

## **ELECTRONIC BANKING AND PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA**

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### **ABSTRACT**

*The broad objective of this study is to examine whether there is any significant relationship between Electronic banking and performance (profitability) of deposit money banks in Nigeria. Secondary data was used for the study. Descriptive statistics, multiple line graph, correlation and regression analyses were used to analyse the data. The study used multiple regressions to identify the possible effects of the independent variables (P-O-S, ATM, internet banking and mobile banking) on the dependent variable (ROA). The findings from the results of analyses have shown that mobile banking and ATM usage are significantly related to financial performance. P-O-S usage and internet banking are not significantly related to financial performance. From the findings of the study, the researcher hence recommends among others, ATMs that can also receive cash should be deployed to different locations for easy accessibility, federal government subsidies for the P-O-S machines for the benefit of the traders and customers, provision of WIFI by the federal government to enable the general public have free access to internet banking, CBN continued implementation of the cashless economy process and establishment of more Smartphone assembly plant in Nigeria .*

**Keywords: Deposit money, Electronic banking, Performance, Point-of-sale (P-O-S), Automatic Teller Machine (A T M), Mobile banking and Internet banking.**

### **Introduction**

The evolution of information and communications technology (ICT) has brought development and adoption of advanced technologies in commerce and industry (Mwatsika, 2016). Electronic banking (E banking) is the peak of information technology in the commercial sector. E-banking involves systems that enable clients and credit institutions to use banking services in three levels of application namely; - announcement, communication and transaction (Mwatsika, 2016). E banking and cashless banking are closely related. Cashless banking is aimed at reducing, but not eliminating the volume of physical cash circulating in the economy while encouraging more electronic based transactions (Osazevbaru, Sakpaide & Ibubune, 2014). E banking is a method of banking in which the customer conducts transactions electronically via the internet.

Vaidya (as cited in Okiro & Ndungu, (2013) states that, during the 21<sup>st</sup> century E-banking advanced from providing mere text messaging services to that of pseudo internet banking where customers could not only view their balances and set up multiple types of alerts but also transact activities such as fund transfers, redeem loyalty coupons, deposit cheques via mobile phone and instruct payroll based transactions. The growth of high speed networks, coupled with the falling cost of computing power, is making possible applications undreamed of in the past.

Rapid access to critical information and ability to act quickly and effectively will distinguish the successful banks of the future. Advances in technology are allowing for delivery of banking services & products more conveniently and effectively than ever before – thus creating new bases of competition (Ghaziri, 1998).

This explosion of technology is changing the banking industry forever, managing the delivery systems of banks to interact with their customers' (Mwatsika, 2016). According to Ghaziri (1998), the banks gain vital competitive advantage by having a direct marketing and accounting customer service environment and new streamlined business processes. Electronic banking based applications such as internet banking; mobile banking, bank cards, telephone banking, ATM and POS network bring significant advantages to customers in the delivery of existing products. According to Akhisar, Tunay and Tunay (2015), Technology – based products give opportunities to have significant cost advantages, increasing profitability and facilitate lower risk than traditional banking products. In developed countries of the globe the communication between buyer and seller, purchase ordering, assurance and money exchange etc. are conducted electronically (Meihami, Varmaghani and Meihami, 2013). Adeolu, (2015) stressed that the implication of Treasury Single Account (TSA) is that banks will no longer have access to the float provided by the accounts they maintained for the Ministries, Departments and Agencies. Hence the need for banks to continue to devise means of mobilizing funds from the private sector. Meihami, et al (2013) noted that the most important goals of for-profit entities managers is to maximize shareholders' wealth and company profit. Ngongo, Mbabazi & Shukla, (2015) noted that there is delay in payment of cheques between banks, time is wasted in banks as people line in queues waiting for services, and errors as result of manual work and fraud related cases were common and increasing. Meihanksmi et al, (2013) further stated that the increasing number of commercial banks and privatization of governmental banks during the period of his study were due to consideration of increasing commercial banks income and increasing share profit. In recent time, the reverse is the case; there is a drastic decline on the number of commercial banks in operation.

The Researcher was actually propelled into this study in an attempt to find a lasting source of income to the banks. Most commercial banks have recorded drastic decline in income from other sources especially from interest charge on issuance of loan to customers which had been the major source of banks income (profit) over the years. Consequently, some of the managers of these banks have been relieved of their duty while others are on hot seats receiving threats from their directors. This paves the need to divert to E-services which are the products of information and communication, yielding rapid development in recent time. Moreover, on 21<sup>st</sup> February of this year, 2017 the banking & payments system department of the Central bank of Nigeria released a circular to all deposit money banks on nationwide implementation of the cashless policy. This circular empowers the banks to review and re – introduce charges on deposits and withdrawals at new rate.

### **Statement of Problem**

Various findings and comments on electronic banking and bank performance have existed. Adewoye & Omoriegie, (2013) revealed that the intensity of ATMs deployment made positive contribution to the cost efficiency of Nigerian banks. Studies by Itah & Eneh, (2014) showed that ATM and P-O-S are positively related to ROE. The results of Jegede, (2014) indicated that less than the benefits the deployment of ATM terminals have averagely improved the performance of Nigerian banks because of the alarming rate of ATM fraud.

Rauf, Qiang & Sajid (2014) observed that increase in debit card usage enhance the profitability of banking industry in form of ROA over the period of 2004 to 2013. Borzekowski, Kiser & Ahmed (2006) discovered that an increase on bank imposed transaction fees causes decline in overall use of certain debit card at P-O-S.

Cheruiyot (2010) discovered that profitability and offering of internet banking have a small significant association of less than 5%. Oyewole, Abba, Gambo & Abbam (2013) in their study in Nigeria for the

period of year 2000 to 2010 observed that internet banking contributed immensely and positively to bank performance in terms of ROA and net interest margin.

Unlike previous related studies, this study made use of a longer period of study (16 years) and used descriptive statistics, multiple line graph, multiple regression and correlation analysis for data analysis in order to give more accurate and conclusive result which differ from descriptive and inferential statistical tool used by Adewoye & Omoriegie (2013) , multiple regression used by Itah & Eneh (2014) , Rauf et al (2014) ,Borzekowski et al (2006), SPSS and chi square used by Jegede (2014), unilabiate analysis used by Cheruiyot (2010) and pooled ordinary least square estimation used by Oyewole et al (2013). This research also studied four e banking variables (independent variables –ATM, P-O-S, internet banking and mobile banking) unlike Adewoye & Omoriegie (2013), Jegede (2014), Borzekowski et al (2006), Cheruiyot (2010), and Oyewole et al (2013) that studied only one e banking variable , Itah & Eneh (2014) and Rauf et al (2014) that studied three and two e banking variables respectively .The gaps in literature have motivated this study as the study seeks to answer the question, “What is the effect of e banking on performance of money deposit banks in NSE?”

### **Objectives of the Study**

The broad objective is to examine whether there is any significant relationship between electronic banking and profitability (performance) of deposit money (Commercial) banks in Nigeria. However, the specific objectives of this study include;

1. To investigate the influence of P-O-S on profit of deposit money banks in Nigeria.
2. To determine the relationship between internet banking and profit of deposit money banks in Nigeria.
3. To investigate the influence of mobile (phone) banking on profitability of deposit money banks in Nigeria.
4. To examine the influence of ATM usage on profit of deposit money banks in Nigeria.

### **Statement of Research Hypotheses**

**The following null hypotheses are stated for this study.**

**H<sub>01</sub>**– P-O-S does not significantly influence profits of deposit money banks in Nigeria.

**H<sub>02</sub>**–Internet banking does not significantly relate with profit of deposit money banks in Nigeria

**H<sub>03</sub>**– There is no significant influence of mobile banking on profit of deposit money banks in Nigeria.

**H<sub>04</sub>**– ATM facility does not significantly influence the profits of deposit money banks profit in Nigeria.

### **Scope of the Study**

The researchers are to examine whether there is any significant relationship between E banking and profitability of deposit money banks (commercial banks) in Nigeria. The electronic banking variables which are the independent variables include; P-O-S, internet banking, ATM & mobile banking. While the performance variable which is the dependent variable is represented by ROA. Time series pooled data from 2000-2016 annual reports of the selected deposit money were collected for the study. The research work will concentrate only on 14 selected quoted deposit money banks in Nigeria. The selected banks include: Access bank Plc., Diamond bank , ECO bank, Fidelity Bank Plc., First Bank

plc., Guarantee trust bank Plc., Skye Bank, Stanbic bank, Sterling bank Plc., Union Bank plc., UBA Plc., Unity Bank, WEMA bank plc., and Zenith bank plc.

## **Review of Related Literature:**

### **Conceptual Framework**

#### **Electronic Banking**

Ngango, Mbabazie and Shukia, (2015) defined E banking as the automated delivery of new and traditional banking products and services directly to customers through electronic, interactive communication channels. Daniel, and Sathye, (as cited in Ngango, et al, 2015) defined E-banking as several types of services through which customers can request information and carry out most retail banking services via computer, television or mobile phone. With the help of electronic channels retail and small value banking products and services such as deposit-taking, lending, account management, provision of financial advice, electronic bill payment can be provided. Electronic banking consists of mobile banking, internet banking, and P-O-S and ATM services. The term payment & transferring is used if a banking services are based on paper, and if it is based on communication technology experts call it E-currency transferring.

#### **Types of Electronic Banking**

Bank Card: Bank Card System involves the use of smart card which can be used as credit card, debit card and even ATM Cards. An electronic card (Bank Card) is a physical plastic card that uniquely identifies the holder and can be used for financial transactions. They include ATM cards, debit cards & credit cards. A credit card is a payment card issued to users as a system of payment. It is given to those that have dollar account. Credit card is meant to be used abroad on ATM and/or P-O-S terminal there when the holder has travelled to outside the country. The issuer of the card creates a revolving account and grants a line of credit to the cardholder from which the user can borrow money for payment to a merchant or as a cash advance. Naim (1995) states that credit card is a contract whereby the card issuer is committed to credit a certain amount of money for someone who is the cardholder so as to meet his personal purchases from shops that are associated with the card issuer with a contract to accept the fulfilment of cardholders purchases and that the final settlement will be after each specified period. Al-zubaidi (2002) defined credit card as a card that gives the holder the opportunity to buy from shops that are consistent with the card issuer to accept the granting of the credit for the cash holder to pay off her purchase. Zenith Bank issues gift card to their customers that want to give cash to their friends as gift. The cash to be given as gift will be electronically put into the card at a charge of ₦1500. The Zenith bank customer will now give it to his/her friend in place of cash. The gift card will be used on P.O.S terminal or ATM by the friend. Debit card is a plastic card through which its holder can have access electronically to his or her account of bank (Rauf, Qiang & Sajid, 2014). Debit card, indeed guarantees instant payment to the customer whereas credit cards re-compensate the merchant at a later date (Demoulin, 2013). Adeoti (2013) rightly stressed that over the globe, most countries are replacing cash based system with debit card based substantially it can equally be used on ATM and P-O-S terminal for cash withdrawal, transfers, and/or payment of goods. In recent years Debit Card use at point of sale has grown dramatically and now exceeds the number of credit card transaction (Ron, Elizabeth & Shaista, 2006). Debit card purchase or payment transaction let you make purchases or payments with a debit card, which may also be your ATM card. ATM are electronic terminals that let you bank almost any time.

Automated Teller Machine (ATM) has become a fundamental part of banking world-wide as it is the easiest way for monetary transaction(s) (Muhammed, Aslam, Afgan & Abbasi, 2014). According to Danlami and Mayowa, (2014), ATM is an electronic appliance that gives out or receives cash deposits from account holders. A smart card is used to initiate and complete a transaction with the machine. Odewale (as cited in Danlami and Mayowa, 2014) postulated that the smart card or simply put, ATM card as widely called, has electronic chip that identifies each customer with respect to corresponding accounts belonging to the customer. Jegede, (2014) observed that ATM are interconnected to allow anyone with a bank card, debit card, or credit card to have access anywhere in the world because each station is connected to an inter-bank network. ATM Cards, debit cards and e-wallets (like mobile money) makes cashless shopping a lot more convenient (Ajayi, 2014). Hence to turn the country to a cashless economy the drive should be towards credit cards, e-wallets and debit cards. These electronic cards can be inserted on ATM or POS terminal to activate a transaction for example, Automated Teller Machine (ATM) and Point of Sale (POS) terminal are used to authorize payment to the business man (James in Ngango et al, 2015). According to Meihami, et al (2013), an ATM is able to do lots of banking activities and to eliminate human interferences. ATM decrease the bank's costs and work round the clock. Modern ATMs identifies a customer when he inserts a plastic bank card (e.g. ATM card) with a magnetic strip or chip containing a unique card number and some security information such as expiration date. Authentication is provided by the customer entering a personal identification number (PIN) All the ATMs are globally interconnected with each other with the financial institutions through the global ATM network like Master card, maestro and visa card etc. According to Ogbuji (2012) ATMs replace the popularly known paper –based payment instruments. ATM hence performs the traditional functions of bank cashier and other counter staff in a faster way. An ATM gives the customer the opportunity to carryout his/her banking transactions from almost every other ATM in the world. Customers can use ATM to access their bank account for cash withdrawals, credit card cash advances, pay bills, check their account balance and also buy prepaid cell phone credit. Ghaziri (1998) identified ATMs as anytime – anywhere banking. ATM can work as a branch of bank since with them clients can do; accounts cashing, accounts bills and payment of bills and transfers between accounts. Zenith bank has introduced a new ATM that accepts cash (small amounts below ₦50,000 ) which must be well arranged (straightened) before being slot into the machine (ATM) the machine will request for account number and the amount which it will confirm by counting the money and subsequently credit that account and issue a receipt accordingly.

POS is a device that is installed in sale centres to remove the need to transfers the physical money and to deduct money from buyer account and to add it to seller account. P.O.S terminals are located at accredited retail shops (merchant). These merchants accept credit & debit cards as means of payment by customer's credit and debit cards can also be used to purchase from merchants on the internet. Point of Sale (P-O-S) terminal is an electronic device used to process card payments at retail locations. It generally does the following:-

- Reads the information of a customer's credit or debit card, The POS is connected to central computer in the bank. The bank provides it for the seller and it has modem and printer. Sale centre and department stores are where POS is used. Exchanging currency from buyer account to seller account, are functions of POS.
- Checks whether the funds in a customer's bank account are sufficient.
- Transfers the fund from customer account to the seller's account.
- Records the transaction and prints a receipt (Technopedi, 2017).

Point of sale terminals are a combination of software and hardware that allows retail locations to accept card payment without updating their cash registers to read cards directly Ugwueze and Nwezeaku (2015). The P-O-S in a cashless system will attract special charges that do not go with cash transaction.

A price 1-25% of the cost of every transaction done through P O S terminal will be charged by the operators of the terminal.

Ademoye and Omoregbe (2013) rightly observed that modern banking services such as electronic banking, internet banking, Point of Sales (POS) transactions, money transfer, ATMs emerged as the most popular with 96 percent awareness level.

Mobile banking involves the use of mobile phone for settlement of financial transactions. It allows person to person fund transfers with immediate availability of funds for the beneficiary telephone banking. According to Meihami et al (2013), the conduction of a little business between bank and clients through phone is called phone banking. Functions of phone banking include bill payment, currency transferring to other account and giving account flow and account balances. Cell phone banking offers clients opportunity to use bank services through installing bank software on their cell phone. Mobile banking offers clients the opportunity of knowing about account remaining, flow, exchanging of funds among accounts with another member, bill payment, buying prepaid cell phone charge and seeing prepaid cell phone charge information. Pay-by-phone systems let you call your financial institution with the instructions to pay certain bills or transfer funds between accounts (Simpson in Ngango et al 2015). Mobile phone users conduct some banking transactions by phone. Based on the analysis, mobile banking transactions has been on the increase over the years from 2000 till date.

Internet banking lets you handle your personal computer without visiting your domicile bank. For example, you may use your computer to view your account balance, request transfers between accounts and pay bills electronically. Computer/internet banking offers the same opportunity as phone banking. Internet banking is used mainly by enlightened people. The bank charges N2500 to give security code to a costumer before he can use it. Nowadays, household banking is done through internet and with the help of debit card. The banks have website to let their clients check their account remaining, account flow, loan applying and ordering their exchanging through internet. Internet banking gives the clients opportunity of; transfer currency to private account or other accounts, seeing bills in accordance with account, bill ordering in chronological order, awareness of all remaining of accounts, payment of bill and seeing last 30 transactions.

### **Performance Measurement**

Globalization has made the world a small place. Hence, business can be conducted anywhere and hence any investor must evaluate the performance of a company before investing or conducting any business with the company. Managers of business must enhance their firm performance through new plan and procedures so as to update its operations and transactions during its life cycle.

Performance of the company is the most important to encourage the people to come to it (Ebrahim, Abdullah & Faudziah, 2014). The work of Neely, Gregory & Plats (1995) defined performance measurement as the process of measuring the actions, efficiency and effectiveness. Lebas (1995) stressed that performance measurement is the conversion of the complex reality of performance in organized symbols that can be related and relayed under the same circumstance. Performance measurement is the process of regular and systematic data collection, analysis and reporting to be used by a firm to follow up the resources it uses, the results it obtained with the produced goods and services (Bamberger in Ngango et al, 2015). The performance of a business can be evaluated based on facts and numbers. There are parts to watch in a business and make changes so as to achieve your goals effectively. As noted by Mercy in Ngango et al (2015) evaluate the assets and liabilities of the business from the statement of financial position, review the cash flow to assess operating, financial and

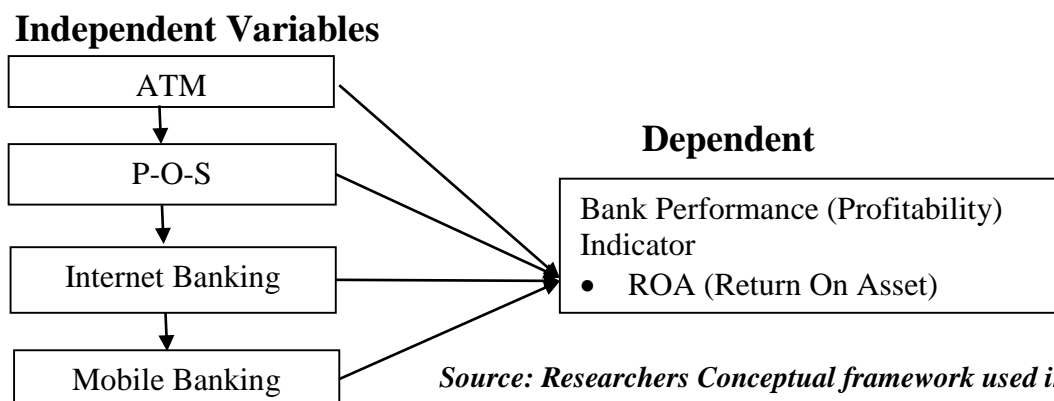
investing activities, the effects of these activities can be understood through income and expenses from the statement of comprehensive income, do internal comparison of cost and sales to understand if the amount of stock accumulated is increasing while sales remain stagnant, indicating poor utilization of stock. Compare the debtor and creditor values between past and present statement of financial position to measure credit history, understand the customer satisfaction level through complaints and reviews from the end users, having consistency and quality in performance and reliability improves (Dixon in Ngango et al 2015). Only performance measures that support the business objectives are used since the organization's performance is central to the future well-being and prosperity of an organization. Profitability has been the widely used measure of financial performance (Sejaka in Ngango, 2015). Profitability is the excess of income over expenditure and can be expressed by the ratios like gross profit margin, net profit margin, return on assets (ROA) and return on equity (ROE). Profit as a measure of performance has got a lot of limitations since it has different meaning as it can be looked at differently by different people. The definition of profit by an economist is different from that of an accountant. This research study used one measure of profitability commonly used in accounting and banking literature – ROA. ROA can be measured using RONA (Return on Net Assets) or Return on Total Assets (ROTA). This study made use of ROTA which is profit after tax divided by fixed assets plus current assets i.e. total assets. ROTA is a measure of extent to which an organization is making use of the organization assets. Once again we examine the effects of electronic banking on the level of ROA. Hence ROA is dependent variable representing banks performance / profitability. In the business environment, performance measurement can be categorized into accounting –based measurement and market based measurement (Ebrahim et al, 2014). The companies' performance hence can be viewed from the financial statement reported by the company. Consequently, firm's success is explained by its performance over a certain period of time.

**Accounting Based Measurements**

According to Ebrahim et al (2014) accounting –based measurement is an effective indicator of the company's profitability such as Return of assets (ROA), Return on equity ROE, return on sales (ROS), Return on investment (ROI), Profit margin (PM), operating cash flow (OCF), Earnings per share (EPS), operation profit (OP), growth in sales (GRO), return on capital employed (ROCE), Expense to assets (ETA), cash to assets (CTA), sales of assets (STS) Expense to sales (ETS), labour productivity (LP), cost of capital (COC), loss Return on revenue (ROR) profit per employee (PPE) and return on fixed assets. ROA is a better metric of financial performance and clearly takes into account the assets used to support business activities. It determines whether the company is able to generate an adequate return on these assets rather than simply showing robust return on sales (Hagel, Brown and Davison, 2010).*Note:*

*Market based measurement is outside the scope of this study*

**E-BANKING SERVICES CONCEPTUAL FRAMEWORK**



*Source: Researchers Conceptual framework used in the study.*

## **Theoretical Frame Work**

The theories that support the relationship between E-banking and financial performance include; technology acceptance model and innovation diffusion theory.

**Technology Acceptance Model (TAM)** was originally proposed by Davis in 1986 and expounds on the attitude behind the objective to use a technology or services. It explains user acceptance of information technology and usage in an organization context. This model was designed to predict the user's acceptance of information technology and usage in an organizational setting. Cracknell in Monyoncho (2015) noted that the reason for the adoption of technology by firms is to cope with the dynamics of the external environment. Davis in Monyoncho (2015), observed that Technology Acceptance Model deals with perceptions as opposed to real usage, and suggest that users- the key factor that influence their decision on how, where and when they will use it. This model can accommodate changes for improved cost reduction and efficiency. Improved performance of a staff hence depends on the degree to which a person believes that using a particular system would result to. This is termed perceived usefulness. Perceived ease – of – use states that improved productivity is a function of the degree to which a staff believes that using a given system would lead to. In technology use acceptance is the first process followed by adoption. Acceptance dictates the attitude and belief of users which will affect number of usage which determines the profitability.

Customers are more likely to adopt E banking when they perceive distinct advantages or benefits it offers. This study is anchored on this theory because customers will use more of an E banking service which is beneficial to them. The more they use such service (variable), the more it accumulates income in form of profit to the bank.

**Innovation Diffusion Theory:-**Rogers (1962) posit that diffusion of innovation is a theory that seeks to explain how, why and at what rate new ideas and technology spread through cultures. According to Mahajan and Peterson in Okiro & Ndungu, (2013) innovation is defined as an idea, object or practice that is seen as new by members of the social system and defined the diffusion of innovation as the process by which the innovation is communicated through channels among the members of the social system. Diffusion of Innovation Theory explain the mechanisms of how new inventions like internet, POS, mobile banking and bank cards are adopted and become successful. Steven (2002) noted that not all innovations are adopted even if they are good it may take a long time for an innovation to be adopted. Resistance to change, he further noted may be hindrance to diffusion of innovation by slowing it down although it might not stop the innovation.

Five attributes that influence the rate of absorption are relative advantage, compatibility, complexity, trialability and observability (Rogers 2003). The rate of adoption of new innovations will depend on how an organization perceives these five attributes in relation to the organization. The rate of adoption of an innovation will be faster if an organization observes the benefits of such innovation once the required tools are available. If an organization in Nigeria for instance observes the benefits of internet banking they will adopt the innovation once the required tools are available.

Rogers, (2003) further stated that another feature of innovation is observability which describes the level to which an innovation is visible to the social system members before benefits can be easily observed and communicated.

Trailability is the capacity to experiment with the new technology before adoption. Potential adopters who are allowed to experiment with an innovation will like to adopt it. Relative advantage refers to the degree to which an innovation is perceived as providing more benefits than its predecessor Okiro



& Ndungu (2013). Previous research has concluded that relative advantage of an innovation is positively related to the rate of adoption.

A user adopts a new technology than the old one when he perceives the usefulness or relative advantage of that new technology. Immediacy, convenience and affordability have been reported to accrue to customers that adopt E-banking.

## **Empirical Study**

### **ATM and Profitability:**

Adewoye & Omoregie, (2013) in their study on determinants of ATM deployment obtained secondary data of twenty two commercial banks. The data were analysed using both descriptive and inferential statistical tools. It was found that bank size, salary level and value of ATM transactions were key determinants of ATMs adopted by banks in Nigeria. The result also revealed that the intensity of ATMs deployment made positive contribution to the cost efficiency of Nigerian banks.

Studies by Itah and Ene (2014) investigated the impact of cashless banking on Banks profitability (evidence from Nigeria). Secondary data (2006 – 2013) were obtained and analysed using regression method. The result showed that ATM and POS are positively related to return on equity (ROE).

Jegede, (2014) investigated the effects of ATM on performance of Nigerian banks using primary data (questionnaire). Data collected through the questionnaire were analysed using SPSS and Chi-square technique. The results indicated that less than the benefits the deployment of ATMs terminals have averagely improved the performance of Nigerian banks because of the alarming rate of ATM fraud.

Meihami, et al (2013) investigated the effects of using electronic banking on profitability of Iranian Private Banks and noted that Automated Teller Machine (ATM) has the maximum influence on bank income.

Mwatsita (2016) studied the impact of ATM banking performance on Customer satisfaction with the bank in Malawi and found that despite influencing customer satisfaction with the bank, ATM banking has no capability to attract customers to switch banks. Hence banks could improve their customer satisfaction ratings through improvements in ATM banking services.

In the study of Khisar, Tunay and Tunay (2005) on the effects of innovation on bank performance: The case of electronic banking services, descriptive statistics of variables and correlation coefficients were used and they observed that the ratio of the number of branches to the number of ATMs is highly significant.

Ali & Kalu (2016) conducted a study on the impact of ATM on banking services delivery in Nigeria: A stakeholder analysis using descriptive statistics of variable and regression analysis, observed that ATM transactions positively and significantly impacts private sector deposit in Nigeria but not private sector savings deposit time deposits.

Rauf, Qiang & Sajid (2014) investigated on electronic debit card usage and their impact on profitability of Pakistan banking sector, using regression analysis found that increase in debit card usage enhance the profitability of banking industry in form of ROA over the period of 2004 to 2013 quarterly.

## **Internet Banking and Profitability**

Simra, Manzoor & Abbas (2011) investigated on the impact of E-banking on the profitability of Pakistan banks using data from interviews from the managers of the banks discovered that E-banking has increased the profitability of banks in Pakistan.

Abaenewe, Chibueze, Ogbulu, Onyemachi & Osondu (2013) examined the Electronic banking and bank performance in Nigeria using judgment sampling on data collected from four banks in Nigeria Pre and Post adoption of E-banking performance was tested using test for difference between means. The study revealed that the adoption of E-banking has positively and significantly improved returns on equity.

Dinh, le and le (2015) investigated the impacts of internet banking to bank performance: Evidence from Vietnam using regression model discovered that internet banking had an impact on bank profitability through an increase of income from service activities.

Okiro & Ndungu (2013) examined the impact of mobile and internet banking on performance of financial institutions in Kenya using questionnaires analysed by simple percentages observed that most prevalent internet banking service is balance inquiry while the least is online bill payment.

Khrawish & Al-sadi (2011) investigated the impact of E-banking on bank profitability and regression analysis: Evidence from Jordan using descriptive statistics for the period year 2000 to 2009 and discovered high expenses and cost are associated with applying for internet banking service and that empirical studies on internet banking was very considerable with different methods.

Oyewole, Abba, Gambo & Abbam (2013) carried out a study on E-banking and bank performance: Evidence from Nigeria for the period of year 2000 to 2010 using pooled ordinary least square estimation noted that internet banking contributed immensely and positively to bank performance in terms of ROA and net interest margin (NIM) with a negative impact was observed in the first year of adoption.

Cheruiyot (2010) conducted a study on the impact of internet banking on financial performance using multiple regressions and univariate analysis discovered that profitability and offering of internet banking have a small significant association (less than 5%).

Stoica, Mehdian & Sargu (2015) in their study on the impact of internet banking on the performance of Romanian banks using data development analyses and principal component analysis observed that there are very few banks in their sample that have utilized internet banking services in their production process to increase their level of efficiency.

In the study of Malhatra and Singh (2009) on the impact of internet banking on bank performance and risk: The Indian experience using multiple regression on secondary data collected they observed no significant association existed between internet banking and bank performance and risk.

## **Mobile Banking and Profitability**

In the study conducted by Kathuo, Rotich & Anyango (2015) on effect of mobile banking on the financial performance of banking institution in Kenya using descriptive statistics, they noted that banks that have adopted mobile banking have improved their financial performance and their customer outreach.

Ritho & Jagongo (2015) conducted a study on mobile banking and financial performance of commercial banks in Kenya using questionnaires found out that the price of mobile banking services had a high positive influence on the financial performance of commercial banks.

Studies by Bamiduro and Ibojo (2015) investigated the impact of E-banking on the performance of Nigerian banks in Oyo State using descriptive statistics and inferential statistics observed that mobile banking .E-payment & E-transaction independently and jointly predict bank performance.

Okoro (2014) in his study on impact of electronic banking instruments on the intermediation efficiency of the Nigerian economy using multiple regression technique observed that there is no significant relationship between mobile service value and intermediation efficiency of the Nigerian economy within the period of study 2006-2011.

Kiprop Too, Ayuma and Kemboi (2016) conducted a study on effects of mobile banking on the financial performance of commercial banks in Kapsabet (Kenya) using descriptive research design, questionnaires and interviews noted that mobile banking improves financial performance of banks.

### **P.O.S and Profitability**

In the study of Ugwueze and Nwezeaku (2015) on E-banking and commercial banks performance in Nigeria: A co integration and casualty approach, it was revealed that P.O.S is not co integrated with both savings and time deposits but are co integrated with demand deposits.

Kambohand and Leghari (2006) conducted a study on impact of cashless banking on profitability. A case study of banking industry of Pakistan using ordinary least square multiple regression for a period of 2007 to 2014 revealed that P.O.S transactions and mobile banking transactions are positively and significantly related to ROE.

Ajayi (2014) investigated on the effect of cashless monetary policy on Nigerian banking industry; issues, prospects and challenges and noted there are significant reasons and benefits inherent in the implementation of cashless policy and has positively affected the development of banks as it facilitates ease of operations and reduces queue and congestion in the banking hall.

Osazerbaru, Sakpeide & Bubune (2014) carried out a study on cashless policy and banks profitability in Nigeria using secondary data analysed by simple percentage, observed that cashless economic policy positively impact on banks' profit through reduction in the cost of operations and banking the unbanked populace. The use of P.O.S for instance was noted to attract special charges that do not go with cash transaction hence added income to the banks.

In the study of Borzekowski, Kiser, and Ahmed, (2006) on the consumers' preferences and price response using multivariate analysis discovered that an increase on bank imposed transaction fees causes decline in overall use of certain debit card at P.O.S.

Al-Qudah, Al-Hawary& Al-mehsen, (2012) conducted an empirical study on electronic credit cards usage and their impact on bank's profitability: the rate of return on owners' equity model using SPSS and Simple regression found that there is positive effect between net income from credit cards and profitability hence recommended that commercial banks in Jordan must increase the issue of credit cards of all kinds.

## Methodology

Research design is an outline of how data was collected and analysed in an attempt to obtain specific answers to research question (Cresswell, 2009). This study made use of ex-post facto research design because secondary data was collected from the financial statements of the banks on NSE.

## Model Specification

The economic model to consider in this study include ; Point of Sale (POS), Internet Banking (IB), Mobile Banking (MB) and ATM as the explanatory variables (independent) variable and Return on Total Asset (ROTA) as dependent variable respectively. The variables are used at constant prices. This is used to get parameter estimates in the time series regression. The following models are needed to test the set hypotheses.

$$ROTA = F( POS, IB, MB, ATM)..... (1)$$

Specifying equation (1) an exponential regression model, we have:

$$ROTA = a_0 + B_1POS_{t1} + B_2IB_{t1} + B_3MB_{t1} + B_4ATM_{t1}+ ER .....(2)$$

## Data Analysis and Interpretation.

### Descriptive Statistics

The descriptive statistics result shows the mean (average) for each of the variables, their maximum values, minimum values, standard deviation and the Jarque-Bera (JB) statistics (normality test).Table 1 below, provides the summary of the descriptive statistics of the data used for the study. The detail result of the descriptive statistics is present in table 1 under the appendix. Table .1 provides the summary of the descriptive statistics of the data covering the period of sixteen years (2000 – 2016).

**Table .1 Descriptive Statistics**

Variables	Mean	Max	Min	StdDev	JB (P-value)
ROA	0.358	0.44	0.28	0.05	7.41 (0.00)
ATM	3.78	4.01	3.39	0.20	4.38 (0.05)
POS	4.35	4.90	4.07	0.26	3.24 (0.03)
INTERNET	4.32	5.10	3.91	0.33	3.43 (0.07)
MOBILE	4.18	5.36	3.20	0.65	2.73 (0.09)

*Source: Researcher's (2017)*

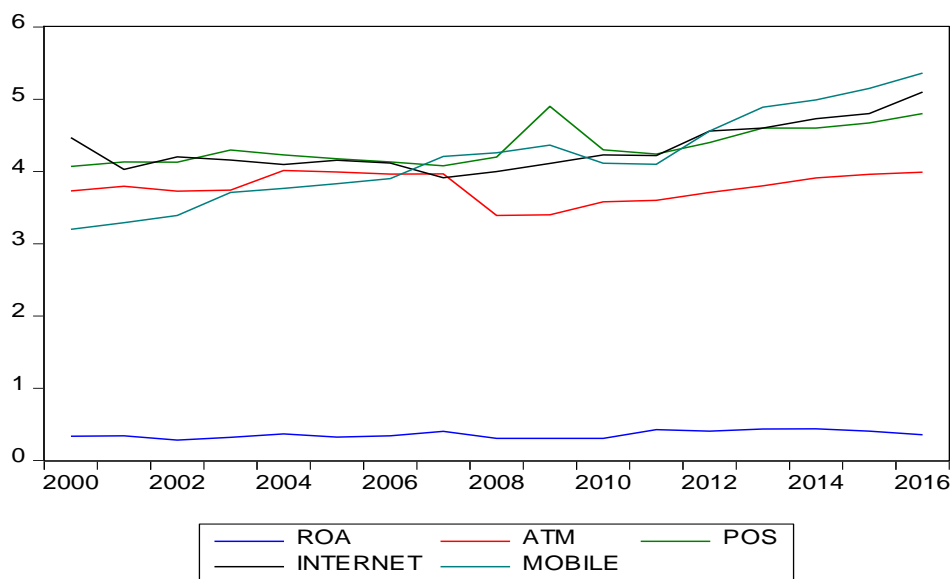
*Note: \*1% level of significance \*\*5% level of significance \*\*\*10% level of significance.*

The result provided some insight into the nature of the selected companies and the e-banking variables that were used for the study. Firstly, it was observed that within the period under review, the sampled companies average ROA have a maximum and minimum value of 0.440 and 0.280 respectively. The large difference between the maximum and minimum value shows that the sampled companies used for the study are not dominated by either large or small companies. Secondly, it was observed that on the average, over the period, the sampled companies were characterized by positive mean ROA 0.358. The table also reveals that ATM has a mean value of 3.78, the maximum sales of 4.01 and minimum value of 3.39. This indicates that the use of ATM increase linearly over the years of study, the small

difference between the mean value and the maximum value reveals that the use of ATM in transaction has been on increase linearly. The use of Point of sales for payment over the period has a mean value of 4.35, maximum value of 4.90 and minimum value of 4.07. This value indicates that within the period under review, Point of sales has great difference between its maximum value and minimum value, this difference reveals that the use of POS fluctuate over the period under review. The result also reveals that internet banking have a mean value of 4.32, maximum and minimum value of 5.10 and 3.91 respectively. The difference between the maximum and minimum value of internet banking indicates that the use of internet banking has been on the increase in volume and value. Mobile Banking has a mean value of 4.18, maximum value of 5.36 and minimum value of 3.20. The large difference between the mean value and maximum value reveals that Mobile Banking has witness tremendous increase over the years. The difference between the maximum and minimum value shows that the use of mobile banking is on the increase.

Lastly, the Jarque – Bera (JB) which test for normality shows that the value of return on assets is distributed at 1% level of significance. The value of ATM and POS was normally distributed at 5% level of significant respectively. While internet banking and mobile banking transactions value were normally distributed at 10% significance level. The result means that no variable with outlier but if there is any variables with outlier, they are not likely to distort our conclusion, and hence the results are therefore reliable for drawing generalization.

**Graphical Result: Multiple Line Graph**



The graph above shows the movement of the data over the years. The graph shows the result of return on assets, ATM banking, internet banking, mobile banking and point of sales. First it was observed that the movement of return on assets over the period is linear, no major or sharp rise or fall was witness within the period. Between 2008 and 2010, return on assets shows a down ward movement. The study noticed that the value of ATM transaction has been on the increase but witness a sharp fall in 2008 but start rising since 2009, this reduction in the value of ATM transaction can be attributable to the fall in the stock market as a result of economic financial crisis which reduces the consumption globally. Mobile banking witnesses an increase from 2003 and has been on the increase over the years. This linear increase may be attributable to increase in mobile telephone and the introduction of android and java mobile software in Nigeria. The value of point of sale transaction has witnessed an increase over the years until 2008 when it experience a sharp rise in 2009 but fall in years 2010, after the years

2010, it has been on the increase till 2016. Internet banking has been increasing steadily over the period.

### Correlations Analysis

In examining the association among the variables, the study employed the Pearson correlation Coefficient (Correlation analysis) and the results are presented below in table 4.2.

**Table .2 Pearson Correlation Analysis**

Variables	ROA	ATM	POS	INTERNET	MOBILE
ROA	<b>1.0000</b>				
ATM	-0.026	<b>1.0000</b>			
POS	0.129	-0.078	<b>1.0000</b>		
INTERNET	0.105	0.316	0.649	<b>1.0000</b>	
MOBILE	0.102	0.155	0.718	0.717	<b>1.0000</b>

*Sources: Researchers summary (2017). Pearson correlation analysis from E-view 9.5 lite*

The use of the correlation analysis is to check for multi-collinearity and to explore the relationship that exists between the variables used for the study. The table above (.2) shows the relationship that exist among the various variables used return on asset, automatic teller machine, point of sales, internet banking and mobile banking. The result shows that return on asset is positively related with point of sales, internet banking and mobile banking but negatively related with automatic teller machine.

Automatic teller machine has negative relationship with point of sales, this reveals that the more ATM used, the lesser the use of point of sales. Automatic teller machine has a strong positive relationship with internet banking and mobile banking. Point of sales has a strong positive relationship with internet banking and mobile banking. Internet banking has a positive relationship with mobile banking.

In checking for multi-collinearity, the study observed that no two variables were perfectly correlated. This means that there is absence of multi-collinearity problem in our model.

### Hypothesis Testing

To evaluate the effect of e-banking on performance of Bank and to test our formulated hypotheses, the study used the multiple regression analysis. The result obtained from the return on asset model is presented in table .3 below.

**Table .3 multiple regression analysis: Return on assets model**

	Coefficient	T-value	P- value
ATM	0.3367	-4.92	0.009
POS	0.0756	0.92	0.361
INTERNET	0.4070	0.72	0.471
MOBILE	0.0559	-1.64	0.093
R.Sq	0.2948		
R.Sq(Adj.)	0.2189		
F-Statistics	6.40		
F-Statistics(P-value)	0.052		

*Source: Researchers summary of Regression Analysis from Stata 13*

In table .3 above, the study observed from the result that the R-sq (adj) 0.2189 this indicates that the independent variables jointly explain about 21.89% of the variation in performance of the sampled Banks. Hence about 21.89% of the performance of Banks in Nigeria can be attributable to e-banking variables/activities. The F-statistics value of 6.40 and its probability value of 0.052 shows that the regression model is well specified and the model specification is statistically significant at 5% levels.

**Hypotheses 1: The use of Automatic teller machine has no significant effect on banks performance.**

The analysis result showed a coefficient value of 0.3367, t-value of 4.92 and a P-value of 0.009. The coefficient value reveals the degree of variation the use of ATM can cause to return on assets (performance), has a value of 0.3367, this reveals that use of ATM has a positive influence on banks performance (return on asset). Hence, the higher the use of ATM, the better the performance of banks in Nigeria. The t-value of 4.92 reveals that the use of ATM has an effect on the performance of banks. The probability value of 0.009 shows that the effect of the use of ATM is statistically significant on the financial performance of banks in Nigeria. Based on the analysis result, the study rejects the null hypothesis and accepts the alternate hypothesis it therefore concludes that, the use of ATM has statistical significant effect on the financial performance of Banks in Nigeria.

**Hypothesis 2: Point of sales has no significant effect on performance of banks.**

The result shows a coefficient value of 0.0756, t-value of 0.92 and a P-value of 0.361. The coefficient value of 0.0756 indicates that the use of point of sale banking service have positive influence on the performance of banks in Nigeria. The t-value of 0.92 reveals that the use of point of sale banking service has an effect on the performance (return on asset) of banks in Nigeria. The probability value of 0.361 reveals that the effect of the use of point of sale banking service on the performance (return on asset) of banks in Nigeria is not statistically significant even at 10% level. Based on the analysis result, the study accept the null hypothesis and reject the alternate hypothesis, it therefore concludes that, the use of point of sale banking service has no statistical significant effect on the financial performance of banks in Nigeria.

**Hypotheses 3: Internet banking has no significant effect on return on assets.**

The analysis result showed a coefficient value of 0.4070, t-value of 0.72 and a P-value of 0.471. The coefficient value of 0.4070, means that the internet banking has positive but negligible influence of about 0.4% on performance of banks in Nigeria. The t-value of 0.72 reveals that internet banking has an effect on the performance (return on asset) of banks. The probability value of 0.471 shows that the effect of internet banking on banks financial performance is not statistically significant; hence internet banking does not affect the performance banks. Based on the analysis result, the study rejects the alternate hypothesis and accepts the null hypothesis it therefore concludes that, internet banking has no statistical significant effect on the financial performance of banks in Nigeria.

**Hypothesis 4: Mobile banking has no significant effect on performance of banks.**

The analysis of the result showed a coefficient value of 0.0559, t-value of 1.64 and a P-value of 0.093. The coefficient value of 0.0559 indicates that mobile banking has about 0.6% influences on performance of banking firms in Nigeria. Thus #1.00 increase in mobile banking value and volume may lead to about #0.06 (6kobo) changes in performance of banks. The t-value of 1.64 reveals that mobile banking has an effect on the performance of banks in Nigeria. The probability value of 0.093 reveals that the effect of mobile banking on the performance of banks (return on asset) in Nigeria is

statistically significant at 10% level. Based on the analysis result, the study accept the alternate hypothesis and reject the null hypothesis, it therefore concludes that, mobile banking service has a positive statistical significant effect on the financial performance of banks in Nigeria.

## **Summary of Findings, Conclusion and Recommendations**

### **Summary of Findings**

1. ATM based on the T- value of 4.92 and P-value of 0.009 was found to have a positive influence on bank performance (ROA). This implies that ATM usage is statistically significant on the financial performance of commercial banks in Nigeria. Hence the higher the use of ATM the better the performance of deposit money banks in Nigeria.
2. P-O-S based on t-value of 0.92 and P-value of 0.361 was found to have negative influence on the performance of banks (ROA) in Nigeria. This implies that P-O-S banking service has no statistical significant effect on financial performance of deposit money (commercial) banks in Nigeria.
3. Internet banking based on t-value of 0.72 and p-value of 0.471 was found to have positive but negligible influence on performance of banks in Nigeria. This implies that internet banking has no statistical significant effect on financial performance (ROA) of deposit money (commercial) banks in Nigeria.
4. Mobile banking based on t-value of 1.64 and p-value of 0.093 was found to have about 6% positive influences on financial performance of deposit money banks in Nigeria. This implies that mobile banking has statistical significant effect on financial performance of commercial banks in Nigeria. Among all the e – banking variables, mobile banking has the highest influence on financial performance of commercial banks in Nigeria.

### **Conclusion**

The purpose of this paper is to examine whether there is any significant relationship between electronic banking and performance (profitability) of deposit money banks in Nigeria. Four independent variables used to determine E-banking services include ATM, P-O-S, internet banking and mobile banking. Return on asset (ROA) was used to measure the dependent variable - bank performance. Panel data of 14 banks from year 2000-2016 were used. Multiple regressions were used to evaluate the effect of e banking on performance of commercial banks. The findings have shown that mobile banking and ATM are significantly related to performance (profitability) of deposit money commercial banks. This study concludes that P-O-S and internet banking are not significantly related to financial performance (profitability) of banks.

### **Recommendations**

With respect to the findings of the study, the researcher recommends the following;

1. Since the findings have shown that the more the usage of ATM, the more of its contribution to profit of banks, more ATMs that can also receive cash from customers should be deployed in different locations for maintenance of quick and convenient service. In addition, the ATM should be constantly serviced to guide against system failure. To ensure uninterrupted, effective and efficient service delivery, banks should subscribe (register) with reliable internet (network) provider.
2. The government should promote the use of P-O-S services by offering subsidies for the P-O-S machines for the benefit of traders and customers .These P-O-S machines will then be supplied to



the traders for free by their banks which will charge a certain percentage based on the overall transactions carried out through these machines. The banks should only deduct from the traders account the nominal transaction charge involved for offering the service as it is instantly transferring money into the account of the trader. Consequently, higher number of transactions can be witnessed through banks and there will be no menace of black money or counterfeit money as all are being routed through banks.

3. There should be a general review of the charges paid to the network providers (MTN, GLO, AIRTEL, ETISALAT) in Nigeria to reduce the cost of internet banking. The fact remains that both the banks and their customers pay much to the network providers to get connected for internet banking to be possible. On the other hand, the federal government should negotiate with the network providers, so as to provide WIFI to enable the general public to have free access to internet banking. Moreover, the banks in order to ensure that cost does not become a barrier to internet banking should also reduce the charges associated with internet banking platforms so that the charges will be reasonable in comparison to other alternative options.
4. Since mobile banking has shown to be the highest contributor to the profit of the money deposit banks in Nigeria, Nigerian Government should strike deal with foreign telecommunications companies to establish more Smartphone assembly plants in Nigeria. This will go a long way to create employment for youths and reduce the prices of the Smartphone used in mobile banking hence more improvement on the income through mobile banking. Afrione, makers of Nigeria's first indigenous Smartphone which started February this year has engaged 5,000 students studying in institution of higher learning in Lagos State. The phone have been modelled on cutting edge technology to facilitate connectivity amongst Nigerians and the rest of the world, they have integrated necessary financial technology such as mobile banking apps to help farmers get higher yields. To encourage cheap and fast telecommunications services to the public, the Federal Government of Nigeria should subsidize the cost of access to inter connectivity, general information and communication technology.
5. The central bank of Nigeria should as much as possible continue the implementation of the cashless economy process that is presently ongoing in Nigeria, as it will lead to increase on customers demand for e-banking services.

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**Appendix:**

**Table 5: Correlations: ROA, ATM, POS, INTERNET, MOBILE**

	ROA	ATM	POS	INTERNET
ATM	-0.026			
POS	0.129	-0.078		
INTERNET	0.105	0.316	0.649	
MOBILE	0.102	0.155	0.718	0.717

Cell Contents: Pearson correlation

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```

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Notes:

```

. *(7 variables, 238 observations pasted into data editor)
. xtset id years, yearly
panel variable: id (strongly balanced)
time variable: years, 2000 to 2016
delta: 1 year

```

. xtregroaatmpos internet mobile, re

```

Random-effects GLS regression           Number of obs   =       238
Group variable: id                     Number of groups =       14
R-sq:  within = 0.0000                 Obs per group:  min =       17
between = 0.0000                       avg =          17.0
overall = 0.0189                       max =          17

                                           Wald chi2(4)    =       5.60
corr(u_i, X) = 0 (assumed)             Prob> chi2      =       0.2313
    
```

```

-----+-----
roa |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
atm |  -.0367153   .0683864    -3.54   0.029   - .1707502   .0973196
pos |   .0755712   .0825788     0.92   0.360   - .0862804   .2374227
internet | .0406977   .0563379     0.72   0.470   - .0697226   .151118
mobile | -.0059085   .0341327    -2.17   0.063   - .0728075   .0609904
      _cons | -.0187216   .3847202    -0.05   0.961   - .7727593   .7353161
-----+-----

sigma_u| .08939614
sigma_e| .17556491
rho | .20589282   (fraction of variance due to u_i)
    
```

. xtregroaatmpos internet mobile, fe

```

Fixed-effects (within) regression       Number of obs   =       238
Group variable: id                     Number of groups =       14

R-sq:  within = 0.2948                 Obs per group:  min =       17
between = .                             avg =          17.0
    
```

overall = 0.2189

max = 17

F(4,220) = 6.40

corr(u\_i, Xb) = 0.0000 Prob> F = 0.052

roa	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
atm	-.3367153	.0683864	4.92	0.009	-.1714916	.0980611
pos	.0755712	.0825788	0.92	0.361	-.0871756	.238318
internet	.0406977	.0563379	0.72	0.471	-.0703334	.1517288
mobile	-.0559085	.0341327	1.64	0.093	-.0731775	.0613605
_cons	-.0187216	.3839776	-0.05	0.961	-.7754668	.7380236

sigma\_u | .09901914

sigma\_e | .17556491

rho | .24133187 (fraction of variance due to u\_i)

F test that all u\_i=0: F(13, 220) = 5.41 Prob> F = 0.0000

. estimates store enak

. hausmanenakanak

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	enakanak	Difference		S.E.
atm	-.0367153	-.0367153	1.18e-14	5.92e-08
pos	.0755712	.0755712	2.50e-14	7.97e-08
internet	.0406977	.0406977	8.73e-15	1.06e-08
mobile	-.0059085	-.0059085	-1.14e-14	2.73e-08



b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(4) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 0.00$$

Prob>chi2 = 1.0000

(V\_b-V\_B is not positive definite)

. random effect is preferable.

Table 2: Correlations: ROA, ATM, POS, INTERNET, MOBILE

	ROA	ATM	POS	INTERNET
ATM	-0.026			
POS	0.129	-0.078		
INTERNET	0.105	0.316	0.649	
MOBILE	0.102	0.155	0.718	0.717