Electronic Payment Paradigm and Price Earnings Ratio of Financial Institutions in Nigeria

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Abstract:
The collective growth of information and communication technology has conveyed many accomplishments to mortal civilization, influencing the lives of people, behaviours and societal measures. The digital economy, electronic commerce and electronic banking are now being used by the new technologies and the wider global network, especially internet, within and outwardly. The aim of this study is to investigate and analyze empirically the relationship between electronic payment paradigm and price earnings ratio of financial institutions Nigeria. Data on different types of electronic payment paradigm and price earnings ratio from 2007-2018 were collected from central bank of Nigeria statistical bulletin, annual reports of the financial institutions and federal inland revenue service. Descriptive statistics, ordinary least square regression analysis, Jarque-Bera test, Stationarity test, fixed effect regression, random effect regression, diagnostic test, Lag range multiplier test, panel error correction model, cointegration test and stacked pair-wise Granger Causality test were used for analysis of collected data with the aid of E-view version 10. The empirical indicate that electronic payment paradigm relate significantly to price earnings ratio; explaining about 81.3% of the variation in price earnings ratio, automated teller machine, point of sale were each found to significantly relate to performance of financial institutions in Nigeria. The empirical study conclude that electronic payment paradigm has the potency to make significant contribution to price earnings ratio and recommends that Financial Institutions need to establish more electronic payment facilities for instance banks should install more automated teller machine cards machines to improve the effectiveness of credit cards since it’s the most common payment method preferred by clients. Similarly internet facilities should be extended to both branches and stations. Massive sensitization campaigns to enrich the public about the existing electronic payment methods in financial institution since the public seem not to be aware of electronic payment methods that exist in these financial institutions and how significant they are in business transaction.

Keywords: Price Earnings Ratio, Financial Institutions, Performance, Automated Teller Machine and Point of Sale.

Introduction
The new millennium brought with it new possibilities in term of information access and availability simultaneously, introducing new challenges in protecting sensitive information from intruders while making it available to others. Today’s business environment is extremely dynamic and experience rapid changes as a result of technological improvement, increased awareness and demands banks to serve their customers electronically. Banks have traditionally been in the forefront of adopting technology to improve their products and services (Akhisar., Tunay & Tunay, 2015; Bilgihan, 2016; Hamidianpour., Esmaeilpour & Dargannvard, 2016; Adeniron & Junaidu, 2017; Gerpott, 2017; Enoruwa, Ezuem & Nwani, 2019; Nwaiwu, 2020).

The banking industry of the 21st century operates in a complex and competitive environment
characterized by these changing conditions and highly unpredictable economic climate. Information and communication technology is at the centre of this global change curve of electronic banking system in Africa today (Hastomo & Aras, 2018; Ibanichuka & Oko, 2019; Jumba & Wepukhulu, 2019). Assert that they have over the time, been using electronic and telecommunication networks for delivering a wide range of value added products and service, managers in banking industry in Nigeria cannot ignore information systems because they play a critical influence in current banking system, they point out that the entire cash flow of most fortune banks are linked to information system.

Strikingly, the application of information and communication technology concepts (Le., Vu., Du & Tran, 2018; Madaku, 2018), techniques (Mustapha, 2018; Nithin; & Jijin & Baiju, 2018), policies (Njeru & Omaywa, 2018; Ogutu & Fatoki, 2019) and implementation strategies to commercial banking services has become a subject of fundamental importance and concerns to all banks and indeed a prerequisite for local and international competitiveness banking (Oju & Onyebuka, 2015; Okello, 2016). The advancement in technology has played an important role in improving service delivery standards in the banking industry. In its simplest form, automated teller machine (ATM) and deposit machines now allow consumers carry out banking transactions beyond banking hours. With online banking, individuals can check their account balances and make payments without having to go to the bank hall. This is gradually creating a cashless society where consumers no longer have to pay for all their purchases with hard cash hence improving customer relationship management system. For example, bank customers can pay for airline tickets and subscribe to initial public offerings by transferring the money directly from their accounts, or pay for various goods and services by electronic transfers of credit to the sellers account. As most people now own mobile phones, banks have also introduced mobile banking to check their account balances and make fund transfers using their mobile phones to enhance their financial performance.

Financial Performance is a subjective measure of how well an enterprise uses assets from its primary mode of business and generates revenues. This term is used as a general measure of a firms overall financial health over a given period of time and can be used to compare similar firms across the same industry or to compare industries in aggregation. Financial performance can also be viewed as the level of performance of a business over a specified period of time, expressed in terms of overall profits or losses. The financial performance valuation of a business allows the decision makers to judge the results of business strategies and activities in objective and monetary terms. Of late, financial performance is used to describe the state of affairs of a firm. In analyzing firm financial performance, emphasis should be made in formulating an adequate description of the concept of financial performance which uncovers the different dimension upon which financial performance should be evaluated. In terms of measurement, several scholars measures financial performance differently. Ucidioloe (2018) measured financial performance by return on equity (ROE) as the proportion of profit after tax to issued share capital and return on capital employed (ROCE) as the proportion of profit after tax to issued share capital plus reserves Abbasi and Weigand (2017) measured financial performance by return on asset and profit margin. Adeniran and Yunaidu (2017) measured financial performance as the net income to total assets, ordinary income to total assets. Aronyosssy (2018) measured financial performance as return on asset and price earnings ratio. Price earnings ratio, one of the most widely sued tools for stock selection, a relative valuation technique which always remained as a center concern of investors and market analysts. Variations of price earnings ratio have significant effect on investor’s perception and several factors are responsible for the variations of price earnings ratio (Gerpott, 2017; Enoruwa, Ezuem & Nwani, 2019; Nwaiwu, 2020). The pricing earnings ratio is probably the most frequently sue in the investment community. Theory and previous empirical research indicates
that although a host of financial variables including risk, payment and leverage account for differences in price earnings ratio of corporate entities, the precise manner in which these expectations are formed by the company is unclear, historical growth rates, recent earnings and other corporate announcements and market forecasts at the economy – wide and industry levels are believed to be significant. Extensive empirical literature widely exists between electronic payment methods and price earnings ratio, there empirical results are rather mixed and sometime controversial (see, for example, Le., Vu., Du & Tran, 2018; Madaku 2018). Unfortunately, the empirical assessment of the relationship between electronic payment methods and firm performance in Nigeria has been sparse (see Njeru & Omanwa,2018; Ogutu & Fatoki, 2019). Interestingly, it is generally conceded that the empirical nature of this relationship between electronic payment methods and firm performance remains a major concern.

Although the aim of this empirical paper is to offer empirical evidence on the relationship of variations in electronic payment paradigm and price earnings ratio of financial institutions banks in Nigeria, and not to derive a set of definitive policy implications, some general principles nevertheless emerge from the analysis about how Nigeria can increase the benefits from, and control the contradictions arising from the mixed empirical results in earlier studies. We really seek to mitigate the contrasting evidence by using a broader sample, adopting various firm performance measures which utilize price earnings ratio and applying rigorous methodologies then earlier Nigerian studies. The rest of the paper proceeds as follows. Section 2 develops the theoretical framework, reviews the related theoretical and empirical literature on electronic payment methods and firm performance, and specifies the hypotheses of the study. Section 3 describes the methodology; section 4 discusses the results, while section 5 ended with concluding remark, recommendations, limitation and suggestion for further studies emanating from the study.

Theoretical Literature and Hypotheses Development Level

There is as yet no consensus on theoretical propositions on propensity towards electronic payment channel and financial institutions. Consequently, electronic payment channel has been studied from different theoretical perspectives, with conflicting and inconclusive evidence. Nwiwu (2020) claim that economic theory’s such as transactions cost economics theory are sketched immediately to provide sufficient rationale for electronic payment channel. Transaction cost economics theory was postulated by Williamson (1981) states that transaction costs arise every time a product or service is being transferred from one stage to another, where new sets of technological capabilities are needed to make the product or service.

It further states that the transaction costs related to the exchange of resources with the external environment could be reflected by environmental uncertainty, opportunism, risks, bounded rationality, core company assets. These factors above will all potentially increase the external transaction costs, where it may become rather expensive for a company to control these factors. Therefore, it may very well be more economical to maintain the activity in-house, so that the company will not use resources on e.g. contracts with suppliers, meetings and supervision. Therefore, if companies see the environmental uncertainty as high, they might choose to not outsource or exchange resources with the environment. This theory supports the influence transaction costs on the financial performance.

Firms intending to adopt e-payments must choose between two options that is to purchase a e-payment system from the vendors or to build its own e-payment system to reduce its operational costs. The first option is considered as “a market based” mechanism in which organizations try to find the best product in the market to suit their needs. This option shows that the transaction costs include the costs of finding information on cost and acceptability of best payment system for the firm. The second option can be called “vertical integration” in that all costs of building the payment platform press on the organization through hierarchical means.

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Notwithstanding the tremendous impact of Transaction costs theory, its assumption has been subjected to multiple criticisms. For example, the assumption of resourcefulness has been criticized for ignoring that human actions influence organizational decisions and that not all decisions will be the same where the resources are the same. (Granovetter, 1985). Williamson responded by re-stating that in his model, opportunism or bounded rationality may differ from person to person much as personality or intelligence do, but when transaction costs change they do so because of changes in the environment, not in the person (Williamson, 1993a,b). From the above theories, the researchers have failed to recognize the Diffusion of Innovation Theory and Technology Acceptance Theory/Model (TAM), in addition to Agency Theory.

Conceptualizing electronic payment paradigm. In the last two decades, electronic payment paradigm have attracted much attention from researchers and information system designer due to their vital role in modern electronic commerce. This led to wide and in-depth researches that produced different perspectives on e-payment definitions from different perspectives ranging from scholars in the field of accounting and finance, business technology to those in information systems. For instance, Dennis (2004) defined e-payment system as a form of financial commitment that involves the buyer and the seller facilitated via the use of electronic communications. Also, Briggs and Brooks (2011) sees e-payment as a form of inter-connections between organizations and individuals aided by an entities and inter-switch houses that enables monetary exchange electronically.

In another perspective, Peter and Bababtunde (2012) viewed e-payment system as any form of fund transfer via the internet. Similarly, according to Adeoti and Osotimehin (2012), electronic payment system refers to an electronic means of making payments for goods and services produced online. Another definition suggests that e-payment systems are payments made in electronic commerce environment in the form of money exchange through electronic means (Kur & Pathak, 2015). Furthermore, Kalkola and Whinston (1997), sees electronic payment as a financial exchange that takes place online between the seller and the buyer. Moreover, Humphrey and Hancock (1997) are in the opinion that electronic payments refers to cash and associated transactions implemented using electronic means. E-payment is also defined as payment by electronic transfer of credit card details direct credit or other electronic means other than payment by cheque and cash (Agimo, 2004).

Antwi., Hanza and Bavoh (2015) defined e-payment as a payer’s transfer of a monetary claim on a party acceptable to the beneficiary. Lin and Nguyen (2011) define e-payment as payments made via the automated clearing house, commercial card systems and electronic transfers. Shon and Swatman (1998) defined e-payment as any exchange of funds initiated via an electronic communication channel. Gans and Scheelings (1999) define e-payment as payments made through electronic signals link directly to deposit or credit accounts. Hord (2015) also sees e-payment as any kind of non-cash payment that does not involve a paper cheque. Also, Tech., Chong., Lin and Chua(2013) viewed e-payment as any transfer of an electronic value of payment from a payer to payee through an e-payment channel that allows customers to remotely access and manage their entity’s accounts and transactions over an electronic network. In a nutshell, going by the above definition as a collection of components and processes that enables two or more parties to transact and exchange monetary value via electronic means.

### Transaction costs
Search costs are one facet of transaction costs or switching costs. Rational consumers will continue to search for a better product or service until the marginal cost of searching exceeds the marginal benefit. According to Aranyossy (2018) costs of searching are divided into...
external and internal costs. External costs include the monetary costs of acquiring the information, and the opportunity cost of the time taken up in searching. Internal costs include the mental effort given over to undertaking the search, sorting the incoming information, and integrating it with what the consumer already knows. Internal costs are determined by the consumer’s ability to undertake the search, and this in turn depends on intelligence, prior knowledge, education and training. These internal costs are the background to the study of bounded rationality.

Bargaining and decision costs are costs required to come to an acceptable agreement with the other party to the transaction and includes contract costs. These costs depend on the bargaining power of the firm. According to Bertonèche and Knight (2013) large firms tend to have a higher bargaining power compared to small and medium sized companies. This in turn leads to lower transaction costs for large supermarkets and therefore lower payment charges compared to the small supermarkets.

Policing and enforcement costs are the costs of making sure the other party sticks to the terms of the contract, and taking appropriate action if this turns out not to be the case. Enforcement costs are fixed in the sense that they do not depend on the number of individuals who commit harmful acts while other costs are variable they rise with the number of such individuals. Bertonèche and Knight (20013) report that optimal fine rises to reflect variable enforcement costs and that the optimal fine is not directly affected by fixed enforcement costs and that the optimal probability depends on both types of enforcement costs.

Performance of Financial Institutions

By Financial Institutions performance, it generally implies whether a bank has faired well within a trading period to realize its objectives. The document used in this evaluation is published financial statement. Nikolai and Bazlay (1997), posit that the amount of net income earned in relation to total assets is an indicator of how efficiently a company uses its economic resources. They further stressed that when ROE is higher than ROA, the company has favourable financial leverage.

According to Rose (2001), a fair evaluation of any bank’s performance should start by evaluating whether it has been able to achieve the objectives set by the management and stakeholders. Performance objective comprises of three basic indices for any banking institution namely: profitability objective, liquidity objective and growth objectives: This study will anchor on Return on Equity (ROE) and Return on Assets (ROA) for all-inclusive measure. Also, market indicator such as stock prices and its behaviour are deemed to reflect the financial performance of a firm, which may not be reliable as a result of capital market volatility. However, the size of a bank, deposit volume and its profitability could be deemed as more reliable performance indicators. The study by Abenewe, Ogbulu and Ndugbu (2002), proxy performance using return on asset (ROA) and return on equity (ROE). However, it is important to note that firms’ profitability is not the only performance indicator of an organization. For the purpose of this study, profitability indicators, precisely, Return on Equity, (ROE), Return on Assets (ROA) Price Earnings Ratio(P/ER) are widely acceptable measure for corporate performance, hence employed in this study. Performance can be described as a measure that reveals the position of an organization. It helps to tell how far and well an organization has improved in terms of its profitability as a result of its services delivery. Performance of a business can be identified using different proxies. Thus, studies like that of Ibukunle and James (2012), Olorunsegun (2010) and some others have identified performance in a different perspective; productivity, increase in sales, cost reduction, competitiveness, efficiency and effectiveness. Based on the above, the study makes a conclusion that performance of a business can be measured with any of these; profitability ratios, growth rates and profit margins. Consequently, the study measures banks’ performance using return on assets (ROA) which is consistent with that of Abaenewe et
al (2013). This profitability measure checks the managerial efficiency in the usage of the business assets to turn over and profit-objective.

**Price to Earnings Ratio**

The price-to-earnings ratio (P/E ratio) is the ratio for valuing a company that measures its current share price relative to its per-share earnings (EPS). The price-to-earnings ratio is also sometimes known as the price multiple or the earnings multiple. P/E ratio are used by investors and analysts to determine the relative value of a company's shares in an apples-to-apples comparison. It can also be used to compare a company against its own historical record or to compare aggregate markets against one another or over time. However, companies that grow faster than average typically have higher P/ER, such as technology companies. Investors not only use the P/E ratio to determine a stock's market value but also in determining future earnings growth. For example, if earnings are expected to rise, investors might expect the company to increase its dividends as a result. Higher earnings and rising dividends typically lead to a higher stock price (Le, Vu, Du, & Tran, 2018).

![Operational Conceptual framework of Electronic Payment Paradigm and Price Earnings Ratio of Financial Institution in Nigeria.](image)

**Empirical Review**

There are a lot of empirical studies relating to electronic payment adoption and corporate performance in both developed and less developing countries with different claims and arguments. Some of the empirical concluded covers the effect of electronic payment on financial performance while other reviewed the impact of electronic payment on financial performance. Notably, each group employed different statistical and econometric models to investigate the data collected deriving different empirical results conclusions, recommendations, limitation and suggestion for further studies in the process while there were also agreements in some of the outcomes.

Bukgugab (2016) examined the effect of electronic payment on price earnings as sub-variable of financial performance in Nigeria during the period 2000-2014. Data were collected from Central Bank of Nigeria Statistical bulletin and annual reports of quoted deposit banks in Nigeria. He adopted multiple regression method (ANOVA) of analysis suing the statistical package for social sciences (SPSS) to run the regression for the period. He claimed there exists
a significant effect of all the explanatory variables (as a whole) on price earnings but that there was no significant contribution of electronic payment channel on price earnings of financial institution in Nigeria. however, his empirical results did not consider if there was short run effect between the variable so there was no evidence to indicate, if a unit root test was conducted to test whether the time series data collected was stationary as it is important for empirical work based on time series data to assume that the underlying time series is stationary (Gujarati & Porter, 2009). If the underlying time series is non-stationary.

Ogutu and Fatoki (2019) examined the effect of electronic banking on financial performance of listed commercial banks in Kenya. This study was guided by four objectives, establishing the effect of mobile banking, agency banking, ATM payment and online banking on corporate performance of listed commercial banks in Kenya. The study employed quantitative research design using panel data analysis. The targeted population of the study was the 11 listed commercial banks in Kenya. Secondary data was extracted from CBK banking supervisory reports and published annual reports of banks. The data was recorded on data collection sheets. Both descriptive and inferential statistics were used. The findings were presented using tables with associated explanations. The study found that there was strong positive relationship between mobile banking, agency banking, ATM payment and online banking and corporate performance of listed commercial banks in Kenya. Corporate performance of commercial banks and m-banking were strongly and positively correlated. There was a strong positive correlation between financials performance of individual commercial and agency banking. There was a weak positive correlation between corporate performance of individual commercial bank and online banking.

Chen and Srinivasan (2019) examined the firm value and performance implications of the growing trend of non-technology (non-tech) companies adopting digital technologies such as artificial intelligence, big data, cloud computing, machine learning. For the entire universe of US public listed firms, we identify companies that are going digital using textual analysis of disclosure of digital-related words in corporate reports and conference calls. We first show that digital adoption by non-tech firms has dramatically grown in recent years. Non-tech digital adopters exhibit greater stock price co-movement with technology companies than with their industry peers, suggesting that the digital activities are making them similar to tech firms. The digital adopters hold more cash and are larger, younger and less Cap Ex-intensive. Digital adoption is associated with higher valuation – market-to-book ratio is higher by 7-21% than industry peers – and is higher for firms that are younger, more Cap Ex-intensive, exhibit higher sales growth and are in industries where digital adoption is prevalent. However, markets are slow to respond to the disclosure of digital activity. Portfolios formed on digital disclosure earn a size/book-to-market adjusted return of 25% over a 3-year horizon and generate a monthly alpha of 40 basis points. Finally, while there is no significant improvement in corporate performance as measured by return-on-assets conditional on digital activities, there is a significant increase in asset turnover but also a significant decline in margins and sales growth. Managerial expertise is important for digital technology adoption, as firms with senior technology executives perform better when going digital.

Ibanichuka and Oko (2019) investigated the relationship between electronic frauds and financial performance of quoted banks on the Nigerian Stock Exchange. Point of sale fraud was electronic fraud proxy while return on investment was the proxy of corporate performance. The researchers adopted expost-facto research design for the study. The study used relevant secondary data obtained from Nigerian Electronic Fraud Forum, Nigeria Deposit Insurance Corporation, and Central Bank of Nigeria (CBN) from 2013 to 2017. The relevant secondary data were analyzed using basic descriptive, Pearson Product Moment Correlation and multivariate regression in a panel data setting with econometric analyses like Unit roots,
granger causality test and cointegrated test. The results showed negative and insignificant relationship between electronic fraud channels and financial performance variables. The study concluded that there is no significant relationship between the electronic fraud and corporate performance of quoted commercial banks in Nigeria in the period of this study.

Gathinu (2018) examined the effect of e-payment on the performance of County Government of Nairobi. The study was guided by the transaction cost theory. It utilized the descriptive research design and explanatory design. The target population comprised 750 respondents drawn from the finance, payment and information technology department. The study sample comprised 75 respondents selected from the three departments using stratified random sampling technique. The data was collected through the administration of the questionnaires to the selected sample. The collected data was sorted and coded and analyzed through descriptive statistics with an aim of summarizing the data, and inferential statistics for the purposes of establishing any association between the variables, with the help of the Statistical Package for Social Sciences (SPSS) version 21. The presentation of findings was through tables. The study found that at 95% confidence interval, E-payment practices had positive and significant relationship with the performance in Nairobi City County Government at 0.481 and P=0.000 < 0.0.05. Use of e-payment practices included the constructional provisions, Public Payment and Asset Disposal Act, and county policies and regulations. The study recommends that the Nairobi City County pays a lot of attention in adopting and implementing various aspects of e-payment to ensure that its activities remain improved. Strikingly, the empirical results were collaborated into webometric investigation as evidence in table 1 below.

Table 1 webometric investigation of electronic payment channel and performance of financial institution in Nigeria.

<table>
<thead>
<tr>
<th>Author(s) and Year</th>
<th>Research Topic</th>
<th>Journal, Volume, Numbers and Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s) (Year)</td>
<td>Title</td>
<td>Journal</td>
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<tr>
<td>Authors</td>
<td>Title</td>
<td>Journal</td>
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</tbody>
</table>

**Research question and Hypotheses Development Context.**

This empirical and cum theoretical study seeks to offer identification of the relationship between electronic payment channel and performance of financial institution in Nigeria. Specifically, this study provides answer to the following research question (RQ).

**RQ1:** What is the relationship between electronic payment paradigm and price earnings ratio.
of financial institution in Nigeria?
The above started research question produced two hypotheses stated in null as it relate to the above research question.

H\(_{01}\): Automated Teller Machine does not relate to price earnings of financial institutions in Nigeria.

H\(_{02}\): Point of Sale does not relate to price earnings of Financial Institution in Nigeria.

**Research Methods**

This section shows the research methods used to explore the relationship in the long run equilibrating and short run dynamics in the variables if any to achieve the set objectives of this empirical study. The study design applied is causal-comparative design which attempts to identify the cause-effect relationship between two or more variables. The study is to explore the effect of overall electronic payment channel and to determine the causal relationship of the variables (Hans & Sollis, 2004; Abbasi & Weigond, 2017; Adeniran & Jumaidu, 2017). We proposed that overall electronic payment channel have no long run and short equilibrium relationship with performance of financial institution in Nigeria (Akhisar., Tunay & Tunay, 2015).

Data regarding the variable of the study were sourced from central bank of Nigeria statistical bulletin, annual Central Bank of Nigeria reports, Federal Inland Revenue Service and financial statements of years 2007; 2008; 2009; 2010; 2011, 2013, 2014, 2015, 2016, 2017 and 2018. The choice of this data and its sources were based on the fact that the data are assumed to be reliable, suitable and adequate for the nature, scope and objectives of the study and are therefore assumed to be error free. The data taken from the CBN 2010 statistical bulletin was from 2007-2010. While those from 2009-2018 were collected from the various year’s CBN annual reports and financial statements.

We utilized the ordinary least square (OLS) of multivariate regression based Autoregression Distributed Lag (ARDL)/Bounds test – General to specific approach to co-interaction for testing the long-run equilibrium relationship among the variables. We also used pair-wise Granger Causality test for testing the causal relationship among the time series variables, Augmented Dickey Fuller unit root test, and Error Correction model with the aid of e-view version 10.

**Model Specification**

The model specification is based on the theory that electronic payment channel contribute to performance of financial institutions in Nigeria (Kumar, 2016; Kosse tal 2017; Jumba & Wepukulu, 2019). Statistically, the model from related empirical evidences used by Laudon & Laudon (2015), Krishaa (2015), Juariah (2015) was adopted but we made modifications. We generated three powerful model specifications to achieve the objectives and attained to the corresponding research questions. Consequently, the model specification was formulated in the following functional forms:

\[ P/ER_t = \gamma(\text{ATM}_t, \text{POS}_t) \]

(i)

Expanding equation i into mathematical model as thus:

\[ P/ER_t = \beta_0 + \beta_1 \text{ATM}_t + \beta_2 \text{POS}_t \]

(ii)

These functional form and mathematical model do not contain a random or stochastic variable and since in statistical relationship we deal with random or stochastic variables, that is variables that have probability distribution, the above functional equations are stated in equations that best describes how the dependent variables are related to all the independent variables and an stochastic error term stated as a multiple regression model as thus:

\[ P/ER_t = \lambda_0 + \lambda_1 \text{ATM}_t + \lambda_2 \text{POS}_t + \mu \lambda_t \]

(iii)
Where: 

- \( P/ER_t \) = Price Earnings Ratio for the time series 
- \( ATM_t \) = Automated Teller Machine for the time series 
- \( POS_t \) = Point of Sale for the time series 
- \( \mu\lambda_t \) = Stochastic Distribution term for the time series 
- \( \lambda_{ot} \) = Intercept term for the time series 
- \( \lambda_1 - \lambda_2 \) = Partial regression coefficients for the time series 
- \( t \) = Time Series

**Apriori Expectation**

Electronic Payment paradigm contributes positively to price earnings ratio of financial institutions in Nigeria. In summary, the apriori expectation is as thus: \( \beta_1, >0, \beta_2 >0. \)

**Empirical Results and Discussion**

Descriptive statistics are the measurements that explain the general nature of the data under research. They define the nature of response from primary data/or secondary data. Descriptive statistics for this research include standard deviation, mean, minimum and maximum. Descriptive data analysis is doe on price earnings, point of sale and automated teller machine. The descriptive statistics results are tabulated below.
Table 2: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>POS</th>
<th>ATM</th>
<th>P/ER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>41.52604</td>
<td>59.65104</td>
<td>41.18010</td>
</tr>
<tr>
<td>Median</td>
<td>43.00000</td>
<td>50.00000</td>
<td>8.900000</td>
</tr>
<tr>
<td>Maximum</td>
<td>80.00000</td>
<td>80.00000</td>
<td>2990.280</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.000000</td>
<td>5.000000</td>
<td>-524.0000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>18.67466</td>
<td>17.36332</td>
<td>241.8932</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.252635</td>
<td>-0.509276</td>
<td>9.961532</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.636948</td>
<td>2.850447</td>
<td>118.1214</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>3.096838</td>
<td>8.478507</td>
<td>1.091989</td>
</tr>
<tr>
<td>Probability</td>
<td>0.212584</td>
<td>0.014418</td>
<td>0.593791</td>
</tr>
<tr>
<td>Sum</td>
<td>7973.000</td>
<td>9533.000</td>
<td>7906.580</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>66609.87</td>
<td>57583.62</td>
<td>11175857</td>
</tr>
<tr>
<td>Observations</td>
<td>192</td>
<td>192</td>
<td>192</td>
</tr>
</tbody>
</table>

The study observes on the average that ATM is the most patronized electronic payment outlet among sampled dimensions of outlets. The POS channel is the least patronized channel based on its mean value of 41.53. All Payment outlets show negative skewness. A negatively skewed data set has its tail extended towards the left. It is an indication that both the mean and the median are less than the mode of the data set. The most volatile outlet based on standard deviation is the POS channel based on its standard deviation score of 20.77, followed by the POS (18.67). While ATM shows the least volatility based on its relatively low standard deviation value of 17.35 due to consistent growth in usage overtime. This implies that POS is riskiest e-product and could make negative or unpredictable contribution to the financial performance of financial institutions in Nigeria, while on the contrary, ATM generates highest contribution to the financial performance of the DMBs in Nigeria with least standard deviation.

**Jarque-Bera Test:** Calculates kurtosis and skewness of the asymptotic data. Their values suggest that data obtained for all variables are normal. This implies the normality of the data and substantiates the validity of the regression results.

**Stationarity Test/Unit Root Test (ADF - Fisher Chi-square and ADF - Choi Z-statistics).**
To evaluate stationarity tendencies of employed variables, the following unit root test is carried out as presented below.

Table 3: Unit Root Test at level (0) Output of Price Earnings Ratio (P/ER), Point of Sale (POS) Expenditure (POS), and Automated Teller Machine (ATM) in 16 sample Deposit money banks over the period of 2007 to 2018.

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF - Fisher Chi-square</th>
<th>Prob</th>
<th>ADF - Choi Z-stat</th>
<th>Prob</th>
<th>Note</th>
<th>Discovery</th>
<th>Conclusion/Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE&lt;sub&gt;it&lt;/sub&gt;</td>
<td>42.9900</td>
<td>0.0587</td>
<td>-1.28344</td>
<td>0.2638</td>
<td>0(0)</td>
<td>Evidence of Unit root</td>
<td>Not stationary</td>
</tr>
<tr>
<td>PE&lt;sub&gt;it&lt;/sub&gt;</td>
<td>38.7192</td>
<td>0.0611</td>
<td>-0.9262</td>
<td>0.0790</td>
<td>0(0)</td>
<td>Evidence of Unit root</td>
<td>Not stationary</td>
</tr>
<tr>
<td>POS&lt;sub&gt;it&lt;/sub&gt;</td>
<td>41.5119</td>
<td>0.0787</td>
<td>1.25694</td>
<td>0.8956</td>
<td>0(0)</td>
<td>Evidence of Unit root</td>
<td>Not stationary</td>
</tr>
<tr>
<td>ATM&lt;sub&gt;it&lt;/sub&gt;</td>
<td>44.5401</td>
<td>0.0426</td>
<td>0.33260</td>
<td>0.6303</td>
<td>0(0)</td>
<td>Evidence of Unit root</td>
<td>Not stationary</td>
</tr>
</tbody>
</table>

The above table which shows the stationarity tendencies at level for the selected quoted banks
shows that all employed panel series variables show evidence of a unit root as their respective probability level are higher than the 1%, 5% and 10% significance level. This shows no form of stationarity in the respective trend at level. This goes to show that, employed variables have high variations in their inherent mean, variance and autocorrelation. This means that variables are not quite stable to show predictive tendencies which is quite bad for analysis and as such will warrant the evaluation of stationarity at first difference which would be present subsequently.

Table 4: Unit Root Test at First Difference (1) Output of Price Earnings Ratio (P/ER), Point of Sale (POS), and Automated Teller Machine (ATM) in 16 sample Financial Institutions over the period of 2007 to 2018.

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF - Fisher Chi-square</th>
<th>Prob</th>
<th>ADF - Choi Z-stat</th>
<th>Prob</th>
<th>Note</th>
<th>Discovery</th>
<th>Conclusion/Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE&lt;sub&gt;it&lt;/sub&gt;</td>
<td>100.616</td>
<td>0.0000</td>
<td>-5.89593</td>
<td>0.0000</td>
<td>I(1)</td>
<td>No Unit root</td>
<td>Stationary at 1st Diff</td>
</tr>
<tr>
<td>PE&lt;sub&gt;it&lt;/sub&gt;</td>
<td>78.1831</td>
<td>0.0000</td>
<td>-6.2531</td>
<td>0.0000</td>
<td>I(1)</td>
<td>No Unit root</td>
<td>Stationary at 1st Diff</td>
</tr>
<tr>
<td>POS&lt;sub&gt;it&lt;/sub&gt;</td>
<td>75.8911</td>
<td>0.0000</td>
<td>-4.16833</td>
<td>0.0000</td>
<td>I(1)</td>
<td>No Unit root</td>
<td>Stationary at 1st Diff</td>
</tr>
<tr>
<td>ATM&lt;sub&gt;it&lt;/sub&gt;</td>
<td>71.7810</td>
<td>0.0000</td>
<td>-3.11747</td>
<td>0.0000</td>
<td>I(1)</td>
<td>No Unit root</td>
<td>Stationary at 1st Diff</td>
</tr>
</tbody>
</table>

Table 4 above shows the employed panel variable at first difference. It can be seen that all probability level are seen to be lower than the 1%, 5% and 10% significance level. This shows an absence of unit root and presence of stationarity tendencies amongst employed variable. It can be inferred from this that employed variables the variables probability distribution does not change overtime when shifted. This gives room for variables with predictive tendencies and gives rise to further tests like the co-integration test which would be carried out after determining the type of model to utilize (where pooled, random or fixed).

Panel Regressions (Ordinary Least Square)
The multiple regression was carried out using the Ordinary Least Square regression tool, as it is the best unbiased linear regression estimator, it was carried out in the differenced form.

Pooled Effects regression
To evaluate for joint influence of employed variables on the criterion, the table above which represents the pooled effect shows that;

Table 5 Pooled Effects Regression Output.
Dependent Variable: D(PE)
Method: Panel Least Squares
Date: 12/22/19  Time: 03:32
Sample: 2007 2018
Periods included: 12
Cross-sections included: 16
Total panel (balanced) observations: 192

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>9002912.</td>
<td>4342048.</td>
<td>2.073425</td>
<td>0.0407</td>
</tr>
<tr>
<td>D(POS)</td>
<td>-0.657071</td>
<td>1.297169</td>
<td>-0.506542</td>
<td>0.6340</td>
</tr>
</tbody>
</table>
Based on the above output in Table 5, it can be easily deduced that Point of Sale (POS) were against the apriori as they both possessed negative coefficient of \(-0.657071\) respectively. Although, only Automated Teller Machine showed signifying influence on price to earnings ratio of deposit money banks. This goes to showed that, unilaterally, deposit money banks’ expenditure of supportive infrastructure in terms of ATM have potentials in promoting its ability to increase the firms price to earnings ratio. The fundamental problem of this model lies from the fact that employed predictor variables jointly account for 48.93 percent of variations in the criterion variables. The second problem with this regression type (pooled effect) is the fact that, it fails to evaluate individuality or heterogeneous tendencies that exists in each of our employed companies. Since all companies cannot be the same, we do not accept this result.

The study proceeds to carry out the fixed effect which unlike the pooled effect shows that Point of Sale (POS) and Automated Teller Machine(ATM) showed coefficient against apriori as they display negative relationship with the level of profitability. The fixed effect model shows a higher predictive ability over the pooled effect. This is seen from the light of the fact that employed predictor variables account for up to 71.94 percent of variation in the dependent variable (PE). And the f-statistics of 7.811728 at a probability of 0.001836 which is less than the 0.05(5\%) significance level shows potential of the model. Although the models’s low Durbin Watson statistics value (0.579880) of is seen to be outside the relevant range.

**Fixed Effect Regressions**

To deal with the issues of heterogeneity bias, the fixed effect is carried out as follows:

**Table 6 Fixed Effects Regression Output.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>18159504.5</td>
<td>2624272</td>
<td>6.91983</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(POS)</td>
<td>0.5966911</td>
<td>0.06675</td>
<td>8.93958</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(ATM)</td>
<td>-3.3357245</td>
<td>1.31898</td>
<td>-2.52932</td>
<td>0.0037</td>
</tr>
</tbody>
</table>

Effects Specification

Cross-section fixed (dummy variables)

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.719361</td>
<td>Mean dependent var</td>
<td>12021453</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.708931</td>
<td>S.D. dependent var</td>
<td>27231462</td>
<td></td>
</tr>
</tbody>
</table>
The coefficient significance level shows that all forms of E-payment expenditure by firms have significant tendencies to stimulate price to earnings ratio as they Possess probability level way below the 5% significance level. Only POS adhered to apriori expectation as it showed a positive and significant influence on price to earnings ratio. Other avenues of electronic payment such as ATM defy apriori expectations based on their various negative and significant coefficients. Despite the dominance of this model (Fixed effect or LSDV model) which allows for heterogeneous factors and individuality amongst employed variables except for the intercept/constant not varying overtime. And the f-statistics of 45.28471 at a probability of 0.00000 which is less than the 0.05(5%) significance level. While the Durbin Watson is seen to be within the relevant range. We further proceed to the Random effect to check for the common mean value of employed variables and their influence on the criterion variable.

**Random Effects Model**

**Table 7 Random Effects Regression Output**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>6455242</td>
<td>3074698</td>
<td>2.099472</td>
<td>0.0383</td>
</tr>
<tr>
<td>D(POS)</td>
<td>0.487861</td>
<td>0.07363</td>
<td>6.625710</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(ATM)</td>
<td>0.182666</td>
<td>0.97234</td>
<td>0.187863</td>
<td>0.8514</td>
</tr>
</tbody>
</table>

Effects Specification

<table>
<thead>
<tr>
<th>S.D.</th>
<th>Rho</th>
</tr>
</thead>
<tbody>
<tr>
<td>19309520</td>
<td>0.7854</td>
</tr>
<tr>
<td>10094552</td>
<td>0.2146</td>
</tr>
</tbody>
</table>

Weighted Statistics

<table>
<thead>
<tr>
<th>R-squared</th>
<th>Mean dependent var</th>
<th>0.291183</th>
<th>2330274.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted R-squared</td>
<td>S.D. dependent var</td>
<td>0.262831</td>
<td>14832776</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>Sum squared resid</td>
<td>12735209</td>
<td>1.62E+16</td>
</tr>
<tr>
<td>F-statistic</td>
<td>Durbin-Watson stat</td>
<td>10.27005</td>
<td>1.052149</td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unweighted Statistics

<table>
<thead>
<tr>
<th>R-squared</th>
<th>Mean dependent var</th>
<th>-0.732719</th>
<th>12021453</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum squared resid</td>
<td>Durbin-Watson stat</td>
<td>1.34E+17</td>
<td>0.127699</td>
</tr>
</tbody>
</table>
The random effect above shows a lower predictive ability of employed predictor variables. This is evident as the R-square of 0.291183 shows that employed predictor variables jointly account for only 29.12 percent of variation in Price to earnings ratio of financial institutions (PE). The idiosyncratic random Rho shows 0.2146 which is very low and as such shows a disconnect between employed variables and also their inherent residuals. Although, only Point of Sale (POS) are significant stimulus to profitability. While the former promotes it, the latter is seen to adversely affect the financial performance (price to earnings ratio) of sampled deposit money banks.

**Diagnostic test**
The need therefore arises to determine which of the model is most efficient i.e. whether the pooled, random or fixed effect.

**Likelihood Ratio Test**
To compare the pooled regression model with the fixed effects model. The null hypothesis favors the pooled model i.e. Unobserved sectional differences are not significant.

**Table 8 Likelihood ratio test output**

<table>
<thead>
<tr>
<th>Effects Test</th>
<th>Statistic</th>
<th>d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section F</td>
<td>19.8346315</td>
<td>(14,86)</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cross-section Chi-square</td>
<td>105.48608</td>
<td>14</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Cross-section fixed effects test equation:
Dependent Variable: D(PE)
Method: Panel Least Squares
Date: 12/22/19  Time: 03:57
Sample: 2007 2018
Periods included: 12
Cross-sections included: 16
Total panel (balanced) observations: 192

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>9002912.</td>
<td>4342048.</td>
<td>2.073425</td>
<td>0.0407</td>
</tr>
<tr>
<td>D(POS)</td>
<td>-0.657071</td>
<td>1.297169</td>
<td>-0.506542</td>
<td>0.6340</td>
</tr>
<tr>
<td>D(ATM)</td>
<td>3.597355</td>
<td>4.493480</td>
<td>0.800572</td>
<td>0.4253</td>
</tr>
</tbody>
</table>

R-squared 0.152563  Mean dependent var 12021453
Adjusted R-squared 0.118666  S.D. dependent var 27231462
S.E. of regression 25564733  Akaike info criterion 36.99777
Sum squared resid 6.54E+16  Schwarz criterion 37.12415
Log likelihood -1937.383  Hannan-Quinn criter. 37.04898
F-statistic 4.500728  Durbin-Watson stat 0.579880
The above likelihood ratio test which shows the predominance between the pooled and fixed effect is seen to show a cross-section F-statistics of 19.8346315 at a probability level of 0.0000 which is seen to be below the 0.05 significance level. This leads to the rejection of the null hypothesis (the null hypothesis supports the pooled model). The alternate hypothesis which is accepted favors the fixed effect. The study therefore upholds the fixed effect over the pooled effect. We therefore proceed to evaluate the better model between the fixed and random model.

**Hausman Specification Test**

To compare the random effect model with the fixed test model. The null hypothesis favours the random effects model i.e. $z_1$ are uncorrelated with the explanatory variables (Its null hypothesis is that the random effects model is appropriate while the alternative hypothesis is the fixed effects model is appropriate).

**Table 9 Hausman Specification Test output**

Correlated Random Effects - Hausman Test

Test cross-section random effects

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>31.0807575</td>
<td>4</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Cross-section random effects test comparisons:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fixed</th>
<th>Random</th>
<th>Var(Diff.)</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(POS)</td>
<td>0.5966911</td>
<td>0.06675</td>
<td>8.93958</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(ATM)</td>
<td>-3.3357245</td>
<td>1.31898</td>
<td>-2.52932</td>
<td>0.0037</td>
</tr>
</tbody>
</table>

Cross-section random effects test equation:
Dependent Variable: D(PE)
Method: Panel Least Squares
Date: 12/22/19   Time: 03:58
Sample: 2007 2018
Periods included: 12
Cross-sections included: 16
Total panel (balanced) observations: 192

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>18159504.5</td>
<td>2624272</td>
<td>6.91983</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(POS)</td>
<td>0.5966911</td>
<td>0.06675</td>
<td>8.93958</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(ATM)</td>
<td>-3.3357245</td>
<td>1.31898</td>
<td>-2.52932</td>
<td>0.0037</td>
</tr>
</tbody>
</table>

Effects Specification

Cross-section fixed (dummy variables)

<table>
<thead>
<tr>
<th>R-squared</th>
<th>Mean dependent var</th>
<th>12021453</th>
</tr>
</thead>
</table>
Adjusted R-squared  0.708931  S.D. dependent var  27231462  
S.E. of regression  10094552  Akaike info criterion  35.25518  
Sum squared resid  8.76E+15  Schwarz criterion  35.73542  
Log likelihood  -1831.897  Hannan-Quinn criter.  35.44978  
F-statistic  45.28471  Durbin-Watson stat  1.814343  
Prob(F-statistic)  0.000000 

The Hausman specification test output via its cross section random chi square statistics of 31.0807575 at a probability level of 0.0000 leads to the rejection of the null hypothesis (the null hypothesis supports the random effect). The alternate hypothesis thus upholds the effect of the fixed model. Therefore, the validity of empirical output of the fixed model stands and is binding on employed variables in the short run.

Lagrange Multiplier Test
To decide between the random effect and a simple OLS regression, we carry out the Lagrange multiplier test below;

Table 10: Lagrange Multiplier Tests output

<table>
<thead>
<tr>
<th>Test Hypothesis</th>
<th>Cross-section</th>
<th>Time</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breusch-Pagan</td>
<td>75.37672</td>
<td>0.414080</td>
<td>75.79080</td>
</tr>
<tr>
<td>(0.0000)</td>
<td>(0.5199)</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>Honda</td>
<td>8.681977</td>
<td>-0.643490</td>
<td>5.684068</td>
</tr>
<tr>
<td>(0.0000)</td>
<td>--</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>King-Wu</td>
<td>8.681977</td>
<td>-0.643490</td>
<td>4.216932</td>
</tr>
<tr>
<td>(0.0000)</td>
<td>--</td>
<td>(0.0000)</td>
<td></td>
</tr>
<tr>
<td>Standardized Honda</td>
<td>10.15698</td>
<td>-0.438603</td>
<td>3.130722</td>
</tr>
<tr>
<td>(0.0000)</td>
<td>--</td>
<td>(0.0009)</td>
<td></td>
</tr>
<tr>
<td>Standardized King-Wu</td>
<td>10.15698</td>
<td>-0.438603</td>
<td>1.637342</td>
</tr>
<tr>
<td>(0.0000)</td>
<td>--</td>
<td>(0.0508)</td>
<td></td>
</tr>
<tr>
<td>Gourieroux, et al.*</td>
<td>--</td>
<td>--</td>
<td>75.37672</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(&lt; 0.01)</td>
</tr>
</tbody>
</table>

*Mixed chi-square asymptotic critical values:
1%  8.132  
5%  4.826  
10% 2.873  

The above probability levels at all Lagrange types show probability level less than 0.05, we therefore reject the null hypothesis. And conclude that random effect is more superior (which
supports our even more superior fixed effect). This is evidence of significant differences across firms. Based on this findings, out fixed effect still stands supreme. This shows in the selected model that Assumptions 8 of classical linear regression model (CLRM) is not violated. The regressors included in the regression model are properly estimated and the regression coefficients of explanatory variables are determinate and their standard errors are finite.

**Panel Co-integration Test**
To evaluate for traces and entrails of long run relationship, the Kao residual co-integration test is carried out for the first model.

**Table 11: Kao Residual Co-integration Test output**

<table>
<thead>
<tr>
<th>Kao Residual Cointegration Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Series: D(PE) D(POS) D(ATM)</td>
<td></td>
</tr>
<tr>
<td>Date: 12/22/19  Time: 01:02</td>
<td></td>
</tr>
<tr>
<td>Sample: 2007 2018</td>
<td></td>
</tr>
<tr>
<td>Included observations: 192</td>
<td></td>
</tr>
<tr>
<td>Null Hypothesis: No cointegration</td>
<td></td>
</tr>
<tr>
<td>Trend assumption: No deterministic trend</td>
<td></td>
</tr>
<tr>
<td>Automatic lag length selection based on SIC with a max lag of 1</td>
<td></td>
</tr>
<tr>
<td>Newey-West automatic bandwidth selection and Bartlett kernel</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>-4.89761</td>
<td>0.0000</td>
</tr>
<tr>
<td>Residual variance</td>
<td>2.31E+14</td>
<td></td>
</tr>
<tr>
<td>HAC variance</td>
<td>7.64E+13</td>
<td></td>
</tr>
</tbody>
</table>

**Augmented Dickey-Fuller Test Equation**

Dependent Variable: D(RESID)
Method: Least Squares
Date: 12/22/19  Time: 01:02
Sample (adjusted): 2011 2016
Included observations: 90 after adjustments

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESID(-1)</td>
<td>-0.816351</td>
<td>0.323100</td>
<td>-2.52662</td>
<td>0.0021</td>
</tr>
</tbody>
</table>

R-squared | 0.489751 | Mean dependent var | -294461.3 |
Adjusted R-squared | 0.443211 | S.D. dependent var | 12439533 |
S.E. of regression | 9016239. | Akaike info criterion | 34.87800 |
Sum squared resid | 7.24E+15 | Schwarz criterion | 34.90578 |
Log likelihood | -1568.510 | Hannan-Quinn criter. | 34.88920 |
Durbin-Watson stat | 2.105145 |  |

In light of long run relationship, the above Augmented Dickey Fuller t-statistics value of -2.52662 at a probability level of 0.0021 which is less than the 5% significance level shows a great evidence in support of the existence of a long run relationship between employed variables. This shows that, there is evidence of similarities in trend between employed variable amidst variations and shocks in the immediate financial environment.

**Implication:** Economically speaking, this implies that there is existence of long run
relationship in the model. The presence of co-integrating relationship depicts that the variables share mutual stochastic trend and are connected in a common long-run equilibrium. We can then conclude that all the model variables have long-run equilibrium relationship.

**Panel Error Correction Model**
To adjust for discrepancies between the long and short run equilibrium, the study carries out the error correction model as follows;

**Table 12: Error Correction Model Estimate Test output**

Date: 12/22/19  Time: 01:03
Sample (adjusted): 2009 2018

<table>
<thead>
<tr>
<th>Cointegrating Eq:</th>
<th>CointEq1</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE(-1)</td>
<td>1.000000</td>
</tr>
<tr>
<td>POS(-1)</td>
<td>0.09183 (0.03198) [2.871482]</td>
</tr>
<tr>
<td>ATM(-1)</td>
<td>211.9803 (12.9804) [ 16.3308]</td>
</tr>
<tr>
<td>C</td>
<td>-7483621</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error Correction:</th>
<th>D(PE)</th>
<th>D(POS)</th>
<th>D(ATM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CointEq1</td>
<td>-0.412711 (0.08759) [-4.71185]</td>
<td>-0.004337 (0.01107) [-0.39171]</td>
<td>-0.001399 (0.00020) [-6.85389]</td>
</tr>
<tr>
<td>D(PE(-1))</td>
<td>-0.738032 (0.17085) [-4.31983]</td>
<td>-0.344759 (0.08141) [-4.23465]</td>
<td>-0.004454 (0.00150) [-2.96761]</td>
</tr>
<tr>
<td>D(PE(-2))</td>
<td>-0.137165 (0.19614) [-0.69931]</td>
<td>-0.112747 (0.09347) [-1.20626]</td>
<td>-0.001381 (0.00172) [-0.80163]</td>
</tr>
<tr>
<td>D(POS(-1))</td>
<td>1.018505 (0.39266) [ 2.59384]</td>
<td>0.417092 (0.18712) [ 2.22906]</td>
<td>0.007107 (0.00345) [ 2.06044]</td>
</tr>
<tr>
<td>D(POS(-2))</td>
<td>-0.017289 (0.41866) [-0.04130]</td>
<td>0.049004 (0.19950) [ 0.24563]</td>
<td>0.003281 (0.00368) [ 0.89229]</td>
</tr>
</tbody>
</table>
The above Error Correction estimate shows that the out of equilibrium model can be adjusted back to equilibrium by 41.27% (-0.412711). This is upheld based on the anticipated negative assigned coefficient of the Error Correction estimate (CointEq1). Which is seen to be significant as the t-statistic of -4.71185 is greater than +/- 1.98 or 2. The long run coefficient shows that subject to variations, only Point of Sale (POS), and Automated Teller Machine (ATM) showed significant t-statistics of 2.871482, and 16.3308 respectively. This shows that in the long run, Point of Sale (POS), and Automated Teller machine (ATM) represents fundamental e-payment dimensions that significantly stimulates the price to earnings ratio of Financial Institutions in Nigeria, whereas non showed no significant influence on profitability (PE).

In summary; the study discovers a positive and significant influence of Point of Sale (POS) on Price to earnings ratio in the selected financial institutions. An The study also discovers a negative and significant influence of Point of Sale(POS) on Price to earnings ratio in the selected financial institutions and it is seen that there existed a positive and significant influence of Automated Teller Machine on Price to earnings ratio in the selected financial institutions. The implication of this, the researcher reasoned, is that, price to earnings ratio does not reactive positively to the level of e-payment, especially in terms of the POS and ATM, the study observes significant influence of these dimensions of electronic payment paradigm on these payment outlets.
**Stacked Pairwise Granger causality test**

To evaluate for causal relationship between the employed variables, the following evaluation is presented as follows:

**Table 13: Pairwise Granger Causality Test output**

<table>
<thead>
<tr>
<th>Null Hypothesis:</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(POS) does not Granger Cause (PE)</td>
<td>75</td>
<td>5.37261</td>
<td>0.0043</td>
</tr>
<tr>
<td>(PE) does not Granger Cause (POS)</td>
<td>75</td>
<td>7.0183</td>
<td>0.0009</td>
</tr>
<tr>
<td>(ATM) does not Granger Cause (PE)</td>
<td>75</td>
<td>1.97296</td>
<td>0.1467</td>
</tr>
<tr>
<td>(PE) does not Granger Cause (ATM)</td>
<td>75</td>
<td>0.78165</td>
<td>0.4616</td>
</tr>
<tr>
<td>(ATM) does not Granger Cause (POS)</td>
<td>75</td>
<td>0.81097</td>
<td>0.4486</td>
</tr>
<tr>
<td>(POS) does not Granger Cause (ATM)</td>
<td>75</td>
<td>0.00395</td>
<td>0.9961</td>
</tr>
</tbody>
</table>

The stacked pair wise Causality test shows the presence of bidirectional causal relationship between Point of Sale (POS) and Portability of employed financial institutions (PE). This shows that more is expended on the salaries, wages and allowances of workers when profit rising. And also firms try to make profit rise by increasing the salaries, wages and allowances of workers. Unidirectional Causality is seen to spill from Point of Sale (POS) to profitability of employed firms. This shows that firms usually have to put supportive infrastructures in place before witnessing its effect on profits. All other variables show negligible causal relation to profitability. The absence of bidirectional causality amongst the predictor variables strikes out the possibility of multicollinearity in the employed model.

**Implication of the result:** The result implies that if Financial Institutions invest heavily in e-Products (especially Point of sales ), robust Information Technology, it will enhance their profitability performance. On the converse, the financial institutions has been and will have to plough back part of the profit on IT Acquisitions and upgrading, procurement of more Automated Teller Machines, Point of Sale devices and general enhancement of internet banking systems that will guarantee higher and sustainable returns. This result confirms the findings of AL-Sukkar (2005) and Aladwani (2001) in their respective investigations.

**Test of Hypotheses:**

\[ H_{01} \]: There is no significant relationship between Point of Sale (POS) and Price to earnings ratio of financial institutions in Nigeria.

The Error correction Model coefficient of 0.09183 shows a positive sign and its t-statistics of 2.871482 which is seen to be greater than the standard tabulated value of ± 1.98 or 2 leads to the rejection of the null hypothesis. The study thus concludes that there is a significant relationship between Point of Sale (POS) and Price to earnings ratio of deposit money banks in Nigeria.

This viewpoint is in consonance with the finding of Abaanewe etal (2013), Akhisar etal (2015) who justified that ATM relate significantly to price earnings ratio. It is also in tandem with the findings of Akinyomi & Adebayo (2013), Aranyossy (2018) who concluded that ATM
Contribute positively to performance of financial institutions in Nigeria.

**H02:** No significant relationship exists between Mobile Pay (MPAY) and Price to Earnings ratio of quoted financial institutions in Nigeria.

The Error correction Model coefficient of -2.097182 shows a negative sign and its t-statistics of -1.01838 which is seen to be less than the standard tabulated value of ± 1.98 or 2 leads to the study not rejecting the null hypothesis. The study thus concludes that there is no significant relationship between Automated Teller Machine and Price to earnings ratio of financial institutions in Nigeria. The perspectives of findings in these hypothetical tests are in line with the a priori expectation and the works of Batiz-Lozo (2018); Hastomo & Aras (2018).

**Concluding Remark and Recommendations**

There is no doubt that there are numerous empirical studies conducted in the relationship between electronic payment paradigm and financial institutions in developed countries but few in developing countries. The significance of this empirical study is of great importance, as it assists firms in Nigeria to know whether electronic payment paradigm relate to price earnings ratio of financial institutions in Nigeria.

The empirical result of the study will be of immense advantage to the government in seeing ways of improving its regulations on electronic payment paradigm. Based on the analysis of data and, the findings, the study conclude that electronic payment paradigm relate to performance of financial institution in Nigeria.

Relying on the empirical analysis of data, and empirical findings, we recommend that:

(i) Financial Institutions need to establish more electronic payment facilities for instance banks should install more ATM cards machines to improve the effectiveness of credit cards since it’s the most common payment method preferred by clients. Similarly internet facilities should be extended to both branches in upcountry stations.

(ii) There is need for the government to revisit the economy from being cash based to electronic systems where business transaction would be done by use of cards to buy a commodity or service which is later paid by the financial institutions on behalf of their client. This would enhance profitability in financial institutions at the sametime improve commerce and trade.

(iii) Introduction of more electronic payment methods to increase preferences and choice of their clients seem to be limited with few electronic methods currently being used. New electronic payment methods like use of electronic telephone need to be introduced for effectiveness and efficiency in use of electronic payment, there is need for the management of financial institutions to hire the skills of well competent labourforce since inefficiency in service delivery seems to affecting the level of profitability that would be accruing from electronic payment methods.

(iv) Massive sensitization campaigns to enrich the public about the existing electronic payment methods in financial institution since the public seem not to be aware of electronic payment methods that exist in these financial institutions and how significant they are in business transaction.

(v) More comprehensive research and in this case it should be a survey to bring more insights about the phenomenon. Topics such as the impact of use of electronic payment methods to support such research project friendly. Purchase of more modern electronic payment machines to increase on the speed and efficiency. Besides this would control/avoid channel conflict since it affects clients business transactions.
There is need for the government to revisit the economy from being cash based to electronic systems where business transaction would be done by the use of cards like smart cards to buy a commodity or services which is later paid by the financial institutions on behalf of their client. This would enhance profitability in financial institutions at the same time improve commerce and trade.

**Limitation and Suggestion for further studies.**

Considerable amount of empirical studies have conducted both in developed and less developing countries by different authors, this empirical study is indeed limited three sub-variables (POS, ATM & P/E) of electronic payment and performance of financial institutions in Nigeria, spanning from 2007-2018, therefore, further studies should be based on comparative analysis of e-payment paradigm and performance of quoted banks between Nigeria and Ghana, spanning from 2008-2019 with moderating factor.

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