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THE SPECIFICS OF E-BANKING IMPLEMENTATION IN LOW-VOLUME COUNTRIES (THE CASE OF RWANDA)

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ОСОБЛИВОСТІ ІМПЛЕМЕНТАЦІЇ ЕЛЕКТРОННОГО БАНКІНГУ В КРАЇНАХ З НИЗЬКИМ РІВНЕМ ДОБРОБУТУ (НА ПРИКЛАДІ РУАНДИ)

Electronic banking is a fundamental innovation in the global banking industry. The Rwandan banking system and the Bank of Kigali itself are no exception, as they are rapidly introducing banking innovation into the daily lives of local people. This study focused on the characteristics of e-banking implementation in Rwanda and its impact on the effective functioning of the entire banking system. Specifically, the study was to ascertain whether there was a relationship between the dependent variable such as performance measure as measured by profit after tax and the independent variables consisting of number of ATMS, number of debit and credit cards issued to customers, number of

point of sale terminals and level of usage of mobile banking, internet banking and electronic fund transfer as components of e-banking. The study used secondary data that were collected from annual reports of commercial banks and the Central Bank of Rwanda. Both descriptive and statistical data were used in data analysis. The results of the study showed that e-banking has a strong and significant impact on the profitability of commercial banks in the Rwandan banking system. Thus, there is a positive relationship between e-banking and bank performance. The significance test showed that the impact of Bank Kigali innovation on bank profitability was statistically significant, which means that the aggregate effect of banking innovation in this study is statistically significant in explaining the profitability of commercial banks in Rwanda. The study recommends that the management of those banks that are slow to innovate should move forward and implement various innovations in their operations to improve profitability. This recommendation is supported by the fact that highly profitable banks are in the majority. Implementing innovations will increase the profitability of organizations as it will lead to increased tax revenues for the budget. In addition, the study of e-banking implementation in Rwanda is of particular interest to specialists because Rwanda, as a republic whose economy was hit by war and genocide, does show all the signs of rapid economic growth and its example can be used to trace the main aspects of e-banking in emerging economies.

Електронний банкінг є фундаментальною інновацією у світовій банківській індустрії. Не винятком стала і банківська система Руанди та безпосередньо Банк Кігалі, які стрімко впроваджують банківські інноваційні технології у повсякдене життя місцевого населення. Дане дослідження присвячено вивченню особливостей імплементації електронного банкінгу в Руанді та його впливу на ефективне функціонування всієї банківської системи. Зокрема, дослідження повинно було встановити, чи існує зв'язок між залежною змінною, такою як показник ефективності, що вимірюється прибутком після сплати податків, та незалежними змінними, що складаються з кількості ATMS, кількості дебетових та кредитних карток, виданих клієнтам, кількості терміналів у торгових точках та рівня використання мобільного банкінгу, інтернет-банкінгу та електронного переказу коштів як компонентів електронного банкінгу. У дослідженні використовувалися вторинні дані, зібрані з річних звітів комерційних банків та Центрального банку Руанди. Під час аналізу даних використовувалися як описові, так і статистичні дані. Результати дослідження показали, що електронне банківське обслуговування надає сильний та значний вплив на прибутковість комерційних банків у банківській системі Руанди. Таким чином, існує позитивний зв'язок між електронним банківським обслуговуванням та ефективністю роботи банку. Тест на значущість показав, що вплив інновацій на прибутковість Банку Кігалі був статистично значущим, що означає, що сукупний ефект банківських інновацій у цьому дослідженні є статистично значущим у поясненні прибутковості комерційних банків Руанди. Дослідження рекомендує керівництву тих банків, які повільно впроваджують інновації, рухатися вперед та впроваджувати різноманітні інновації у свою діяльність для підвищення прибутковості. Ця рекомендація підтверджується тим фактом, що високоприбуткові банки здебільшого є такими. Впровадження інновацій підвищить прибутковість організацій, оскільки це призведе до збільшення податкових надходжень до бюджету. Крім того, дослідження особливостей імплементації електронного банкінгу в Руанді викликає особливий інтерес у фахівців, оскільки Руанда як республіка, економіка якої була вражена війнами та геноцидом, дійсно демонструє всі ознаки швидкого економічного зростання і на її прикладі можна простежити основні аспекти становлення е-банкінгу в країнах з економікою, що розвивається.

Key words: e-Banking, introduction, productivity, commercial banks, types of e-banking products, information technology.

Ключові слова: e-Banking, імплементація, продуктивність, комерційні банки, види електронних банківських продуктів, інформаційні технології.

PROBLEM STATEMENT

The new millennium has brought with it new opportunities in terms of access to information and its availability at the same time, posing new challenges in protecting sensitive information from intruders while making it available to others. According to Chang, T. Y., electronic banking has made significant contributions to the distribution channels of banks such as ATMs, telephone banking, tele-banking, computer banking and now Internet banking [1]. In addition, the transfer of funds, viewing and checking of savings account balances, mortgage payments, bill payments and the purchase of financial instruments and certificates of deposit have improved significantly as a result of internet banking [2]. This means that e-banking has led to improved efficiency in service delivery in the banking sector as customers can conduct business from one end of the country to the other, from both long and short distances.

According to Aladwani A. [3], Ilyash O. [4], Kreidych I., Roshchyna N., Kazak O. [5], Shevchuk O. [6] today's business environment is extremely dynamic and experiencing rapid changes due to technological improvements, increased awareness and requirements of banks to serve their customers electronically. Banks have traditionally been at the forefront of adapting technology to improve their products and services.

The growth and rapid development of information and communication technology (ICT) in today's world has affected service delivery in most, if not all, organisations. They have caused significant changes in forms of cash, money transfer systems, service delivery, and customer satisfaction in the banking sector. These changes have affected the financial performance of banks. On the one hand, the use of remote banking methods, simplification of tasks and cost reductions have increased the number of customers and thereby improved management [7].

E-banking is crucial in banks' drive for transformation in areas such as products and services and how they are delivered to customers. Thus, it is seen as a valuable and powerful tool for development, growth, promotion of innovation and increasing the competitiveness of banks [8,9]. Considering the significant role of e-banking in the development of banks, it has been found that information technology leads to improved business efficiency and service quality and hence attracts and retains customers [10].

The 21st century banking industry operates in a complex and competitive environment characterised by a changing environment and a highly unpredictable economic climate. Information and Communication Technology (ICT) is at the center of this curve of global e-banking change in contemporary Africa [11]. Arguing that over time they are using electronic and telecommunication networks to provide a wide range of value-added products and services, managers in the Rwandan banking industry cannot ignore information systems as they play a crucial role in the current banking system, they note that all cash flows of most banks are linked to the information system.

The application of information and communication technology concepts, methods, policies and strategies in banking services has become a matter of fundamental importance and concern for all banks and a prerequisite for the local and global competitiveness of banks.

The development of technology has played an important role in improving the standards of service delivery in the e-banking industry. In their simplest form, automated teller machines (ATMs) and deposit machines now allow consumers to carry out banking transactions after hours [12].

With online banking, people can check the status of their accounts and make payments without having to visit a bank hall. This gradually creates a cashless society where consumers no longer need to pay for all their purchases in cash, which improves customer relationship management. In Rwanda, this method was first popularized by Bank of Kigali; customers can also top up their mobile phones via SMS. E-banking has simplified banking around the world, and it is rapidly gaining acceptance in Rwanda. For the purpose of this study, the authors chose Bank of Kigali Rwanda Ltd as a case study to examine the contribution of e-banking to banking efficiency in Rwanda [13].

One of the issues under consideration is the impact of e-banking on traditional banking participants. After all, there are risks associated with maintaining the traditional banking system [14]. However, there are more arguments in favour of this technological innovation in banking. Electronic banking is seen to be much cheaper than transactions at branches or even by phone, and this has allowed banks to decentralize financial services to customers in remote locations. This, in turn, has had a positive impact on the development of the financial industry worldwide [15]. E-banking gives consumers much more choice. However, although e-banking is not new in Rwanda, Rwandans are not familiar with this technological advancement in the banking sector.

A World Bank study [16] found that 5.3% of Rwandans use internet banking, and Rwanda has a higher level of internet banking adoption than neighboring East African countries such as Burundi, Tanzania and Uganda. A recent study by the East African Bankers Association found that the number of Rwandans using internet banking reached 6.2% of the population in September 2014, with an annual growth rate of 0.9% [17].

Some customers prefer traditional ways of banking. According to the National Bank of Rwanda [18], there are delays in payment of cheques between banks; people lose time in banks by standing in queues waiting for service, manual errors and cases of fraud. As a result, some customers complain about the above, which is why the authors wanted to study the role of e-banking in the development of financial institutions, as the researchers believe that the adoption of electronic banking transactions and grieving customers, based on the experience of other developed countries.

Bank Kigali is the largest bank in Rwanda in terms of number of customers, number of branches and even banking services. Since its inception, the bank has remained the bank of choice for urban and rural dwellers, rich and poor, common and privileged, active workers and pensioners. Unsurprisingly, the bank has a presence in virtually every district of the country. These numerous branches, combined with its predisposition and the needs of the poor, have increased the bank's customer base exponentially across the country. The bank's customer base is so large that daily visits to the bank's banking halls show long meandering queues of people waiting to complete any transactions.

The example of this bank shows, in real time, how e-banking has been introduced and its impact on the efficiency of the entire banking system in a fast-growing economy.

ANALYSIS OF RECENT RESEARCH AND PUBLICATIONS

Commercial banking is undergoing rapid change as the international economy expands and moves towards institutional and market completeness. The main driver of this change is technology, which is overcoming geo-

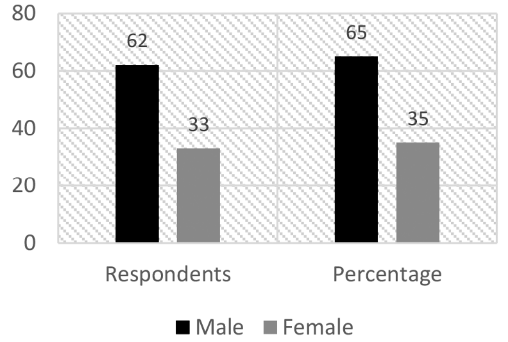

Figure 1. Gender information

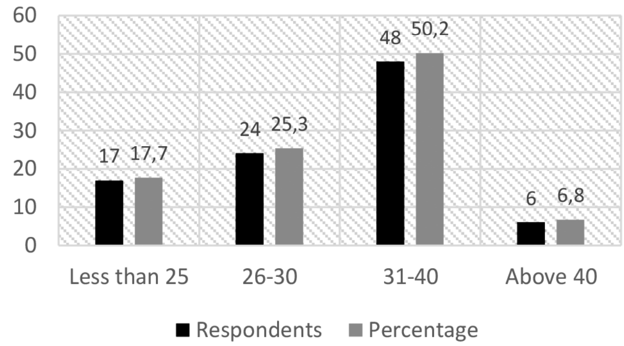

Figure 2. Age of respondents

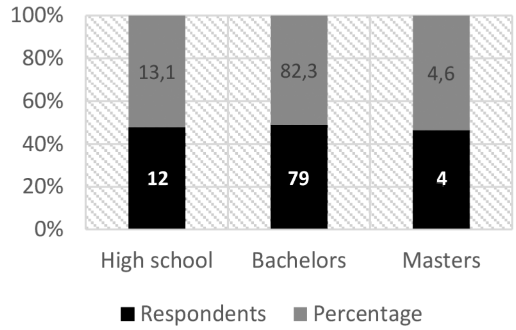

Figure 3. Level of education of customers

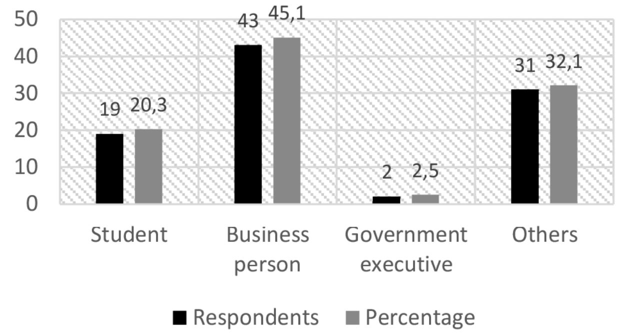

Figure 4. Professional level of respondents

Source: Primary data, August 2020.

graphical, industrial and regulatory barriers, creating new products, services and market opportunities, and developing more information and system-oriented business processes and management processes.

In this regard, many researchers have studied e-banking and its impact on the activities of financial institutions in depth, such as: B. Kim [19], K. Katri [20], M.Ongkasuwan [21], W. Tantichattanon [22], O. Shaleva [23], Y. Korobov [24], S.Pirog [25], etc.

However, it should be noted that Rwanda, as a republic whose economy was scarred by war and genocide, does show all the signs of rapid economic growth and its example can be used to trace the main aspects of the emergence of e-banking in emerging economies. In addition, as noted by experts such as: C. Osage, D. Littler and D. Melanthiou, J. Oleka, that there are many challenges to developing an effective remittance system in developing countries. These include infrastructural weaknesses such as unstable electricity and communication, especially in developing countries. In this case, a stable and efficient power and telecommunication system needs to be provided by the government or organizations [26]. There is a shortage of skilled managers and necessary tools for end users and customer systems, here efforts should be made to provide infrastructure and skilled manpower, another problem is the large accumulation of cash in the economy, in which case the government should pass legislation that will force the dominant use of cash for electronic payments. In addition, there is a high fee or cost of electronic payment terminals (ATMs), so banking legislation should set a standard fee for electronic payment services [27].

Moreover, funds that can be used to acquire new information technology and upgrade existing systems tend to be in short supply. In addition, major challenges to the development of remote banking include: declining employment in the country [28]; high fees or charges and low public acceptance due to performance failures [29].

C. Osage in his study on the adoption of e-banking by Kenyan commercial banks concluded that while the adoption of e-banking was beneficial, it was influenced by factors such as the availability of services 24/7, speed of transactions and convenience for customers [26].

Despite such a significant number of works on e-banking development, it is very relevant to study the specifics of its implementation in developing countries, each of which has its own history and specifics of development.

TASK DEFINITION

Thus, the purpose of the work is to study the features of the implementation of electronic banking in the banking system of Rwanda and its impact on the efficiency of the Bank of Kigali. The study further explored the relationship or impact on service delivery and customer satisfaction, taking into account the e-banking services available at the presented bank.

STATEMENT OF THE MAIN BODY OF RESEARCH

This section is devoted to an analysis of the results obtained during data collection in relation to the aims of the study. These data are presented in a descriptive statistical table and in percentages. Based on the aims of the study and the research questions, information was collected from 95 respondents. The authors analyzed and interpreted the results obtained, in addition to quantitative analysis, the researchers also presented and analyzed qualitative data to complement the questionnaire results.

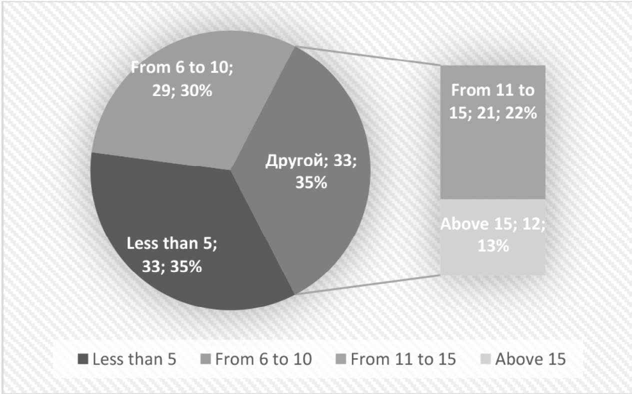

Figure 5. Duration being Bank of Kigali customer

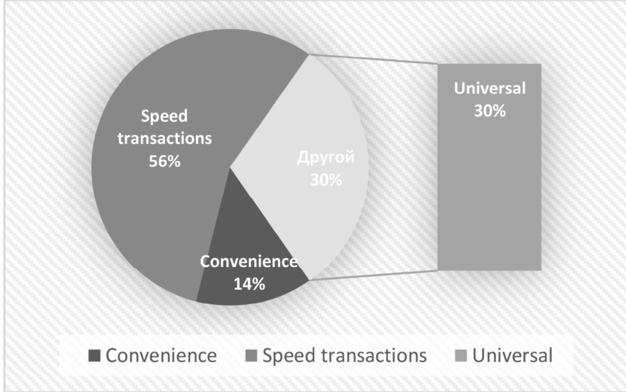

Figure 6. Important reason for choosing electronic banking services

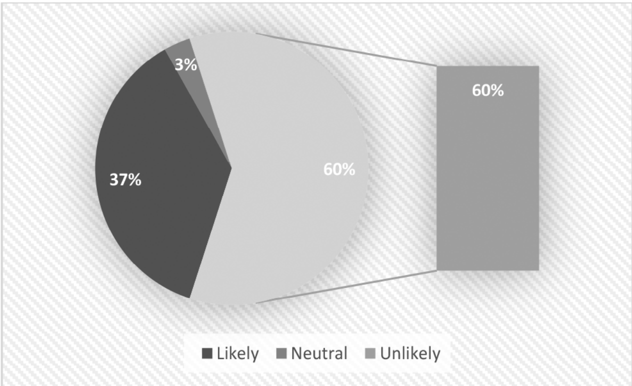

Figure 7. Likelihood of electronic banking failure to provide desired customers' transactions

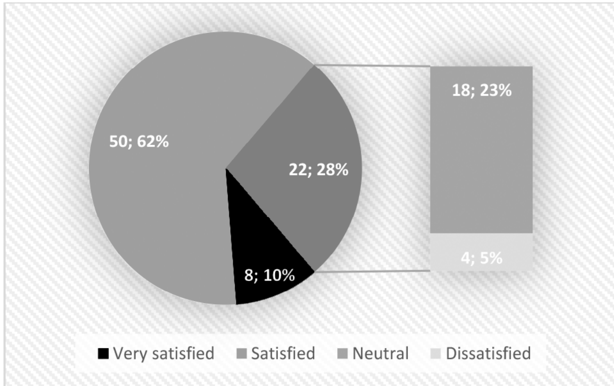

Figure 8. Level of satisfaction on use of electronic banking services

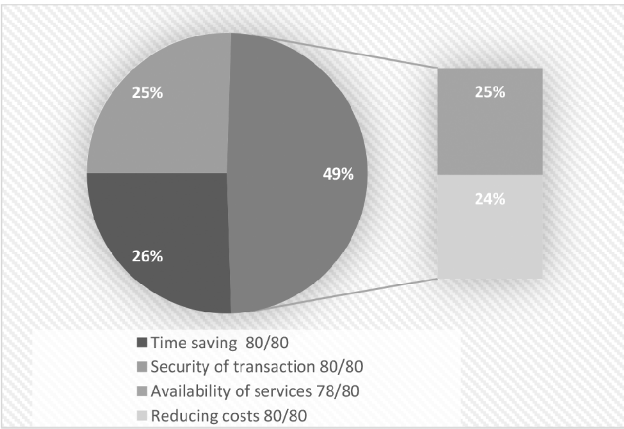

Figure 9. Benefits from electronic banking

Source: Primary data, August 2020.

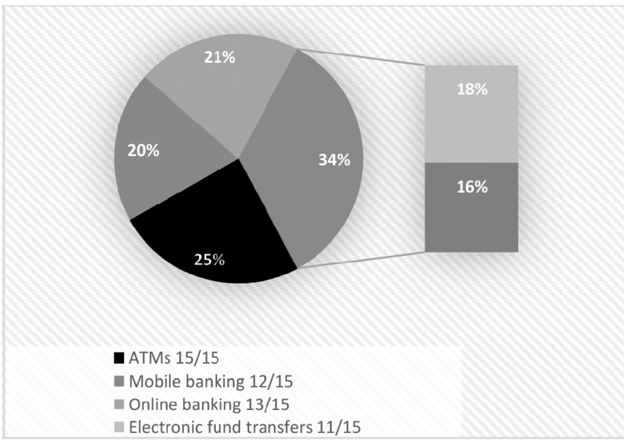

Figure 10. Electronic banking services customers mostly use

All the questionnaires were collected by the researchers, no one was missed and 100% of the distributed questionnaires were collected and processed (Fig.1—4).

This shows that most of the customers who filled the questionnaire were Male. We can see that the percentage for Male is 65% and Female are less in number 35%. This contributes to know that the male engages in E— banking transactions most of the time than Female. The finding shows that most of the respondents that returned the questionnaires were aged between 31—40 years represented by 50.2% and the second were between 26—30 years represented by 25.3% and less than 25 years represented by 17.7% and the fourth were those from 40- and above represented by 7.5%. This means that most of the customers surveyed shows that level of customers dealing with the bank is between 31 to 40, because this level of age, most of them are the responsible.

Table 1. The understanding and accepting the fulfillment on the terms of using electronic banking services

Does customers understand and accept the fulfillment on the terms of using	Respondents	Percentage
Very satisfied	12	80
Satisfied	3	20
Neutral	-	-
Unsatisfied	-	-
Very unsatisfied	-	-
Total	**15**	**100**

Source: Primary data, August 2020

Table 2. Analysis on the performance of Net profit margin ratio from e-banking

Years	Net profit Rwf (000)	Turnover Rwf (000)	Net Profit Margin in
2015	20,484,058	46,239,769	0.442
2016	26,189,460	55,687,492	0.470
2017	23,246,922	63,746,575	0.364
2018	27,366,616	75,798,699	0.361
2019	37,308,336	94,773,445	0.393

Source: Bank of Kigali financial statement, 2015—2019.

The figures above show that most of the customers who deal with electronic banking transactions are either studying or have completed university but the number of respondents with masters' degrees is small (4.4%) and there were no respondents with primary, PhD and illiterate level. Means that most of the customers dealing with the electronic banking have bachelors' level, and the responses given by them was true and analyzed to make this research rich in contain of its result. The most of the customers' profession is business, presented by 45.1 % and the number of students is represented by 20.3%. But some customers answered that they are students. In others presented by 32.1% include customers in different activities (employees for private companies, NGO activities, etc.). The government executive is 2.5%, means that most of people dealing with the electronic banking are business person.

The next stage of the survey is to present the respondents' answers about e-banking at Bank of Kigali.

Fig. 6 shows that in most customers have been customer of Bank of Kigali in less than 5 years represented by 35%, in 6—10 years customers dealing with the bank are 30%, in 11—15 years they are presented by 22% and in above 15 years they are presented by 13%. This means that most of customers have above 5 years being BK customers.

Fig.7 shows that most customers use electronic banking because it speeds transactions which is represented by 56% and 30% of respondents use electronic banking because it is universal and 14% use it because it is convenient. This shows that, people choose electronic services because of its speed transaction.

Fig.8 shows that most customers presented by 60% unlikely meet failures of electronic banking to provide them with the services they desire and 37.5% of the customers likely meet with the failures of electronic banking to provide them with services they desired. This means that a big percentage shows that customers are unlikely to meet problems with electronic banking services which are good for the bank.

Customer satisfaction is important because it provides business owners with a metric that they can use to manage and improve their businesses.

Fig. 9 shows that a big number of customers 62.02% are satisfied with services provides by electronic banking, 10.12% are very satisfied, 22.36% of customers are Neutral and 5. % of the customers are dissatisfied with electronic banking services. Means that more than 70% of population answered are satisfied.

The section below details benefits of using electronic banking and customers respondents on most benefits among listed.

Fig. 10 shows the benefits of using e-banking, 100% of respondents answered that they saved time as before using e-banking they always visited the bank to transfer money, pay bills and now they make transactions without moving around the area. About security of services, 100% of respondents confirmed that using e-banking has contributed a lot to the security of transactions as they use a personal password, no one can access the account without the permission of the account holder. Accessibility of services, 97.9% of all respondents confirm that the services provided by Bank Kigali through e-banking are available 24/7; wherever they are in the country, they have access to their account.

Cost reduction, by cost we mean the costs associated with transactions, including the ticket that customers pay to visit the nearest bank branch, 94.7% confirmed that using e-banking has helped them minimise costs.

The table above shows that a large number of customers use ATMs — 100%, but some customers who use ATMs also use the other electronic banking services mentioned above. Customers who do not use ATMs but use mobile banking and Western Union are represented by 67% and online banking is represented by 87%, customers who do not use ATMs but use electronic account to account transfers are 73%. This means that the services most commonly used in e-banking are ATM services, because of the fast service, their proximity and 24-hour service.

When using e-banking, there are some conditions that the user must comply with; this section presents respondents' views on these requirements Table 1.

Those who answered "Very satisfied" at the 80% level explained it this way: "Customers are satisfied with e-banking services because these services help them in their daily transactions, they are easy to use, speed up transactions, provide good service quality and provide services 24 hours a day".

Those who answered "satisfied" at 20% gave the following reasons: "customers are satisfied with the use of e-banking because some want to continue using traditional banking systems, customers using e-banking face the problem of lack of self-study by staff and that their complaints are sometimes not dealt with, some customers are wary of using e-banking because of security issues, so some customers still do not trust this.

Financial performance is a subjective measure of how well a firm can utilize assets from its core business and generate income. The term is also used as an overall measure of a firm's overall financial health over a period of time and can be used to compare similar firms in the same industry or to compare industries or sectors collectively.

Net profit margin is the amount of profit earned by a company as a percentage of revenue earned. The net profit margin ratio shows how the bank controls the value of its reserves and the value of its customers' loans Table 2.

The above table shows that BK's net profit margin was good as there was an increase in net profit and turnover during the study period, which led to an increase in the net profit margin. The management of Bank of Kigali has adopted cost-cutting strategies to earn more net profit. Generally, a higher ratio is considered better. In 2015 the net profit margin ratio was 44.2%, in 2016 Bank of Kigali net profit margin was 47% of total revenue, in 2017 it was 36.4%, in 2018 Bank of Kigali net profit margin was 36.1% and in 2019 the ratio was 39.3%.

Bank of Kigali's higher ratio indicates an increase in turnover and a decrease in the value of inventory and loans on offer from 2015 to 2019. And e-banking tracks the procedures of each transaction from turnover to net income over the period to identify mismanagement and collect those errors and frauds that may affect income.

Return on equity or ROE is a profitability ratio that measures a firm's ability to generate a return on shareholders' investment in the company. In other words, the return on equity ratio shows how much profit each dollar of shareholders' equity generates Table 3.

Table 3. Return on equity ratio from 2015 up to 2019 due to effective e-banking

Years	Net profit Rwf (000)	Equity Rwf (000)	ROE
2015	20,484,058	99,245,545	0.206
2016	26,189,460	108,302,384	0.242
2017	23,246,922	122,471,529	0.189
2018	27,366,616	194,705,081	0.141
2019	37,308,336	220,810,886	0.168

Source: Bank of Kigali financial statement, 2015—2019.

The table above shows the return on equity of Bank of Kigali was 20.6%, 24.2%, 18.9%, 14.4%, and 16.8% in 2015, 2016, 20147, 2018 and 2019 respectively. This means that the higher the return Equity ratio, the more efficient the company is at using its stockholder's equity to generate more income but the ROE was generally good in the period of study because all ROE was positive and the management should utilize more stockholders' equity in order to generate more income. The return on equity is the best measure of the return, since it is the product of the operating performance, asset turnover, and debt-equity management of the firm. If a firm can borrow money and use it to achieve a higher return than the cost of the debt, then the leveraging creates additional revenue that accrues to stockholders as increased equity.

The return on assets ratio, often called the return on total assets, is a profitability ratio that measures the net income produced by total assets during a period by comparing net income to the average total assets. In other words, the return on assets ratio or ROA measures how efficiently a company can manage its assets to produce profits during a period Table 4.

Table 4. Variation of Return on Asset ratio in Bank of Kigali due to effective e-banking

Years	Net profit Rwf (000)	Total assets Rwf (000)	ROA
2015	20,484,058	561,226,400	0.036
2016	26,189,460	639,117,735	0.041
2017	23,246,922	727,160,327	0.032
2018	27,366,616	877,401,364	0.031
2019	37,308,336	1,019,075,587	0.036

Source: Bank of Kigali financial statement, 2015—2019.

The table above This ROA ratio indicated the amount of net income generated by 100 Rwf invested in assets of Bank of Kigali from the year 2015 to 2019. Means that to invest 100 Rwf in asset the Bank of Kigali investors gained 3.6 Rwf as return during the period ended 2015, 4.1 Rwf as return during the period ended 2016, gained 3.2 Rwf in 2017, investor gained 3.1 Rwf in 2018 and 3.6 Rwf as return during the period ended 2019. These higher values of return on assets show that business is more profitable. The ratio should be only used to compare companies in the same industry. An increased trend of ROA ratio indicates that the profitability of the company is improving. Contrariwise, a decrease trend means that profitability is deteriorating. e-banking verify how management use the assets for generating income and check the inventory, fixed assets, financial assets and other bank assets so that no one can use the assets of the company in her/his own interest.

Table 5. Debt to asset ratio from 2015 up to 2019

Years	Total Assets	Total liabilities Rwf (000)	Debt ratio
2015	561,226,400	461,980,855	1.21
2016	639,117,735	530,815,351	1.20
2017	727,160,327	604,688,798	1.20
2018	877,401,364	393,060,231	2.23
2019	1,019,075,587	416,980,855	2.44

Source: Bank of Kigali financial statement, 2015—2019.

Solvency ratios, also called leverage ratios, measure a company's ability to sustain operations indefinitely by comparing debt levels with equity, assets, and earnings. In other words, solvency ratios identify going concern issues and a firm's ability to pay its bills in the long term.

Many people confuse solvency ratios with liquidity ratios. Although they both measure the ability of a company to pay off its obligations, solvency ratios focus more on the long-term sustainability of a company instead of the current liability payments.

Solvency ratios show a company's ability to make payments and pay off its long-term obligations to creditors, bondholders, and banks. Better solvency ratios indicate a more creditworthy and financially sound company in the long-term. The debt ratio is shown in decimal format because it calculates total liabilities as a percentage of total assets. As with many solvency ratios, a lower ratio is more favorable than a higher ratio Table 5.

The table above shows the variation of debt to asset ratio 1.21, 1.20,1.20, 2.23 and 2.44 in 2015, 2016, 2017, 2018 and 2019 respectively. The ratios were greater than one and it is the evidence that bank of Kigali had ability to meet its long-term liabilities by using the assets. It shows that the bank was in good position during the period of the research and it is the positive impact of e-banking on decision making for the use of assets and liabilities. e-banking apply solvency ratio to compare the information

Table 6. Variation of Cost-to-Income ratio in Bank of Kigali from strong and effective e-banking

Years	Operating expenses Rwf (000)	Operating income Rwf (000)	Cost-to-income
2015	30,433,050	56,170,282	0.54
2016	29,537,708	59,480,795	0.49
2017	39,147,661	73,152,676	0.53
2018	47,515,029	90,116,654	0.53
2019	50,216,677	102,591,637	0.49

Source: Bank of Kigali financial statement, 2015—2019.

Table 7. Financial Leverage Ratio

Years	Asset Rwf (000)	Equity Rwf (000)	Leverage ratio
2015	561,226,400	99,245,545	5.65
2016	639,117,735	108,302,384	5.90
2017	727,160,327	122,471,529	5.94
2018	877,401,364	194,705,081	4.51
2019	1,019,075,587	220,810,886	4.62

Source: Bank of Kigali financial statement, 2015—2019.

Table 8. Return on capital employed within BK Ltd due to effective and strong e-banking

Years	Profit before tax Rwf (000)	Capital employed (000)	ROCE
2015	25,737,232	6,721,842	3.83
2016	29,943,087	6,724,428	4.45
2017	34,005,015	6,745,370	5.04
2018	42,601,625	8,967,592	4.75
2019	52,092,606	9,045,474	5.76

Source: Bank of Kigali financial statement, 2015—2019.

within that of prior periods, the entity's expected results how relationship between assets with liabilities and compare it with competitors in the same or similar industry (financial institutions).

The cost-to-income ratio is a key financial measure, particularly important in valuing banks. It shows a company's costs in relation to its income. To get the ratio, divide the operating costs (administrative and fixed costs, such as salaries and property expenses, but not bad debts that have been written off) by operating income Table 6.

The table above shows the variation of cost to income during the period of research 2015, 2016, 2017, 2018 and 2019 and ratios were 0.54, 0.49, 0.53, 0.53 and 0.49 respectively. This ratio gives investors of Bank of Kigali a clear view of how efficiently the firm is being run — the lower it is, the more profitable the bank will be. The ratio was decreased means that the bank was profitable due to the strong management on how e-banking contribute on better performance by decreasing costs and increasing income in order to reach high profitability level of Bank of Kigali. Changes in the ratio can also highlight potential problems: if the ratio rises from one period to the next, it means that costs are rising at a higher rate than income and this no such case in the period.

The financial leverage ratios measure the overall debt load of a company and compare it with the assets or equity. This shows how much of the company assets belong to the shareholders rather than creditors. When shareholders own a majority of the assets, the company is said to be less leveraged. When creditors own a majority of the assets, the company is considered highly leveraged. All of these measurements are important for investors to understand how risky the capital structure of a company and if it is worth investing in Table 7.

The financial leverage ratio, often simply called the leverage ratio, quantifies the total assets supported by each monetary unit of equity. The table above shows the ratio of 5.65 in 2015, 5.90 in 2016, 5.94 in 2017, 4.51 in 2018 and 4.62 in 2019 indicates that each Rwf 1 of equity supports Rwf 5.1, 6, 5.3, 5.7 and 5.9 of assets in 2015, 2016, 2017, 2018 and 2019 respectively. e-banking consider Valuation and allocation of assets and equity, this means that all items have been included in the financial position statement at appropriate amounts according to company policy and the relevant financial reporting framework.

Return on capital employed or ROCE is a profitability ratio that measures how efficiently a company can generate profits from its capital employed by comparing net operating profit to capital employed. In other words, return on capital employed shows investors how many dollars in profits each dollar of capital employed generates.

Return on capital employed formula is calculated by dividing net operating profit or EBIT by the employed capital Table 8.

The table above shows the variation of return on capital employed ratio in Bank of Kigali shows how much profit each 100 Rwf of employed capital generates. Obviously, a higher ratio would be more favorable because it means that more francs of profits are generated by 100 Rwf of capital employed. A return of 3.83%, 4.45%, 5.04%, 4.75% and 5.76% indicates that for every 100 Rwf invested in capital employed, the company made 3.83 Rwf, 4.45 Rwf, 5.04 Rwf, 4.75 Rwf and 5.76 Rwf of profits in 2015, 2016, 2017, 2018 and 2019 respectively.

Investors are interested in the ratio to see how efficiently a company uses its capital employed as well as its long-term financing strategies. Companies' returns should always be high than the rate at which they are borrowing to fund the assets. But bank of Kigali is in good condition for investors. E-banking contribute on the financial performance of bank of Kigali by review the use of capital employed to generate income for the period.

CONCLUSIONS AND DISCUSSIONS

Thus, summarizing the results of the study, we can say that the objective, which was to study the specifics of e-banking implementation in Rwanda and its impact on the efficiency of financial institutions (using the example of Bank Kigali) — has been achieved.

The survey results showed that there are a number of challenges faced by Bank Kigali in the implementation of electronic banking systems. These are inadequate technological skills among bank employees, as confirmed by 61% of respondents, high costs associated with training employees in the application and administration of online banking (58%), lack of familiarity of customers with online banking (74%), lack of resources and infrastructure required to implement the strategy, as confirmed by 80% of respondents, lack of a strong legal framework for online banking (88%), lack of interest from senior management (85% of respondents), negative attitude from bank employees, who should lead the project, according to 22% of respondents, and the fact that a small proportion of Rwandans use or have access to the internet, making online banking insignificant for them (32%).

Researchers were interested in determining how banks are responding to the challenges of e-banking. Based on respondents' views, it was found that strategies to overcome the challenges to e-banking implementation include training on e-banking (65%), reducing transaction fees for electronic payments so that they are lower than manual transfers (62%), creating laws governing e-banking (55%), involving senior bank management in programmer implementation (36%), educating customers about the benefits of e-banking (60%), free internet access (28%), allocating an adequate budget for e-banking (20%), increasing the number of ATMs (24%) and discontinuing the strategy (2%).

The results show that the net profit margin of BC Main Branch, was good as there was an increase in net profit and turnover during the study period, which led to an increase in the net profit margin. The management of Bank of Kigali has adopted cost-cutting strategies to generate higher net profit. Generally, a higher ratio is considered better. In 2012 the net profit margin ratio was 30.78%, in 2015 the net profit margin of Bank Kigali was 27.58% of total revenue, in 2019 it was 31.48, in 2017 the net profit margin of Bank Kigali Main Branch was 32.14% and in 2018 it was 26.99%. Electronic banking system contributes to the net profit margin as when customers have access to their accounts, it increases deposits and these deposits are used by the bank to provide loans to the public, these loans generate income and increase the net profit for the year.

Return on equity of Bank of Kigali was 18.67%, 20.95%, 20.45%, 20.64%, 19.13% in 2015, 2016, 2017, 2018 and 2019 respectively. This means that the higher the return on equity ratio, the more efficiently the company uses its equity capital to generate more income, but the return on equity was generally good during the study period as all return on equity ratios were positive and management should use more equity capital to generate more income. Return on equity is the best measure of profitability because it is a product of the firm's operations, asset turnover and debt and equity management.

The ROA ratio shows the amount of net income generated per 100 Rwf invested in Bank Kigali's assets from 2015 to 2019. This means that when investors invested 100 Rwf in the assets of the main branch of Bank Kigali, they received 3.65 Rwf as income in the period ended 2012, 3.51 Rwf as income in the period ended 2013, 3.80 Rwf in 2017, 3.65 Rwf in 2018 and 3.25 Rwf as income in the period ended 2019. These higher Rwf values show that the business is more profitable. This ratio should only be used to compare companies in the same industry.

The variation in the debt-to-asset ratio was 1.24, 1.20, 1.23, 1.21 and 1.20 in 2015, 2016, 2017, 2018 and 2019 respectively. The ratios were greater than unity and this indicates that Kigali Bank is able to meet its long-term liabilities at the expense of assets. This shows that the bank was in a good position during the study period and this is a positive impact of the e-banking system on asset and liability utilization decisions. The e-banking system applies the solvency ratio to compare information with historical information, the expected performance of the organization, the ratio of assets to liabilities and comparison with competitors in the same or similar industry (financial institutions).

The variation of expense to income ratio for the study period 2015, 2016, 2017, 2018 and 2019 and the ratios were 0.58, 0.58, 0.55, 0.53 and 0.50 respectively. This ratio gives investors of Bank of Kigali, Main Branch a clear indication of how well the firm is managed — the lower it is, the more profitable the bank will be. Changes in the ratio can also reveal potential problems: if the ratio rises from one period to the next, it means that costs are rising at a higher rate than revenues, which was not the case in this period.

The leverage ratio, often referred to simply as the leverage ratio, quantifies the total amount of assets supported by each unit of cash equity. The above table shows that the ratio of 5.1 in 2015, 6 in 2016, 5.3 in 2017, 5.7 in 2018 and 5.9 in 2019 means that every 1 Rwf of equity supports 5.1, 6, 5.3, 5.7 and 5.9 Rwf of assets in 2015, 2016, 2017, 2018 and 2019 respectively.

The e-banking system takes into account the valuation and allocation of assets and equity, meaning that all items have been included in the statement of financial position in appropriate amounts in accordance with company policy and the relevant financial reporting framework. In this study, the authors confirmed the positive relationship between the electronic banking system and the performance of Bank of Kigali. Since the Pearson correlation value is.947 and is significant, we can say that there is a strong and positive relationship between the dependent and independent variables. Based on the previous results, the first hypothesis of this study has been tested and confirmed.

Having identified that e-banking plays a very important role for an organization and its efficiency, commercial banks are advised to make full use of e-banking in order to improve their efficiency. As ICT reduces the workload of the manager in terms of close supervision, it also increases the eagerness, initiative and quality of the employees, which helps them to be more committed to achieving the goals and objectives of the organization and this tends to improve the efficiency of the employees in the organization.

It is suggested that critical infrastructure such as power, security and telecommunication should be strengthened to ensure that e-banking is applied in Nigeria and optimum customer satisfaction. Banks should continuously train and retrain their employees to keep pace with the dynamism of information technology. Based on the above, foreign direct investment will increase, production capacity will double. This will raise the living standards of citizens and contribute to economic growth and development.

In addition, more ATMs should be placed in convenient locations within the city to reduce the distance and time it takes to access an ATM. It is also suggested that banks should reduce fees for e-banking services to attract or entice more customers to use these products.

Since e-banking services have been introduced by non-banking institutions, a study can be conducted on the challenges these institutions face, the responses they are using and the impact these services are having on the

Rwandan economy. This will provide a broader view of the broader financial and non-financial group of companies.

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