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Dynamics of Lintner's Model in the Dividend Payment Process of Nigerian Banks

Odunayo Magret Olarewaju[a], Mabutho Sibanda[b], Stephen Oseko Migiro[c]

[a]*PhD candidate, School of Accounting Economics and Finance,*
University of KwaZulu- Natal, South Africa. Email: olarewaju_odunayo@yahoo.com
[b]*School of Accounting, Economics & Finance,*
University of KwaZulu-Natal, Westville Campus, South Africa. Email: sibandam@ukzn.ac.za
[c]*Graduate School of Business and Leadership,*
University of KwaZulu-Natal, Westville Campus, South Africa. Email: migiro@ukzn.ac.za

Abstract

This study examines the dynamics of Lintner's model using bank-specific panel data from 15 commercial banks listed on the Nigerian Stock Exchange, using the newly introduced dynamic Panel-Auto Regressive Distributed Lag technique for the period 2006Q01 to 2015Q04. The study findings from the long-run estimates reveal that Lintner's model holds well, but with a negative effect of profitability on dividend payout of banks in Nigeria during the period in question. The findings further reveal evidence of a co-integrating relationship among past year dividend, profitability, capital adequacy and taxation, and with evidence of unidirectional short-run causality among the variables used to test Lintner's model and the dividend payout ratio. Based on these findings, this study concludes that dividend process in Nigeria support the 'information-content-hypothesis' argument by strict adherence to Lintner's model in Nigerian banking sector.

Keywords: Dynamics of Lintner's model, Nigerian banking sector, dividend policy, Panel-ARDL
JEL Codes: G11; G21; G35.

1. Introduction

Dividend decisions in any institution that practices agency relationship is crucial because of its effect on other key decisions. In making these crucial decisions, there are many factors that influence the managers' actions. Research has examined Lintner's model using diverse factors to explain the dividend decision – but a unanimous conclusion has not been made on these factors. Findings on dividend policy remain conflicting, since Black (1976) concluded that "dividend is a picture, scattered and difficult to fit together".

Since the seminar paper of Miller and Modigliani (1961), research on dividend policy has grown significantly, and has come up with different views that dividends are relevant in various economies, including that of Nigeria. Researchers like Lintner (1956), Darting (1957), Brittain (1966), Walter (1967), Dobrovolsky (1951), Charest (1978), and Pettit (1972) – to mention but a few – have developed a mathematical model to solve this decision problem. Based on these past works and arguments, many researchers from Nigeria and other

economies have conducted a few studies studies over time. The recent works of, for example, Ozuomba, Anichebe and Okoye (2016), Ibrahim and Shaibu (2016), Ozo, Arun and Kostov (2016), Nyor and Adejuwon (2013), Uwuigbe (2013), Olowe and Moyosore (2014), Obembe, Imafidon and Adegboye (2014), Odeleye (2015) and Adelegan (2003), are noteworthy in the Nigerian context. Even though most of these studies are in the context of the Nigerian banking sector, none have been able to conclude whether Lintner's model – which is the best model to explain the dividend process across various economies (Bawa & Kaur, 2012; Kapoor, 2011; Benartzi et al., 1997) – holds for the Nigerian banking sector.

In lieu of the above factors, our study mainly attempts to confirm whether Lintner's dividend process model holds in the Nigerian banking sector. It is noteworthy that dividend payout has been the most common dividend policy in the Nigerian banking sector and that the rate these banks pay differs because of the different components of boards of directors that decide on how, when and even what to pay as dividend, in order to maximise the overall wealth of shareholders. Whatever ratio a bank chooses to pay as dividend, there are some important factors to consider in terms of setting up such payment ratios – so that the legal and regulatory conditions guiding the bank will not be violated in a way that will lead to insolvency, bankruptcy and liquidation. Hence, this study seeks to evaluate these factors in Lintner's model of dividends and to establish if it holds for short- and long-run estimates using the Chudik and Pesaran Panel-Auto Regressive Distributed Lags – which is the first research of this kind in the Nigerian banking industry.

2. Brief Overview of The Nigerian Banking Industry

The banking system in any economy promotes economic development and the promotion of economic growth via the process of financial intermediation between the surplus and the deficit units of the economy (Kama, 2006). The Nigerian banking sector commenced operation during the colonial era with the colonial banks, so that they could meet the colonial government's commercial needs. The Nigerian banking system is regulated by the apex bank (Central Bank of Nigeria) which started operation on 1 July 1959. The banking sector in Nigeria plays a crucial role in the overall economy, as it is the leading sector with a high impact on the activities of all other sectors (Nzotta, 2014; Ikeor*a et al.*, 2016). Prior to the 1986 deregulation, the banking sector in Nigeria comprised 28 commercial banks and 12 merchant banks (Olowe, 2011b).

Following the Central Bank report of 1994, the number of banks in Nigeria increased to 120 (66 commercial banks and 54 merchant banks) due to the deregulation of the economy that led to bank licensing deregulation. As of 1998, Olowe (2011a) posits that the number of functional banks reduced to 89 following the increment in their capital base from ₦50 million to ₦1 billion and later to ₦2billion – to reduce the capital inadequacy of banks to withstand any economic shocks. In response to the global financial system's trend, CBN issued a universal licence to all the banks to enable them to render their traditional and any other financial services. As of 6 July 2004, and following the Basel II framework, the Central Bank of Nigeria increased the capitalisation of banks from ₦2 billion to ₦25 billion – to be implemented before 31 December 2005. In a bid to meet this requirement, most Nigerian banks were merged while some were absorbed by bigger banks. This led to the reduction in the number of Nigerian banks to 24, as of 31 December 2008.

Nigerian banks raised N406.4 billion from the capital market – out of which apex banks reckon with only N360 billion in a bid to meet the minimum capital requirement. According to Olowe (2011b), about USD652 million was raised from foreign direct investment, which

has led to increases in public awareness of the Nigerian stock market as an alternative source of income which can enlarge an asset base with the expectation that investors get a benefit in return, mostly in the form of a dividend payment. Since the increment in bank capitalisation, some banks have been merging and re-merging, and as of September 2015 only 18 commercial banks and 3 merchant banks remained functional – with only 15 quoted commercial banks on the Nigerian Stock Exchange. It will be interesting to evaluate the dynamics of Lintner's model in the Nigerian banking sector and to detect if it holds, as it was stated by Sanusi (2012) that banks in Nigeria will be allowed to implement democratisation of policy. Hence, Nigerian banks can institutionalise any dividend policy, and it is expedient to inquire whether the dividend payment of banks is from the real turnover as in Lintner's model or the false declaration of profit which is against the laid-down conditions of Section 381 of the Company and Allied Matters Act of 1990 (CAMA 1990) – which restricts the dividend payment by banks except all liabilities (fixed or current) and all other expenditure that has been catered for.

2.1 Literature Review

2.1.1 Optimal Dividend Payout Policy of Banks

The banking sector can be categorised mostly into three, and the optimal dividend payout policy of banks can be concluded based on the category the bank falls into. First, a bank that is experiencing a high growth rate is expected to maintain a zero payout, but will keep re-investing in positive and viable NPV projects because at that growth stage there are other measures such banks can use in signalling the market, apart from the payment of a dividend. At the growth stage of a bank, it is expected that it operates under a large market share and an adequate capital framework in which there are enough shareholders, and they are required to keep maintaining the investors' stake in the bank by the maximisation of their wealth. For banks operating on a normal scale, not growing and not declining in assets, they might decide to payout or to retain, as their board of directors chooses to maximise owner wealth and justify the entire bank's growth – and hence their optimal payout policy is undecided. Last, for a declining bank, following Gordon's approach to dividends that a dividend is a basis of establishing firms' share value, it is better for them to adopt a payout policy to invite potential investors. This is because the dividend they can see today looks more certain to invite them to purchase their shares, than capital gains which are futuristic and uncertain.

2.1.2 Empirical Review of Literature

The dividend decision is an important strategic financial decision in an organisation, which has long been an interesting research topic in financial economies. Gordon (1959) posits that the expected share price is expressed as a function of the dividend one year (D_1), and if such a company increases the payout ratio it is expected that D_1 would increase and invariably cause a rise in the share price because less cash would be available for re-investment plans meaning that the growth rate and corresponding share price will decline. Miller and Modigliani (1961) argue that dividends are irrelevant to the determination of the firm's share value under perfect capital market conditions. Conversely, Lintner (1962) and Gordon (1963) found that a dividend is relevant in maximising owner wealth. They found that there is a direct relationship between the market value of a firm and its dividend policy. Fama and Babiak (1968) tested the two-variable dividend model of Lintner (1956) in 392 major industrial firms in North America for the period 1946-1964. They found that Lintner's dividend model holds up fairly well in terms of explaining the dividend changes across the firms. Noe and Rebello (1996) examined the effect of managerial opportunism and

asymmetric information on firm payout and overall financing policies and found that restriction of dividends is the most preferred signalling mechanism by shareholders, followed by equity financing and by securities' under-pricing. In a study of the clientele effect of dividends by Pettit (1977), it was revealed that retired investors and pensioners tend to prefer dividend income, and therefore they prefer the established high payout ratio, and young and working-class shareholders are growth orientated and hence prefer dividend re-investment plans and a lower payout ratio. Aivazian et al. (2003) found that size significantly affects dividend policy, that dividends are negatively related to asset tangibility, and the higher ROE leads to more dividend payments. Olowe and Moyosore (2014) found that in Nigerian banks profitability, liquidity, retained earnings, revenue growth, size, loan-loss provision, debt-equity ratio, loan-deposit ratio and activity mix are the factors influencing dividend payout. Similarly, Obembe et al. (2014) found that market power, profitability and size of firms had a positive and significant effect on the dividend payment of Nigerian firms – suggesting that product market competition has a negative impact on the dividend payout of firms in Nigeria. Bassey, Asinya and Elizabeth (2014) found from two Nigerian commercial banks, that lagged dividend, current earnings, and lending rate were the major determinants of cash dividend payout – while inflation rate and liquidity ratio are not significant in terms of explaining the variation in dividend payout ratio. Yusuf and Muhammad (2014) examined the determinants of dividend payout ratio in Nigerian banks and found that of the variables examined, profitability, size, liquidity and leverage, and liquidity and profitability are the most critical determinants of the dividend payout of Nigerian banks. Finally, Nyor and Adejuwon (2013) examined what accounts for dividend policy in Nigerian banks, and found that profit after tax, and liquidity and shareholder funds (SHF) account for the dividend payout in banks Nigerian banks, but that liquidity is the most significant.

From the extensive review of literature (above), no study has been able to examine the dynamics of Lintner's model and to conclude whether it holds good in Nigerian banks' dividend payment process, using both the short- and long-run estimates. Thus, this study differs for previous studies in terms of examining Lintner's model in the Nigerian commercial bank dividend process – giving both the short- and long-run estimates via Panel-Auto Regressive Distributed Lag estimation.

2.2 Theoretical Underpinning

2.2.1 Bird in the Hand Theory of Dividends

According to the literature, most banks in Nigeria adopt the cash dividend payout policy and the shareholders view dividend income as safer and more certain than future capital gains, considering the time value of money. This theory was propounded by Lintner (1962) and finalised by Gordon (1963). This theory reveals the reasons for firms to payout dividend by arguing that shareholder uncertainty is reduced by the current dividend they receive, because it allows them to discount the firm's earnings at a minor rate and places increased value on the firm's share. Dividends paid as at when due are more reliable to the benefits generated from the re-investment plans (Gustav and Gairatjon, 2012). Conversely, if a firm decides to reduce or refuse to pay a dividend, the reverse will be true. The theory further suggests that a rational investor prefers to receive a dividend as it is a signal of the future performance of the firm, in that a bird in their hands is worth thousands in the bush. The Bird in the hand theory has been the main theory supporting a positive correlation between a dividend and the value of a firm, in that firms get a higher rating from the respective rating agencies than firms not paying out a dividend. This higher rating enables them to raise funds from the capital market easily, because creditors (loan institutions) will prefer disbursing loans to dividend-paying

firms with the assurance of their ability to meet financial obligations. In fact, these firms can borrow at preferential rates because of their higher ratings. Expressing 'bird in the hand' in financial terms means that shareholders prefer to invest in the shares of firms that pay a current dividend – than in firms that retain profits generated and delay dividend payment to the future due to unexpected future occurrences that make the degree of uncertainty about the fulfilment of future dividend payment and capital gain high.

3. Methodology

3.1 Research Designs, Scope, Data Description and its Sources

This study is entirely quantitative; therefore, it falls under the positivism paradigm and deductive approach. Data from all the 15 quoted banks on the Nigerian Stock Exchange (Zenith, Skye, Diamond, Guarantee Trust, Stanbic, Sterling, Ecobank, Enterprise, Unity, United Bank for Africa, First Bank of Nigeria, Access, Fidelity, Union and Wema Bank) were extracted from Bloomberg database for the period 2006Q01-2015Q04.

3.2 Lintner's Model Specifications

Following Lintner's model;

$$\Delta D_{it} = \beta_0 + c_i\left(D_{it}^{*} - D_{i(t-1)}\right) + U_{it} \ldots\ldots (i)$$

If $D_{it}^{*} = r_i Y_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (ii)$

If equation (ii) is substituted into equation (i)

$$\Delta D_{it} = \beta_0 + c_i\left(r_i Z_{it} - D_{i(t-1)}\right) + U_{it} \ldots\ldots\ldots (iii)$$

Following BODMAS,

$$D_{it} = \beta_0 + \beta_1 D_{i(t-1)} + \beta_2 Z_{it} + U_{it} \ldots\ldots\ldots\ldots (iv)$$

Where, $(1 - c_i)$ is β_1 and $c_i r_i$ is β_2 and they are both parameters.

Explicitly, β_0 is the intercept; D_{it} = current year dividend; $D_{i(t-1)}$ = the preceding year dividend; c_i is a parameter of (D_{it}^{*} minus $D_{i(t-1)}$); r_i is the he target payout ratio and Z_{it} is the profit after tax of the current period. i and t denotes the panel data form.

To include legal and regulatory factors that can affect dividend paying process in the Lintner model, tax, size and capital adequacy ratio are included as a control variable to avoid omission of germane variables, simultaneity bias and to ensure full explanation of Lintner model in the context of Nigerian banking sector;

$$D_{it} = a_0 + \beta_1 D_{i(t-1)} + \beta_2 Z_{it} + \beta_3 P_{it} + U_{it} \ldots\ldots (v)$$

Where P_{it} is the vector of the control variables: $Q_{1,}, Q_2 and Q_3$

$$D_{it} = a_0 + \beta_1 D_{i(t-1)} + \beta_2 Z_{it} + \beta_3 Q_{1it} + \beta_4 Q_{2it} - \beta_5 Q_{3it} + U_{it} \ldots\ldots\ldots\ldots\ldots (vi)$$

Conclusively;

$$DPR_{it} = \beta_0 + \beta_1 DPR_{i(t-1)} + \beta_2 \log PAT_{it} + \beta_3 ETA_{it} + \beta_4 SIZ_{it} - \beta_5 TAX_{it} + U_{it} .....(vii)$$

A priori Expectation

$\beta_{1,}, \beta_2, \beta_3 and \beta_4 > 0$, while $\beta_5 < 0$ following the past empirical literatures

Model specification in P-ARDL form:

$$\Delta DPR_{it} = a_0 + \sum_{r=1}^{z} \beta_{1r} \Delta DPR_{i(t-r)} + \sum_{r=0}^{z} \beta_{2r} \Delta \log PAT_{i(t-r)} + \sum_{r=0}^{z} \beta_{3r} \Delta ETA_{i(t-r)} + \sum_{r=o}^{z} \beta_{4r} \Delta \log SIZ_{i(t-r)} -$$

$$\sum_{r=0}^{z} \beta_{5r} \Delta TAX_{i(t-r)} + \lambda_1 DPR_{i(t-1)} + \lambda_2 \log PAT_{i(t-1)} + \lambda_3 ETA_{i(t-1)} + \lambda_5 \log SIZ_{i(t-1)} -$$

$$\lambda_5 TAX_{i(t-1)} + u_{it} .....(viii)$$

3.3 Definition and Measurement of Variable

Table 1: Variable Description

Variables	Data Point	Data Sources	Measurement
Dividend Payout Ratio (DPR)	Percentage	Bank Scope	$\frac{Totaldividend}{TotalEarningsaftertax} * 100$
Profit After Tax (PAT)	USD	✓	Natural logarithm of Profit After Tax
Tax ratio (TAX)	Percentage	✓	$\frac{TaxPaid}{\Pr e - taxincome} * 100$
Bank Size (SIZ)	USD	✓	Natural logarithm of Total Asset
Capital Adequacy Ratio (ETA)	Percentage	✓	$\frac{Totalequity}{Totalasset} * 100$

3.4 Estimating Technique

Panel-ARDL is used in this study. It is also referred to as the Pool Mean Group. Panel Auto Regressive Distributed Lag was finalised by Chudik and Pesaran (2013). It is a technique that shows both long- and short-run estimates without disparity in the stationary level of data, as to whether I (0), I (1) or fractionally integrated at I (2) make it more suitable than the conventional techniques giving restrictions to the order of variables. P-ARDL only disagrees when all the variable are at I (2). It is a technique that avoids the bias of pre-test results, as the literature has concluded that various unit-root tests gives various results (Akinlo, 2006; Sharifi-Renani, 2007), it allows for sufficient lag selection based on the lag selection criterion in the modelling framework, and, according to Gerni et al. (2013), it can accommodate more than six (6) explanatory variables. Moreover, Lintner's model is dynamic in nature, and hence we adopt the Chudik and Pesaran (2013) Panel-ARDL model because our series is stationary at I(0), I(1) and fractionally at I(2), this study quest to test for the dynamism of Lintners' model in Nigerian banks.

4. Data Analysis and Model Estimation

4.1 Pre-Testing of Data

4.1.1Unit Root Testing

Table 2

Levin Lin and Chu, Im Perasan and Shin and Madala and Wu (PP) Fisher-type unit root tests

Variable	Levin, Lin, Chu (individual intercept)			Levin, Lin, Chu (intercept and trend)		
	Order	*t* Stat*	*Prob-Value*	*Order*	*t* Stat*	*Prob- Value*
DPR	I(1)	-7.01215	0.0000***	I(1)	-4.24340	0.0000***
PAT	I(0)	-6.90129	0.0000***	I(0)	-4.98360	0.0000***
TAX	I(0)	-7.53646	0.0000***	I(1)	-4.96423	0.0000***
ETA	I(0)	-2.39786	0.0082****	I(0)	-1.33205	0.0914*
SIZ	I(0)	-1.91653	0.0276***	I(1)	-6.76189	0.0000***
Variables	IPS Unit-root test (individual intercept)			IPS Unit-root test (intercept and trend)		
	Order	*t* Stat*	*Prob-Value*	*Order*	*t* Stat*	*Prob- Value*
DPR	I(0)	-2.57110	0.0051***	I(1)	-12.5040	0.0000***
PAT	I(0)	-4.69628	0.0000***	I(0)	-2.98651	0.0014***
TAX	I(0)	-3.60560	0.0002***	I(1)	-1.49537	0.0674*
ETA	I(0)	-4.81545	0.0000***	I(0)	-4.36626	0.0000***
SIZ	I(0)	-4.19264	0.0000***	I(1)	-2.33817	0.0097***
Variables	PP Fisher-type Chi Square Unit root-test (individual intercept)			PP Fisher-type Chi Square Unit root-test (intercept and trend)		
	Order	*t* Stat*	*Prob-Value*	*Order*	*t* Stat*	*Prob- Value*
DPR	I(0)	58.0498	0.0016***	I(1)	75.2741	0.0000***
PAT	I(0)	97.2070	0.0000***	I(0)	56.3339	0.0024***
TAX	I(0)	55.3832	0.0032***	I(1)	85.3832	0.0000***
ETA	I(0)	56.4136	0.0024***	I(1)	100.012	0.0000***
SIZ	I(0)	99.1673	0.0000***	I(0)	62.1315	0.0005***

Source: Authors' computation (2017) using E-views 9.5 Statistical Package. "***", "**" and "*" represents 1%, 5%, and 10% significant level respectively.

We conducted different unit-root tests to establish the true nature of our data. The tests conducted were: Im, Pesaran and Shin (IPS); Levin, Lin and Chu (LLC); and the Madalla and Wu (1999) Fisher-type (PP) unit-root test. These three approaches were used to ensure consistency via comparison and validation of their results, as it has been posited by Akinlo (2006) that different tests give different results depending on their strength (see, also: Moon & Perron, 2004; Frimpong, 2012). The results show that our data are stationary at I (0) and I

(1) which agrees with the postulations of Sharifi-Renani (2007) and Giles (2013) that ARDL can accommodate variables stationary at level I(0), order one I(1) and fractionally integrated I(2) – but not when all the variables are at I(2).

4.1.2 Test for Cross-Sectional Dependency

This test is conducted to detect any cross-sectional dependency across our subjects – to establish there is no evidence of any common factors influencing the 15 banks.
The benchmark hypotheses that are tested in the cross-sectional dependence tests are:

$H_0 : \sigma = 1$, that is there is no correlation of the residuals (stochastic error term, u_{it}.).

$H_1 : \sigma \neq 1$, that is there is correlation of the residuals (stochastic error term, u_{it}.).

Acceptance rule: Accept H_0 when the P-Value is less than 5%.

Reject H_0, when the P-Value is greater than 5%.

The Pesaran-Scaled LM, Breusch-Pagan LM, Pesaran and the Bias-Correlated Scaled LM cross-sectional dependence tests revealed there are no common factors affecting the 15 subjects, and hence no cross-sectional dependence in our data. From the tests conducted, the null hypothesis was accepted due to the significance level of all the variables across all the tests at 1%. This study rejects the alternative hypothesis (H_1) that there is a correlation of residual in Nigerian banks using the Lintner model, and therefore accepts the (H_0) that there is error-term (residual) correlation in our model.

4.1.3. Optimal Lag Selection

Table 3: Lag Length Selection Criteria

Lag Lengths	AIC	SBC
3,3*	-5.384601*	-3.467208
2,3	-5.055898	-3.727868
2,2	-5.055898	-3.727868

Source: Authors' computation (2017) using E-views 9.5 Statistical Package

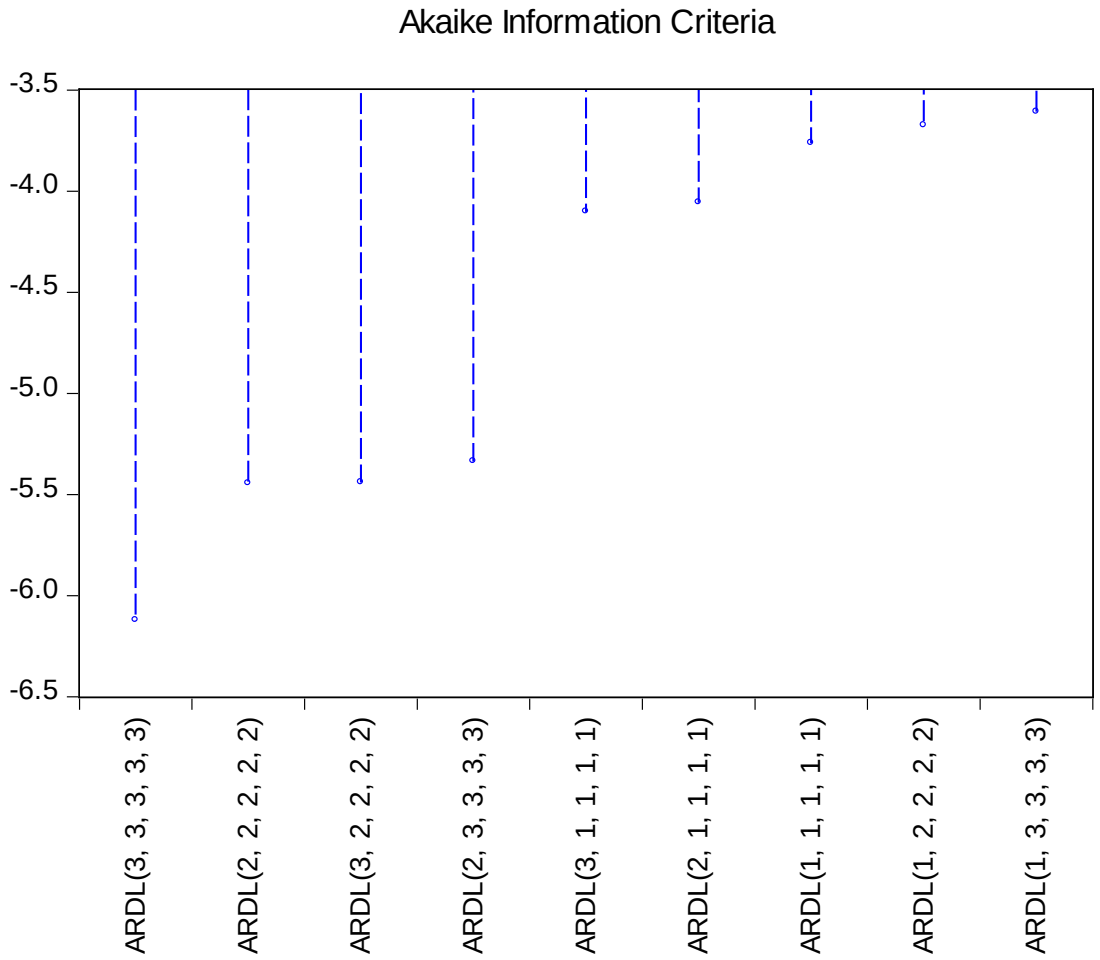
The optimal lag determination is done using the Akaike Information Criterion and the Schwarz Bayesian Criterion, which are the common criteria used in panel estimations (see Raza et al., 2015). The rationale is to select the model with the least AIC and SBC, as it is the best model. Based on this rationale, this study will base the final judgement of model selection on the AIC, due to the large number of observations and the model selected for discussion is the model with the number of lags that gives the least AIC.

4.1.4 Depicting the Strength of the P-ARDL Regression Model

To know the strength of the Akaike Information Criterion (AIC) model selection summary over other selection criteria models like the Schwarz criterion and Hannan-Quinn criterion, the criteria graph is used to depict the top Nine (9) different P-ARDL models – choosing the best model based on the benchmark analysis favouring the model with the least value of AIC as the best model. As shown in Figure 1 (above), the first ARDL (3, 3, 3, 3, 3) model appears to be the best model to be strongly preferred over other models, as it gives the lowest most

negative (-6.15) value of the Akaike Information Criterion. In addition, the P-ARDL model (2, 2, 2, 2, 2) and (3, 2, 2, 2, 2) appear to be second as they recorded a -5.4 value concurrently, followed by model (2, 3, 3, 3, 3) that comes fourth with a -5.3 value as indicated by its own generated criteria graph.

Figure 1: The Strength of the Model Selection Summary



Source: Authors' computation (2017) using E-views 9.5 Statistical Package

4.2 Interpretation of P-ARDL estimations

Table 4: Panel-ARDL Dynamic Regression for Short-run and Long-run Estimates

Dependent Variable: D(DPR)				
Method: P-ARDL				
Sample: 2006Q01-2015Q04				
Model selection method: Akaike Information criterion (AIC)				
Automatic Selection of 3 lags for dependent and 3 lags for regressors				
Selected Model: ARDL (3, 3, 3, 3, 3)				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.**
Long-Run Estimates				
PAT	-0.184000	0.036200	-5.082860	0.0000***
ETA	2.826967	0.778424	3.631656	0.0003***
SIZ	0.272697	0.051785	5.265957	0.0000***
TAX	0.040975	0.011867	3.452801	0.0006***
Short-Run Estimates				
COINTEQ01	-0.091545	0.032097	-2.852131	0.0046***
D(DPR(-1))	0.669965	0.114450	5.853804	0.0000***
D(DPR(-2))	0.133499	0.089408	1.493143	0.1364
D(PAT)	-0.246046	0.255812	-0.961825	0.3369
D(PAT(-1))	0.025020	0.157516	0.158845	0.8739
D(PAT(-2))	0.155398	0.136047	1.142235	0.2543
D(ETA)	1.192040	5.095915	0.233921	0.8152
D(ETA(-1))	-3.524871	2.392357	-1.473389	0.1417
D(ETA(-2))	-2.595802	1.186491	-2.187798	0.0294**
D(SIZ)	0.701149	0.780013	0.898894	0.3694
D(SIZ(-1))	-0.625808	0.335664	-1.864391	0.0632*
D(SIZ(-2))	-0.460368	0.181894	-2.530970	0.0119***
D(TAX)	-0.377683	1.288094	-0.293211	0.7696
D(TAX(-1))	-0.199543	0.710030	-0.281034	0.7789
D(TAX(-2))	0.099643	0.236463	0.421389	0.6738
C	-0.050622	0.029595	-1.710478	0.0882*

Source: Authors' computation (2017)

using E-views 9.5 Statistical Package. "***", "**" and "*" represents 1%, 5%, and 10% significant level respectively.

From Table 4, in the short-run estimation, past year dividend (DPR (-1)), capital adequacy ratio (ETA (-2)), and bank size (SIZ (-1) and SIZ (-2)) are statistically significant, while profitability is insignificant. This signifies that Lintner's model does not hold looking at the short-run estimate for Nigerian banks during the years under study. The significance of past year dividend confirms Agyei (2011), Eriotis (2011), Ibrahim and Shaibu (2016), and Lintner (1956). From the long-run estimate, all the variables examined are found to be significant at 1%, and this signifies that Lintner's model holds in the Nigerian bank dividend payment process in the long run. Profitability is contrary to the postulations of Lintner's model and our *a priori* expectation with the negative relationship it has with the dividend payment ratio. This can be a result of the political unrest, economic hardship and recession state of the country – such that the commercial banks, in a bid to survive, re-invested their surplus

earnings in viable investments to serve as a cushion for the low returns they get from their operational activities, to enhance their ability to bear the burden of the huge operational costs unharmed and without the capital adequacy of the bank being jeopardised during such harsh economic times. The negative relationship of profitability is like the findings of Yusuf and Muhammed (2014), Abdella and Manual (2016), and Maladjian and El Khoury (2014). Similarly, the taxation ratio (TAX) does not align with the *a priori* expectation in the long run, and it has a positive and highly significant effect on the dividend payment ratio of banks in Nigeria. An increase in tax remission by commercial banks in Nigeria leads to a 4% increase in the dividend payment in the long run, while a 1% increase in taxation leads to about a 37% decrease in dividend payout in the short run. Because of the time value of money, immediate tax payment has a greater capital cost compared to the same amount of tax paid in the future period. The dividend decision in banks is an integral part of the entire operating decision because of its explicit relationship with the other two crucial decisions (investment and financing decision). Banks are liable to pay corporate taxation and it influences the decision-making on dividend payment in diverse ways. Taxation influences the after-tax- earnings of the bank, which invariably determines the bank's dividend paying, and conversely it has implications for the shareholders by reducing their net dividend value. The rate of corporate tax plays a crucial role in determining the dividend declaration, distribution, and even the entire dividend policy adopted by the bank. However, tax will reduce the dividend ratio, as dividend income suffers from the incidence of double taxation. The negative relationship confirms the Tax Preference Theory of Litzenberger and Ramaswamy (1979) and Amidu and Abor (2006). While the positive sign in the long run confirms the findings of Datta et al. (2000) and implies that the higher the earnings of a bank, the higher the corporate tax - so also the higher dividend-paying banks pay out dividend because a higher taxation is a signal of higher profitability of the bank. Also, capital adequacy (ETA) and bank size (SIZ) are directly related to the dividend payment ratio in Nigerian banks and concurs with the study by Theis and Dutta (2009) on US banks, and that of Olowe and Moyosore (2014) on Nigerian banks. This implies that an adequately capitalised bank with a large asset base (size) will operate on large economies of scale, and the corresponding payout will be higher since the dividend payout ratio, according to Lintner (1956), is a proportion of earnings generated by the paying company.

Also from Table 4, the negativity and significance of the default parameter estimate of the short-run coefficient (COINTEQO1) of -0.091545 met our expectation (otherwise there will be no proper co-integration among the variables). However, it was found that the variables with negative effects are unstable and reduced at the long run estimate to only profitability (PAT) – while others changed to positive effects. Whenever the ECT (-1) is negative and significant, there is evidence of co-integration among the variables, and hence the need to test for co-integration among these variables.

4.3 The Panel-ARDL Co-integration Analysis

Table 5: The Panel-ARDL Wald Testing Result

Wald Test			
Equation: P-ARDL			
Test-Stat	*Value*	*DoF*	*Prob-Value*
F-statistic	9.127044	(4,304)	0.0000***
Chi-square	36.50817	4	0.0000***

Source: Authors' computation 2016 using E-views 9.5 Statistical Package. "***", "**" and "*" represents 1%, 5%, and 10% significant level respectively.

The presence of co-movement among the variables is determined via the Wald test. From the result of the Wald test in Table 5, the P-Value is less than 0.01, depicting that at 1% the variables are statistically significant, and hence the study rejects the null hypothesis of no evidence of co-integration (that is, $H_0 : C(1) = C(2) = C(3) = C(4) = 0$) and accepts the alternative hypothesis that there is a long-run co-movement among the variables explored in Nigerian bank dividend payout ratio model (that is $H_0 : C(1) \neq C(2) \neq C(3) \neq C(4) \neq 0$). The The F-statistic value of 9.127044 is higher than the upper band level of (4.85) at the 5% level set by Pesaran and Pesaran (1997: 478). The significant and positive F-statistics' value indicates a long-run co-movement among the variables in the model.

4.3.1 P-ARDL Error Correction Model

Table 6: Error Correction Coefficient

Variable	*Coeff*	*Std. Error*	*t-Stat*	*Prob-Value*
ECT (-1)	-0.445551	0.962837	-0.462748	0.0000***

Source: Authors' computation (2017) using E-views 9.5 Statistical Package. "***", "**" and "*" represents 1%, 5%, and 10% significant level respectively.

Using the ECM, the study investigates both the short-run and long-run estimates of the chosen model. The Error Correction Term (ECT) shows the speed of adjustment, fast or slow, at which all the variables in the model can go back to equilibrium. The rationale for ECT is that it must be less than 1, negative and statistically significant. As shown in Table 6, ECT with a negative coefficient reveals that there was disequilibrium in the past periods and that the adjustment to the equilibrium is in the right direction at the long run. The ECT value of -0.445551 at 1% suggests the moderate speed of adjustment from the short-run deviation to the long-run equilibrium of the dividend payout ratio in Nigerian commercial banks. This indicates that about a 45% deviation from the long-run determinants of the payout ratio of Nigerian banks is corrected quarterly. Moreover, the ECT is statistically significant at the 1% level – indicating that a long-run equilibrium among these determinants is achievable. Our findings concur with Waliullah and Rabbi (2011) who affirmed that a highly significant and negative ECT is further proof that there is a stable, long-run relationship among the variables.

4.4 Tests for Short-Run Causality in the Nigerian Bank Lintner's Model

H_0 : there is no short run causality between selected regressors and the dependent variable.

H_1 : there is short-run causality among selected regressors and the dependent variable.

The Decision rule: Accept the null hypothesis (H_0) when the P-Value is greater than 5%

Reject the null hypothesis (H_0) when the P-Value is less than 5%

Table 7: Short-Run Causality Test

Wald Test			
Equation 1: P-ARDL, Ho: C (1) = C (2) = 0			
Test Stat	*Value*	*Degree of Freedom*	*Prob-Value*
F-stat	10.32404	(2,379)	0.0000***
Equation2: P-ARDL, Ho: C (2) = C (3) = 0			
F-stat	8.293980	(2,379)	0.0003***
Equation3: P-ARDL, Ho: C (3) = C (4) = 0			
F-stat	7.240718	(2,379)	0.0008***
Equation4: P-ARDL, Ho: C (2) = C (4) = 0			
F-stat	7.355177	(2,379)	0.0007***
Equation5: P-ARDL, Ho: C (1) = C (3) = 0			
F-stat	8.588667	(2,379)	0.0002***

Source: Authors' computation (2017) using E-views 9.5 Statistical Package. "***", "**" and "*" represents 1%, 5%, and 10% significant level respectively.

This section seeks to detect if pairs of explanatory variables will jointly cause the dividend payment ratio of Nigerian banks, using the Wald test with a null hypothesis of no short-run causality among the variables. From Table 7, equation 1 combines profit after tax (PAT) and capital adequacy ratio (ETA); equation 2 combines capital adequacy ratio (ETA) and bank size (SIZ); equation 3 combines bank size (SIZ) and taxation (TAX); equation 4 combines the regulatory and statutory factors [capital adequacy ratio (ETA) and taxation (TAX)]; and equation 5 combines profitability (PAT) and bank size (SIZ). We found that all the tests are statistically significant at 1%, and therefore reject the Ho that there is short-run causality of the different pairs of variable and the Nigerian bank dividend payment ratio. This means that all these pairs can jointly cause banks' payout policy in Nigeria.

5. Conclusions

This study examined the well-known Lintner's model in the fifteen (15) quoted Nigerian banks – with the inclusion of the regulatory factor (capital adequacy) and the statutory factor (taxation) as a control variable, for the period 2006Q01 to 2015Q04. The empirical results differ from the contentious findings on some of the variables by past researchers in Nigeria, using a technique that shows both the long- and short-run estimates concurrently. First, our findings from the long-run estimation are that all the variables are statistically significant at 1%, revealing evidence of long-run relationship among profitability, capital adequacy ratio, size, tax and dividend payout ratio in commercial banks of Nigeria – and that Lintner's model holds good during the period under review.

Second, there is a consistent and balanced relationship in terms of implementing and adopting Lintner's model in the dividend payment process of Nigerian banks, due to the negative sign

and significant value of the ECT in the P-ARDL ECM model. The ECM reveals a directional relationship between the dividend payout ratio and the examined Lintner's model factors in the Nigerian banking sector – such that these variables co-move in the long run with 45% speed of adjustment to the equilibrium.

Third, it was revealed that with Lintner's model being a dynamic model to be estimated in the Nigerian banking sector, the optimal lag structure following Akaike Information Criteria is 3, and with this optimal lag structure and all the Nigerian Lintner model variables paired together it can jointly cause a dividend payout ratio in the short run, with the Wald test of each pair being statistically significant at 1%. Moreover, the negative effect of profitability on the payout ratio can be traced to the ongoing economic down-turn that is affecting the Nigerian economy – such that banks are diverting their excess inflow to withstand the harshness and effect of the poor economic situations on the operational efficiency of the banks, so that the asset base of the banks is not jeopardised. We also conclude that the preceding year dividend is the most important factor explaining the actual year dividend from the short- and long-run estimates. Therefore, Lintner's model holds good for the Nigerian banks at the long run and we recommend that for these banks, whenever they choose a dividend payout policy, Lintner's model should be strictly followed in terms of carrying out the dividend payment process, to enhance the information content of the dividend to the public.

6. Likely Areas for Further Study

Our study was only conducted on the 15 quoted commercial banks out of the 21 functioning commercial banks in Nigeria. Further research could be conducted using all commercial banks with an extended period – to test whether Lintner's model still holds in their dividend payment process. Also, further studies could focus on other dividend models like Pettit's model, Charest's model, Britain's model and Darling's model – in the Nigerian banking context – to compare with Lintner's model, which has been regarded as the best model explaining the dividend-setting process.

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