

Innovation in Bank Payment Systems and Related Services among Selected Commercial Bank Branches in Wa Municipality

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ABSTRACT

Innovation in bank payment systems and related new ways of banking in Ghana is radically changing the face of banking and its impact on customers and their satisfaction. Underlying this innovative initiative is a general understanding that ensuring access to the fundamental tools of a digital society is one of the most significant investments the banking world can make for the future. This main objective of the is to evaluate the perceptions of banking customers on the use of innovative payment systems on banking services in Ghana. The study focused on customers with banks that have at least one form of technological innovation. The results of the study generally indicate that, innovations in bank payment system through electronic delivery channels have contributed positively to the provision banking services and the growth of the banking system in Ghana. It also revealed that, the major innovations in bank payment system includes; Automated Teller Machines (ATMs), Telephone Banking, PC-Banking, Mobile Banking, SMS Banking, E-zwich, Mobile Money, Internet Banking, Credit and debit cards, Smart cards, Electronic billing and payment systems

Keywords: Innovation, Banking systems, Payment systems, Electronic payments

1. Background

Innovation in bank payment systems and related new ways of banking in Ghana is radically changing the face of banking and its impact on customers. Underlying this innovative initiative is a general understanding that ensuring access to the fundamental tools of a digital society is one of the most significant investments the banking world can make for the future. Thus, the significance of innovations is not in the technologies as such, but in the possibilities they open up for access to facilities, knowledge, information, communications and the elements of ever increasing importance in present economic and social interaction, Annon, (2003), Consequently innovative banking practices are rapidly taking a centre-stage in development planning and policy making at all spheres of life in the banking industry. Innovations in bank payments systems and in particular, electronic payment systems and related new ways of banking in Ghana being developed to support the traditional ways of banking cannot be examined in isolation

A failure to place these developments into proper context is likely to result in undue focus on the various initiatives to develop electronic forms of payment without a proper reflection on the broader implications for the existing payment systems. Cash payments, cheques and other paper credits were mainly the traditional mode of payment in Ghana until the recent development of alternative methods of payments in the Ghanaian banking sector. In Ghana, majority of individual payment transactions involve goods and services being exchanged for cash that are made face to face, i.e. both buyer and seller are physically present.

Furthermore, a high percentage of individual non-cash payments continue to involve the exchange of paper in some form. Electronic payments occurs when the instructions to pay are generated and received electronically and remain in the exclusive domain of an electronic network that has been specifically designed for handling high value payments. Examples of such innovations in the Ghanaian banking systems include; Credit Cards payments, Debit cards, Stored Value Cards, Automated Teller Machines (ATMs), Telephone banking, personal computer banking, internet banking, branch banking, the Electronic Funds transfer at point of Sale (EFTPoS), Electronic Funds Transfer and Inward Remittances such as Western Union and Moneygram (Abor 2004).

Despite the advancement made in banking through innovation in bank payment systems, several problems still exist in the Ghanaian banking sector. The payment system is currently facing a multiplicity of seemingly conflicting pressures, creating complex challenges for financial institutions and their IT managers. These have been compounded by technological changes (especially those provided by the Internet) that have created opportunities for new entrants to propose new ways of delivering payment services, accelerating the speed of change while reducing costs. The rapid concern for Internet banking is worth mentioning. Another rapidly approaching threat is that posed by telecommunications companies as they look for new revenue streams by exploiting the ubiquity of mobile phones to provide mPayment (popularly known as mobile-banking/services). Financial institutions are faced with mounting regulatory requirements, from national constraints, card scheme requirements, bureaucratic procedures, to name but a few. Compliance has become a complex and critical issue,

absorbing the time and effort of industry experts and requiring continual monitoring. The more the payment instruments are harmonised, the less those payment instruments are potential differentiators between the banks / acquirers. In this way, the cards payment business becomes more and more a cost-driven business, based on high volumes needed to achieve the necessary scale. As a result, some banks will need to reconsider their current business models in payments and move towards a more industrialized scale and method of processing. Strong cost pressures in the transaction processing mass-market is leading to a search for added-value services and niche offerings from banks or merchants.

Banks now have to, within a short time-frame, adapt their new procedures and customer information accordingly to increase transparency, faster incident management, and withstand the test of competition. While the use of ATM (with its associated MasterCard, Visa platforms) programs have decrease physical fraud in Ghana, There are new security challenges for banks in securing remote card payments and online banking operations. The number of reported fraud cases is increasing and many customers are losing trust for these new methods of bank payment. There is the need therefore for anti- fraud tools to critically monitor these channels. It is widely recognized that safe and efficient retail payment systems enhance the effectiveness of the financial system, boost consumer confidence and facilitate the functioning of commerce (BIS, 2003). Conceptionally, payment systems are coined as being two-sided markets (Rochet and Tirole, 2006). Virtually every economic transaction involves the use of a payment instrument, such as cheques, electronic funds transfers, etc. (Berger et al., 1996). Over the past decades, the payments business has witnessed important ongoing challenges and opportunities, comprising regulatory changes, increased consolidation and competition and technological advances. As a result, today's banking and payments business differs substantially from that in the past. At present, these developments are being intensified by the recent financial market turmoil, which may trigger fundamental changes in the business model for retail banking and payments.

According to (Sarpong, 2003), long queues; long distance traveling and time wasting are the major characteristics of the payment system in Ghana. These usually affect business activities and ultimately economic development. Banks in Ghana are yet to realize the full benefits of the innovations in bank payment systems and other related new ways of payments. These innovations may include electronic payment such as the use of cards, automated teller machines (ATM), the Internet, mobile phones, and etc. (Sarpong, 2003). The payments and clearing system in Ghana is yet to take advantage of its full potential in developing alternative and innovative payments systems. There is no central clearing system to clear debit card transactions between banks. Currently, there are only limited opportunities for commercial banks to undertake inter-bank clearance in Ghana. According to (Abor, 2004, Sarpong 2003), many people have been holding large sums of money outside the banking system as a result of the difficulties they expect to go through in either making withdrawals or making payment. (Sarpong, 2003). This situation is worsened by long queues at the end and beginning of each month as people come in to collect their monthly wages or salaries.

Advancements in computer technology in Ghana led to the banks networking their branches and operations, thereby making branch banking fully operational. Barclays Bank (Gh.) and Standard Chartered Bank (Gh.) were the first to consider such very important electronic innovations in the Ghanaian banking industry, which changed the bank payments system in the country. ATM has been the major innovation in banks payment systems the world over. A number of banks have taken up the initiative to offer innovative payment systems. Particularly in Ghana, the Trust Bank was the first to offer ATM services in 1995. Many more commercial Banks have followed this innovation process. The Ghana Commercial Bank started its ATM in 2001 in collaboration with Agricultural Development Bank. Today all banks (including some savings and loans company's) currently operate their ATMs in Ghana. The ATM has been the most successful delivery medium for consumer banking in this county. Customers consider it as important in their choice of banks, and banks that delayed the implementation of their ATM systems, have suffered irreparably. Other technological innovations that have taken place in the Ghanaian banking are the various electronic cards, which the banks have developed over the years. The first major cash card is a product of Social Security Bank, now SG-SSB, introduced in May 1997. Their card, 'Sika Card' is a value card, onto which a cash amount is electronically loaded. Standard Chartered Bank launched the first ever debit card in this country in 2001.

Study Objectives

Generally, the study seeks to examine the contribution of innovations in bank payment system to the development of the banking sector in Ghana. Specifically, this will be achieved through achieving the following objectives;

- Identify the form of innovations in bank payment systems that have taken place among commercial banks in Ghana.

- Examine how these innovation have affected the banking behaviour of bank customers
- Identify the possible constraints faced by customers using the IT innovation
- Examine the knowledge of IT innovation in bank payment in Ghana

2. ELECTRONIC BANKING

E-banking can be defined as the deployment of banking services and products over electronic and communication networks directly to customers. E-banking is about using the infrastructure of the digital age to create opportunities both local and global transactions. E-banking enables the dramatic lowering of transaction costs, and the creation of new types of banking opportunities that address the barriers of time and distance. Banking opportunities are local, global and immediate in E-banking. E-banking also means developing new relationships with customers, regulatory authorities, suppliers, and banking partners with digital age tools.

Reasons for the adoption of E-banking by banks

Electronic Banking has become attractive and preferred channel of service delivery because of; the increasing penetration of personal computers has made the cost of procuring ebanking services easy and cheaper. The availability of broadband internet services through digital Subscriber Lines (DSL), wireless and mobile internet has made it relatively easier access to the Internet. The wider diffusion of mobile phones with SMS facilities and also improved communication infrastructure e.g LAN, WAN, Radio, Satellite technologies.

Benefits of E-banking

1. Cost savings for both the bank and the customer
2. Offer convenience and flexibility with online transactions
3. Delivery of banking products to the doorsteps of the customer.
4. Reduction in the use of cash for transactions.
5. Provision of 24/7 Banking Services
6. Prevention of customers from carrying cash which can be an attraction for robbery.
7. Decongestion of Banking Halls

2.1 Electronic Delivery Channels and Products

Electronic delivery channels and products are systems that enable financial institution customers, individuals or businesses, to access accounts, transact business, or obtain information on financial products and services through a public or private network. In Ghana, the following channels are mostly used;

- Automated Teller Machines (ATMs)
- Telephone Banking
- PC-Banking
- Mobile Banking
- SMS Banking
- E-zwich
- Mobile Money
- Internet Banking
- Credit and debit cards
- Smart cards
- Electronic billing and payment systems

Automated Teller Machines (ATMs)

An automated teller machine or automatic teller machine (ATM) (also called cash machine, ATM Scrip to Cash machine, "bank machine" or "ABM", "autoteller" or guichet) is an electronic computerized telecommunications device that allows a bank's customers to directly use a secure method of communication to access their bank accounts, order or make cash withdrawals and check their account balances without the need for a human bank teller (or cashier). Some ATMs allow withdrawals funded by clerical staff in retail merchant locations. The clerical staffs are not considered bank tellers. Many ATMs also allow people to deposit cash or cheques, transfer money between their bank accounts, top up their mobile phones' pre-paid accounts or even buy postage stamps. Smaller indoor ATMs dispense money inside convenience stores and other busy areas. ATMs rely on authorization of a transaction by the card issuer or other authorizing institution via the communications network.

Benefits of the ATM Service

- To Ease Congestion at the Banking Halls
- To offer 24hr Banking Services to customers

- Increase the Profitability of the Bank by charging for the ATM services
- Advertisement of Bank's own Services as well as Third Party products to generate revenue
- Provision of International Network access to member banks such as Visa, Master Card etc.
- Off-site Banking Through standalone ATMs
- Selling Mobile Top-ups and Tickets
- To keep up with Competition
- Access to National Switch

Services Available on ATMs

- Cash Withdrawal
- Balance Enquiry
- Mini Statement
- PIN Change
- Transfers from one Account to the other
- Cheque Book Requests
- Statement Requests
- Mobile Top Ups – Tigo, Vodafone, MTN
- Utility Payments – ECG, GWCL

Telephone Banking

Telephone banking is a service feature offered by many banking institutions. The process involves using the keypad on a touch-tone telephone to perform a variety of banking functions. Along with traditional banks, phone banking is also utilized extensively by online banking institutions, including banks that conduct business primarily with the use of telephone technology. For telephone banking, telephone software is integrated with the banking software application. The software picks balances from the banking application and puts it in an interactive voice response (IVR) system. When you subscribe to this service a pin code is given to you and after you dial a menu follows in the form of a voice prompt and options like check balance, statement request, cheque book request etc are given to select the required response.

Advantage

- Bank customers could call any time of the day or night and check the status of their accounts.
- There are several ways that a telephone banking service may be configured e.g voice recognition, use of login credentials
- customer can use telephone banking to request information on other services the bank offers
- **It is also being utilized by virtual banks that rely heavily on telephone and Internet access to process transactions and provide information to customers.**
- Convenient for consumers who may not carry handheld devices that are Internet ready, or who are uncomfortable with using online banking for some reason.

PC-Banking

PC banking is your personal bank branch, open for business day and night. With PC banking you connect over a secure Internet connection and can do all your banking transactions from your PC: your payments, investments, savings and so on. PC banking is mostly used by corporate customers with large accounts. The idea is to give corporate direct access to the bank's software because of the volume and frequency of their transactions with the bank to do their transfers themselves and also to avoid delay of processing transactions thereby bringing banking services to the house of the customer. PC banking is computer specific in that the customer's computer is registered on the bank's network to the network card level, IP address and MAC address, which is the only machine that will be allowed or accepted on the bank's network. The difference between PC banking and internet banking is that, PC banking is computer specific while internet banking is computer independent that is to say you can use any computer anywhere for your transaction.

Advantages

- Anywhere, anytime: access your account where and when you want.
- Fast: manage your payments, savings, investment fund subscriptions, etc. in a flash.
- Safe: access is only possible with your personal codes and the Internet connection is highly secure.
- Cheaper transactions: dedicated connectivity to the banking floor via the bank's software.

Mobile Banking

Mobile banking (also known as M-Banking, mbanking) refers to provision and availment of banking and financial services with the help of mobile telecommunication devices. It is the term used for performing balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (PDA). Mobile banking is a new technology where the banking application interfaces with software that runs on a mobile phone so that you request for your balance, get your last 8 transactions and other things on the mobile phone. Mobile banking gives you an application on your mobile phone with a drop down menu to select the service you want just like you are sitting in front of your computer

Advantages

- The biggest advantage that mobile banking offers to banks is that it drastically cuts down the costs of providing service to the customers.
- Additionally, this new channel gives the bank ability to cross-sell up-sell their other complex banking products and services such as vehicle loans, credit cards etc.
- For service providers, Mobile banking offers the next surest way to achieve growth.
- Mobile banking is helping service providers increase revenues from the now static subscriber base.
- Also service providers are increasingly using the complexity of their supported mobile banking services to attract new customers and retain old ones.

SMS Banking

SMS banking involves the use of short messaging on mobile phone. It is also a mobile phone service just like mobile banking but the difference here is that it the bank gives you a short code messages on your mobile device for example bal. will represent your balance and you send it to a short code which is built into the banking software and that will return the message in the same short code format. Meaning that between you and the bank the transaction is by SMS. SMS banking services are operated using both push and pull messages. Push messages are those that the bank chooses to send out to a customer's mobile phone, without the customer initiating a request for the information. Typically push messages could be either Mobile marketing messages or messages alerting an event which happens in the customer's bank account, such as a large withdrawal of funds from the ATM or a large payment using the customer's credit card, etc. Pull messages on the contrary are messages initiated by customers making a request or enquiry on a service e.g request for bank statement, account balance etc

Features

- Balance Enquiries (for book and available balance)
- Statement Enquiries (for the last five Transactions)
- Rates Enquiries
- Rates Equivalent (for the rate equivalent between two different currencies)
- SMS Account Enquires (for receiving a list with all the SMS-enabled accounts and cards).
- SMS alerts
- SMS block account message
- SMS Campaigns.

Benefits of SMS

- Corporate and Retail clients can have the convenience of banking from their offices without physically moving to the bank's premises.

- Enhances regular monitoring of the customers' accounts
- To Ease Congestion at the Banking Halls
- To offer 24hrs Banking Services to customers
- Increase the Profitability of Bank by charging for the service.
- Advertisement of Banks own Services as well as Third Party products to generate revenue.
- Off-Shore customers can easily open accounts with the bank
- Differentiation of the Bank from Direct Competition

E-ZWICH

E-ZWICH utilises smart card technology to provide a common fully integrated platform for paying for goods and services throughout the country based on biometric fingerprint identification. E-ZWICH technology allows for a secure national payment system that manages the flow of funds between customers, merchants and financial service providers. Customers are able to perform transactions at any bank no matter where their traditional accounts are domiciled. All transactions occur between a client card and a merchant or a bank teller card at a Point Of Sale (POS) terminal rather than through a host mainframe. This allows the e-zwich system to operate in rural settlements that have very poor network infrastructure. The Ghana Interbank Payment and Settlement System (GhiPSS) was established by Bank of Ghana to deploy the E-ZWICH technology. GhiPSS is the legal entity that operates the E-ZWICH System Host.

Facts about E-zwich

- It is an account on its own right, that is, a personal computer in your pocket.
- It is issued by an issuing Bank for existing customers or new customers.
- Only one account of a customer's traditional accounts can be linked to E-Zwich smart card.
- It uses automated clearing system for settlement.
- The card holder should be issued with the E-zwich smart card free of charge.
- Customers do not need to have accounts with a bank before being issued with an e-zwich smartcard.
- Only your fingerprint can be used to authorise transactions from your card. Therefore you cannot send someone to withdraw money or buy something with your e-zwich card for you.
- The card holder pays some fees for his/her transactions.
- Companies cannot be hooked onto the E-Zwich where signatories to the account are more than one.
- E-zwich can perform Online and Offline transactions.

Benefits of E-zwich

- There is no minimum balance required on a smart card.
- The smart card holder can spend and draw cash only when necessary, hence there is no risk of money being stolen.
- Interest on funds is calculated on the current Savings Wallet balance at the end of each month.
- There is an innovative application of technology which allows offline and online processing.
- It is a national electronic switch which targets the banked and unbanked.
- Due to its interoperability, customers of other banks can use any bank's ATM or POS devices to transact business.
- Customers are secured as a result of the biometric identification (fingerprint).
- Secure cash movement.
- Banks will benefit by charging transaction fees.
- Daily sales of merchants will be safe from robbers who might attack them on their way to the bank.

Mobile Money

Mobile money or payment known also as Mobile wallet is an alternative payment method. Mobile money is being adopted by the mobile phone companies to make transfers and transactions on account using a mobile phone. The difference between mobile money and the other mobile technology applications is that there is no direct integration into any banking software so that it runs independently. It is a prepaid service first you have to load money on the mobile phone which is outside the banking software and then you later do the transaction. You can do money transfer, payment for goods and services at merchant stores with mobile money. Instead of paying with cash, cheque or credit cards, a consumer can use a mobile phone to pay for a wide range of services and digital or hard goods such as music, videos, ringtones, online game subscription or items, wallpapers and other digital goods.

Internet Banking/Online banking

Online banking (or Internet banking) is a term used for performing transactions, payments etc. over the Internet through a bank, credit union, or a building society's secure website. This allows customers to do their banking outside of banking hours and from anywhere Internet access is available. In most cases a web browser is utilized and any normal Internet connection is suitable. No special software hardware, or connectivity is usually needed by the user.

Advantages of online banking are

- Providing convenience for customers.
- instant access to banking services
- Ability to pay bills electronically.
- transfer of funds between accounts
- providing flexibility for customers

2.2 ELECTRONIC DELIVERY PRODUCTS

Credit and Debit cards

The Credit Card holder is empowered to spend wherever and whenever he wants with his Credit Card within the limits fixed by his bank. Credit Card is a post paid card. Debit Card, on the other hand, is a prepaid card with some stored value. **Credit card** is a small plastic card issued to users as a system of payment. It allows its holder to buy goods and services based on the holder's promise to pay for these goods and services. The issuer of the card creates a revolving account and grants a line of credit to the consumer (or the user) from which the user can borrow money for payment to a merchant or as a cash advance to the user. A **debit card** (also known as a **bank card** or **check card**) is a plastic card that provides the cardholder electronic access to his or her bank account/s at a financial institution. Some cards have a stored value with which a payment is made, while most relay a message to the cardholder's bank to withdraw funds from a designated account in favor of the payee's designated bank account. The card can be used as an alternative payment method to cash when making purchases. In some cases, the cards are designed exclusively for use on the Internet, and so there is no physical card. However, unlike credit cards, the funds paid using a debit card are transferred immediately from the bearer's bank account, instead of having the bearer pay back the money at a later date. Debit cards usually also allow for instant withdrawal of cash, acting as the ATM card for withdrawing cash and as a check guarantee card. Merchants may also offer cash back facilities to customers, where a customer can withdraw cash along with their purchase.

Smart Cards

Banks are adding chips to their current magnetic stripe cards to enhance security and offer new service, called Smart Cards. Smart Cards allow thousands of times of information storable on magnetic stripe cards. In addition, these cards are highly secure, more reliable and perform multiple functions. They hold a large amount of personal information, from medical and health history to personal banking and personal preferences. Smart cards can provide identification, authentication, data storage and application processing. A single contact/contactless smart card can be programmed with multiple banking credentials, medical entitlement, driver's license/public transport entitlement, loyalty programs and club memberships to name just a few.

Electronic Bill and Payment Systems

Electronic bill payment is a feature of online banking and mCommerce, allowing a depositor to send money from his demand account to a creditor or vendor such as a public utility or a department store to be credited against a specific account. The payment is optimally executed electronically in real time, though some financial institutions or payment services will wait until the next business day to send out the payment. The bank can usually also generate and mail a paper cheque to a creditor who is not set up to receive electronic payments. Most large banks also offer various convenience features with their electronic bill payment systems, such as the

ability to schedule payments in advance to be made on a specified date, the ability to manage payments from any computer with a web browser, and various options for searching one's recent payment history: when did I last pay Company X? To whom did I make my most recent payment? In many cases one can also integrate the electronic payment data with accounting or personal finance software.

Features Electronic billing and payment systems

- Bill payment service
- Fund transfer
- Credit card customers
- Investing through Internet banking
- Recharging your prepaid phone

Shopping EMPIRICAL LITERATURE

Abor (2004) was concerned with technological innovations and banking in Ghana. Additional work by Deutche Bank Research (2001), Vartanian (2000) and Birch (1998) looks at the future of electronic payments. Several researchers have addressed the problem of retail payment, Ferguson (2000), Malek (2001), Bank for International Settlements (2000), Mester (2000) and OECD Information Technology Outlook (2000) studied various aspects of this subject. Abor (2004) analyses the perception of bank customers pertaining to the effect of technological innovations on banking services in Ghana. A number of studies have also concluded that information technology has appreciable positive effects on bank productivity; cashiers' work, banking transaction, bank patronage, bank services delivery, and customers' services (Balachandher et al, 2001; Hunter, 1991; Yasuharu, 2003). In effect, it enhances savings mobilization and financial intermediation. Efficient payment systems rely on non-cash payments, and that an efficient and reliable payment system facilitates economic development. Annon, (2003), Carow and Staten (1999) used a logistic regression model to investigate preferences of consumers in using debit cards, credit cards, and cash for gasoline purchases. Humphrey and Hancock (1997) have provided an extensive survey of the payments literature. Using the Federal Reserve's 1995 Survey of Consumer Finances (SCF), Kennickell and Kwast (1997) analyzed the influence of demographic characteristics on the likelihood of electronic payment instrument usage among households. Payment services are an important part of the banking industry, accounting for a significant part of its revenues and operational costs. It is also considered as the backbone of banking activities as it is significantly associated with increased market share of other bank business, e.g. the provision of credit and the evaluation of associated risks [Boston Consulting Group (BCG), 2009]. BCG also reports that payments business accounts for 30-50 percent of bank revenues, and is actually considered the most attractive element of banking business, in terms of income generation, growth rates, and relatively low capital needs. Hirtle and Stiroh (2007) finds a significant link between retail focus by the U.S. banks (retail loan and deposit shares and extent of branching network) and bank stability although such focus also resulted lower return.

Effective payment services are important in helping banks to establish long-term relationships with their customers, both private individuals and corporate clients. These services are strongly linked to other banking services, e.g., deposits, as customers prefer to deposit money into a system in which they can obtain a good payment service (Kemppainen, 2003, 2008). Against this background, banks perform better in countries with a more developed retail payments business. From an economic perspective, efficient and safe payment systems are important insofar as they facilitate real and financial transactions in advanced economies. Their production is subject to economies of scale due to the significant investment in infrastructure needed to start the operation (large fixed costs) and the relatively small marginal cost of services provided using the existing infrastructure. Bolt and Humphrey (2007) provide evidence that standardisation of retail payment instruments across the euro area is likely to result in economies of scale in payment services in Europe. Similar economies of scale effects are to be gained in the European payment processing industry (Beijnen and Bolt, 2009). Berger and DeYoung (2006) showed that technological progress has facilitated the geographic expansion of the banking industry. Specifically, ATMs, POS terminals and similar shares and extent of branching network) and bank stability although such focus also resulted in technologies that can potentially reduce the costs of asset convertibility for households over time.(Berger et al., 1996).

Carlton and Frankel (1995) reported higher volumes and lower costs after the merger of competing ATM systems. Analysing customer switching effects, Massoud et al. (2006) find that higher ATM surcharges result in a greater market share of deposits of larger banks and a lower market share for smaller banks. The distribution network of payment services plays a crucial role as it attracts customers to the bank and generates more revenue in retail banking and other related business lines. At the same time, these retail payment transaction technologies

reduce the labour cost for banks and have the potential to reduce the costs of handling cash. Columba (2009) shows that transaction-technology innovation, i.e. the diffusion of ATM and POS technologies, has a negative effect on the demand for currency in circulation, while the overall effect on M1 is positive. In other words, transaction technologies and sophistication, e.g. ATM and POS networks, help banks to improve their overall performance.

Amromin and Charkravorti (2009) show that demand for small-denomination currency decreases with greater debit card usage and with greater retail market consolidation. Besides the direct impact on bank performance, we also predict that retail payment transaction technologies have an intensifying effect on the relationship between retail payment services and bank performance. Advanced retail payment transaction technologies will foster innovation and growth in the retail banking sector. This will further create more value associated with retail payment services for banks. On the other hand, if more retail payment transactions have been done through ATMs or Post Office System instead of retail payments offices, banks can be more cost efficient and obtain more profit. We believe that retail payment services have a larger impact on bank performance in countries with a relatively high adoption of retail payment transaction technologies. There are several varieties of retail payment instruments, like credit transfers, direct debits, card payments, e-money purchases, cheques, etc. Competition in retail payment markets has commonly been seen as an important contributor to efficiency (BIS, 2003). In a very competitive retail payment market, consumers have more choices to complete retail payment transactions and to make transactions more quickly and efficiently. Competition among retail payment instruments may also encourage retail payment providers to improve their service.

Additionally, a greater variety of retail payment instruments may result in more retail banking innovations. Therefore, heterogeneity among retail payment instruments helps banks to improve their performance. The European payments industry has undergone considerable change as electronic payment has increasingly gained popularity. New payment technologies, particularly newer electronic methods for consumer payments that may replace older paper-based methods, can potentially speed up settlement and reduce the financial costs of making payments for bank customers (Berger et al., 1996; Humphrey et al., 2006; Humphrey and Vale, 2004). Intuitively, the total cost of making payments for society might be expected to be high. In an early study, the costs have been estimated to amount to as much as three percent of GDP (Humphrey et al. 2003). A number of recent central bank studies provide more detailed estimates, especially where European countries are concerned. Depending on the chosen approach and methodology, the estimated total costs in connection with the production of payment services are in between 0.49 and 0.74 percent of GDP in 2002 (Brits and Winder, 2005; Banque Nationale de Belgique, 2005; Gresvik and Owre, 2003). Moreover, in general, there is a positive relationship between the use of electronic payment methods and the efficiency of the payment system. Significant potential benefits from adopting technological innovations can be expected, but typically there are extraordinary costs associated with the introduction of new payment methods. Humphrey et al. (1996) find that payment instrument choices strongly depend on bank customers' learning costs. In this paper, we examine whether the physical distribution of 7 according to Scholnick et al. (2007) provides a survey of the literature on credit cards, debit cards and ATMs.

Constraints to implementing Innovations

The level of bank payment systems modernization varies across countries. In industrial, transitional, and developing economies, countries have faced a range of obstacles including their existing legal framework, technical infrastructure, and maturity of banking systems. Payment system strategies undertaken in these countries often have the involvement of the central bank and commercial banks in diverse ways. These innovation theories to bank payment systems show how the strategies are developed under unique environments of advanced and emerging banking systems and compare the involvement of the central bank and the private sector in payment operations. They illustrate how ownership, pricing policies, and cost recovery may vary, and how such factors may influence efficiency and innovation in terms of changes in paper-based and electronic payment market shares. The rapid pace in which these new innovations are introduced may also pose risks to consumers and the wider financial system if not properly regulated and supervised. Thus, the challenge is to strike a balance between fostering new innovations and maintaining proper oversight of the associated risks to avoid stifling innovation itself. The main challenges to the continuing modernisation of payment systems theoretically are; financial stability, financial integration, trade liberalisation in financial services, and continuous technological innovation.

METHODOLOGY

A purposive and convenience sampling design was adopted to obtain participants for the study from the selected commercial bank branches in the Upper West Region. The sample size was drawn from among Commercial Banks in Ghana with branches in the Upper West Region. The banks in Ghana were sampled on the basis that they have at least one form of IT innovation channel. In all six commercial banks branches were identified and studied. The researcher also interviewed banking IT executives in the sampled banks to ascertain the form of IT innovation introduced by their respective banks. A Sample of fifty (500) questionnaire were administered across all respondents. The responses were measured with a five-point Likert-type rating scale, where strongly Agree (SA) = 4; Agree (A) = 3; Strongly Disagree (SD) = 2; Disagree (D) = 1; and Neutral (N) = 0. A three sectional questionnaire instruments was used to gather data for this study. The first section of the instrument will be a demographic questionnaire. The second instrument of the questionnaire asked questions about customers' perception about effects of the forms of innovation in bank payments system on service delivery. The final section of the questionnaire asked questions about the constraints customers face in using any form of IT innovation.

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

For operational purposes, the survey defined six age groups. Young people less than 20 years, range of ages 20-29, 30-39, 40-49, 50-59 and 60 year and above. Majority of the respondents 440 representing 88% aged between 20 and 29 years. 30 each representing 6 percent were between the ages of 30-39 and 40-49 respectively. None of the respondents were less than 20 years, and above 50 years. The survey made conscious efforts to achieve an equal gender representation. However, the customer response data result that about 370 representing 74 percent of the respondents were males and the rest of the 26 percent were females. This indicates that majority of the customers interviewed were male. A large majority of respondents, 88 percent, said they were single while 12 percent described themselves as married. None of the respondents were widowed or divorced. Interestingly, all the 500 respondents representing 100% of responses had some form of formal education. Occupationally, majority of respondents, 36% described themselves as students, 10 % as businessmen, and 12% as public/Civil Servants. Another 6% also described themselves as unemployed. All respondents operate an account with at least one of the studied bank.

Table 1: Representation in Selected banks Branches?

Customers of Selected Bank	Frequency	Valid Percent
Barclays Bank Ghana Ltd (BBG)	85	17
Stanbic Bank	85	17
SG-SSB Ltd	85	17
Agricultural Development Bank (ADB)	85	17
Ghana Commercial Bank Ltd (GCB)	85	17
National Investment Bank (NIB)	85	17
First National Bank	75	15
Total	500	100

Source: Field Survey 2013

The types of IT innovation in bank payments utilized by customers were identified. Special focus is placed on three major delivery channels namely ATMs, Telephone Banking, and Internet Banking. The information was basically from personal interviews with customers of the selected bank branches. It was found that 450 out of the 500 customers representing 90 percent of recent used at least one of IT innovation. The responses from customers confirmed that banking innovation takes the form of ATM, Telephone banking, PC banking, Mobile banking, SMS banking, E-zwich, Mobile banking, internet banking, Credit and debit cards, smart cards as well as Electronic Billing and payment systems. These innovations in the bank payment system in Ghana reduce the time involved in bank transactions. 100% of the respondents were aware on ATM as an innovation with majority having some knowledge about the form of innovation taken place in the banking industry. Majority also agreed that the time involved in transacting business with their banks can be reduced significantly with ATM, telephone banking internet banking and the other forms of IT innovation.

Table 2: Forms of form of IT Innovation in Banks payment system

Innovative Payment System	Frequency	Percent
Automated Teller Machines (ATMs)	500	100
Telephone Banking	400	80
PC-Banking	300	60
Mobile Banking	300	60
SMS Banking	225	45
E-zwich	150	30
Mobile Money	350	70
Internet Banking	300	60
Credit and debit cards	250	50
Smart cards	150	30
Electronic billing and payment systems	100	20
Total	500	100

Source: Field Survey 2013

The responses of customers about the effect of Technological Innovation on quality of products and service delivery in bank payment system were ascertained. About 390 representing 78% of the customers who responded agreed that IT Innovations ensures efficient quality products and service delivery. This is against only 22% who disagreed with the view. Another 380 representing 76% agreed that telephone banking improves product quality and services delivery as against 24% that disagree with the view. 410 representing 82% shows that internet banking Innovation enables banks to deliver efficient services to their customers. In all, internet banking improves quality of products and service delivery in bank payments in Ghana. It was also confirmed that, the advent of IT Innovation has led to increased bank charges. Even though 44% of the respondents disagreed with this assertion in the case of ATM, 56% agreed that ATM Innovation has resulted in increased bank charges. A contradictory finding appeared in the case of Telephone banking, SMS banking, PC banking and internet banking. All the IT innovations in bank payments are viewed by customers to have reduced transaction cost.

IT innovation and Customer Satisfaction

From table 11, out of a total of 500 respondents, 74%, 56%, 94% and 100% agreed that IT Innovation in the form of ATM, telephone, internet baking and SMS banking respectively provides adequate responses to their inquiries of products/services information, as against 26%, 38% and 6% who disagreed respectively. Overall, the customers are generally satisfied with the IT innovations in bank payment systems. The willingness of customers to continue saving with their banks was also established. 380 respondents representing 76% of the customers agreed that they will continue to save with their banks and use ATM. 68% and 58% also believe that IT Innovation in the form of telephone and internet banking discourages customers from their banks. This implies most of the respondents, appear to be satisfied with the services and products offered by their respective banks and so will continue to save with the banks. Specifically, about 60% agreed with varying degree that innovation in bank payment has a positive effect on customer satisfaction, 20 % are indifferent with Innovation while others 20% disagrees that innovation increases their satisfaction. Majority of the respondents also agreed that Innovations in bank payment system motivated them to operate with the selected Bank.

Table 3: Effects of IT Innovation on Customer Satisfaction

RESPONSE	FREQUENCY	PERCENTAGE
Strongly Disagree	20	4
Disagree	80	16
Neutral	100	20
Agree	100	20
Strongly Agree	200	40
Total	500	100

Source: Field Survey 2013

Table 4: Motivated to operate with a Selected Bank due to IT innovation

RESPONSE	FREQUENCY	PERCENTAGE
Strongly Disagree	50	10
Disagree	80	16
Neutral	80	16
Agree	150	30
Strongly Agree	250	50
Total	500	100

Source: Field Survey 2013

Customers were asked to enumerate some of the problems confronting them in using innovations in bank payment. Customers' response to this part of the survey was very revealing. Problems range from ineffective ATMs machines, illiteracy to poor internet access. Of the 500 response received from bank customers, majority cited their inability to correct errors in ATMS as the major problem that needs a critically look. Other common problems that the respondents cited includes; Illiteracy, cheating/ expensive bank charges, most ATMs are often Out of order/Service, No money in ATMs. Out of the 500 customers surveyed, 30 (6. %) cited No money in ATM and illiteracy as the major problems confronting them.

Table 5: Major constraints on ATM usage

Major ATM constraints	Frequency	Valid Percent
Missing response	70	14
cannot correct ATM errors	80	16
Costly	20	4
Illiteracy	30	6
it is a cheat	20	4
No money in ATM	30	6
Some ATMs are out of order	250	50
Total	500	100

Source: Field Survey, 2013

The major problems that customers encounter in using telephone banking include; expensive bank charges, inability to access mobile phones, poor networks and ineffective response from banks. Out of the 50 respondents in the survey, Majority of the respondents, 130 (26%) identified poor access to networks as the major constraints to the use of Telephone banking in Ghana. Another 70(14%) mentioned expensive bank charges as their major constraints. 30% of the respondents maintained that Ineffective response from the banks, difficulty in accessing phones and problem in getting access of network services are their major constraints respectively.

Table 6: Major constraints on Telephone banking

Major Telephone banking constraints	Frequency	Valid Percent
Missing responses	210	42
ineffective response from bank	30	6
Cannot get access to phone	30	6
Expensive charges	70	14
difficult to access service	30	6
poor network	130	26
Total	500	100

Source: Field Survey 2013

Out of the 500 respondents, several constraints have been identified. Difficulty to access internet, illiteracy, ineffective internet banking in most banks, slow and unreliable internet connection as well internet fraud are among the major constraints mentioned in regarding the use of internet banking in Ghana. Specifically, majority of the respondent's 150 respondents representing 30% identified difficulty in accessing internet as the major

constraint to the use of internet banking in Ghana. 18% of the respondents also mentioned illiteracy as a major constraint. Another 6% and 4% found ineffective use of internet banking and internet fraud as the main constraints hindering the use of internet banking in Ghana.

Table7: Major constraints on Internet banking

Major Internet banking constraints	Frequency	Valid Percent
Missing responses	80	16
difficult to access internet	150	30
Internet Fraud	20	4
Illiteracy	90	18
Ineffective	30	6
No privacy	20	4
Slow internet connection	110	6
Total	500	100

Source: Field Survey 2013

DISCUSSION

Banks have recognized that innovations in bank payments system represent an opportunity to increase profits and their competitiveness in the banking sector. Currently, only few banks in Ghana are offering internet banking (i-banking) as well as telephone banking. However, ATM is the most commonly available and used innovation in bank payments system in Ghana. In the case of Telephone banking, has also taken a big leap with its convenience and time. The services available with this system are ascertaining credible information about the bank's products, the customers' complaints, bank statements and cheque book request and any other complaints and inquiry. About 90% of the respondents have used one of three type of banking innovations in payments system (ATM, telephone banking and/ internet banking).

Automated Teller Machines (ATMs)

Rose (1999), describes ATMs as follows "an ATM combines a computer terminal, record-keeping system and cash vault in one unit, permitting customers to enter the bank's book keeping system with a plastic card containing a Personal Identification Number (PIN) or by punching a special code number into the computer terminal linked to the bank's computerized records 24 hours a day". Once access is gained, it offers several retail banking services to customers. They are mostly located outside of banks, and are also found at airports, malls, and places far away from the home bank of customers. Banks tend to utilize this electronic banking device, as all others for competitive advantage. Though ATMs have enjoyed great success because of their great utility, it has been recognized that it is possible for banks to improve their competitive stance and profitability by providing their clients with even more convenience (Abor, 2004). Barclays Bank of Ghana is the first Commercial bank in Ghana to introduce an ATM Machine that Accept Deposit electronically. The combined services of both the Automated and human tellers imply more productivity for the bank during banking hours. Also, as it saves customers time in service delivery as alternative to queuing in bank halls, customers can invest such time saved into other productive activities. ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human tellers (an average of about 6,400 transactions per month for ATMs compared to 4,300 for human tellers (Rose, 1999). Furthermore, as the ATMs continue when human tellers stop, there is continual productivity for the banks even after banking hours.

Telephone Banking

"Telebanking (telephone banking) can be considered as a form of remote or virtual banking, which is essentially the delivery of branch financial services via telecommunication devices where the bank customers can perform retail banking transactions by dialing a touch-tone telephone or mobile communication unit, which is connected to an automated system of the bank by utilizing Automated Voice Response (AVR) technology" (Balachandher *et al*, 2001). According to Leow (1999), telebanking has numerous benefits for both customers and banks. As far as the customers are concerned, it provides increased convenience, expanded access and significant time saving. On the other hand, from the banks' perspective, the costs of delivering telephone-based services are substantially lower than those of branch based services. It has almost all the impact on productivity of ATMs, except that it lacks the productivity generated from cash dispensing by the ATMs. For, as a delivery conduit that provides

retail banking services even after banking hours (24 hours a day) it accrues continual productivity for the bank. It offers retail banking services to customers at their offices/homes as an alternative to going to the bank branch/ATM. This saves customers time, and gives more convenience for higher productivity.

Internet Banking

The idea of Internet banking according to Essinger (1999) is: "to give customers access to their bank accounts via a web site and to enable them to enact certain transactions on their account, given compliance with stringent security checks". To the Federal Reserve Board of Chicago's Office of the Comptroller of the Currency (OCC) Internet Banking Handbook (2001), Internet Banking is described as "the provision of traditional (banking) services over the internet". Internet banking by its nature offers more convenience and flexibility to customers coupled with a virtually absolute control over their banking. Service delivery is informational (informing customers on bank's products, etc) and transactional (conducting retail banking services). As an alternative delivery conduit for retail banking, it has all the impact on productivity imputed to Telebanking and PC-Banking. Aside that it is the most cost-efficient technological means of yielding higher productivity. Furthermore, it eliminates the barriers of distance / time and provides continual productivity for the bank to unimaginable distant customers.

CONCLUSION AND RECOMMENDATION

It was also found that banking innovation in payment system in the form of Automated Teller Machines (ATMs), Telephone Banking, PC-Banking, Mobile Banking, SMS Banking, E-zwich, Mobile Money, Internet Banking, Credit and debit cards, Smart cards, Electronic billing and payment systems reduces the time involved in bank transactions. Out of 500 respondents, 450, 480 and 440 representing 90%, 96% and 88% agreed that the time involved in transacting business with their banks can be reduced significantly with ATM, telephone banking and internet banking innovation respectively. The results of the study generally indicate that, these new delivery channels have drastically reduced the time involved in making bank transactions in commercial banks in Ghana. Responses of customers about the effect of Technological Innovation on quality of products and service delivery in bank payment system revealed that, 78% of the customers who responded agreed that ATM Innovations ensures efficient quality products and service delivery. Another 380 representing 76% agreed that telephone banking improves product quality and services delivery while 82% shows that internet banking Innovation enables banks to deliver efficient services to their customers. The study therefore established that internet banking improves quality of products and service delivery in bank payments in Ghana. Overall, the customers are generally satisfied with the IT innovations in bank payment systems. Out of a total of 500 respondents, over 56% of the respondents agreed that IT Innovation in the form of ATM, telephone and internet banking respectively provides adequate responses to their inquiries of products/services information. This implies most of the respondents, appear to be satisfied with the services and products (ATM) offered by their respective banks and so will continue to save with the banks. The major problems that customers encounter in using these innovations in the bank payment system in Ghana includes; expensive bank charges, inability to access mobile phones or internet, poor networks and ineffective response from banks, illiteracy, ineffective machines.

Recommendation

Although this study yielded important results about the perception of customers on innovations in bank payment system in Ghana, there is much more research to be done. One recommendation is to conduct a further research using a much larger, randomized sample and more standardized test to measure the level of customer satisfaction on the various forms of bank innovations. This will help to improve the findings and allow us to generalize the results to a larger and more diverse population. There are many other studies that could further the study of innovative banking in Ghana. One would be to do a qualitative study that examines which factors are most important to the choice of a particular banking innovation over the other.

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