that there is no autoregressive heteroscedasticity and no serial correlation. Besides, the residuals of the estimated ARDL model are normally distributed. The diagnostic tests confirmed the validity and stability of the estimated ARDL model. In Figures 1 and 2, the stability of the ARDL is ascertained.

Table 5. Long run and short analysis ARDL (1,4,1,4,4,4)

	Coefficient	Std. Error	t-Statistic	Prob.
Long-run analysis				
FD	0.710*	0.348	2.037	0.055
FDI	-0.223	0.355	-0.628	0.537
TOP	0.488***	0.247	1.974	0.062
GOV	0.120	0.239	0.501	0.621
PST	0.108	0.162	0.665	0.513
C	4.021	1.761	2.283	0.033
Short-run analysis				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ΔFD	0.019	0.040	0.484	0.634
ΔFDI	-0.085*	0.036	-2.371	0.027
ΔTOP	0.145*	0.035	4.105	0.001
ΔGOV	0.039	0.039	0.980	0.338
ΔPST	0.032*	0.013	2.420	0.025
$ECT_{(-1)}$	-0.129**	0.074	-1.731	0.098
Diagnostic tests				
Serial correlation	0.839			0.448
Normality	1.717			0.424
heteroscedastic	1.733			0.105

Note: *, ** and *** indicate significance level at 1, 5 and 10% respectively

Figure 1 Cusum plot

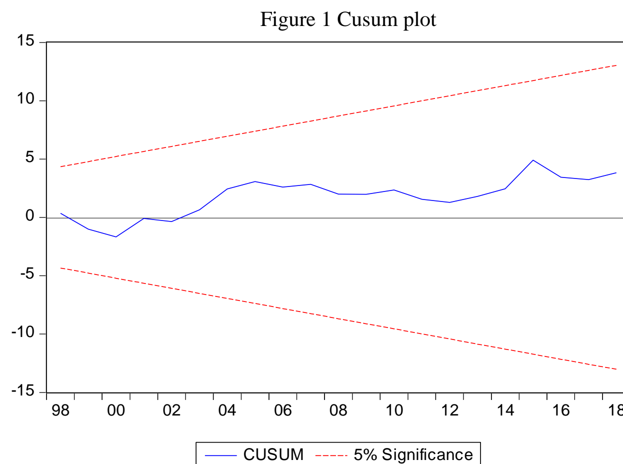
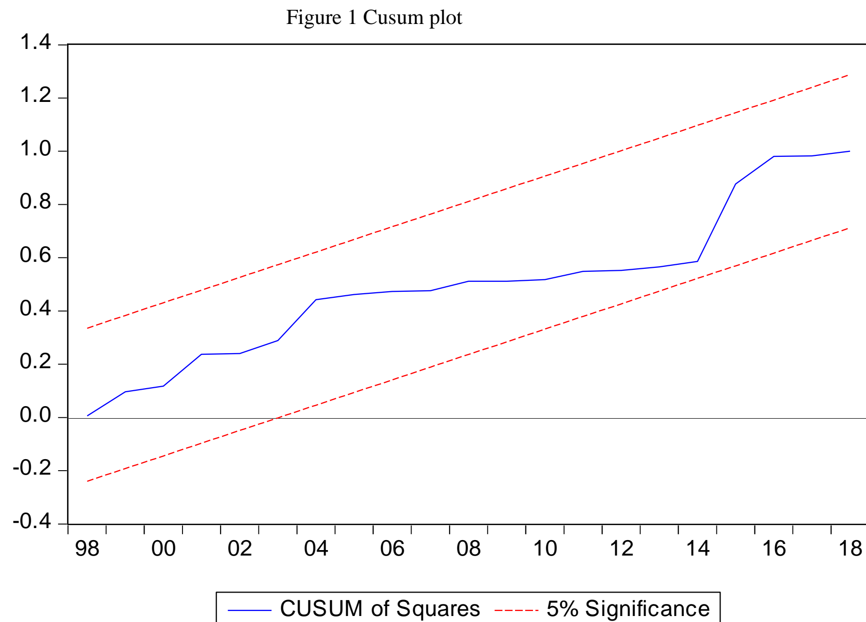


Figure 1 Cusum plot



5. CONCLUDING REMARK

This study investigated the impact of financial development, FDI, and trade openness on economic growth to integrate control variables government expenditure and political stability. The period 1970-2018 was considered in the study. The results indicated that financial development and trade openness stimulate economic growth. However, foreign direct investment and government expenditure impede economic growth. The policymakers should consider policies that promote economic growth through financial development and trade while de-emphasising their priority on FDI. The developed economies stand to benefit more from it. The emphasis on FDI in Nigeria should ensure a stable political environment as it is ongoing now. Later the needed FDI for growth will flow effortlessly. The new AfCFTA agreement is a strong chance for Nigeria's economy to thrive significantly as the trade openness enhances growth.

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Ethical Culture Survey of Malaysian Government Departments

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Abstract

This study aims to investigate the level of ethical culture of the Malaysian public sector. The paper used a set of a questionnaire as the medium for data collection. Two hundred fifty-one respondents from various government organisations took part in the survey. These employees are from various federal ministries, departments, and government agencies. The paper presents a descriptive survey of the levels of ethical culture maintained in these organisations. The findings show that some ethical culture components present a high value in a score representing their ethical culture level in the organisation. The levels of ethicalness in employees will impact the workplace's efficiency and total social environment. The study's value is in terms of public sector feedback, where there are usually substantial barriers to obtaining feedback.

Keywords: Ethics, ethical culture, public sector

1. INTRODUCTION

Having high levels of ethical values may result in positive results in an organisation. The relationship between ethics and efficiency shows that high ethics levels improve organisational efficiency (Dobel, 2009). The impact it has on having an acceptable organisational climate is also influenced by the levels of ethical culture (Dickson, Smith, Grojean, & Ehrhart, 2001). The performance levels in an organisation are also related to the levels of ethical values instilled in the organisation (Koh & Boo, 2004). Such studies observed the impact of no ethics codes and found that unethical behaviour increases due to low ethical values (Treviño, Butterfield, & McCabe, 1998). Human behaviour research enables understanding values that can impact performance, efficiency, and commitment an employee has towards the organisation.

The studies of ethical values provide information on areas that can be further improved in a group or organisation. The construct of ethics is the moral reasoning or compass that the person has in navigating their current society (Ross, 1999). Modern-day studies engage in normative ethics to understand the action or ethical action of moral reasoning when conducting a behaviour (Hursthouse, 2015). The subject is broad as cultural, socio-economic, and other factors may influence the investigation results. Studies of organisational culture have shown that each culture holds different values in interpreting ethics (Kolthoff, Erakovich, & Lasthuizen, 2010).

Malaysian cultures are a mixture of knowledge. The population comprises various ethnic groups, mainly Malay, Chinese, Indian, and many other ethnic groups. Through these various ethnic groups, each race holds different values towards cultural beliefs as religions come into play that primarily influences their actions (Kennedy & Mansor, 2000). Based on Hofstede's (2017) analysis, Malaysia has high collectivism levels and high levels of power distance in society in terms of values. Race actions have shared values as their upbringing is based on religion's teachings. In early 2000, prior studies related to race and values showed no significant difference

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between the Malays and the Chinese workers (Lim, 2001). That particular study had also highlighted that there are high levels of power distance in Malaysia.

2. LITERATURE REVIEW

2.1 Ethical Culture

Organisational culture is the shared principle of beliefs and assumptions that influence how individuals or groups behave in the organisation (Van Den Berg & Wilderom, 2004). The early studies of organisational culture can be seen from the works of Elton Mayo of the "Hawthorne Effect" in the 1950s (Rob et al., 2007). The factory workers in Hawthorne were observed in terms of their productivity and adjustment of surrounding lights. The development was that people work harder when being observed, thus creating the Hawthorne effect. Organisational culture encompasses the values, beliefs, and principal of the employees, management, and organisations visions and missions (Needle, 2010). Culture is from the common pattern of behaviour of groups or organisations, which can be considered the norm developed during the organisation's history (Andrew, 1998; Needle, 2010). Organisational culture from various literature suggests it comes from a collection of variables from history, technology, ownership, leadership, and strategies. This can be influenced by political, economic, or socially which can affect the organisation's culture

Ethical culture is the set of values incorporated in an individual or organisation towards the expected level of ethical behaviour practised (Kaptein, 2011). The values in ethical behaviour include the level of ethics that are currently maintained and the subconscious ethical values embedded within the individual or organisation (Treviño, Weaver, & Reynolds, 2006). The ethics within the workspace environment represents the components of ethical culture within the organisation (Treviño et al., 1998). They suggested that the ethics action within the people in the organisation influences the organisation's levels of ethical climate.

Studies on ethical culture often investigated the aftereffects or consequences when there are low levels of ethics within the individual or organisation. Past studies of ethical culture show that high levels of ethics negatively influence misbehaviour (Kangas, Muotka, Huhtala, Mäkikangas, & Feldt, 2015). The studies of ethical cultures' impact on the organisational climate found that ethics levels will influence the organisation's setting and climate (Silvija & Ksenija, 2012). The individual impact on auditors shows that ethical culture levels positively improve the employees (Svanberg & Öhman, 2013). This is why such cultural studies of ethics are essential areas of research.

2.2 Malaysian Culture

Cultural studies investigate theories, politics, and values practised by society's population (Hall, 1980). It is related to the community's native behaviour or standard societal practices. Malaysian culture presents vital harmony and social responsibility (Naqshbandi, Kaur, Sehgal, & Subramaniam, 2015). They value continuous harmony due to the complexity of having multiple races in the population. Social responsibility includes being accountable for their actions for the sake of family and friends.

The positive culture of Malaysians includes being helpful and considerate (Mansor & Kennedy, 2000). Although there are some gender inequalities between men and women, women have opportunities to have a successful career in employment (Hirschman, 2016). In terms of ethics, most of Malaysia's culture falls back to religion in improving their levels of ethicality (Majid, Mohamed, & Mahmud, 2010). Malaysia is also a developing country that still has room for improvement.

3. RESEARCH METHOD

3.1 Research Model

This study uses the Cultural Ethical Values Model (CEVM) developed to determine the levels of ethical culture within an individual or organisation (Kaptein, 2008). The original CEVM is with eight items that evaluated the ethical culture model. This study focused only on five items: clarity, supportability, transparency, discussion ability, and sanctionability (Kaptein, 2008). Each of these measurements considers the ethical values that the entity has.

Table 1. Items of Cultural Ethical Value Model

Description	*Ref.*	Items
Ethical Culture		
Clarity	*A1*	My organisation has clear ethical conduct guidelines
	A2	My organisation makes it clear on methods of obtaining proper authorisation
	A3	My organisation makes it sufficiently clear on the use of office equipment (e.g., Photostat machines)
	A4	My organisation makes it sufficiently clear on the handling of money and other financial assets responsibly
	A5	My organisations make sufficiently clear on how to deal with conflict of interests
	A6	My organisation makes it sufficiently clear on dealing with confidential information responsibly
	A7	My organisation makes it sufficiently clear on how to deal with external persons (visitors or customers)
Supportability	*B1*	My organisation employees have the best interests for their department
	B2	My organisation employees take the existing norms and standards seriously
	B3	My organisation employees treat one another with respect
Transparency	*C1*	Management will find out if an employee does something unethical
	C2	Employees or co-workers in my organisation will find out if a person does something ethically
	C3	If the organisations superior or management does something unethical, someone will find out about it
Discussability	*D1*	My organisation handles reports of unethical conduct with caution
	D2	My organisation has opportunities to express any opinions
	D3	My organisation has adequate room to discuss unethical conduct
	D4	My organisation takes any reports of unethical conduct seriously
	D5	My organisation has adequate room to discuss personal ethical dilemmas
	D6	My organisation provides adequate opportunities to discuss ethical misconducts
	D7	My organisation respectfully handles cases of unethical conducts
	D8	My organisation provides adequate opportunities to correct unethical behaviours
	D9	If the unethical conduct does not receive adequate attention, there are sufficient channels to raise the matter elsewhere
Sanctionability	*E1*	My organisation employees will be disciplined if they behave unethically
	E2	My organisation employees involved with unethical misconduct are disciplined fairly regardless of their position
	E3	My organisation employees with integrity have better chances to receive positive performance appraisals

3.2 Sample and Data

A survey was given to government employees using these measurements as questions. The scale was evaluated from one to seven. The seven Likert scales form an ascending order of strongly agree represented by seven, the most robust answer for the items questioned (Creswell & Creswell, 2017). There are a total of 251 government employees that answered the survey.

4. ANALYSIS AND RESULTS

4.1 Frequency Distribution

The frequency distribution for corruption shows the number of times perceived corruption occurs in a government organisation. Respondents were asked to indicate a scale of one to seven on which statements they agree or disagree with. The scale measured strongly disagree, somewhat disagree, slightly disagree, moderate, slightly agree, somewhat agree, and strongly agree. Where one is the weakest and seven is the most substantial value. The following table shows the frequency distribution of corruption in the public sector.

Table 2. Frequency of ethical culture in the public sector

Ethical Culture	*Ref.*	Valid Cases	Mean	Strongly disagree 1	Somewhat disagree 2	Slightly disagree 3	Moderate 4	Slightly agree 5	Somewhat agree 6	Strongly agree 7
Clarity	*A1*	250	5.54	**4**	11	7	33	44	70	**81**
	A2	252	5.47	7	12	**4**	34	45	72	**76**
	A3	250	5.46	**3**	16	4	34	49	70	**74**
	A4	250	5.53	7	10	**5**	30	47	72	**79**
	A5	248	5.35	10	12	**3**	38	48	68	**69**
	A6	247	5.53	7	12	**4**	31	38	75	**80**
	A7	247	5.47	8	9	**7**	33	36	**85**	69
Supportability	*B1*	249	5.20	**7**	8	16	43	53	**66**	56
	B2	249	5.26	**6**	9	14	41	53	**67**	59
	B3	248	5.25	13	**8**	10	36	53	61	**67**
Transparency	*C1*	248	5.26	**5**	13	11	42	51	67	60
	C2	249	5.20	**7**	10	10	49	46	**76**	51
	C3	249	5.18	10	12	**7**	48	45	**72**	55
Discussability	*D1*	249	5.30	**5**	13	8	40	52	**72**	59
	D2	249	5.09	12	12	11	37	61	**66**	50
	D3	248	5.13	**8**	11	12	455	55	**67**	50
	D4	248	5.37	**5**	14	6	42	45	**64**	72
	D5	249	5.05	9	16	**7**	47	59	**65**	46
	D6	247	5.08	**9**	14	10	49	47	**69**	49
	D7	248	5.20	**5**	14	9	46	51	**71**	52
	D8	247	5.11	**8**	13	13	44	49	**73**	47
	D9	248	4.98	**11**	13	15	47	52	**64**	46
Sanctionability	*E1*	249	4.99	**13**	16	17	45	38	**70**	52
	E2	250	4.86	**15**	17	**15**	53	40	**60**	50
	E3	249	5.08	**11**	14	**11**	50	42	**64**	57

Table 2 indicates that each public sector employee is perceived to have high ethical culture levels in their organisation. There are still many cases where there are deficient ethical climate levels, although it is insignificant. The most frequent value in the descriptive is that most public sector departments have ethical guidelines (Item A1, N=81). In contrast, the employees are evident in public sector equipment and their responsibilities (Item A3, N=3).

5. CONCLUSION

The importance of ethical culture in an organisation increases the likelihood of having more ethical values. The ethical culture also influences efficiency and helps organisations run better (Treviño et al., 1998). The employees' motivations are also improved when there are high levels of ethical culture (Kaptein, 2009). This study indicates that the Malaysian government department maintains high levels of ethical culture in their organisations.

The organisation's ethical culture is one of the crucial elements of organisations circumstances as the practice of ethical cultures in organisations will uphold ethical behaviour throughout members of the organisation (Brown & Treviño, 2006; Kaptein, 2011). The critical point here is that ethical culture shows informal areas in an

organisational context. In contrast, integrity and ethics control programmes are part of the formal organisational context. Integrating an ethics programme to ensure ethical behaviour is part of the organisational culture is difficult (Ferrell, 1998).

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A review of the relationship between Sustainability Initiative and Firm Performance

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Abstract

The main aim of this paper is to generate debate as to the degree to which sustainability initiative is an explanatory variable for firm performance, based on the condition that firms are to be in a position that will enable them to harness the resources at their disposal perform effectively. Concerning this study, the stakeholders and institutional theories are the underlying theories adopted for evolving the research framework about evaluating the relationships between sustainability initiatives and firm performance. Not many studies have changed about the variables in the less developed nations, especially the influence of sustainability initiatives on medium-sized firms' financial and non-financial corporate performances. Thus, scholars and practitioners are encouraged to further contribute to the body of knowledge in this study area for the worldwide enrichment of efficiency. The review has conceptualised the integration of the sustainability initiative as a mechanism for improving firm performances locally and internationally.

Keywords: Financial performance, non-financial performance, firm performance, institutional theory, stakeholder theory, sustainability initiative

1. INTRODUCTION

Performance is a measure attributable to a firm's capability to achieve its set goals about the environment where its services and goods are needed. Thus, in Jackson's (2017) view, performance measurement has to conform to the following criteria: inimitable and quantifiable; transferrable within a firm and her units; essential to attaining set objectives; and relevant to strategic business units (SBUs). Nevertheless, performance is a latent variable commonly used as a dependent variable (Richard, Devinney, Yip & Johnson, 2009) due to its multidimensional characteristics (Dess & Robinson, 1984; Rauch, Wiklund, Lumpkin & Frese, 2009). Besides, financial statements, even when considered necessary for the evaluation of performance (Maali & Nour, 2019), are inadequate for the complete assessment of firms (Fernández, Iglesias-Antelo, López-López, Rodríguez-Rey, & Fernandez-Jardon, 2019). Researchers (Steyn-Bruwer & Hamman, 2006) believe that non-financial indicators are also adopted to investigate the achievements of firms because of the deficiency of financial statements as to means of evaluating the performance of firms. Thus, it creates the need for further studies (Purves, Niblock & Sloan, 2015). Hence, with the related feature of performance associated with the matter (sustainability initiative) for consideration, the underlying issues concerned with performance are in terms of the firms' circumstances, especially from sustainability and sustainability initiative (Adedeji et al., 2017).

The sustainability of business operations and management responsibilities never gained prominence until the 1980s and 1990s, after the stakeholders had agitated to acknowledge the obligations for social issues from those who run businesses (Kakabadse et al., 2005). Nevertheless, firms' sustainability initiative from the perspective of the developed countries is with attention to depth, quantity, quality, and content, which have focused on both financial and non-financial representations (Ioannou & Serafeim, 2014). Unfortunately, the emerging, developing,

and under-developed nations worldwide can hardly attest to the statement above (Adedeji, Ong, Rahman, Odukoya & Alam, 2019). Also, are the questions raised about firms' continued existence because of the enlarged social, regulatory, cultural, legal, environmental disclosures and technological improvements associated with the transformation of businesses (Ernst & Young, 2013).

In addition to the introduction, this paper also covers the conceptual framework based on the theoretical foundation, focusing on firm performance and sustainability initiative concepts. The second part entails developing the hypotheses concerning the conceptual framework in terms of the relationships between dimensions of sustainability initiative and firm performance. The next is the contribution and implications, with the last being the conclusion and recommendations for future studies.

2. A CONCEPTUAL FRAMEWORK BASED ON THE THEORETICAL FOUNDATION

A theoretical underpinning is to have a foundation for the conceptual framework design to validate the relationship between the variables. Therefore, the theories reviewed in this paper comprise the stakeholder theory and institutional theory.

The stakeholder theory assumes that a firm owes a duty to other interested parties known as the stakeholders. They include the shareholders, who consist of any person/group that can control/be controlled by a firm (Freeman, 1984). In line with Jensen and Meckling (1976) opinions, the stakeholder theory concerns those aspects of corporate well-being, emphasising the operations and performance of a firm about the capability to maintain the connections it has with the varieties of concerned groups in its sphere of activities. Nevertheless, in contrast, a firm has a duty to itself and other connected persons in the course of doing business to ensure profound effectiveness and efficiency that can aid it in exercising its legitimate rights for survival (Jizi et al., 2014). This theory also helps researchers examine the differences between performance outcomes and their related antecedents, despite its usage in evaluating performance more diversely. In a way, the different stakeholder groups have had their needs met (Carneiro et al., 2007) through some underlying bases of performance which are financial such as return on assets, return on equity, return on investments, net profit margin, gross profit margin while others are non-financial like firm reputation, workers' satisfaction, customers' satisfaction, etc. (Al-Matari et al., 2014; Choongo, 2017).

Moreover, the capabilities and resources at the firms' disposal and information and knowledge engagement through the sustainability initiative can enable firms to operate advantageously to benefit the stakeholder groups. Nevertheless, this theory is critical because it creates a high level of awareness due to its contribution to an area of study like this. It ensures sensitivity for responsibility concerning everyone group connected to a firm or more of the firms.

Consequently, the institutional theory validates the sustainability initiative (Caprar & Neville, 2012). The latter is due to the recognition of sustainability, focusing on the importance of nation-wide behaviour to evaluate why firms relate with institutional forces for determining outcomes and the acceptance of cultural research, which is fundamental for investigating corporate values concerning nation-wide opinions. Additionally, this theory conforms to the view embedded in each social setting as an institution, with many dimensions such as its cultural-regulative, normative, and cognitive potentials. Therefore, institutional standards and values are lasting, manageable, and ensure social attitudes; and interconnectivity (Scott, 1995). Thus, the institutional theory explains how corporate engagements improve sustainability and environmental revelations' shaping due to its emphasis on the measures adopted to guarantee their inclusion in institutions or recognised initiatives.

Still, the advocates of institutional theory aligned with the view that institutional involvements influence corporate members by reducing existing choices, mitigating specific configuration of resources sharing, and decreasing specific arrangements of actions (Di Maggio & Powell, 1991). The implication is that designing and executing sustainability initiatives can likely mitigate and hinder the firm from moving forward in the already arranged plan of action. Hence, the status quo can significantly hinder firms' owners or managers (institutions or establishments). In other words, the extent or magnitude of sustainability initiative is at whims and caprices of the belief, norms, and interests of the owners or managers engaged in running the firm's day-to-day operations. In sum, the primary submission of the institutional theory's proponents is that a firm's existence is about its strength to conform to the social norms or the conventional attitude (Covaleski & Dirsmith, 1988). However, various researchers have adopted the institutional theory to validate social, economic, and environmental tasks (Chih et al., 2010; Jackson & Apostolakou, 2010) agree with other methods like legitimacy, stakeholder, and the social contract.

3. LITERATURE REVIEW, HYPOTHESES DEVELOPMENT, AND CONCEPTUAL FRAMEWORK

This section reviews the literature concerning the variables (firm performance and sustainability initiative) to develop the hypotheses and reveal the conceptual framework required to establish the relationship between the variables.

3.1 Firm Performance

The implementation of exceptional financial performance is premised on profitability, growth, and market value to encourage investors (Chen and Huang, 2012; Rahman et al., 2017; Raposo et al., 2014). On the other side, the non-financial performance indices are also relevant, despite less attention to improving the association with the business's situations, the order of business, and business consequences (MDG Africa Steering Group, 2008; Mühlbacher, Siebenaler & Würflingsdobler, 2016). They focus on the issues concerning employee satisfaction and the firm's reputation. However, the non-financial indicators are now receiving attention to examine the consequences of firm performance (Madrid-Guijarro, Garcia-Perez-de-Lema & van Auken, 2011; Steyn-Bruwer & Hamman, 2006; Fernández et al. 2019). Nonetheless, Chuvakhin and Gertmenian (2003) assert that the latter position determines the precise and consistent accounting evidence that firms engage, which inadvertently may influence the analysis in question.

Moreover, the timely and proper evaluation of the firms has been due to making only the financial statements the primary basis for determining performance (Madrid-Guijarro, Garcia-Perez-de-Lema & van Auken, 2011). Thus, to pay attention to the matters above, a few scholars (Madrid-Guijarro et al. 2011; Steyn-Bruwer & Hamman, 2006) have lent their voices on the need to adopt non-financial indicators as part of the basis for the examination of firm performance, and this has created the necessity for further studies (Purves, Niblock & Sloan, 2015). However, some studies (Beaver, McNichols & Rhie, 2005; Hossari, 2006) reveal that a combination of the indicators is suitable enough to assess firm performance, mainly about other institutional factors such as sustainability initiative. Therefore, adopting the dimensions of firms' financial and non-financial performance can determine corporate outcomes. Consequently, determining the relationship between sustainability initiative and firm performance becomes imperative.

3.2 Sustainability Initiative

The Brundtland Report of 1987 brought sustainability to the open for further debate by researchers and practitioners to ensure the integration of the developmental dimensions of social, economic, and environmental issues so that the less privileged globally can have a better share in the scheme of events and circumstances. Through their publication, the latter gave recognition to sustainability as a "development that meets the needs of the present without compromising the ability of the future generations to meet their own needs" (World Commission on Environment and Development, 1987). However, the debate on sustainability gained proper attention in 1990 in Rio de Janeiro in Brazil through the United Nations Conference on Sustainable Development. Besides, in the 2010s, there was again the Rio+20 meeting held to refocus on the matters relating to sustainability.

Consequently, the Millenium Development Goals (MDGs) emphasised the economic and environmental developmental goals without neglecting the social purposes relevant to the Sustainable Development Goals (SDGs). Additionally, the Global Reporting Initiative (GRI, 2006) specifies sustainability as a measure of performance concerning the impact of social, economic, and environmental activities on the internal and external stakeholders. This initiative comprises six spectacular dimensions: financial, human rights, product responsibilities, labour practices and decent work, society, and the environment.

According to Chang (2016), corporate sustainability is a far-reaching concept that emphasises socially inclined issues, including social justice, governance, environmental protection, product safety, diversity, employees' welfare, and community well-being. Therefore, sustainability issues are essential components of strategic thinking or lens integrated for everyone firm for effective performance globally (Håkanson,2010; Moura-Leite, Padgett, & Galán, 2014). Sustainability initiative is the tool used by firms to make information available concerning their environmental, economic, and social activities and the influence the above have on the various interest groups concerning firms' performances (Fernandez-Feijoo, Romero & Ruiz, 2014). Therefore, it constitutes the collection of inputs about the ideas introduced by firms to maintain their operations in a highly competitive environment to improve the stakeholders' value and firm performance.

Nevertheless, the business sustainability initiative has had recognition in terms of both financial and non-financial outcomes, particularly in the advanced nations concerning depth, quantity, quality and content (ACCA, 2014; Janggu, Darus, Zain, & Sawan, 2014). However, sustainability initiative about practitioners is not only

compliance-based, as management now views them as a way to innovate, create new prospects, and achieve brilliance in firm responsibilities. Hence, the deviation from compliance has led to sustainability that drives shareholder value and requires firms to deal with the contradictions of simultaneously improving corporate performance. Meanwhile, Pellegrino and Lodhia (2012) supported the adoption of sustainability management. It enables them to show-forth their social and environmental operations, though less is concerning the medium-sized firms, especially in the developing nations (Adedeji et al., 2019).

3.3 Sustainability initiative and firm financial performance

Ong, Tho, Goh, Thai and Teh (2016) suggest that the relationship between sustainability initiative and financial performance is a positive one as the integration of business strategy, connected to significant business purposes and primary competencies create the positive economic yields by the company through positive social and environmental impact globally. Again, the financial rewards are more concerning savings in operational costs. Thus, the introduction of social and environmental initiatives in the profile of firms is beneficial in establishing the association between the firm and the stakeholders such that information is made available to inform, educate and vary the opinions and visions of the interested groups. Furthermore, Adedeji et al. (2019) posit that sustainability initiative improves firm performance through enhanced market value and attraction of firms to investors for investment purposes. Again, the sustainability initiative provides the capability for firms to secure data required to inform, educate, and change the opinion and expectations of interested groups (Ong, The, & Lee, 2019).

On the other hand, Agyemang and Ansong (2017) view that the improvement in the understanding of the sustainability initiative from the literature indicates that sustainability initiatives affect firms' access to funds among SMEs in growing economies. In light of the preceding, the following is the hypothesis:

Hypothesis 1a: Sustainability initiative has a positive relationship with the firm financial performance of companies.

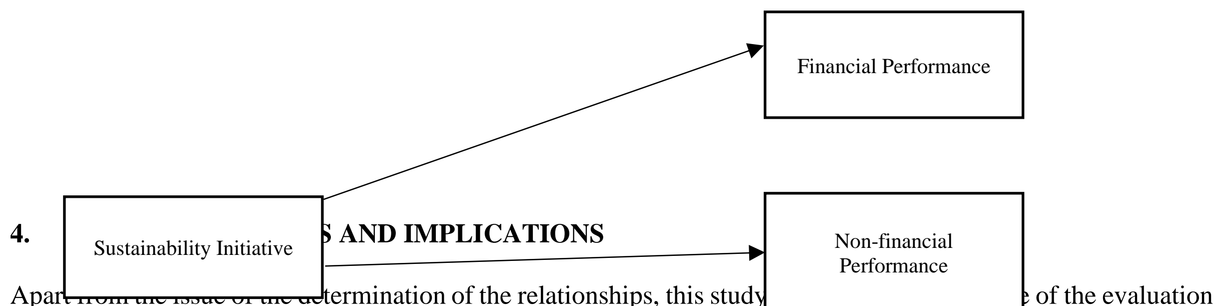
3.4 Sustainability initiative and firm non-financial performance (NFP)

Sustainability initiatives can increase respect for firms in the open market. The outcome is enhanced employee performance apart from the great attraction and retention of highly informed staff to the firm (Cho, Laine, Roberts, & Rodrigue, 2015). Also, the establishment of a sustainability initiative enhances the capabilities of firms to improve corporate performance concerning reputation, minimisation of reputational risks and innovation (Bebbignton, Larrinaga, & Moneva, 2008). Besides, Jo and Harjoto (2012) reveal that firms' sustainability initiatives about the employees and community play a significantly positive role in enhancing corporate performance. However, engaging in sustainability initiatives can generate favourable stakeholder attitudes and better support behaviours, including purchasing behaviours and company investment and can build corporate image, strengthen stakeholder ¬company relationships, and enhance stakeholders' advocacy behaviours, all leading to a positive effect on company profitability (Du, Bhattacharya, & Sen, 2009).

Hypothesis 1b: Sustainability initiative has a positive relationship with the non-financial performance of companies.

Figure 1 below depicts the conceptual framework that shows the direct relationship between sustainability initiatives and firm performance (financial and non-financial). The sustainability initiative represents the independent variable, while financial and non-financial performance is the dependent variable.

Figure 1: Conceptual framework for the relationship between sustainability initiative and firm performance



4. [illegible]S AND IMPLICATIONS

Apart from the issue of the determination of the relationships, this study [illegible] of the evaluation of the performance of firms not only from the perspective of the financial aspects slightly, but the need for the

assessment of firms from the view of non-financial indicators has also been to ensure a complete reporting on the performance of firms. The study has also identified the need for empirical research in this respect in the developing climes. Subsequently, the study has also shown that management and owners of businesses have responsibilities for ensuring the improvement in the value of the various stakeholders and not only the shareholders. Besides, the firms will benefit better if the focus is on introducing a sustainability initiative in terms of the firms being conscious of their social, environmental and economic responsibilities to all and sundry because globally, the issues are no longer limited to the financial viability of the firms.

5. LIMITATIONS AND AREAS FOR FURTHER STUDIES

The review does not look at the issues relating to an intervening variable, either as moderator or mediator, as only the direct relationships are emphasised, thus, not covering the studies on the indirect and total effects as required by the modern-day research efforts. Therefore, future studies are to consider the introduction of either the moderator (firm age, firm size, gender) or mediator (corporate governance, social capital, human capital, spiritual capital, innovation, competitive advantage) respectively to make further the outcome of any empirical study in this area of research more robust to generate better contributions to the body knowledge. Besides, emphasis need also be on applying the theories for evaluating the impact of these variables on the corporate feasibility of medium-sized firms on a global basis by academia and practitioners, due to the neglect in the scheme of things for long. The import here is that these firms, despite their contributions in terms of employment and growth in the gross domestic product (GDP), will in the nearest future grow to become the large firms of tomorrow for sustaining the global economies.

6. CONCLUSION

Despite the linear relationships in this study, the relationships between sustainability initiative and firm performance are of the essence, hence the need for empirical research to further substantiate the links, especially in the developing climes. The need to introduce the mediator or moderator variables in future studies will make the outcome of the empirical studies appealing to both academia and practitioners alike. Furthermore, the recognition of the non-financial indicators for evaluating firm performance is highly relevant if the results of future studies are of value to the various stakeholder groups.

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The influences of Shariah Governance Mechanisms in Islamic Banks Performance and Shariah Compliance Quality

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Abstract

This paper examines the influences of Shariah Governance (SG) mechanisms in Islamic banks' performance and Shariah compliance quality in Bangladesh. Applying semi-structured face-to-face personal interviews, this study discovers that the quality of the BOD, SSB, management, and Shariah executives has more positively and negatively influenced the Islamic banks' performance, Shariah compliance quality, image, and goodwill proven in Bangladesh. The composition, formations and quality of SSB and Shariah officers positively influence Islamic banks' fatwas, Shariah decisions, compliance quality and firm performance. The study significantly contributed to the national and global regulatory bodies' operations suggesting that the Islamic banks, regulators, and BOD should provide competent, knowledgeable and efficient executives that will positively impact Islamic banks' performance, image and quality compliance. This research extends the literature concerning the influences of SG mechanisms of Islamic banks in Bangladesh. The study enhances the concerns on the theoretical base of the agency and stakeholder theory, not only on efficient and effective tools but also the prevailing banking pressure, current political situation, and social limitations impact on Islamic banks' performance and Shariah compliance quality.

Keywords: Shariah governance; Shariah governance mechanisms; Islamic banks performance and Shariah compliance quality

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1. INTRODUCTION

Islamic banks' obligatory is to enhance the institutional image and reputation through Shariah compliance quality, the unique feature that differentiates itself from its conventional counterparts (Belal et al., 2015;). As the philosophies and principles recommended by Islamic belief diverge distinctly from the structures implemented in general corporate governance (CG), there are extensive normative (Islamic doctrines and values) and critical examinations concerning the uniqueness of Islamic governance frameworks (Abu-Tapanjeh, 2009). For instance, conventional CG underlines profit maximisation and financial performance. At the same time, Shariah Governance (SG) emphasises applying Shariah principles in a Shariah Governance Framework (SGF). Theoretically, Islamic banks are devoted to social well-being. Their business promotion diversified from conventional banks (Hasan & Dridi, 2011). Islamic banks are supposed to follow the Islamic principles of "fair and just" earnings (i.e., profit and loss sharing model), impartially distributing the earnings and disallowing "riba" (interest). Therefore, Islamic banks have inaugurated the SSBs to confirm compliance with these principles as their backers and promoters (Mollah & Zaman, 2015).

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Islamic banks should concentrate on the profit maximization of the institution. Indeed, a reasonable consensus in the literature has recommended that Islamic banks increase firms' profitability. However, research on Shariah supervisions concerning firms' performance has been ventured, particularly SG on Islamic banks' performance and credit rating (Mollah & Zaman, 2015; Grassa, 2016; Almutairi & Quttainah, 2017). Nevertheless, the studies did not cover the influence of SG mechanisms on both sides as Islamic banks' performance and Shariah compliance quality. Thus, there is an opportunity to investigate the impacts of SG mechanisms on Islamic banks' performance and Shariah compliance quality in Bangladesh. Therefore, previous researchers examined the SG practices, problems and challenges, legal and regulatory issues of the SG, Shariah compliance and disclosure, and application of SG guidelines in Bangladesh's context (Alam et al., 2020a; 2020b; Alam et al., 2019).

This paper examines the influences of SG mechanisms in the performance and Shariah compliance of Islamic banks, which is theoretically the cornerstone of Islamic banks, is associated with performance. Explicitly, the influence of SG mechanisms is examined in Islamic banks' performance and quality compliance in Bangladesh. By concerning the governance and performance relationship (Aebi et al., 2012), this study focuses on the appointment criteria, composition, qualification, and quality of Boards of Directors (BOD), SSB, management Shariah department officers about Islamic banks performance and Shariah compliance quality. In this regard, the enriched and improvised SG mechanisms of 'Islamic Bank Bangladesh Limited (IBBL),' the first Islamic Bank in South East Asia, was established in 1983; it has proven itself a successful pioneer. Therefore, the qualified and experienced BOD, SSB, management, Shariah executives, and general executives have influenced the Shariah principles, compliance, and performance

The study is significant as it varies from previous inquiries and contributes to the existing literature in numerous ways. This is the first education to explore SG mechanisms' influence on Islamic banks' performance and Shariah compliance quality. The literature concerning Islamic banking is normally normative and theoretical. There are few experimental pieces of evidence on their performance and Shariah compliance. It contrasts with the past research, which mainly focused on the conventional banks' performance (i.e., Andres & Vallelado, 2008) or provides theoretical implications concerning the Islamic banks' uniqueness due to SG (Hassan, 2011). The empirical findings of this study focused on the influence of SG mechanisms in the performance and Shariah compliance quality of the Islamic banks in Bangladesh.

Secondly, the research extends the literature of Islamic banking and SG mechanisms, performance, and quality compliance in Bangladesh, which has been unexplored for several decades. Thirdly, the study significantly extends SG's literature by outlining the composition and formations of the SSB and Shariah officers, which positively influence fatwas development, Shariah decision making, institutional performance, and Shariah compliance quality. These directly enhance the confidence and beliefs of the general people and customers. The study significantly contributed to the national and global regulatory bodies by suggesting that the Islamic banks, regulators, and BOD should provide competent, knowledgeable, and efficient executives to positively impact Islamic banks' performance, image, and quality compliance. Finally, the study extends the concerns that the efficiency and effectiveness of mechanisms and the prevailing banking pressure, current political situation, and social limitations also hinder the functions and employment system of the Islamic banks. As a result, these affect the Islamic banks' image, performance, Shariah implementations, and compliance. Thus, the theorist needs to consider these mechanisms to extend the agency and stakeholder theories and select the resources.

2. LITERATURE REVIEW

CG model of Islamic banks are constructed based on property rights and contracts' principles, the need to develop a structure to confirm the Shariah law for safeguarding the stakeholders' rights (Bhatti & Bhatti, 2009). Therefore, SG is a complete system that outlines how Islamic Financial Institutions (IFIs) follow the Shariah principles in conducting their business functions (Ginena & Hamid, 2015). IFSB-9 (2009) has illustrated SG systems as "a set of structural procedures where IFIs assure the Shariah compliance throughout its operational activities''.

Literature has investigated the association between governance mechanisms and firm performance, comprising the shareholder value in non-financial institutions. However, the experiential studies are diversified (Larcker et al., 2007). Therefore, numerous earlier researches report a positive outcome of CG on the value of non-financial institutions. Gupta et al. (2009) do not see any effects of CG on firm value. Consequently, some studies have also investigated the association between governance and performance in the banking industry and found a positive, negative, and no relationship (Pathan & Faff, 2013; Andres & Vallelado, 2008). Besides, the previous study recommended that sound BOD enhanced bank performance. Andres and Vallelado (2008) find similar outcomes concerning the size of the BOD.

2.1 Theoretical Framework

Agency theory illustrates the prearranged connection between the managers and shareholders identical to an agent and principal relation complete the functions supporting the principal (Jensen & Meckling, 1976; Fama & Jensen, 1983). Agency theory claims that management roles are to protect the interest of shareholders and monitor management behaviour to minimise the management (Jensen and Meckling, 1976). However, the BOD's oversight function is one of the monitoring mechanisms of the monitoring roles of the shareholders. The BOD signifies "a market-induced institution, the ultimate internal monitor of the set of contracts called a firm" (Fama, 1980).

However, the SSB role is comparatively similar to external auditors and audit committees (Abdul Rahman & Bukair, 2013). Hereafter, SSB members are inclined to the same issues that affect external auditors and audit committees (Abdul Rahman & Bukair, 2013). Therefore, SSB members try to uphold their honesty by evading doubtful functions (Garas, 2012). Owing to their vast knowledge regarding Islamic principles, which gives higher trustworthiness, Shariah intellectuals enjoy strong standings (Abdul Rahman & Bukair, 2013). Islamic banks having reputable SSB members are thus, often anticipated to get higher revenues.

Equally, the stakeholder theory suggests a broader concept of CG and SG be executed in the corporations. The stakeholder theory outlines better freedom in broadening the idea of CG as management take care of the interest of shareholders and other stakeholders through its activities (Freeman, 1994; Collier, 2008). Therefore, management has provided responsibilities to formulate numerous corporate guidelines for maintaining business legitimacy, foremost to improve corporate stakeholders (Ashforth & Gibbs, 1990; Suchman, 1995; Khan et al., 2013).

3. METHODOLOGY

This study is based on qualitative research to understand how and why things occur (Cooper & Schindler, 2011). It comprises "an array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world" (Cooper & Schindler, 2011: 162). The education has implemented qualitative research rather than quantitative research as the researchers intend to discover the answer for "how" questions rather than "how many" questions (Silverman, 2010: 11). Besides, the researchers consider this study as an exploratory investigation that comprises "an attempt to determine whether or not a phenomenon exists" (Dane, 1990: 5). The case study technique (Yin, 1994) explains the BOD's complete roles and responsibilities and connections with the employed management. Another reason for choosing a case study is that the researchers cannot deploy real behavioural actions (Yin, 2003). Therefore, the interview question is related to the Islamic banks' regulators, SSB members, field experts, and Shariah department executives. A similar method was applied in previous research in exploring the reasons behind the absence of comprehensive SGF, the formation of a central Shariah authority, and implementations of SG guidelines in Bangladesh (Alam et al., 2020a; 2020b).

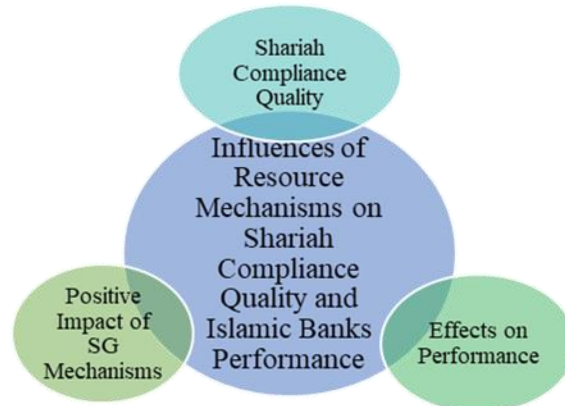
The researchers selected the semi-structured interview to provide additional data about this study and have a more comprehensive understanding of the practical feature of the subject issues. Therefore, the face-to-face interview may comfort the procedure of getting a clear understanding of the research issues. This process assists the participants in understanding the questions more clearly (Sekaran & Bougie, 2010). In total, 17 respondents were to accomplish the research objective. The selected respondents for the interviews are regulators, SSB members, Shariah department executives, and finally, the field experts from the Islamic banks and the central bank of Bangladesh, whose functions are associated with Islamic banks' SG functions. To maintain the confidentiality of the respondents, the study has used symbolic identifications for the respondents where regulatory respondents coded as 'RA' (Regulatory Aspects), 'SP' (Shariah Practitioners) for SSB members, and Shariah department executives and 'E' (Experts) for field experts concerning the Islamic banking and SG knowledge. However, a research strategy is a judgment that associates the study objective and research question to experimental data gathering and analysis procedures to reach the final decisions based on the data collected (Rowley, 2002; Yin, 2009). The NVivo analyses massive textual data in qualitative research. It permits in-depth analysis and delivers more advanced tools to envisage data (Gibbs, 2002).

4. DISCUSSIONS AND FINDINGS

The researchers have collected from Bangladesh, and the respondents were related to the Islamic banking industry and regulatory bodies. The NVivo data analysis identifies three major categories of the question, "how do you think that the appointment criteria, composition, qualification and quality of BOD, SSB, management, and Shariah

department officers influence Islamic banks' performance and Shariah compliance quality? If yes, how? If not, why?". The resource mechanisms of every Islamic bank influence Shariah compliance quality and overall performance. The identified categories are Shariah compliance quality, effects of performance, and positive impacts of SG mechanisms.

Figure 1: Theme of influences of resource mechanisms on Shariah compliance quality and Islamic banks performance



The Shariah governance mechanisms impact Islamic banks' performance and Shariah compliance quality. Most of the respondents (E#4, 5; RA#2; SP#2, 3, 4, 7) agree in one point that people who are more qualified would confirm the success of Shariah principles and ensure Shariah compliance quality.

In this case, one of the respondents emphasises that qualified people and the intention of the management and BOD are essential to ensure the Shariah principles and quality assurance. Therefore, if the executive of the Shariah departments and the SSB members are qualified and well experienced in Shariah, fiqh-al-muamalat, or Islamic banking business, then it will have a positive impact on the performance, SSB decision making, and quality compliance. Additionally, their formation, composition, and education qualification will also affect the general people's relation, confidence, and trust. Almutairi and Quttainah (2017) also discover the size of SSB, composition, education, qualifications, and knowledge in Islamic jurisprudence. Conventional and Islamic finance have positive relations in IFIs performance.

> *"Because if the members do not have sufficient qualification or experience about the fiqh al muamalat or the banking transactions, then his decisions sometimes will not be consistent with the present situation even for the smooth operation of the bank. It will influence the relations of the public". [SP#2] "The education qualification, Shariah knowledge and contemporary banking concepts of SSB members influence the decision-making process." [SP#4]*

Practically, it is evident in Bangladesh that the qualified SSB and BOD positively influence the performance of Islamic banks and Shariah implementations. Due to the current banking structure, political pressure, and social bindings, Islamic banks cannot recruit skilled Shariah candidates as required and BOD's proper function, resulting in banking performance, image and Shariah applications, and compliance.

> *"We saw previously those from the Shariah background when they entered the banking. They are competent in both areas, but now we are not getting such a combination because the candidate comes from various courses such as social, political, and so on. ..... When the BOD recruits the SSB members, there is a lack of competency among these people due to the different reasons such as low qualified members recruited and prioritised rather than the highly qualified people". [SP#7]*

Additionally, similar views of the participants (E#3, 4, 5; SP#2, 9) show that the bank's performance and success largely depend on BOD roles, functions, quality, experiences, and knowledge. Conversely, if BODs are not qualified and well experienced, it will negatively impact banks' financial performance.

> *"BOD can influence their financial performance." [E#4] "If they are not qualified, not experienced, there will be an influence on the performance." [E#3] "Yes, of course, their quality and experience are very important." [SP#2]*

However, BOD members with better knowledge and abilities ensure more compliance with Islamic principles. The institutional procedure of SG sets SSB as the mainstream of the structure. This construction has become an essential part of the SGF of IFIs (Hasan, 2011). The external members in BOD from the other countries and institutions brought diverse knowledge and experience from their countries and global perspective, which influence the bank's performance and as proven in terms of IBBL performance. Conversely, one of the respondents argues that it is partially true, rather than adequately, because some banks have performed well and ensured more Shariah compliance only for the commitment and intention of BOD and management.

> *"In my view, it is quite true, not fully." [SP#6] "…… Their system trains to provide knowledge and have an organized Islamic banking system directed by top management to consider everything. However, we will not consider or accept the Shariah violation". [SP#6]*

Another respondent points out that Shariah compliance and financial performance are different things. Additionally, suppose the developed products and services and the promotion of the product are acceptable. In that case, it will influence the Islamic banks' performance. The SSB checks Shariah compliance quality and product promotion instead of product selling.

> *"There are two things; one is financial performance and Shariah compliance. Financial performance is not related to the Shariah experts….. Shariah experts can influence Shariah compliance, and BOD can influence their financial performance. So, both are different". [E#4]*

Based on the above discussions, Shariah governance mechanisms positively and negatively influence the Islamic bank's performance and ensure Shariah compliance quality in Bangladesh.

5. CONCLUSION AND RECOMMENDATIONS

The study has outlined that the SG mechanisms influence Islamic banks' performance and Shariah quality compliance. The study delineates how SG mechanisms influence Shariah compliance quality and the performance of Islamic banks. This research highlights qualified and experienced SSB, Shariah executives, general executives, management, BOD, and people to ensure successful Shariah principles, compliance, and performance. Therefore, we draw the concept that the proper SG mechanisms and the willingness of the BOD, management, and the appropriate system to play a significant role in ensuring Shariah compliance. Secondly, the composition, formations, reputation, and quality of SSB and Shariah officers positively influence Islamic banks' fatwas, Shariah decisions, Shariah compliance quality, and firm performance that increase trust, confidence, and faith of the customer and general people. Thirdly, in Bangladesh, it is already proven that knowledgeable and qualified BOD and SSB promote their role in ensuring Shariah applications, compliance, and firm performance. Thus, one of the reasons for the success of Islamic banks.

As proven by other studies, this research also has beneficial implications. First, our review is helpful for Islamic banks and regulators operating in diverse jurisdictions. This study's results can be a valuable source of knowledge for regulators and policymakers, mainly for the Islamic banking and finance areas, in formulating policies to manage qualified and proper SG mechanisms for appropriate Shariah applications, better performance, and quality Shariah compliance. Secondly, we argued that if BOD can accomplish adequate tools with a combination of qualified, experienced, and renowned personalities, definitely it will influence the Islamic banks' performance positively, as well as Shariah decisions, implementations, Shariah compliance quality, institutional image, transparency, competence, and goodwill. Therefore, the recommendation is that if the Islamic banks recruit qualified and experts BOD, SSB, management, Shariah executives, and general executives by following formal requirements, it will enhance the applications of Shariah principles, quality compliance, Islamic banks performance, image, and goodwill.

The study is limited to SSB and Shariah officials of Islamic banks and executives of Bangladesh's central. However, we cannot generalise our findings to be relevant and similar in other Islamic banking practising countries. Therefore, researchers can investigate the influence of resource mechanisms in Islamic banks' performance and Shariah compliance quality in other dual banking practising countries such as Malaysia, Pakistan, Indonesia, and Gulf countries such as Saudi Arabia, Iran, Bahrain, and Qatar justifications. New research can also explore these influences in other Islamic institutions such as service, real-estate companies, Islamic microfinance, and cooperative institutions. Therefore, future researchers can justify these findings in diversified jurisdictions with a combination of the same respondents or other participants' involvement from numerous sources qualitatively. Besides, the researchers can justify the findings in a quantitative methodology in the context of Bangladesh and other jurisdictions.

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Board IT Committees and Firm Performance: A Review and Future Directions

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Abstract

Scholars seem to agree on the significance of board members delving into Information Technology Governance (ITG). Still, just a few boards globally accept responsibility for governing Information Technology (IT), thus, creating a knowing-doing gap. Efforts are required to mitigate this gap by designing execution procedures for this form of involvement. One of the most often stated guidelines is the creation of an IT oversight or comparable committee at the level of the board. However, the study shows that insignificant boards have created such a committee due to the lack of thorough leadership on the mechanisms and duties of such committees. The focus of this paper is a review of IT oversight committees at the board level and the future direction required. We determine how IT oversight committees can be created and how they contribute to the board's functions about ITG and influence the performance of firms.

Keywords: board, board of directors, firm performance, information technology, information technology governance, information technology oversight committee

1 INTRODUCTION

Organisations are increasingly dependent on IT for both transformation and procedures. So, IT deserves a place in risk and strategy deliberations. Due to boards' involvement in strategy and risk management, the argument is that IT-related strategic decision-making and control are no longer to the board's benefit for full delegation. Indeed, more research calls are concerning the board members' involvement in IT governance (Bart & Turel, 2010; Jewer & McKay, 2012; Turel et al., 2017). In the meantime, research reveals that insignificant boards accept responsibilities for governing IT (Adams et al., 2010; Bart & Turel, 2010; Coertze & Von Solms, 2013; Valentine & Stewart, 2015). Hence, the view is a knowing-doing gap, indicating that boards are grappling with executing the prescribed governance functions. Nevertheless, few research energies are in place to close this gap through the execution guidelines.

ITG is a scheduling and oversight instrument for ensuring the governance of IT investments' transformation for corporate worth. ITG refers to: "the leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends its strategies and objectives" (IT Governance Institute, 2003). Therefore, it delineates the decision-making team (e.g., the Chief Information Officer or Chief Executive Officer) and the BoDs (IT Governance Institute, 2003; De Haes & Van Grembergen, 2009). Meanwhile, many ITG research has emphasised management-level ITG (Ali et al., 2012; Bowen et al., 2007; Prasad et al., 2012). Thus, the literature on board-level ITG (B-ITG), board IT competency (BITC) and board IT committee (BITCo) has been very scarce and not popular (Jewer & McKay, 2012). However, concerning the present study, an attempt is made to review the literature on the association between board IT committees and firm performance.

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The execution of an IT oversight (or similar) committee at the board level is one of the guidelines most commonly stated (Coertze & von Solms,2014; Nolan & McFarlan, 2005; Oliver & Walker, 2006; Posthumus et al., 2010; Read, 2004; Turel & Bart, 2014). Still, the practice seems not to have benefitted from this recommendation (Adams et al., 2010; Coertze & Von Solms,2013; Jewer & McKay, 2012). Therefore, an apparent inconsistency is between the suggestions put forward by academics and the existing practice condition. Again, research shows that although IT oversight committees are usually stated in ITG practice at the board level in academic research, not much information exists about their importance and mechanisms. Hence, the present study remains relatively shallow. In this paper, the aim is to enhance the ITG knowledge base from an IT oversight committee's operation and how these committees connect with the significance of the board about ITG and influence organisational performance. Hence, our study has drawn motivation from the following research question: Do Board Information Technology (BIT) committees influence firm performance?

The other aspects of this paper are structured as follows. First, a short explanation of IT oversight (or similar) committees is available at the board level and firm performance and an overview of the related theories applicable in the literature. Hypothesis development is next. The paper ends with a conclusion and areas for further research.

2 BOARD IT COMMITTEES

A feasible way out of having boards with a lack of IT knowledge is to engage IT-savvy board members. However, the implementation of the recommendation is not always an easy task. Several boards are unwilling to allow technologists who may only have IT the knowledge to have their ways. The facts support the latter view, as only 7.8% of firms prefer board members with IT experiences (Andriole & Bojanova, 2014). A study on Standard & Poor’s 500 firms shows that IT-savvy directors occupy only 15% of new board positions (Spencer, 2018), translating to 1% of the total figure for directors.

Consequently, boards are encouraged to constitute an IT committee standalone (ITGI, 2003; Nolan & McFarlan, 2005). This is indirect to mitigate the threats of breaches of IT security. It is recommended that the IT committee consists of independent directors to be chaired by an independent director. The Standard & Poor’s 500 firms have independent directors on audit and compensation committees independent directors' chairs. The IT committee needs to closely work with the audit committee on risk alleviation responsibilities. With over 80% of Standard & Poor’s 500 firms having administrative structures, specifical managers in managerial IT positions, such as Chief Information Officer (CIO) and Chief Technical Officer (CTO), board structures (IT committees) comprised of only 4.4% to oversee IT issues. So, establishing more board IT committees can ensure the closure of this gap.

The most often stated method to enhance board involvement in ITG is the creation of an IT oversight or comparable committee at the level of the board (Coertze & von Solms,2014; Higgs et al., 2016; Nolan & McFarlan, 2005; Oliver & Walker, 2006; Posthumus et al., 2010; Premuroso & Bhattacharya, 2007; Read, 2004; Turel & Bart, 2014). Various terms are available to describe such a committee; board-level technology committee (Higgs et al., 2016; Premuroso & Bhattacharya, 2007), IT oversight committee (Coertze & von Solms, 2014; Nolan & McFarlan, 2005; Posthumus et al., 2010), ITG committee (Nolan & McFarlan, 2005; Oliver &Walker, 2006), IT steering committee (Read, 2004), and IT committee (Benaroch & Chernobai, 2017; Turel & Bart, 2014). According to Nolan and McFarlan (2005), such a committee should oversee what competing and other organisations are doing with technology on behalf of the board of directors. Posthumus et al. (2010) opine that the IT oversight committees need to certify that “IT is a standard topic on the board’s agenda to be addressed through a structured approach.” Furthermore, the committee ensures the board has all data necessary for decision-making about IT-related issues. Higgs et al. (2016) focus on threats and posit that the committee should be adequately motivated to detect, mitigate, and report IT-related concerns.

Presently, corporate governance rules do not favour the establishment of an IT oversight committee (Premuroso & Bhattacharya, 2007). Thus, some form of benefits exists for firms that encourage the deliberate creation of such a committee. That is, the prime-mover advantage (Premuroso & Bhattacharya, 2007) and signalling theory (Higgs et al., 2016) could promote the formation of an IT oversight committee, as it shows the firm’s higher IT governance and signals the significance it ascribes to IT-related matters. Despite the pieces of advice emanating from these research outcomes to create a board-level IT oversight committee, the study points out that the launch of these committees in practice stands out as an exclusion (Andriole, 2009; Coertze & Von Solms, 2013; Héroux & Fortin, 2018; Jewer & McKay, 2012). Percent range was from 74.5% (Andriole, 2009) to 78.8% (Héroux & Fortin, 2018) and then 91% (Jewer & McKay, 2012) of respondents who indicate the absence of such a committee. However, Benaroch and Chernobai (2017) reveal that about 17% of the sample organisations had a board-level IT committee.

Likewise, practitioners interviewed (Andriole, 2009; Jewer & McKay, 2012) reveal that a couple of them do not favour introducing such a committee due to time restrictions or the view about not having the relevant skills. Undeniably, Higgs et al. (2016) posit that creating a board-level technology committee is luxurious because it involves board members' time, extra compensation, additional reporting and could threaten reputation and capital if risks materialise on the committee's watch. Therefore, the authors argue that boards might be hesitant in allowing such a committee's existence if the appropriate level of IT expertise is lacking. Coertze and Von Solms (2013) warn about the drawbacks of creating a committee at the board level. They cast doubts on the existence of a committee to the extent that boards remain answerable for all committees' actions.

Indeed, not all organisations need to establish an IT oversight or similar committee. The necessity for such a committee rests on IT's functionality in the firm (Coertze & von Solms, 2014; Nolan & McFarlan, 2005; Posthumus et al., 2010). Coertze and von Solms (2014) used a slightly different definition based on the belief of a defensive and offensive IT strategy, as defined by Nolan and McFarlan (2005). They opine that firms can emphasise an IT alignment range, moving to an aggressive position where IT is the business from a defensive posture where IT supports the company. Researchers submit that an aggressive IT strategy or situation needs a different IT oversight committee (Coertze & von Solms, 2014; Nolan & McFarlan, 2005; Posthumus et al., 2010). The risk management committee can use the defensive IT strategy or position to assume responsibility for IT governance at the firm's board level (Nolan & McFarlan, 2005; Posthumus et al., 2010). Another influencing factor for an IT oversight committee is the IT expertise within the board. Hence, boards limited in IT expertise might gain more from creating an IT oversight committee than those with adequate IT skills (Coertze & von Solms, 2014).

When organisations implement an IT oversight or similar committee, the board must engage its members and chairman, define its association with the audit committee, and put a committee charter in place. Independent directors should be members similar to other board-level committees such as audit or compensation committees for adequacy. Additionally, an IT expert with sound knowledge of the business requirements should be a member. Based on IT's degree of significance in the firm, the chairman should be an IT-savvy business executive or an IT expert. Also, the IT oversight committee requires a deep connection with the audit committee by, for instance, allowing the same person in both committees (Nolan & McFarlan, 2005). IT oversight or similar committees at the BoD's level appear to have a rather precise scope in practice. Nevertheless, Benaroch and Chernobai (2017), in their sample, identified the board-level IT committees to include: IS audit committees, which are often a subcommittee of the audit committee and monitor IT controls and IT risk management processes, IT steering committees which oversee the overall IT performance and the governance of IT resources, and the information security committees and technology and operational risk committees are the others.

Posthumus et al. (2010) specify the frequency with which the board-level committee responsible for IT governance should report to the board. As explained previously, the audit committee should adopt the defensive mode in going about their tasks in firms. More precisely, the audit committee should report to the board every six to twelve months for firms in support mode. In comparison, the factory mode requires a report every three to six months. IN AN OFFENSIVE MANNER, the IT oversight or similar committee in organisations should make their reports available to the board every three months.

The organisational performance determines an organisation's health based on economic, systemic, and social scopes (Zahra & Pearce, 1989). The financial performance sphere focuses on wealth sustenance and creation; the systemic performance dimension emphasises existence and growth. The social performance aspect considers organisations' reactions to societal prospects. In this study, a slightly narrower view is argued for, focusing on the financial performance aspect for two critical reasons. First, the social and systemic elements often transform into firms' bottom-lines and are shown in their economic outcomes (McGuire et al., 1988; Habbershon et al., 2003). Second, directors are more comfortable perceiving, mirroring, and reporting on complete financial performance in contrast to the other two.

The ITG committee and processes' essence increases the investment in IT; thus, IT investments predominantly produce financial settlements (Posthumus et al., 2010). This impact is because the IT governance committee's role satisfies the three criteria required for maintainable competitive advantage (Mata et al., 1995), with such a position producing enhanced performance (Nolan & McFarlan 2005; Higgs et al. 2016). First, the IT governance committee's role is treasured and can impact firm performance (Benaroch & Chernobai, 2017; Turel & Bart, 2014). Second, the IT expertise within IT oversight committees become distributed heterogeneously within competing firms. So, not every firm possesses this capability equally (Weill, 2004; Weill & Ross, 2004; Coertze & von Solms, 2014). Finally, the creation of an IT oversight or similar committee is imitable. That is not easy to change and requires learning on a long-term basis through trial and error (Mata et al., 1995). The potential

influences of various stages of the execution of an IT oversight or similar committees on firm performance have earned attention in several studies (Nolan & McFarlan, 2005; Benaroch & Chernobai, 2017; Higgs et al. 2016; Oliver & Walker, 2006; Posthumus et al. 2010). Therefore, this study's view is that the board-level IT committee's role in IT governance committees is underestimated, despite its influence on organisational performance.

The few empirical studies in this research area postulate that IT oversight committee at the board level improves organisational performance (Nolan & McFarlan, 2005) and points to definite contributions of IT to financial performance and non-financial gains (Jewer & McKay, 2012), irrespective of the IT use mode of the firm, profit orientation, organisation size, and sales level (Turel & Bart, 2014). Given the confirmed positive effects of board-level IT committees on organisations, this form of research denotes a new frontier, with the need for further exploration (Nolan & McFarlan, 2005; Turel & Bart, 2014).

3 THEORETICAL BACKGROUND

For an academic validation of ITG at the board's level, agency theory is the most broadly used philosophical view (Best & Buckby,2007; Mähring, 2006; Posthumus & von Solms, 2008; Yayla & Hu, 2014). The latter approach implies an emphasis on the board's monitoring role regarding IT. Based on corporate governance literature, agency theory is the most widely used to examine board-level IT governance (Benaroch & Chernobai, 2017; Best & Buckby, 2007; Mähring, 2006; Posthumus & von Solms, 2008; Yayla & Hu, 2014), providing attention on the overseeing function of boards about IT.

The IT governance committee is a body responsible for governing: "expenditure and realisation of benefits of current and future IT investments, standards, risk and compliance and performance." Many researchers also use the resource-based view of the firm (Turel & Bart, 2014; Turel et al., 2017; Valentine & Stewart,2015; Yayla & Hu, 2014) as a means to examining board-level IT governance, considering boards and IT governance committees as theoretically treasured resources for governing IT (Bart & Turel, 2010; Turel & Bart, 2014; Turel et al., 2017). Similarly, Jewer and McKay (2012) combined agency and institutional theories to determine the antecedents and implications of board-level IT governance. They argue that the board's engagement in IT governance is contingent on institutional pressures that impact the organisation and the strategic preferences the board itself makes. Also, because institutional theory suggests that industry norms affect corporate procedures via isomorphism (DiMaggio & Powell, 1983), entities favouring IT are likely to operate in a sector that depends heavily on IT, the industry norm encouraging higher board interest in IT governance. Lastly, stakeholder theory relates to board-level IT governance research, suggesting that the board has responsibility for the oversight by IT governance committees of the leading IT resources in favour of organisation stakeholders (Best & Buckby, 2007). These different theoretical paradigms imply several board roles regarding IT governance. The board has a control, service, and resource dependence role in governing IT, as is proposed in corporate governance literature (Johnson et al., 1996). Still, the board's involvement in IT governance is a function of numerous factors, including board decisions and institutional pressures.

4 HYPOTHESES DEVELOPMENT

The audit committee's primary duty is to monitor the financial reporting procedure with the fundamental purpose of enhancing the high level of financial reporting (SEC, 2003). The previous study generates proof that their features influence governance-based results. For example, the audit committee's independence concerns fewer earnings management (Klein, 2002), little earnings reaffirmations (Abbott et al., 2004) and a more negligible occurrence of fraud-related financial reporting (Beasley et al., 2000). Audit committees' active participation involves little SEC implementation activities, more minor earnings endorsements, and a lower frequency of fraud-related issues (Abbott et al., 2004; McMullen & Raghunandan, 1997).

The audit committee's duty is significant to firms' internal controls concerning financial reporting procedures, apart from its improvement of corporate governance in standard terms and its real contribution to the enhancement of internal control. Additionally, IT needs technical discernment above other disciplines to comprehend how IT contributes to sustaining the value and ensuring risk reduction. Therefore, audit committees are likely to monitor. IT controls appropriately respond to IT drawbacks when they comprise members with good IT experiences. Li et al. (2007) opine that IT experienced audit committee members and aid firms with IT-informed internal controls.

Many of the IT governance study has suggested the adoption of board-level IT Strategy Committees, IS auditing committee, information security committee or technology and operational risk committee to fast track the processes for executive team decision making efforts (e.g., IT Governance Institute, 2003; Nolan & McFarlan, 2005; Wilkin & Chenhall 2010; Weill & Ross, 2005). However, as other research has established (e.g., De Haes

& Van Grembergen, 2005; Ernst & Young, 2006; Huff et al., 2006), the studies by Jewer and Mckay (2012) also opine that most boards do not have such committees, a majority (91%) of the respondents in their survey agreed that their boards do not have the committees. The latter further confirms the essence of the institutional theory that views every firm as a product of rules, regulations, norms, and pressure groups since at the heart of every social formation is an organisation. The establishment of the committees is an attempt to conform to societal demands for meeting up the various stakeholders' needs. Therefore, based on those above, the following hypothesis is developed:

Hypothesis 1a. Firms with extensive audit committee members and IT experience are positively associated with financial and non-financial performance.

Hypothesis 1b: The establishment of IT committees is positively related to financial and non-financial performance.

5. CONCLUSION

This research aimed to create awareness for IT oversight (or similar) committees at the level of the BoDs. More explicitly, it provided insights into such committees' functions and style of operations. It is concluded that an IT oversight committee could assume various roles based on the organisation's desires. Still, boards can implement their controls, services, and resource dependence responsibilities through such a committee.

Nevertheless, the review does not emphasise B-ITG and board IT competency. Thus, future studies need to focus on this direction. Also, a quantitative approach can be adapted to determine the extent of the relationships between the number of audit committee members and IT experience and firm performance, on the one hand, and the establishment of IT committees and firm performance on the other side.

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The Moderation Effect of Neuroticism on Knowledge and Fraud Risk Assessment Performance: A Conceptual Study

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Abstract

The auditing and accounting profession recently faced many challenges following fraudulent practices among the Jordanian public sector. So, continuing such fraudulent activities in the public sector impedes national economic developments and growth. This study's main objective is to propose a conceptual framework for the practical and effective way of reducing fraud incidence in the Jordanian public sector. Specifically, this research introduced neuroticism on knowledge requirements as a moderating factor in the fraud risk assessment framework's performance in the Jordanian public sector. The conceptual framework will contribute to the existing literature on forensic accountants, auditors, knowledge capability requirements, and neuroticism as a personality factor and fraud risk assessment performance of regulators regarding the prevention and detection of fraud in the Jordanian public sector work environment.

Keywords: Fraud risk assessment, neuroticism, knowledge, forensic accounting, auditing, Jordanian public sector

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1 INTRODUCTION

In the last 25 years since the Enron crisis, fraud and corruption have remained a source of concern in many countries. Fraud has created high costs for many organisations (Bierstaker, Brody, & Pacini, 2006). It occurs almost in all organisations and expensively causes persistent and increasing businesses (Zahra, Korri, & Yu, 2005). Accordingly, It is pertinent for producing nations to improve auditors and prosecutors' expertise in fraud risk assessment.

Following "the Statement on Auditing Standard (SAS) No. 99, Consideration of Fraud in a Financial Statement Audit", it is mandatory for auditors in the US public companies to perform a fraud risk assessment as part of financial statements audit to detect material financial misstatements (Kassem & Higson, 2012; Victoravich, 2010). An organisation needs to develop an effective fraud prevention method and detection to minimize fraud (Bierstaker, Brody, and Pacini, 2006). These fraud prevention and detection procedures may include administrative communication concerning intolerance to fraudulent activities, the execution of transparent performance and remuneration schemes, pre-employment and ongoing screening, and, most significantly, promoting a culture of fraud awareness (PricewaterhouseCoopers, 2012). According to the survey conducted by the World Economic Forum's Global Competitiveness in 2014, fraud and corruption are considered as one of the obstacles to foreign investment attraction in Jordan. Frauds cases are prevalent in Jordan and create a severe economic crisis. For example, the embezzlement scandal of Petra Bank led to the loss of about JD200 million (USD670 million). This embezzlement scandal led to a decline in the country's financial strength, which resulted

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in the depreciation of the Jordanian Dinar from (1JD = USD 3.35 to USD 1.41) after the crisis. Further corporate collapses in the wake of this increased unemployment rate (Zureigat, 2015; Al-Awaqleh, 2008).

Fraud risk assessment (FRA) is one of the internal control components that assist auditors and forensic accountants in ascertaining organisations' conditions and the extent of the audit procedures necessary to respond to red flags of fraud (COSO, 2019). Consequently, FRA is directly linked to the auditors' capability to detect and prevent fraud (Popoola et al., 2015; Popoola, 2014; Chui, 2010).

Forensic accountants and auditors need to gain more specialised knowledge, improved abilities, and fraud-related mentality (Salleh et al., 2019; Howieson, 2018; Bhasin, 2015; DiGabriele, 2008). Improvement of the ability requirement is vital to significantly impact the changing perceptions and understanding of fraud schemes and the effects of fraud in the public-sector environment. However, the latest studies have shown that it is not straightforward for auditors to detect fraud. Companies sometimes take steps to mask fraud through deliberate means. (DeZoort & Harrison, 2018; Knapp & Knapp, 2001).

Ashton's (1999) study suggests that certain personality factors are individual predictive performances (i.e., fraud risk assessment) and various elements related to the essential aspects of the big-5 factors. The big-5 factors are "agreeableness, extraversion, conscientiousness, openness to experience, and neuroticism" (Goldberg, 1990). The current study assumes that highly neurotic forensic accountants and auditors would not perform well in their employment instead of low-neuroticism forensic accountants and auditors. The reason is that people with high-level neuroticism continue to display negative attitudes such as fear, depression, a lack of courage, and anxiety. When such attitudes are demonstrated, the current research assumes that forensic accountants and auditors might not be willing to prevent and detect fraud appropriately. The present study suggested that a forensic accountant or high-level auditor with neuroticism will decrease the interaction between the capability to assess fraud risk tasks and forensic accountants and auditors' knowledge requirement in any fraud circumstances because neurotic persons put themselves into conditions that encourage negative effects.
From the background to this research paper, it is evident that there are corrupt practices and fraud in the Jordanian public sector. The increase in fraud necessitates developing a conceptual framework that incorporates neuroticism as a moderating factor in forensic accountants and auditors' fraud risk assessment models in the Jordanian public sector.

This paper is organised as follow; Section 2 of this paper covers the literature review of fraud, internal control concept, the competency requirement (fraud risk assessment performance), capability requirement (knowledge), and neuroticism as a personality factor; Section 3 presents the conceptual and theoretical framework of this study; Section 4 shows the Hypothesis Development, and; Section 5 shows the conclusion of this study.

2 LITERATURE REVIEW

2.1 Fraud Concept

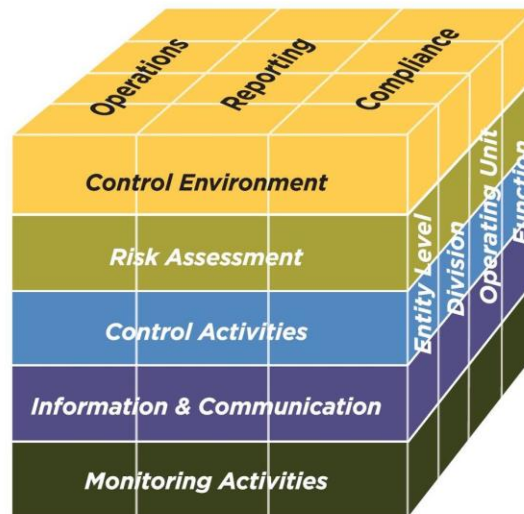
In 2009, The Chartered Institute of Management Accountants (CIMA) defined 'fraud' as "all activities such as fraud by robbery, fraud by conspiracy, money laundering, bribe, and properties obtaining." Hopwood, Leiner, and Young (2012) define 'fraud' as "the intention to cheat to get assets from the victims." While Singleton et al. (2006) stated that 'fraud' is the "behaviours of human beings in the way of cruel and defalcation, immorality, illegality, or have an intention to avoid the laws, including any actions against the positions, responsibilities, and other rights," and Klitgaard (1988) and Heywood (1997) identified that 'corruption' is " behaviour that deviates from regular responsibilities of the public services for private benefits by violating the rules and regulations with the abuse of power." In conclusion, fraud and corruption mean the swindle, deception, cheat, misappropriation, or intention to cause misunderstanding for seeking benefits both in terms of financial and nonfinancial to acquire the gains on position, power, money, property, or legal right toward oneself and companion from the organisation which that person works. This follows Maslow's theory of human needs (Need Theories) (1943). It depends on each individual's behaviours through five aspects as follows: "(1) physiological needs, (2) safety needs, (3) belongingness and love needs, (4) esteem needs, and (5) self-actualisation needs" This explains all human beings struggle and fight for their own goals.

2.2 Internal Control Concept

Internal Control means the organisation's operating system is organised to reduce the potential risks from fraud. It might damage the properties of the organisation. Organising a sound internal control system is essential for enhancing the operation to achieve organisational conduction goals both in efficiency and effectiveness, including

constructing the reliability of the financial report. Furthermore, internal control includes the following laws and related rules and regulations to prevent fraud or resource misuse, reducing possible mistakes from all operation activities (Clinton, Pinello, and Skaife, 2014). It consists of five elements as follows: "(1) Control Environment (2) Risk Assessment (3) Control Activities (4) Information and Communication and (5) Monitoring," as shown in Figure 1. In 2013, the Committee of Sponsoring Organisations of the Treadway Commission (COSO) developed the guidelines of internal control and investigation by increasing the intensity of the analysis and risks from five factors previously to eight factors focusing on the behavioural analysis of the wrongdoer on fraud based on Fraud Triangle concept by Cressey. Cressey (1953, 1951) reveals that "the fraud behaviours are caused by three motivation, which includes incentive/pressure, opportunity, and attitudes/rationalisation. Singleton et al. (2006) said that if an organisation has a weakness in the internal control system, it will open up the opportunity for fraud.

Figure 1. The Five Elements based on the COSO Model



2.3 Fraud Risk Assessment Performance FRAP

According to COSO framework components and principles, their indicators are considered essential for risk assessment (COSO, 2019 p.6). The component and principles of risk assessment are: "1) specifies suitable objectives, 2) Identifies and analyses risk, 3) Assesses fraud risk, and 4) Identifies and analyses significant change". FRAP is a complex process carried out by auditors that require advanced cognitive knowledge and skills (Desai & Gupta, 2016). Fraud risk assessment (FRA) helps an auditor understand the complexity of the audit processes needed to increase the likelihood of detecting fraud (Wuerges, 2011; Bloomfield, 1997). Regrettably, prior studies have presented that auditors are typically not adequately capable of assessing fraud risk and, therefore, cannot detect fraud in a financial statement audit (Asare et al., 2015; Wuerges, 2011; Allen et al., 2006). Following "the Statement on Auditing Standard (SAS) No. 99, Consideration of Fraud in a Financial Statement Audit", auditors of US Government companies are required to conduct a risk assessment of fraud as part of audits of the financial statements to avoid material financial errors (Kassem & Higson, 2012; Victoravich, 2010).

According to the American Institute of Certified Public Accountants (AICPA) in "Managing the Business Risk of Fraud: A Practical Guide" (2009), "An efficient FRA ought to determine where fraud might happen and who the perpetrators might be. Therefore, control activities should always consider both the fraud scheme and the individuals within and outside the organisation who could be the perpetrators of each scheme. If the scheme is collusive, preventive controls should be augmented by detective controls, as collusion negates the control effectiveness of segregation of duties".

Furthermore, FRA is perceived as a valuable tool for preventing fraud and thus was endorsed to enhance auditor's competence in the quest for fraud prevention and detection (Baz et al., 2016; Payments, 2015; Subramanian, 2014; Knapp & Knapp, 2001). For this study, FRA performance is defined as the forensic accountant and auditor's ability to access fraud risk to prevent and detect fraud within the public sector's working environments.

2.4 Knowledge Requirement

Knowledge of forensic accounting includes "professional responsibilities and practice management, laws, courts, and dispute resolution, planning and preparation, information gathering and preservation (documents, interviews or interrogations, electronic data), finding, reporting, experts and testimony" (Lessambo, 2018; Popoola, Che-Ahmad & Samsudin, 2015; Popoola, Che-Ahmad & Samsudin, 2014; Davis et al., 2010; Durkin & Ueltzen, 2009). Seven fields are defined as a component of specialised knowledge in forensic accounting, according to "the American Institute of Certified Public Accountants" (Davis et al., 2010). These areas comprise "fraud prevention, detection and response, computer forensic analysis, family law, valuation, financial statement misrepresentation, economic damages calculations, and bankruptcy, and insolvency and reorganisation" (AICPA, 2011; Durkin and Ueltzen, 2009). This research paper embraces fraud detection, prevention, and response to highlight the potential failure to manage Jordan's accounting and auditing systems. A forensic accountant has the necessary resources to detect fraud based on his education and training in communications, legal and criminology, information technology, and investigation (Popoola, Che-Ahmad & Samsudin, 2015; Davis et al., 2010).

Recent studies show that individuals with specialist knowledge in the use of information technology, legal investigative criminology, and accounting would be more useful at documenting and processing reports, reviewing financial statements, questioning and acting as professional witnesses than individuals in auditing (Hopwood et al., 2012; Singleton et al., 2006). The International Education Standard No 8, Competence Requirements for Professional Accountants, identifies the auditors' knowledge capability to include "historical financial information audit at a higher level, financial accounting and reporting at a higher standard, and information technology" (IFAC, 2019).

This research agrees with the Association of Certified Fraud Examiners (ACFE) that standard-setter statements are inappropriate for identifying fraud (ACFE, 2018). Popoola (2014) notes that the identification and reaction of fraud prevention is not just a child's play and requires much more than the explanations in IES No. 8, Audit Professional Competence Requirements (IFAC, 2019).

2.5 Neuroticism as a Personality Factor

The effect of personality as a dominant influence on task performance has been dealt with through the present century in numerous studies and meta-analyses across many nations and cultures to comprehend how personality factors can affect task performance. Over the years, researchers have identified many personality traits that may represent individual characteristics (McCrae & Terracciano, 2005; McCrae & Costa, 1997). For example, the Big-5 Model ("extraversion, neuroticism, conscientiousness, agreeableness and openness to experience") reflects human behaviour and reaction in a different context, such as Job performance (Trouba, 2009; Vakola et al., 2004). After reviewing the literature, several studies recognised the impact between personality factors and auditor's behaviour (Asni et al., 2018; Asmara, 2016; Donelly et al., 2003; Dole & Schroeder, 2001; Tsui & Gul, 1996), a judgment made by auditors' (Tsunogaya et al., 2017; Lehmann, 2001), workload and job exhaustion (Law, 2003) and managers' opinion (Hartmann, 2005). However, these studies found diverse findings regarding the impact of the personality factors on the dependent variables.

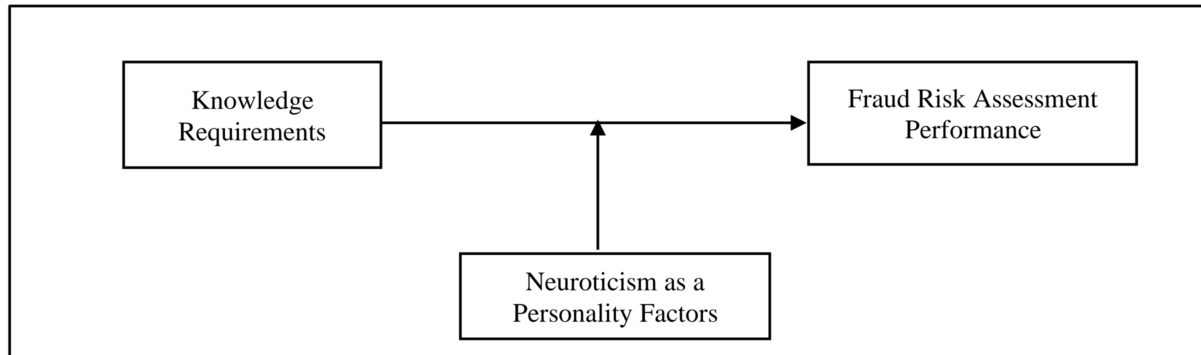
As per McCrea and John (1992), Neuroticism signifies individual differences in the inclination to experience distress and the cognitive and behavioural styles that follow this tendency. They state that neuroticism highlights anxious, self-pitying, tense, sensitive, unbalanced, and worrying behaviours. Goldberg (1993) posits that neuroticism comprises individual characteristics such as anxiety, emotional instability, and tempera.
The Big-5 factors have been investigated in many studies, including vigilance performance and workload. In particular, Rose et al. (2002) find that neuroticism was linked to perceived frustration in terms of perceived workload.

Previous studies offered diverse findings regarding the influence of neuroticism on task performance (e.g., Gullkvist & Jokipii, 2015; Jaffar et al., 2008; Zimbelman & Waller, 1999; Bernardi, 1994; Pincus, 1984). The current research assumes that forensic accountants and auditors with high neuroticism will not perform efficiently and effectively in their work matched to those with low neuroticism, as those with high-level neuroticism appear to have negative attitudes. This research assumes that the auditors might not effectively detect the risk of fraud if such attitudes are demonstrated.

3. CONCEPTUAL FRAMEWORK OF THE STUDY

A conceptual framework relates to rules, assertions, and principles that incorporate ideas about a particular concept (Mugenda & Mugenda, 2003). The conceptual framework is intended to explore the moderating effect of neuroticism, forensic accountants, and auditor's knowledge capability on FRAP in the Jordanian public sector. Figure 2 presents the proposed research framework of this paper.

Figure 2. Conceptual Framework of the Study



3 HYPOTHESIS DEVELOPMENT

3.1 Knowledge Requirement and Fraud Risk Assessment Performance

The first conceptual connection in this study is the knowledge requirement influence on the FRAP. As stated by International Education Standard No. 8, competency requirements for audit professionals, auditor's knowledge is divided into three: (1) higher-level of historical financial information analysis, (2) higher-level financial accounting and monitoring, and (3) IT. (IFAC-IES, 2019). This research paper agrees with Daniel and Lee (2006) that other accountants may look at the charts. However, forensic accountants look deep into the body. Previous literature suggests that a modest change in knowledge capability produces considerable changes in performance and an imposing impact on a person's resolve; assertiveness; and commitment to achieve set objectives (Popoola et al., 2015; Hopwood, Leiner, and Young, 2012; Davis, Farrell & Ogilby, 2010; Di-Gabriele, 2008; Messmer, 2004; Haris & Brown, 2000). This research, therefore, postulates so:

Hypothesis 1: There is a relationship between knowledge requirement and fraud risk assessment performance in the Jordanian public sector.

3.2 Neuroticism as a Personality Factors and Fraud Risk Assessment Performance

The second conceptual relation in this study is the influence of neuroticism as a personality factor on FRAP. Neuroticism is a dimension of big-five factors that experience adverse impacts like fear, sorrow, confusion, irritation, fault, and loathing. Some kinds of psychiatric problems may be at risk for a high level. A high neuroticism level indicates that individuals are vulnerable to illogical beliefs, are less capable of controlling urges, and poorly deal with stress. A low level of neuroticism shows emotional stability. Usually, such people are generally calm, quiet, confident, and capable of handling stressful situations without getting upset (Warrington, 2017; Rothmann & Coetzer, 2003; Hough et al., 1990). The previous study found neuroticism as a forecaster of performance in different professions (Tuteja & Sharma, 2016; Hörmann & Maschke, 1996). Dunn, Mount, Barrick, and Ones (1995) indicated that the second most important feature affecting candidates ' employability is emotional stability (the opposite of neuroticism). A recent study stated that neuroticism is backwards linked to task performance (Terrier, Kim, and Fernandez, 2016; Judge Higgins, Thoresen, and Barrick, 1999). However, Salgado (1997) argued that neuroticism predicts job performance in certain circumstances. This study predicts that forensic accountants and auditors' high neuroticism would not perform effectively in their work matched to those with lower neuroticism as those with a high level of neuroticism tend to have negative attitudes. This research, therefore, postulates so:

Hypothesis 2: There is a relationship between neuroticism and fraud risk assessment performance in the Jordanian public sector.

3.3 The Moderating Effect of Neuroticism on Knowledge Requirements and Fraud Risk Assessment Performance

The third conceptual link in this research is the interaction effect of neuroticism on knowledge (forensic accountants and auditors) and FRAP. The impact of neuroticism on performance is found to have mixed results (e.g., Gullkvist & Jokipii, 2015; Jaffar et al., 2008; Zimbelman & Waller, 1999; Bernardi, 1994; Pincus, 1984). The current study posits that forensic accountants and auditors with high neuroticism would not perform more effectively in their work than those with a lower level of neuroticism as those with high neuroticism appear to have negative attitudes. Thus, the current research suggests that highly neuroticism would reduce the relationship between knowledge (capability requirements) and fraud risk assessment in any fraud situation. This research, therefore, postulates thus:

Hypothesis 3: Neuroticism positively moderates the relationship between knowledge requirement and fraud risk assessment performance in the Jordanian public sector.

4 CONCLUSION

This research investigated the moderating influence of neuroticism as a personality factor on the association among knowledge of (forensic accountants and auditors) FRAP in the public sector in Jordan, having expanded on the issue statement and research objectives. The research helps to understand forensic accounting processes of fraud detection, improved fraud mediation, and reactions to the public sector's environment. The relevant literature on the capability requirements of forensic accountants and auditors and the moderating influence of neuroticism as a personality factor in the Jordanian public sector's FRA and capability requirements are reviewed. This research paper offers a conceptual framework that could be used to deter and detect fraud by forensic accountants and public sector auditors. The current research is theoretical. Thus, future empirical research will be undertaken to determine the importance of the proposed framework in fraud risk assessment performance.

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The Tax Avoidance Opacity

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Abstract

This study reviews the relationship between tax avoidance and earnings transparency. Tax avoidance is perceived as management actions that entail possible hidden actions and hidden information, hence opacity. Furthermore, this study explores the effects of companies' ownership structure, including its ultimate and second-largest owners, along with its family ownership and corporate governance, like the board and audit committee's effectiveness in moderating the relationship between tax avoidance and earnings transparency. Using samples of companies from the Indonesian Stock Exchange between 2008-2012, this study finds that tax avoidance negatively relates to earnings transparency. It is also found that concentrated ownership strengthens the negative tax avoidance-earnings transparency relationship, and effective board and audit committees weaken the relationship. However, this study cannot prove that family ownership and second-largest shareholder have moderating power over the relationship. This study is among the first studies that use earnings transparency to indicate the company's earnings quality and one of a few research types that look into the second-largest shareholder's role.

Keywords: Corporate governance, earnings transparency, ownership structure, tax avoidance

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1. INTRODUCTION

Tax is always a substantial issue in corporate earnings reporting. In Indonesia, it counts as much as 25%. Simultaneously, the tax percentage may exceed half of the corporate earnings in other countries. On the other hand, earnings exhibit the achievement of the company's management. Therefore, companies should focus on reporting earnings effectively to increase shareholder value and its impact on the reward is also achieved.

Management of the companies is in the dilemmatic decision. While investors require the companies to gain higher net income to increase their share price, companies think higher earnings are associated with higher tax payments. Therefore, companies' management considers tax management, defined as any creative actions corporations take to pay as little tax as possible (Slemrod, 2004), as a significant aspect of the company performance reporting.

Tax avoidance is one of many tax management decisions that companies choose. This action, despite legal, is not without consequences. Previous studies found that firms that avoid tax tend to have a higher number of discretionary accruals (Frank et al., 2009) and have lower earnings persistence (Tang & Firth, 2012), hence lower earnings quality. Tax avoidance is also perceived as hidden actions and information (Slemrod, 2004), which means less transparency and higher information asymmetry.

Earnings transparency is defined as how well the firm's earnings report captures changes in its economic value (Barth, 2013). The more considerable extent it captures its economic value changes, the more transparent the earnings are. As companies that avoid tax (Slemrod, 2004), the information provided in their earnings may also be low in transparency.

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This paper examined the relationship between the companies' tax behaviour and reported earnings transparency, hence its opacity. Further, it evaluates whether the ownership structure and corporate governance affect the relationship whether the structure and corporate governance can increase transparency in tax avoidance cases. Even though this study is not the first study that examines the relationship between tax avoidance and earnings quality, this study is the first one that uses earnings transparency as a proxy for earnings quality. Moreover, it is also one of the few studies that examine the second-largest shareholder's role in mitigating agency problems.

This paper is organized into the following order. First is the introduction, followed by the literature study that shows the previous study on tax avoidance and earnings opacity. Then, research methodology, data gathering, and hypothesis are followed. Results and discussion are in the next section. Lastly, the findings are concluded.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Tax avoidance is highly dependent on management discretion and indicates a low level of corporation's transparency. Previous studies investigated factors determining management indiscretion when tax management is associated explicitly with opportunistic behaviour (Desai et al., 2006; Moore, 2012). Studies by Lim (2011) concluded that tax avoidance would have a lesser effect on the capital cost when shareholders have control in supervising management.

In Indonesia, like in many other Asian countries, companies' ownerships are more concentrated with family dominating pyramidal shareholder structure (Fan & Wong, 2002; LaPorta et al., 1999; Diyanty, 2012). With this shareholding structure, institutional shareholders' role is considerably less prominent than ultimate controlling shareholders (UO) and family-owned shareholders (Douma et al., 2006).

With this structure, the ultimate owner has more control over management through excess control rights over cashflow rights (Claessens et al., 2002). The agency problem (Jensen & Meckling, 1976) usually exists between the ultimate and non-ultimate owners (Diyanty, 2012; Attig, 2008). The reason is that the ultimate owner can influence management to undertake actions that benefit ultimate owners (entrenchment effect), including tax avoidance.

Other studies found that the ultimate owners (companies with family as their ultimate owners) usually undertake less tax avoidance than tax aggressiveness (Chen et al., 2010). This is because these companies aim to preserve a family reputation to be inherited. They believe that the reputation would uphold the sustainability for the companies for the next generations.

Laeven & Levine (2006) and Attig et al. (2008) found that other ultimate owners hold some monitoring roles, those are the second (third, fourth, and even fifth) largest shareholders or multiple largest shareholder (MLS). This role is becoming essential for companies whose shareholding structure is more concentrated in controlling management, particularly when the ultimate owner has aligned interest with the management (Attig et al., 2008). Moreover, Attig et al. (2008) found that MLS hold a more prominent monitoring role in companies in developing countries, including Indonesia, where the legal protection of minority is considered ineffective. This research only examines the second-largest shareholder's role. It is noted that a concentrated shareholding structure only involves a few or family-owned shareholders (Diyanti, 2012).

Other factors that could mitigate companies' tax avoidance are adopting good corporate governance (CG). According to Desai & Dharmapala (2006), good corporate governance (CG) could help management decide if the company carries out rent diversion or tax avoidance in the form of tax shelter. CG also reduces the unfavourable impact between tax avoidance and company values (Wahab & Holland, 2012).

CG consists of policies developed to clarify the relationship between shareholders, management, commissioners, and other stakeholders. CG is the mechanism that assists external parties in carrying out monitoring activities against the companies to undertake corporate activities that maximize both ultimate owners and other shareholders' value. Adopting good corporate governance could lower the rent diversion in companies' tax avoidance, thus increasing information transparency.

2.1 The Impact of Tax Avoidance on Earnings Transparency

Many studies associate tax avoidance with earnings quality. Companies that carry out tax avoidance and tax aggressiveness often undertake earnings management (Dhaliwal et al., 2008; Blaylock et al., 2010; Tang & Firth, 2011; Tang & Firth, 2012; Frank et al., 2009). Blaylock et al. (2010) argue that the difference between accounting

income and tax income would impact earnings quality. The positive difference in which accounting income is more considerable than tax income exhibits tax avoidance, increasing earnings (upward earnings management). Companies that carry out upward earnings management tend to reverse the accrual accounting in the following year. The positive or negative difference would undoubtedly lower the earnings quality by lower transparency.

Studies by Tang & Firth (2011) found that abnormal BTD, or the difference between accounting income and tax income, which resulted from other factors than the difference between accounting standard and tax regulation, intensifies the companies' earnings management and tax avoidance.

With the premise that earnings management impact earnings quality through its transparency, this paper hence proposes the first hypotheses as follows:

Hypothesis 1: Tax avoidance negatively impacts the company's earnings transparency

2.2 Role of ultimate owners, second-largest shareholders and corporate governance in moderating the relationship between tax avoidance and earnings transparency

This paper's further objective is to affirm the influence of shareholding structure and CG implementation on the relationship between tax avoidance and earnings transparency. The shareholding structure that the paper examines includes a family-owned structure and second-largest shareholders. This paper's corporate governance aspects are the board of commissioners and the audit committee's effectiveness.

Tax avoidance could lead to lower transparency and asymmetric information between the company's management and shareholders and debt holders through management rent-diversion (Lim, 2011). Previous studies also exhibited that corporate governance (CG) and ownership structure has a mitigating role for the agency problem resulting from tax avoidance (Desai & Dharmapala, 2006; Desai & Dharmapala, 2009).

2.2.1 The role of family (ultimate) owners

Companies whose shares are owned by the family are often perceived as having more excellent value than those who do not belong to non-family (Maury, 2006). Companies that belong to families in the US show less tax aggressive than those not owned by family shareholders (Chen, 2010). The family-owned companies seem to conserve the reputation and sustainability by taking more risk-averse than those who do not own by family.

In the other case, Claessens & Yutroglu (2013) stated that most South East Asia companies, including Indonesia, are primarily owned by families. With this structure, information asymmetry between the management of the companies and the owner is lesser. Their interests are even aligned (Diyanti, 2012). In such cases, agency problem type II, of which the agency problem arises, are between the ultimate owners and minority shareholders. It is perceived that the ultimate owner can influence management in undertaking corporate actions hence disadvantaging minority shareholders (Diyanty, 2012). In other words, the interest alliances between ultimate owners and management could lead to potential entrenchment performed by the ultimate owner that adversely impacts the interest of minority shareholders and other stakeholders. As one of management discretional actions, tax avoidance could be an entrenchment. It could only be beneficial for generating cash flow for the family owner rather than to residual claimants.

While some studies found that the family-owned structure may strengthen the relationship between tax avoidance and earnings transparency (for family companies that inquire about maintaining their reputation), others argue that this relationship may be weakened through the potential entrenchment inherent in family ownership. This paper then proposes the following hypothesis 2:

Hypothesis 2: The negative impact of tax avoidance on the companies' earnings transparency with a family-owned structure would be different from those not owned by a family.

2.2.2 The influence of ultimate owners

The ultimate owner's considerable influence is the significant difference between control rights (CR) and cash flow rights (CFR). The more considerable difference of the CR compared to CFR leads to higher chances of ultimate shareholders to expropriate minority shareholders (Claessens et al., 2002; Attig et al., 2008; Fan & Wong, 2002).

Companies who undertake tax avoidance tend to have lower earnings transparency because ultimate owners are perceived to expropriate minority shareholders in order for them to maximize their wealth and interests. The larger

the cash flow leverage held by ultimate owners, the more significant influence of ultimate owners on managing the corporation, including managing earnings (Claessens et al., 2002; Diyanty, 2012). This argument is examined through the following hypotheses 3:

Hypothesis 3: The higher the ratio of control rights over cash flow rights are, the stronger the influence of the negative impact of tax avoidance on earnings transparency

2.2.3 The influence of second-largest shareholders on the relationship between avoidance and earnings transparency

The second-largest shareholders significantly reduce agency problems and asymmetric information by determining the chances of expropriation risk arising by ultimate owners that impact minority shareholders (Attig et al., 2008). In particular, agency problem type II, which exists between controlling and non-controlling shareholders (Shleifer and Vishny, 1997), can be reduced with parties with a monitoring function. The second-largest shareholders can be referred to as parties that can have such a role (Attig et al., 2008).

On the other hand, second-largest shareholders could also contribute to the occurrence of tax avoidance if they have aligned interests with either management of the company or the ultimate owner (Kim et al., 2007) in achieving objectives that are not in the company's best interest (Thomsen et al., 2006). Therefore, the second-largest shareholders' presence could positively and negatively impact the relationship between tax avoidance and earnings transparency. Thus, this paper suggests the following hypotheses 4:

Hypothesis 4: The negative impact of tax avoidance on the companies' earnings transparency with the second-largest shareholders would be different from those with second-largest shareholders.

2.2.4 The influence of Corporate Governance (CG) on the relationship between tax avoidance and earnings transparency

Theoretically, the CG mechanism is often used to reduce the agency problem. Previous studies on CG found that companies whose CG implementation effectively tend to have better earnings quality. Jiang et al. (2008) further found that the companies that acquired high CG scores have low absolute discretional accrual, named better earnings quality. Therefore, as CG adoption could minimize rent diversion and improve information transparency and symmetry, it is strongly argued that CG adoption could impact the relationship between tax avoidance and earnings transparency. The paper hence suggests the following hypotheses 5:

Hypothesis 5: The more vigorous CG implementation in the company leads to weakening tax avoidance's negative influence on earnings transparency.

3. RESEARCH METHODS

To investigate tax avoidance's effect on its earnings reporting and the influence of ownership structure and corporate governance, a sample from companies listed on the Indonesia Stock Exchange from 2008 until 2012 was gathered. Following Barth et al. (2013), earnings transparency is calculated using cross-sectional data's explanatory power obtained from the relationship between returns and earnings. Tax avoidance is measured by abnormal book-tax difference adopting Tang & Firth (2011).

For determining the control power of ownership structures, the following measures are used:

- Cash-Flow Leverage (CFL) is the ratio of the ultimate owner's (UO's) control rights (CR) to its cashflow rights (CFR) (Claessens et al., 2002).
- Family shareholders are the firm's UO defined as an individual or a group of individuals who constitute a family (Diyanty, 2012). In this study, a family is a dummy variable given the value of 1 if the UO is an individual name within a family or group of families and 0 if otherwise.
- The second-largest shareholder (SLS) considers other shareholders' presence than the ultimate owner (UO). Following Attig et al. (2008), the SLS's role will be measured using a dummy variable: if the company has an SLS and 0 if otherwise.

Other than the ownership structure, the corporate governance (CG) variable is used to measure board commissioners and audit committees' effectiveness using the score developed by Hermawan (2009).

Some control variables are used in the model employed in this study. Those are:

- Leverage: higher leverage leads to the higher risk borne by the company, which results in lower earnings quality (Dechow et al., 1996).

- Growth: high growth rate is expected to have high discretionary accruals associated with performance, not manipulation (Siregar, 2005).
- Market to Book Ratio: shows how confident the market perceived the company, indicating higher transparency (Nelson et al. 2002).
- Size and Age: larger companies tend to have more earnings management, hence less transparency (Nelson, 2002). Older companies strive to maintain their reputation (Lim, 2011).
- ROA: shows company profitability. The higher its profitability, the less likely it manipulates its financial data, the higher its transparency is.

Table 1: Statistics Descriptive

Variable	N	Mean	SD	Min	Median	Max
ABTD	811	-0.013	0.069	-0.30	-0.01	0.75
ET	811	0.000	0.12	-0.37	0.0003	0.37
GROWTH	811	0.15	0.28	-0.74	0.12	1
LEV	811	0.51	0.62	-0.87	0.3	2.36
SIZE	811	5720	14100	6.4	1250	152000
MTBV	811	1.94	1.8	-1.26	1.28	7.34
ROA	811	0.05	0.08	-0.19	0.04	0.31
AGE	811	12.34	7.1	0.08	13.58	32
FAM	811	0.7	0.46	0	1	1
CFL	811	1.16	0.3	1	1	2.03
OWN2	811	0.7	0.46	0	1	1
CG	811	0.69	0.09	0.43	0.7	0.95
Earnings Transparency (ET): earnings transparency represents earnings relevance; ABTD: tax avoidance; Growth: sales growth; Lev: total debt to total equity; Size: the natural logarithm of total assets; MTBV: the market-to-book value of equity; ROA: return on the asset; Fam: 1 if the firm's UO is an individual or group of individuals in a family, and 0 if otherwise; CFL: a ratio of UO's CR to CFR; OWN2: 1 if the firm has an SLS and 0 if otherwise; CG: CG score.						

4. EMPIRICAL EVIDENCE

The following equation is used to regress the earnings transparency on tax avoidance, employing the control variables:

$$ETit = \alpha 0it + \alpha 1ABTDit + \alpha 2LEV\ it + \alpha 3GROWTH\ it + \alpha 4MTBV\ it + \alpha 5SIZE\ it + \alpha 6AGE\ it + \alpha 7ROA\ it + \varepsilon\ it$$

ET is earnings transparency representing earnings relevance. The relationship between earnings and returns and ABTD is the tax avoidance variable. Another equation is used to test the moderating variables on their roles to mitigate the relationship between tax avoidance and earnings transparency. Table 2 shows the result of the regression. The second column is for answering the first hypothesis 1 (H1). The next column is proof for the rest of the hypotheses tested in this study.

Table 2: Effect of Tax Avoidance on Earnings Transparency

		No Moderation			With Moderation		
Variabel	Pred	Beta	p-value	Signf.	Beta	p-value	Signf.
C		0.154	0.000	***	0.222	0.000	***
ABTD	-	-0.132	0.070	*	-0.981	0.152	
LEV	+	0.023	0.018	**	0.022	0.021	**
GROWTH	+	-0.100	0.000	***	-0.105	0.000	***

MTBV	-	-0.007	0.020	**	-0.008	0.019	**
SIZE	+	0.001	0.402		0.002	0.299	
ROA	-	0.385	0.000	***	0.388	0.000	***
AGE	+	-0.001	0.276		-0.001	0.258	
FAM	+/-				0.004	0.400	
FAM*ABTD	+/-				-0.290	0.276	
CFL	+				-0.022	0.175	
CFL*ABTD	+				0.745	0.063	*
OWN2	+/-				0.002	0.434	
OWN2*ABTD	+/-				-0.299	0.266	
CG	-				-0.064	0.094	*
CG*ABTD	-				0.442	0.349	
AdjR-squared		3.41%			4.79%		
Prob F-stat		0.0000			0.0000		

Earnings Transparency (ET): earnings transparency represents earnings relevance; ABTD: tax avoidance; Growth: sales growth; Lev: total debt to total equity; Size: the natural logarithm of total assets; MTBV: the market-to-book value of equity; ROA: return on the asset; Fam: 1 if the firm's UO is an individual or group of individuals in a family, and 0 if otherwise; CFL: a ratio of UO's CR to CFR; OWN2: 1 if the firm has an SLS and 0 if otherwise; CG: CG score.

From Table 2, it can be deduced that tax avoidance negatively relates to earnings transparency. The result proves the hypothesis. The tax avoidance decision of the management implies hidden information and less transparency, hence opacity. This result support Slemrod's (2004) argument on the tax implication of hidden information. This result affirms Desai and Dharmapala's (2006) findings that tax avoidance can increase information asymmetry.

Next is the moderating variable. The third column of Table 2 shows the result of moderating variables tested in this study:

- It is found that family ownership does not have any moderating impact on the relationship between tax avoidance and earnings transparency. This suggests that tax avoidance's negative impact on earnings transparency is not found different between companies owned by family or by non-family. This result, however, does not support hypothesis 2.
- The cash-flow leverage ratio of the ultimate owner control rights to its cash-flow rights show, moderated against tax avoidance, shows a significant positive relationship with the earnings transparency. This supports hypothesis 3 and means that the higher the cash-flow leverage owned by the ultimate owner heightens the negative impact of tax avoidance on earnings transparency. This result implies the underlying perception of the market on expropriation effect by the ultimate owner, as found in previous studies of Claessens et al. (2002) and Attig et al. (2008).
- However, the second-largest shareholder variable in Table 2 does not significantly affect the relationship between tax avoidance and earnings transparency. This result is not according to hypothesis 4, which explains that the market does not perceive that the second-largest shareholder has any monitoring role to the management. Therefore, it cannot alter the management's market reaction to tax avoidance.
- CG score on the board and audit committee's effectiveness also does not mitigate the negative effect of tax avoidance on earnings quality. This result does not support hypothesis 5, which says that good corporate governance would convince the market of the monitoring scheme. Any management action such as tax avoidance would not be perceived as opacity. The result confirms that the market, however, is not.

5. CONCLUSION

This study aims to confirm the opacity of the tax avoidance carried out by companies whether the companies' ownership structures and their corporate governance would increase transparency. Using earnings transparency as a proxy for company transparency, this study can prove that tax avoidance will decrease companies' transparency. However, this study cannot offer evidence that ownership structure and corporate governance's monitoring roles can solve the agency problems caused by tax avoidance. This conclusion is derived from the fact that the second-largest shareholders' effectiveness and effectiveness cannot increase the negative relationship between tax avoidance and earnings transparency.

This paper also finds that the market views the controlling power of ultimate owners as a source of opacity. This concludes that the higher control rights owned by ultimate owners are perceived negatively by the market concerning tax avoidance behaviour (through higher irrelevance earnings to its returns).

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Numerical Analysis of Malthus and Verhulst Growth Models using Block Method in Predicting National Population

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Abstract

Differential equation models are encountered in various fields of study such as science, technology, engineering, economics, demography, among many others. In ordinary differential equations (ODEs), population growth models are vastly adopted to investigate growth rate dynamics. This paper considers two growth models, namely the Malthus model and the Verhulst model, which describe exponential and logistic growth. These models are solved by employing a highly accurate block method developed with a higher derivative to improve the accuracy resulting from its maximal order. Convergence properties of the block method are investigated to validate its usability. They can be applied to solve the growth models expressed in the ODEs form. The method's accuracy is compared to other recently introduced numerical methods adopted for the ODE growth models' solution, such as the Chebyshev collocation method and the modified Heun's iterative method. The solution obtained is then utilized to obtain a population prediction for Nigeria. The prediction results obtained indicate that they agree with the results available in the literature, thus confirming the proposed method's reliability and applicability.

Keywords: Ordinary differential equations, growth models, block method, national population, Nigeria

1. INTRODUCTION

Differential equations have shown broad applicability in various fields such as engineering, biological sciences, economics, and other sciences fields. These differential equation models in which a dependent variable and one independent variable are related, known as ordinary differential equations (ODEs), have a range of modelling growth in various application areas.

The commonly adopted population growth ODE models known as the Malthus model and Verhulst model, which describe exponential and logistic growth, have been studied by Huang (2014) to obtain a population prediction of Huanggang City in China, and also Andriani, Suyitno, and Junaidi, (2019). They specifically applied the Verhulst model to estimate the population of Bandar Lampung, Indonesia. Likewise, Lal (2018) and Ekele (2018) studied this growth above models to investigate India and Nigeria's population dynamics and growth, respectively. These individual studies inform the relevance of these growth models in recent literature; however, a numerical insight is yet to be explored concerning the population growth predictions.

Studies are continuously developed to develop new numerical methods with improved accuracy compared to existing approaches for solving ordinary differential equation models. The trend has evolved from the simplest numerical methods such as Euler and Runge-Kutta methods to highly accurate block methods (Zainuddin et al.,

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2016; Ramos, Mehta, & Vigo-Aguiar, 2017; Omar & Kuboye, 2018). In the application of numerical methods to exponential and logistic population growth models, Pirzada, Shaikh, and Shah (2018) modified Heun's iterative method to solve some sample population growth rate problems, while Öztürk, Anapalı, and Gülsu (2017) adopted a numerical scheme using Chebyshev coefficients to solve the logistic population growth model. However, the methods were not adopted to predict the national population.

Hence, this article introduces a new approximate solution to Malthus and Verhulst growth models using an efficient block method developed with a higher derivative. The next section of this article discusses the population growth models. It develops the block method to solve the two models. The convergence properties of the block method are also stated in Section 2. Section 3 validates the block method by comparing the solutions to Chebyshev and modifying Heun's methods. In contrast, Section 4 applies the block method to the population prediction of Nigeria using the growth models. Finally, Section 5 concludes this article.

2. METHODOLOGY

This section details the population growth models' solution approach using the block method and investigates its convergence properties. The exponential growth model coined the Malthus model follows the primary hypothesis that the population growth rate is constant. This hypothesis implies that the population growth in unit time is proportional to the population at that time. The model assumes that the population value $p(t)$ is a continuously differentiable function of the time t and can be expressed as

$$\frac{dp}{dt} = rp,\ p(t_0) = p_0 \tag{1}$$

where *r* denotes the net growth rate of population and $p(t_0)$ is an initial condition chosen as a known population value p_0 at a time t_0. The solution to the Malthus model in Equation (1) is given by

$$p = p_0 e^{-r(t_0 - t)}\ . \tag{2}$$

However, this model is unrealistic in a real-world setting because it implies that the population can grow without bounds as time goes on. It is also known that various factors may affect and limit the growth rate of a particular population, such as birth rate, death rate, food supply, and predators. The constant growth *r* usually considers the birth and death rates but none other factors. It can be interpreted as a net (birth minus death) percent growth rate per unit time. Thus, whether the population growth rate stays constant or changes over time comes to light. Scientists have found that in many biological systems, the population grows until a specific steady-state population is reached. This possibility is not taken into account with exponential growth. However, the concept of carrying capacity allows for the possibility that only a certain number can thrive without running into resource issues in a given area.

An organism's carrying capacity in a given environment refers to be the maximum population of that organism that the environment can sustain indefinitely. Denoting the carrying capacity by K, and still have r been an actual number that represents the growth rate. The function $p(t)$ represents the population value as a function of time t, and the constant p_0 represents the initial population $t = 0$. Then the Verhulst population model is defined as

$$\frac{dp}{dt} = rp\left(1 - \frac{p}{K}\right),\ p(t_0) = p_0 \tag{3}$$

The solution to the Verhulst model in Equation (3) can be obtained by

$$p = \frac{Kp_0 e^{rt}}{Ke^{t_0 r} - p_0 e^{t_0 r} + p_0 e^{rt}}\ . \tag{4}$$

To develop the block method to solve (1) and (3), maximal order $\vartheta = 2(k+1)$ is ensured by choosing the steplength value $k = 2$. This guarantees improved accuracy over the conventional low accuracy one-step methods. The algorithm developed by Adeyeye and Omar (2018) is adopted to obtain the expressions for the block method as:

$$p_{n+1} = p_n + \frac{101hp_n^{(1)}}{240} + \frac{8hp_{n+1}^{(1)}}{15} + \frac{11hp_{n+2}^{(1)}}{240} + \frac{13h^2p_n^{(2)}}{240} - \frac{h^2p_{n+1}^{(2)}}{6} - \frac{h^2p_{n+2}^{(2)}}{80} \; .$$
$$p_{n+2} = p_n + \frac{7hp_n^{(1)}}{15} + \frac{16hp_{n+1}^{(1)}}{15} + \frac{7hp_{n+2}^{(1)}}{15} + \frac{h^2p_n^{(2)}}{15} - \frac{h^2p_{n+2}^{(2)}}{15} \qquad (5)$$

Thus, the block method schemes are combined as simultaneous integrators for the solution of the growth models.

Investigating the block method's convergence properties in (5), the block method should satisfy zero-stability and consistency to ensure convergence. Hence, to examine its zero-stability, the block method is normalized to give the first characteristic polynomial as:

$$\rho(R) = \det\left(R_{ij}A^0 - A^1\right) = R(R-1), \qquad (6)$$

where A^0 is the identity matrix of order 2 and $A^1 = \begin{pmatrix} 0 & 1 \\ 0 & 1 \end{pmatrix}$.

Since the roots of $\rho(R) = 0$ satisfying $\left|R_j\right| \le 1,\ j = 1, 2$, then the block method is zero stable (Butcher, 2008).

In particular, the block method is consistent if it has order $\vartheta \ge 1$. To investigate the order of the block method, the linear operator $L_h\left[p(t)\right]$ is defined as:

$$L_h\left[p(t)\right] = \begin{bmatrix} p_{n+1} - \left(\sum_{j=0}^{k-2} \alpha_{1j} p_{n+j} + \sum_{i=0}^{l} h^i \sum_{j=0}^{k} \beta_{ij} p_{n+j}^{(i)}\right) \\ p_{n+2} - \left(\sum_{j=0}^{k-2} \alpha_{2j} p_{n+j} + \sum_{i=0}^{l} h^i \sum_{j=0}^{k} \beta_{ij} p_{n+j}^{(i)}\right) \end{bmatrix}$$

(7)

Equation (7) can be rewritten as:

$$L_h\left[p(t)\right] = \begin{bmatrix} p_{n+1} - \left(\sum_{j=0}^{k-2} \alpha_{1j} p_{n+j} + \sum_{i=0}^{l} h^i \sum_{j=0}^{k} \beta_{ij} f^{(i-1)}\left(t_n + jh, p\left(t_n + jh\right)\right)\right) \\ p_{n+2} - \left(\sum_{j=0}^{k-2} \alpha_{2j} p_{n+j} + \sum_{i=0}^{l} h^i \sum_{j=0}^{k} \beta_{ij} f^{(i-1)}\left(t_n + jh, p\left(t_n + jh\right)\right)\right) \end{bmatrix} \qquad (8)$$

which becomes an equation of the form below (after expanding $p\left(t_n + jh\right)$ and $f^{(i-1)}\left(t_n + jh, p\left(t_n + jh\right)\right)$ in a Taylor series about t_n),

$$L_h\left[p(t)\right] = \begin{bmatrix} C_{10}p\left(t_n\right) + C_{11}hp^{(1)}\left(t_n\right) + \cdots + C_{1\vartheta}h^{(\vartheta)}p^{(\vartheta)}\left(t_n\right) + \cdots \\ C_{20}p\left(t_n\right) + C_{21}hp^{(1)}\left(t_n\right) + \cdots + C_{2\vartheta}h^{(\vartheta)}p^{(\vartheta)}\left(t_n\right) + \cdots \end{bmatrix} \qquad (9)$$

The block method is of order ϑ if $C_{q0} = C_{q1} = \cdots = C_{q\vartheta} = 0,\ C_{q(\vartheta+1)} \ne 0;\ q = 1, 2$, and for the block method (5) $C_{q0} = C_{q1} = \cdots = C_{q6} = 0;\ q = 1, 2$. This implies that the block method is of order $\vartheta = 6$, satisfying the maximal order criterion $\vartheta = 2(k+1)$.

Therefore, since the block method satisfies both conditions of zero-stability and consistency, it is likewise convergent.

3. VALIDATION OF THE BLOCK METHOD

This section compares the block method's solution with the Chebyshev expansion method in Pirzada et al. (2018) and the modified Heun's method in Öztürk et al. (2017).

Firstly, consider the exponential population growth rate problem

$$\frac{dp}{dt} = kp\,,\ t \in [0,1] \tag{10}$$

with the exact solution given by $p(t) = 100e^{0.250679566129t}$ an initial condition $p(0) = 100$ with $k = 0.250679566129$.

A comparison with the modified Heun's method is given in Table 1 below.

Table 1: Comparison of the Modified Heun's Method (MHM) and Block Method (BM)

t	Exact Solution	Absolute Error (MHM)	Absolute Error (BM)
0.1	102.53847998347332	0.088	1.421085e-14
0.2	105.14139877321155	0.180	0.000000e+00
0.3	107.81039213541338	0.277	1.421085e-14
0.4	110.54713735987491	0.379	1.421085e-14
0.5	113.35335431405804	0.486	1.421085e-14
0.6	116.23080652391599	0.598	1.421085e-14
0.7	119.18130228215516	0.716	1.421085e-14
0.8	122.20669578463047	0.839	1.421085e-14
0.9	125.30888829558741	0.969	1.421085e-14
1.0	128.48982934248377	1.104	2.842171e-14

Next, we consider the logistic population growth rate problem form

$$\frac{dp}{dt} = p\left(1-p\right),\ t \in [0,1] \tag{11}$$

with the exact solution is obtained to be $p(t) = \frac{-1}{e^{(-t-\ln(2))} - 1}$ an initial condition $p(0) = 2$. A comparison with the Chebyshev expansion method is given in Table 2 below.

Table 2. Comparison of the Chebyshev Expansion Method (CEM) and Block Method (BM)

t	Exact Solution	Absolute Error (CEM)	Absolute Error (BM)
0.1	1.8262128682421239	-	5.149214e-13
0.2	1.6930941063701719	0.880e-5	5.895284e-13
0.3	1.5883330213710647	-	5.471179e-13
0.4	1.5041213444160908	0.141e-4	4.791723e-13
0.5	1.4352665983935839	-	4.114487e-13
0.6	1.3781808411258631	0.170e-4	3.519407e-13
0.7	1.3303049418392214	-	3.015366e-13
0.8	1.2897642077008449	0.212e-4	2.591261e-13
0.9	1.2551537079897774	-	2.240430e-13
1.0	1.2253996735605639	0.249e-3	1.940670e-13

From the results displayed in Tables 1 and 2, the accuracy of the block method is established. Note that the solutions provided by Pirzada et al. (2018) for the Chebyshev expansion method in Table 2 only presented values at 0.2, 0.4, 0.6, 0.8, and 1.0. The following section further adopts the block method to obtain a population prediction for Nigeria. A comparison is made with prediction results in the literature.

4. POPULATION PREDICTION USING GROWTH MODELS

The Malthus and Verhulst models defined in Equations (1) and (3) respectively will be adopted to predict Nigeria's population. A comparison will be made with the exact solution of the ODE models and other prediction results already obtained in the literature. The data culled from World Bank Group (2020) selected the population statistics data of Nigeria from 1983 to 2013 (in hundred thousand). They then used the Malthus and Verhulst models to predict the population value for subsequent years till 2050. Tables 3 and 4 show the solution obtained using the block method in column 3, compared to the exact solution of the ODE models in column 2 and the prediction by the World Bank Group in column 1. The initial conditions were chosen with corresponding values of the 2013 data, and all predictions are in bold fonts.

Table 3: Prediction Results using the Exact Solution of the Malthus Model and the Block Method

Year	Population Value	Malthus Model -Exact Solution	Block Method -Malthus Model
2013	1717.65769	1717.65769	1717.65769
2014	1764.04902	**1762.37870**	**1762.37870**
2015	1811.37448	**1808.26407**	**1808.26407**
2016	1859.60289	**1855.34411**	**1855.34411**
2017	1908.73311	**1903.64992**	**1903.64992**
2018	1958.74740	**1953.21343**	**1953.21343**
2019	**2009.64000**	**2004.06738**	**2004.06738**
2020	**2061.40000**	**2056.24536**	**2056.24536**
2021	**2114.01000**	**2109.78186**	**2109.78186**
2022	**2167.47000**	**2164.71223**	**2164.71223**
2023	**2221.82000**	**2221.07277**	**2221.07277**
2024	**2277.13000**	**2278.90071**	**2278.90071**
2025	**2333.43000**	**2338.23427**	**2338.23427**
2030	**2629.77000**	**2658.89450**	**2658.89450**
2035	**2949.86000**	**3023.52935**	**3023.52935**
2040	**3290.67000**	**3438.16942**	**3438.16942**
2045	**3647.12000**	**3909.67231**	**3909.67231**
2050	**4013.15000**	**4445.83604**	**4445.83604**

To obtain a Verhulst model solution, the carrying capacity value, as obtained by Gabriel (2018) as 8891134631, was utilized to obtain the solution in the table below.

Table 4: Prediction Results using the Exact Solution of the Verhulst Model and the Block Method

Year	Population Value	Verhulst Model -Exact Solution	Block Method -Verhulst Model
2013	1717.65769	1717.65769	1717.65769
2014	1764.04902	**1762.37869**	**1762.37869**
2015	1811.37448	**1808.26405**	**1808.26405**
2016	1859.60289	**1855.34408**	**1855.34408**
2017	1908.73311	**1903.64988**	**1903.64988**
2018	1958.74740	**1953.21338**	**1953.21338**
2019	**2009.64000**	**2004.06732**	**2004.06732**
2020	**2061.40000**	**2056.24529**	**2056.24529**
2021	**2114.01000**	**2109.78176**	**2109.78176**
2022	**2167.47000**	**2164.71212**	**2164.71212**
2023	**2221.82000**	**2221.07264**	**2221.07264**
2024	**2277.13000**	**2278.90057**	**2278.90057**
2025	**2333.43000**	**2338.23410**	**2338.23410**
2030	**2629.77000**	**2658.89421**	**2658.89421**
2035	**2949.86000**	**3023.52891**	**3023.52891**
2040	**3290.67000**	**3438.16876**	**3438.16876**
2045	**3647.12000**	**3909.67134**	**3909.67134**
2050	**4013.15000**	**4445.83468**	**4445.83468**

The results obtained in Tables 3 and 4 have shown the block method efficiently, obtaining the same values as the exact solutions in both growth models. Another comparison considered a similar study by Gabriel (2018). The author adopted the exponential growth model to predict Nigeria's population to be 456103747 in 2050, while the solution by the author using the logistic growth model predicted the population of Nigeria to be 452614778 in 2050. The predictions by the block method to solve the growth models are in closer agreement to the values proposed by the World Bank Group (2020) in comparison to the predictions by Gabriel (2018).

5. CONCLUSION

This article has shown the adoption of block methods to solve ordinary differential equations modelling concepts in demography. The developed block method satisfied its convergence properties and further displayed superior accuracy than the Chebyshev expansion method and modified Heun's method, and both were adopted to solve growth models. The method was adopted to solve the growth models and compare them with their exact solutions. The methods efficiently obtained accurate solutions as the growth models. Future research aims to explore growth models with consideration of relevant additional variables. It is expected that a better prediction could be obtained with the consideration of other parameters in developing the growth models. However, the possibility of these additional variables making it difficult to obtain an exact solution is likely. However, the block method developed in this article has shown that even in the absence of exact solutions, there is a guarantee of a highly accurate solution.

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