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"Electronic Banking Problems and Opportunities: The Sudanese Context"

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Abstract
The term electronic banking means an electronic handling of all types of banking business, primarily over the internet. E-Banking is one of the most successful on-line businesses, which save the individuals and companies time and money. This paper investigates the problems and opportunities of the electronic banking in Sudan, whereas, the provision and use of financial services and products that conform to interest-free banking principles which pose many challenges. Banking sector plays a crucial role in economic growth, it allows an efficient transfer of resources from those who save to those who invest under certain rules and regulations, and this study highlights the fact that changes have always been the hallmark of this sector. Here, this study replicates, extends and adds a longitudinal dimension to a recently introduced information technology in banking and financial institutions. The study reviews the experience of the Sudan as a developing country, and it concludes that regardless of the progresses achieved in recent years namely, enacting of electronic transactions Act 2007, the study finds out many deficiencies, poor infrastructure, and lack of skilled and well-trained human resource force in banking sector and security, which remain the key factors that constrain the applicability of e-banking.

Keywords: Electronic Banking, Problems, and Opportunities.

1. Introduction:

The importance of sophisticated or high technology for improving customer services, productivity, and operational efficiency of banks is well-recognized. As a part of their action plans, banks have introduced many new techniques and considerable degrees of mechanisation and computerisation in their operations (Bhole & Mahakud 2012). Increasingly, during this millennium, the financial services are being marketed and provided through the internet, which is one of the electronic media of transaction. Nowadays, people can bank online, offer services or get investment advice, such developments of information technology had led many banks and other financial institutions to fear that the internet may destroy their traditional businesses. The wide spread of cyber-cafes and internet connections springing up in different cities, access to the net is going to be easy the world over. Internet banking is the latest in this series of information technologies, wonders in the recent past involving use of internet for delivery of banking products and services. Internet banking (or E-banking) means any user with a personal computer and a browser can get connected to his bank -s website to perform any of the virtual banking functions. In internet banking system the bank has a centralised database that is web-enabled. All the services that the bank has permitted on the internet are displayed in menu. Any service can be selected and further interaction is dictated by the nature of service. The traditional branch model of bank is now giving place to an alternative delivery channels with ATM network. Once the branch offices of bank are interconnected through terrestrial or satellite links, there would be no physical identity for any branch. It would a borderless entity permitting anytime, anywhere and anyhow banking.

The network which connects the various locations and gives connectivity to the central office within the organization is called intranet. These networks are limited to organizations for which they are set up, SWIFT is a live example of intranet application. The developed banking system with internationally reputation, namely, in the Switzerland, the USA, Canada, European countries and others, where individuals prefer to directly deal with their respective bankers, are not yet became accustomed to e-banking as is compare to the Scandinavian countries. However, the present situation, upon closer examination, the existing legal framework proves sufficient in many respects to address the particular issues which are raised by the electronic provision of banking.

As a matter of accepted fact, that with the wide spread of cyber-cafes, internet kiosks and an easy access to the net; electronic banking is changing the banking industry relationships with major effects on banking. Banking businesses such as, an inquiry, transaction is processed online with any reference to a specific branch and at any time. Thus, e-banking is norm rather than to be an exception in many developed countries. But also provided such facilities of electronic business in the developing countries such as India, Korea, Singapore, Egypt and even the Sudan, is increasingly becoming a matter of must. Internet banking is changing the banking industry and is having the major effects on banking relationships. Banking is now no longer confined to the branches where, one

has to approach the branch in person, to withdraw cash or deposit a cheque or request a statement of account. In true internet banking, any inquiry or transaction is processed online without any reference to the branch at any time. Hence, we mean by the term e-banking or electronic banking as an electronic handling of all types of banking business, primarily over the internet. E-baking is one of the most successful online businesses which save the individuals and the companies' time and money (Busty and Bhusry, 2005).

This study is to investigate, extends and adds a longitudinal dimension to a recently published studies focusing on the problems and opportunities of electronic banking. The study which is being investigated has utilized the available information to explain the working of e-banking with specific reference to the Sudan a Sub-Saharan-African (SSA) country. This paper is divided into many sections; section two summarizes the survey of related literature with emphasis to the Sudan. The third section studies the scope and concept of e-banking. The fourth section discusses the application of information and communication technology in Sudan; and section five investigate the problems facing e-banking in the Sudan. Finally, concluding observations and policy directions.

1.1 Objectives of the Study:

The study aim to find the growth prospects of electronic banking; specifically, the broad objective of this research work is to highlight the problems and opportunities of e-banking and to determine the impact of Information Technology on financial sector on money deposit banks in Sudan. The broad objective is broken down into the following specific objectives which are:

a) Examine the factors influencing the electronic banking
b) Investigate the problems that the banks are facing while using the technology.
c) Study the opportunities of electronic banking in the Sudan.
d) To suggest some remedial measures to improve e-banking services.

*1.2 Questions of the Study***:**

The questions the researcher hopes to answer in the research are outlined below:

To what extent can the accuracy, reliability, relevance and comparability of banking business be enhanced by Information Technology?

what are the advantages of electronic banking?

2. Survey of Literature:

The developing economies with evolving monetary systems provided a sort of laboratory for examining the effects of finance on production, trade, investment and capital intensity and currently globalization, human resources development and the information technology. This paper is set to contribute to literature of e-banking as a supporting device to our ordinary daily banking business. A number of the International Monetary Fund (IMF) and other economists and bankers have written volumes papers those related to e-business, e-money, e-finance, e-banking and other electronic systems. The role of internet in the revolution of electronic banking is crucial and the completion of e-banking business could have been without the international network, generally known as internet. Economist, banker or a researcher often conducts a survey of literature, so as to review the present status of a particular research topic. A writer will be able to know the quantum of work already done and the research topic so far not touched, or yet to be undertaken. Hence, there are many benefits beget from review of literature, that is, to avoid duplicating efforts, adopting the methodologies that were used successfully, suggests new approaches of planning investigation and understanding of theoretical implications, clearly delineates research problem and reveals overlooked facts and conclusions. Here, in this section, we focus our attention on the huge and scattered literature that related to electronic banking. Herewith, we survey a number of studies those were done by economic writers' policy-markets, bankers and others, as follows:

Jarrah (1999a) has reported that Arab electronic shoppers spent approximately 95 million US Dollars in April 1998. Payments were made mainly by credit cards (82%), followed by bank transfers of 11 per cent, cash upon delivery of nine per cent, and cheques of three per cent. 78 per cent of online shoppers said that they believed fax transmission of private financial information was secure enough, versus telephone at 70 per cent, and e-mail at confidence of 50 per cent. This suggests that opportunities are available to banks in order to strengthen their on-line presence and assure both security and privacy of their operations to customers. Jarrah (1999b) also presented descriptive statistics that provide a good overview of internet usage in the Arab world. It is estimated that the total number of users in thirteen Arab countries was close to one million in April 1999. Egypt took the and ranked as the highest in terms of users with 207,200 followed by United Arab Emirates with 204,000 Saudi Arabia with 112,500 and Kuwait with 62,800 while Jordan ranked sixth with approximately 50,000 users. Jarrah has argued that the growth percentages in this industry are very impressive and are expected to spur the development of electronic business and other online services in the region. In Jordan, banks are now establishing their web sites and offering what is called a new generation of financial services.

Mustafa (2001) studied the electronic banking in general and has investigated the situation of the Sudanese banking system in particular as a developing one. His study explains how the Sudanese banking sector is of need to improve and establishing of complete infrastructure that permits introducing solution of network among the banks. He argued that the banking sector has changed and becomes more liberal after the merging of many banks with each other which generate mass and huge resources and working capitals. Hence, providing the needful information for banking business can be obtain only through the new information technology. His study provides and proposed the correct and needful policy indicators that to be introduced, implemented and subsequently improves the electronic banking in developing countries and the Sudan.

Jasimuddin (2001) observed that the advent of internet has set in motion an electronic revolution in the global banking sector since 1995. Within one year of the introduction of internet service in Saudi Arabia, Saudi banks have at least decided on their internet presence. 73 per cent of the Saudi banks possess their own web sites and 25 per cent of the web sites are offering full services over internet. The banks are increasingly viewing the internet as a key alternative delivery channel. However, there is no specific strategy for exploiting the opportunities offered by internet. Hence, Saudi banks via internet have much to improve in their Websites. He has concluded that: "*The possibility of rendering all banking services electronically, with adequate security and at the lowest possible cost, is pushing banks towards the Internet. While the banks in developed countries are working primarily via internet as non-branch banks, Saudi banks use the Internet as an information delivery tool to improve relationship with customers. Among the Saudi banks, some are using it as an electronic brochure. Very few are using as banking channel*".

Nsouli and Schaechter (2002) have explained the electronic banking as is the wave of the future. It provides enormous benefits to consumers in terms of the ease and cost of transactions. But it also poses new challenges for country authorities in regulating and supervising the financial system and in designing and implementing macroeconomic policy. "*Electronic banking is the wave of the future. It provides enormous benefits to consumers in terms of the ease and cost of transactions. But it also poses new challenges for country authorities in regulating and supervising the financial system and in designing and implementing macroeconomic policy*.", (Nsouli and Schaechter, 2002).

Awamleh, et. al. (2003) have replicated the work Diniz (1998) survey using the case of Jordan as an example of an emerging market. They found that a gap between Jordanian bank web application and American bank web application. The results of their analysis indicate that Jordanian banks have been successful in the introductory phase of web banking. What is now required is to focus on moving Jordanian web banking usage forward with a view to conducting real financial transactions and improving electronic customer relations. They concluded that: "*Online banking is increasingly used by banks and other financial service providers to gain competitive advantages, operational efficiencies and direct marketing opportunities…It is important to reaffirm that electronic banking is a new phenomenon. We have observed a major change from metal and paper money, to plastic cards, to smart cards, to online payments and fund transfers…Future research should focus on methods of advancing the interactivity levels towards the higher end of the matrix. Specifically, linkages between investments in web banks and organizational performance need to be anchored.*"

Abdulnabi (2004) studied the role of the monetary authorities in facing risks of electronic banking. He has cited some example from union of the Arabian banks by presented a diagram chart that shows to the percentage of banking transactions through internet from September 1999 to December 2000. His study explains the positive characteristics of e-banking, that is, on time payments, safety and security, improve cash flow reduce paperwork, saving money and time and promotes customers satisfaction. In details, he has studied the concerned risks of e-banking, those are, different from those that banking management customarily dealt with in assessing credit and market risks. Those risks are of strategic, operational, reputation, legal and other e-banking businesses risks. In the summary of his paper, he has proposed identical principles to help banking institutions expand their risk oversight policies and process to cover their e-banking activities. As he presents that the management should focuses to develop risk management guidance for e-banking which guide bankers, and promotes effectiveness and consistent bank supervision. Banks must managed the unprecedented speed of technological change and also assess how it relates to their technology investments and to provide high-quality services to their customers. The banks need to assess and manage security and safety risk, since internet banking becomes more widespread. He also puts forward the legal angle of national jurisdiction, where, banks transact business within the same country, but what about banking transactions of customers of other countries? It is observed that his paper never mentioned anything about the demise situation within the Sudanese banking sector.

Brown and Molla (2005) have come to know that more banks are turning to self-service technologies to provide customers with many channels to access products and services. Internet and cell phone are some of the least cost and increasingly popular financial services delivery channels. In developing countries though, the level of information and communications technology development, the cost of Internet and the limited bandwidth of mobile networks and other access technologies constrain such innovation. They have found that both the

adoption intent and the perception of Internet banking users differ markedly from cell phone banking users. The results are discussed and some implications for banks are outlined. In the conclusion of their study they observed that: "*Internet banking and cell phone banking are both fairly recent innovations in South Africa. However, the success of cell phone banking has not mirrored that of Internet banking, despite the far greater success of cell phone use as compared to Internet use. This study shows that perceptions of Internet banking are more positive amongst Internet users, than of cell phone banking among cell phone users, which explains the lower levels of cell phone banking adoption*".

Guru et al. (2005) their study shows that the majority of Islamic countries are still in the early stages of developing internet banking. They observed that some Islamic banks in the Middle East have well-developed internet banking websites for the convenience of their customers. However, since these banks are still in the infancy stage, there is still room for improvement. Evidence shows that Islamic countries are moving steadily towards e-internet banking. Given time, Islamic banks may one day stand along their conventional counterparts in the field of internet banking. They concluded that: "*Despite the rather late debut of Islamic banking the global financial arena, there is evidence to indicate its rapid growth not only in the number of financial institutions around the globe including both in Islamic countries and non-Islamic countries such as the United States and the United Kingdom. Internet banking is increasingly used by banks and other financial service providers to gain competitive advantages, operational efficiencies, faster processing and direct marketing opportunities… This study showed that only some of the banks had very well developed internet banking while most others did not have well developed features since 41.4% of the banks web sites surveyed in this study had a rating of less than 10 on a maximum rating of 27*".

Agboola, (2006) in his well studied paper that has examined electronic payment systems and tele-banking services in Nigeria. He has selected for the study thirty six out of the eighty nine banks in Nigeria in 2005. He used the questionnaire method for gathering data from bank workers. The findings of his paper revealed that there has been a very modest move away from cash. Some payments are now being automated and absolute volumes of cash transactions have declined. Connectivity via the use of networks has facilitated electronic transfer of funds. He observed that thirty five out of the thirty six banks, he has studied have fully networked their systems to ease communication of account information. The paper concluded that tele-banking is capable of broadening the customer relationship, retain customer loyalty and enable banks to gain commanding height of market share if their attendant problems are taken care of. E-banking operations have continued to change payment systems in Nigeria; a lot of efforts are however required to fully utilize its numerous capabilities. Banks in Nigeria should explore the internet more intensely to avail themselves of the bountiful opportunities locally and globally. Banks should also ensure safety of financial transactions on the net and ATM via authentication, authorisation, data integrity, and non-repudiation. Devices such as message integrity, digital signature, digital wallet, secure electronic transaction, e-cash, e-cheque, smart cards, electronic bill payment and digital certificate can be used in this regard. Lack of enabling environment to be provided by functioning electricity in the country has reduced the level of assimilation of the services and systems in Nigeria.

Kamaruddin et al. (2008) showed that the Islamic banks achieved technical efficiency through using technology such as ATMs, Internet banking, smart cards, and wireless banking. For cost efficiency, the Islamic banks used about 30% of their resources to produce outputs, a figure indicating waste.

The foresaid studies focused on e-banking and only two research studies are related to the Sudanese e-banking. We covered some related studies over here, specifically from the Middle East countries and Malaysia where the interest-free banking and finance are common. Some studies are related only to internet banking from developed and developing countries which show the benefits from this new system.

3. Electronic Banking:

A savings bank is a financial institution whose primary purpose is accepting savings deposits. In some countries, savings banks were created on public initiative, while in others, socially committed individuals created foundations to put in place the necessary infrastructure. A bank is a business that provides banking services for profit. Traditional banking services include receiving deposits of money, lending money and processing transactions. Some banks issue banknotes as legal tender; many banks offer ancillary financial services to make additional profit; for example: selling insurance products, investment products or stock broking. Currently in most jurisdictions the business of banking is regulated and banks require permission to trade. Authorization to trade is granted by bank regulatory authorities and provides rights to conduct the most fundamental banking services such as accepting deposits and making loans. There are also financial institutions that provide banking services without meeting the legal definition of a bank (see banking institutions). Banks have a long history, and have influenced economies and politics for centuries. E-banking has been around since the mid of 1970s and the first step toward e-banking was the form of automatic-teller-machines (ATMs) and telephone transactions. E-banking is not one technology, but on attempt to merge several technologies. In these words: "*is some*

combination of the features of a personal finance program combined with electronic bill payment. It operates through a dial-up connection to the bank" (Philips, 2005).

In Sudan, Islamization of the banking sector took place gradually by optimizing available opportunities with regards to the development of Islamic banking products and services. With these developments in Islamic Banking the next challenge is in taking the Islamic banking products and services to the internet. In addition a recent research carried out by the Institute of Banking Studies in Kuwait had found that almost 20 per cent of the customers are willing to move to another financial institution if their current bank fails to offer online banking services. This indicates that the Islamic banks can no longer ignore the importance of internet banking, especially with the ever-increasing computer literacy and Internet awareness and usage around the world. This coupled with the benefits of low cost of operations, access to a wider global market for Islamic banks and greater customer convenience would transform internet banking from a novelty to a necessity if these banks are to compete effectively in a global market. It is in this context that this study is undertaken to investigate the extent and quality of the web or internet presence of banks in the Muslim countries. Interest-Free banking, also known, as Islamic banking and financing became a reality that the West was compelled to recognize and study and subsequently to implement. It is therefore, suggested that this study be carried out: (i) to evaluate the interest free banking performance under the electronic banking, (ii) the interest-free banking in the wake of globalization of the financial system, and (iii) risks of e-banking under Interest-free financing system.

4. Applications of Information Technology Sudan's Financial Institution:

Internet users as of September, 2009 stood at 4,200,000, or 9.3% of the population. (This includes the population of South Sudan as the figures pre-date its independence.) In 2010 the total number of mobile subscribers in Sudan was 17,739,175 and in 2011 the total was 23,035,202, an increase of 29.85%. This figure includes both contract and pre-paid connections for both Sudan and South Sudan, as the data pre-dates the latter's independence. In the 2012 the internet subscribers were 6.5 millions in the Sudan. To enable Sudanese financial institutions from leveraging the benefits of this international network the Shamik SWIFT Service Center was established in 2000 to connect Sudanese Banks to SWIFT. This center acts as the SWIFT Sudanese Service Bureau. The center manages the transfer of various financial data based on the standards set by SWIFT guaranteeing the success and security of these transactions and in order to satisfy our clients we guarantee that we cope with all the developments in this area by continually updating our equipment and systems. Currently, almost 90% of all banks in Sudan whether local or international are connected to this network via our center. A mirror center has been established in order to guarantee a continuous service in case the original center faces any unwarranted malfunctions. The center has an ambitious plan to provide connectivity to the SWIFT network for non-financial institutions in Sudan to enable them from leveraging the benefits of the various services provided by the network in their operations in and out of Sudan. The National Assembly passed the Electronic Transaction Act 2007, which enable all financial institutions in the country to provide their services through electronic system.

(*a) Automatic Teller Machine (ATMs):* The ATMs were introduced in the retail banks with the objectives of reducing personnel costs associated with traditional "teller window" customer services transactions. Most of the Sudanese banks are providing their services via branches and throught the utilization of ATMs, table no. 1 shows there were around 25 ATMs in the year 2005 which increase to 865 in 2012.

*(b) Smart Cards***:** Smart cards are small sized piece of plastic devices with embedded integrated circuit and used as payment instrument. The power of smart cards lies in the ability to store and manipulate data, to handle multiple applications on one card and to perform secure transactions. table no. 1 shows the issued were less 55,848 smart cards in the year 2005 which increase to 1,326,931 in 2012

*(c) Global Depository Receipt Programme***:** Through this instrument, the financial institution was able to attract, institutional investors from diverse markets such as Europe, Middle East and other countries in Africa to Sudan.

Table No. 1 – Components of E-Banking in Sudan

Item	2005	2006	2007	2008	2009	2010	2011	2012
Banks	29	30	32	35	38	39	33	33
Branches	517	522	532	564	585	617	589	644
ATMs	25	115	265	395	507	661	739	865
POS	3	5	162	941	1436	1556	1732	1741
Cards	0	55848	145635	136616	186243	211962	1158429	1326931
Cheque Clearance	0	0	0	3027427	3919891	4175849	4321854	4379127
Transactios	0	460142	3338791	9042324	14168413	18870643	25842033	30143673

Sources: Reports from Central bank of Sudan, Commercial Banks, and Shamik Company

*4.1 Role of Information Technology Today***:**
Every day, financial Institution use computers in new ways computers are increasingly affordable; they continue to be more powerful as information processing tools as well as easier to use. Computers in Financial Institution one of the largest applications of computers is keeping all the financial record and also keeping the employment records of all their workers in large. Databases that are manage by computer programs. Program and databases are use as billing customers; tracking payments received and payment to be made and tracking supplier needed and items produced, stored, shipped. Data processing is the input, verification, organization, storage, transformation and extraction of information from data. Any information system refers to the application of computer system that processes the data. Databases store the master files. Application programs provide the data entry, up dating and query and report processing.

*4.2 Computerization in the Sudan's Financial Institutions***:**
The financial Institutions comprise the banking and non-banking institution. It is widely recognized that computerization promotes efficiency and ensures timely delivery of high quantity products and services; hence, the interest of government and monetary authorities and the financial public for a computerized financial system. Therefore, the global financial system is witnessing a major change in information technology with increasing use of computer. Structural Adjustment Programme (SAP), 1986, SAP aimed at increasing competition, promoting more efficient financial intermediation and encourage more licensing of new banks and non-bank financial institutions. The bankrupted and subsequently closed-down International Credit and Commerce Bank was the first bank in Sudan that computerized the inter-banks transactions in 1978, then followed by Elnielin Bank and Khartoum Bank in 1981. In July 1999 the Central Bank of Sudan along with Sudan-Telecommunication established the Electronic Banking Services Company (EBSC); after that Sudan becomes a member of the SWIFT community in 2000. To upgrade the banking services, new modern technology has been introduced besides the emphasis on the basic structures. In this context half of the banks are in the process of changing their systems to cope with the modern technology. In addition to that, all the banks introduced magnetic checks in all the States. EBSC imported the system of the prepaid card and Central Bank of Sudan finished the preparations for its use. Furthermore, the Company started the marketing of the card for banks, clients, beside the payment points. Also, Central of Bank of Sudan completed the computer network in the head office, and the branches. The Bank signed contracts with two companies to develop the administrative and financial information systems, beside three foreign exchange systems, and they will be applied during the year 2003.

*4.3 Electronic Cheque Clearance Centre***:**
The amount of cheques being processed on a daily basis and transferred from one institution to another is on the rise continuously. The number of court cases regarding cheques and their dealings are on the rise continuously. The number of people not willing to deal with cheques is growing significantly. The national payments framework is in urgent need for change. The traditional means of clearing cheques are very cumbersome, requiring great effort and consuming too much time. Currently cheques are all bundled at the end of a working day and then physically sent at the beginning of the next working day to the regional clearing-settlement point creating great inefficiencies and great risks including interruptions and security breaches. Furthermore, this approach is very expensive in both time and numbers. In general cheques must adhere to certain design criteria and be printed on paper conforming to standards set by the Central Bank of Sudan. Advances in technology can replace these outdated, expensive and difficult processes; through image based cheque clearing the front and back of cheques can be captured as images and electronically transmitted between the financial institutions. Al-Shamikh Company (EBS) has been delegated by the Central Bank of Sudan to manage the development of the Electronic Image Based Cheque Clearing System developed by an international company called Progress Soft. The Central Bank of Sudan (CBS) introduced the magnetic ink character recognition (MICR), a computerized system for processing cheques and other payment instrument to replace the manual processing of clearing cheques. The bank is also implementing the bank analysis system (BAS), which will provide the Bank and other corporation with information to monitor developments and financial viability of the banks.

5. Research Methodology:

The present study is concerned with the Sudanese banking industry in general and in particular those banks that are providing services through e-channels, i.e., electronic banking, which the study focuses on its problems and opportunities. The sample consists of all banks in Sudan, namely, public, private and foreign branches; the number of ATMs, points of sales (POSs), smart cards, electronic clearance of cheques, and transactions, table no. 3 shows the services that provided through e-banking in Sudan. Meanwhile, figue no. 1 and table 4 gives a

clear picture to the number of banks' branches and ATMs, many banks haven't website. The data is collected from the Central Bank of Sudan, Shamik Company for eight years.

Table No. 2 - Descriptive analysis:

	No. of Banks	No. of Branches	ATMs	Point of Sales (POS)	No. of Cards	Cheques Clearance	No. of Transactions
Mean	33.62500	571.2500	446.5000	947.0000	402708.0	2478018.	12733252
Median	33.00000	574.5000	451.0000	1188.500	165939.0	3473659.	11605368
Maximum	39.00000	644.0000	865.0000	1741.000	1326931.	4379127.	30143673
Minimum	29.00000	517.0000	25.00000	3.000000	0.000000	0.000000	0.000000
Std. Dev.	3.543102	46.06129	300.8365	779.3242	524802.1	2094181.	11522239
Skewness	0.309988	0.232874	-0.050577	-0.269022	1.121171	-0.406605	0.296677
Kurtosis	1.908433	1.793494	1.691461	1.298257	2.387992	1.277229	1.665350
Jarque-Bera	0.525296	0.557526	0.574169	1.061807	1.800884	1.209749	0.711120
Probability	0.769013	0.756719	0.750448	0.588073	0.406390	0.546143	0.700781
Observations	8	8	8	8	8	8	8

5.1 Results and Discussion:
As we know the recent bank transformation is taking place with IT and all this affects the banking services. From table no 2 shows descriptive methods, where the means and standard deviation of the e-banking system and its components From the results, the standard deviation reflects a large amounts of variation in ATMs, POS, cheques clearance, and transactions. Jarque-Bera test is a goodness of fit test whether sample data have skewness-kurtosis matching a normal distribution, where this study has only eight observations. The data are positively skewed, but negatively skewed for ATMs, and POS variables and it is approximately symmetric (-0.1 to +1.0).

6. Problems Facing E-Banking in Sudan:
Electronic banking has been around for some time in the form of ATMs and telephone transactions. More recently, it has been transformed by the internet, a new delivery channel for banking services that benefits both customers and banks. Access is fast, convenient, and available around the clock, whatever the customer's location. Plus, banks can provide services more efficiently and at substantially lower costs. There are many trends in electronic banking that are gaining ground. Banks increasingly operate websites through which customers are able not only to inquire about account balances and interest and exchange rates but also to conduct a range of transactions. In Sudan there are many problems facing the proper practice of e-banking, such as: Firstly, lack of co-ordination between the private and public sectors to create the right environment for banking, secondly, lack of awareness of e-banking and distrust of online payments and security and lack of legal protection against online intrusions, fraud and money-laundry; and thirdly, inadequate infrastructure, computer internet literacy and connectivity, and, lastly, most of the banks are not have their web-site pages.

*Barriers to ICT in Financial Institutions***:** Some barriers to information, communication technology are:
*5.1 Costs***:** Most of the banking institutions have not been able to benefit from the opportunities of information flow because of various barriers they are confronted with. One of these involves the costs arising from the acquisition and maintenance of new information technology. It is observed that the cost of establishing networks and tariffs charged are so high that even if computers, are available it is only the privileged few who can have access to the service, but nowadays these instruments have low costs, then, the banks must adopted and provide services via electronic transactions. Meanwhile, the average cost of a direct banking transaction via Web is $0.10, in comparison, an ATM transaction costs $0.27, a phone transaction $0.54 and a branch transaction cost $1.07 (Kurtas 2000).
*5.2 Standardization***:** In banking institutions, there is also the problem of the standardization of hardware facilities. The information superhighway has engineered the importation of various brands of information technology by Financial Institution. Technologists assert that imported technologies are designed to operate in an air-conditioned, dust free environment with a good maintenance support.
*5.3 Illiteracy***:** Illiteracy in banking institutions is one of the serious constraints to the effective use of information technology. The quality of training in information communication technology is also unsatisfactory. Introduction to physical equipment will not solve the problem of information availability and flow unless it is coupled with human capacity and skill lack of infrastructure remains the main setback to the development of information

communication technologies in banking institution. Telephone line failures and electronic blackouts are frequently experienced.

7. Concluding Observations Policy Directions:

E-banking will continue to significantly alter banking and financial services system the world wide. The movement towards the legal recognition of purely electronic contracts and electronic communication will continue. Whether or not such recognition will allow banks to replace paper files with purely electronic records is an issue yet to be addressed, and it will likely do so only in co-ordination with other bank regulators. Furthermore, it is likely that consumer protection and privacy laws will continue to impact the manner in which electronic financial services may be provided to the customers. Many difficulties and complexities are standing infant of the banking management authorities, e-banking and e-business will move ahead. The technologies surrounding it work together in some way and fail also in others. Canada is already developed in this field and India, the sleeping tiger, is doing quite advance, both the countries have to help in setting the correct system and provide the guideline and required technologies to the struggling Sub-Saharan-African economies, and specifically, the Sudanese banking sector. We observed many short-comings in adopting the e-banking in the Sudan, despite, the fact that the Islamic banking and financing system always looking forward and ahead to the new technologies, it is not an obstacle but the spread-head of development. Many among the Sudanese banks do not have their own web-site-pages. Which, they suppose to help their customers to get the needful information of banking transactions.

7.1 Some Managerial Implications and Gray Areas of Research:

a) Per transaction cost in traditional banking and in e-banking system.
b) Training of human resources (mainly banks' employees).
c) Comparative study of quality of services of the entire Sudanese banking groups.
d) Quality and availability of traditional and e-banking services in the sub-urban and rural areas in Sudan.
e) IT impact of performance, efficiency and profitability of banks: investing in e-banking will reduce costs and raise profitability of the banking sector.
f) Convenience: many customers now prefers to perform execute financial operations from the comforts of their homes and offices.

Table No. 3: E-Banking Services Offered by the Sudanese Banks - 2012

Bank's Name	Branches	ATMs	PoS	IVR	Mobile Phone	Internet Banking	SWIFT
Abu Dhabi National Bank	√	√	√	√	√	N.A	√
Africa Sahel & Sahra Bank for Inv. & Trade	√	√	N.A	N.A	N.A	N.A	√
Agricultural Bank of Sudan	√	√	N.A	N.A	N.A	N.A	√
Al- Baraka Islamic Bank (Sudan)	√	√	√	√	√	N.A	√
Aljazeera Jordanian-Sudanese Bank	√	√	N.A	N.A	N.A	N.A	√
Alsalam Bank (Sudan)	√	√	√	√	√	√	√
Al-Shamal Islamic Bank	√	√	√	√	√	N.A	√
Animal Resources' Bank	√	√	√	√	√	N.A	√
Arab Sudanese Bank	√	N.A	N.A	N.A	N.A	N.A	√
Bank of Khartoum	√	√	√	√	√	N.A	√
Blue Nile Mashreq Bank	√	√	√	√	√	N.A	√
Byblos Bank (Africa)	√	√	√	√	√	√	√
Egypt National Bank (new)	√	N.A	N.A	N.A	N.A	N.A	√
El-Nilein Bank	√	√	N.A	N.A	N.A	N.A	√
Export Development Bank	√	√	√	√	√	N.A	√
Faisal Islamic Bank (Sudan)	√	√	√	√	√	N.A	√
Family Bank	√	√	N.A	N.A	N.A	N.A	N.A
Farmer's Commercial Bank	√	√	√	√	√	N.A	√
Financial Investment Bank	√	N.A	N.A	N.A	N.A	N.A	√
Industrial Development Bank	√	√	√	√	√	N.A	√
Islamic Cooperative Development Bank	√	√	√	√	√	N.A	√
Ivory Bank	√	N.A	N.A	N.A	N.A	N.A	N.A
National Bank of Sudan-Audi Group	√	√	√	√	√	N.A	√
Omdurman National Bank	√	√	√	√	√	N.A	√
Qatar National Bank	√	√	√	√	√	N.A	√
Real Estates Commercial Bank	√	√	√	N.A	√	N.A	√
Savings & Social Development Bank	√	√	N.A	N.A	N.A	N.A	√
Saudi Sudanese Bank	√	√	√	√	√	N.A	√
Sudanese Egyptian Bank	√	√	N.A	N.A	N.A	N.A	√
Sudanese French Bank	√	√	√	√	√	N.A	√
Sudanese Islamic Bank	√	√	√	√	√	N.A	√
Tadamon Islamic Bank	√	√	√	√	√	√	√
United Capital Bank	√	√	N.A	N.A	N.A	N.A	√
Workers' National Bank	√	√	N.A	N.A	N.A	N.A	√

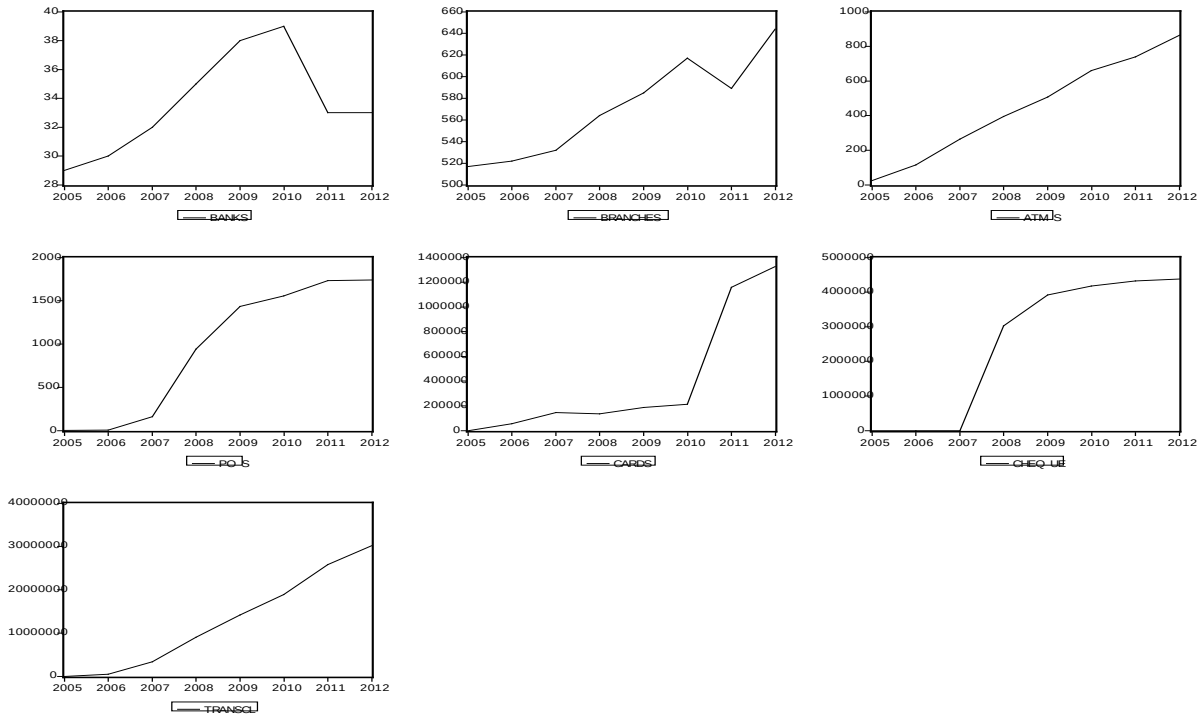
Sources: Central Bank of Sudan, & Banks Reports
N.A. = not available

Table No. 4: Number of Branches and ATMs - 2012

Bank's Name	No. of branches	No. of ATMs
Abu Dhabi National Bank	03	05
Agricultural Bank of Sudan	96	12
Al- Baraka Islamic Bank (Sudan)	25	32
Aljazeera Sudanese Bank	07	11
Alsalam Bank (Sudan)	04	18
Al-Shamal Islamic Bank	20	21
Animal Resources' Bank	18	16
Arab Sudanese Bank	22	N.A
Bank of Khartoum	49	22
Blue Nile Mashreq Bank	10	11
Byblos Bank (Africa)	03	13
Egypt National Bank (new)	02	N.A
El-Nilein Bank	37	04
Export Development Bank	24	40
Faisal Islamic Bank (Sudan)	31	113
Family Bank	02	04
Farmer's Commercial Bank	29	58
Financial Investment Bank	01	N.A
Industrial Development Bank	05	05
Islamic Cooperative Development Bank	31	34
Ivory Bank	07	N.A
National Bank of Sudan-Audi Group	05	03
Omdurman National Bank	18	65
Qatar National Bank	06	06
Real Estates Commercial Bank	10	11
Sahel & Sahra Bank for Inv. & Trade	03	04
Savings & Social Development Bank	36	54
Saudi Sudanese Bank	14	29
Sudanese Egyptian Bank	08	16
Sudanese French Bank	23	66
Sudanese Islamic Bank	42	34
Tadamon Islamic Bank	19	06
United Capital Bank	04	07
Workers' National Bank	14	12

Sources: Central Bank of Sudan, & Banks Reports
N.A. = not available

Figure N. 1



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