ABSTRACT: The researcher aim was to ascertain what exactly affects the financial performance of Commercial banks in Central Equatorial State, South Sudan, a case of KCB South Sudan, African National bank, Ecobank-South Sudan, CFC Stanbic Bank-South Sudan, Ethiopian Commercial Bank-South Sudan and Ivory Bank branches in Juba. There are numerous elements that affect performance, this study focused on technological innovations that are thought to drive financial performance. The study was divided into three main common areas that have recently caught the attention of the banking industry namely internet banking, agency banking and mobile banking that affect the financial performance of KCB South Sudan, African Nation bank, Ecobank-South Sudan, CFC Stanbic Bank-South Sudan and Ethiopian Commercial Bank-South Sudan in Central Equatorial State. Central Equatoria State has been chosen since it hosts Juba as the capital City and an epicenter of numerous commercial activities. The study’s specific objectives were to determine the influence of agency banking, mobile banking, Automated Teller Machines and debit and credit cards on financial performance of commercial banks in Central Equatorial State, The study employed a descriptive research design. The study targeted population of 294 respondents. The sample size was 169 staff of KCB South Sudan, African Nation bank, Ecobank-South Sudan, CFC Stanbic Bank-South Sudan, Commercial Bank of Ethiopia-South Sudan and Ivory Bank spread across the branches in Juba, Central Equatoria State. Respondents were selected using purposive random sampling. Structured questionnaires were used to collect primary data from respondents while secondary data was obtained from the annual financial reports from KCB South Sudan, African Nation bank, Ecobank-South Sudan, CFC Stanbic Bank-South Sudan, Commercial Bank of Ethiopia-South Sudan and Ivory Bank of South Sudan. Measures of central tendencies were used to describe the results and data was presented using graphs charts and tables. The influence of dependent and independent variable was depicted by use of multiple regression. The study found that agency banking significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.889; p=0.000). The study revealed that mobile banking significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.613; p=0.000). The study established that automated teller machines significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.744; p=0.000). The study found that debit and credit cards significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.640; p=0.000). The study concluded agency banking, mobile banking, automated teller machines and debit and credit cards significantly influences financial performance of commercial banks in Central Equatorial State, South Sudan. The study recommended that commercial banks in South Sudan should ensure that bank agent’s guarantees security of data and information that is operated on the agency banking platform. The study recommends that commercial banks in South Sudan should work with regulatory authorities to establish a clear and comprehensive regulatory framework for agency banking including guidelines on risk management, customer protection, and agent licensing. The study also recommends that commercial banks in South Sudan should implement stringent security protocols and fraud prevention mechanisms for ATMs.

Key Words: Technological Innovations, Agency Banking, Mobile Banking, Automated Teller Machines, Debit and Credit Cards, Financial Performance
I.0 INTRODUCTION

1.1 Background of the Study

Innovations and technological changes have come with great benefits to modern commerce. In order to get financial stability in firm’s maneuvers and greater competitive advantages, businesses from last few decades have diverted their focus on making information technology an integral part of their operations (Oliveira, Faria, Thomas & Popovic, 2014).

Globally banking industry has been the focal point of research and study by researchers and decision makers in the banking sector. It remains the centre of interest due to its being the foundation of many business and commerce transactions and a pillar to economies. The quest to have efficient and profitable banking businesses is very key especially for the banking sector that is full of competition and the ever changing economic environment. This is particularly true for developing countries. It applies specifically for emerging economies Khatik & Nag, (2014) and in particular South Sudan where commercial banks are the dominant players in the financial sector. It showcases the Kenyan economy where the banks are key players in the financial sectors being followed closely by insurance companies.

While, Agwu (2018), investigate the effect of electronic banking growth of deposit money banks in Nigeria using a time series data in the period from 2006 to 2012. The result reveals that there are a positive and significant relationship between mobile banking and total deposit. Purpose of their study was to evaluate the financial innovation like internet banking and mobile banking for banks to attract more deposit Kashmari, (Nejad and Nayebyazdi, 2016). The study was conducted in Iran using data from 23 Iranian banks in the year of 2007 until 2013. The result based on Granger causality test shows that every variable used including mobile banking has causal relation in affecting the increases in banks share to attract deposit.

According to Central bank of Kenya Banking sector survey innovation survey 2020, one of the key pillars of the Kenya Banking Sector Charter issued in 2019 by the Central Bank of Kenya (CBK) was a keen focus on customer centricity. The Kenyan banking sector is renowned for its uptake of technology to meet customer expectations for “anytime anywhere” financial services, and to drive efficiency gains. As part of aligning to the Charter, the sector has witnessed the diversification of products tailor made to meet the ever-changing customer needs while improving the competitive edge of the institutions. While institutions have been successful in leveraging technology to achieve their objectives, primarily as a cost reduction strategy, there is a change in focus towards an alternative strategic coin, where technology is no longer perceived as a cost saver but as a revenue generator. Furthermore, with the onset of the coronavirus pandemic (COVID-19) in 2020 and the resultant disruptions to the lives and livelihoods of individuals in the economy, and the impact to businesses, including banks, it is evident that innovation was a critical point in adapting to the new “business as usual” (Musa, & Njeru, 2023).

Susanto, (2017) and Farah, et al., (2018) are among the studies which provide empirical supports on the mobile banking application based on the service quality. For instance, Susanto, (2017) analyses the Indonesian data and find that mobile banking is significantly and positively have effect on the level of service at commercial banks with the value of significance at level 0.05. The impact from implementation of mobile banking led to the increasing of the banking transaction to Rp. 6447 Trillion or RM 1.74 trillion. While Farah, et al, (2018) studies the mobile banking adoption in banking sector of Pakistan. This study shows that the variables used which are performance
expectancy, perceived risk and trust for the bank are highly significant to the usage of the mobile banking.

Some internal and external elements Soylu and Durmaz, (2013), have contributed to the growth of the commercial banks in Turkey. The internal factors are things like turnaround, time up time on the banks platform customer care and general organisational efficiency. However, the effects of bank-specific variables tend to be more significant in South Sudan than the macro-economic variables. Specific configuration of the internal configuration of the bank contributes greatly to the performance of the bank more as compared to the microenvironment in the South Sudan Contest. These factors are as follows; capital components, liquidity client base management technology innovation and corporate governance. No researcher was able to give specific attention and measurable statistic to banking innovations as one of the many factors that has a big impact on the performance commercial banks in Central Equatoria State, South Sudan to be precise however in this study there is broken down to innovations in to 3 areas agency banking mobile banking and Automatic Teller machine banking.

The six commercial banks, in their competitive business nature, have adopted a strategy to meet the new financial needs that are associated with emerging economies, this has pushed the banks to leverage on technology and innovation to structure products that will not only guarantee extra income but also lower the cost of availing the products and services. This has made it possible for the banks to partner with SMEs who act as agents, rolling out mobile banking systems and adopting latest internet banking platforms for service delivery.

1.2 Statement of the Problem
Despite the obvious value of financial innovation in describing banking performance, the effect of innovation on performance is still confused for two major reasons: first, lack of awareness of the generators of innovation; and second, the influence of innovation on bank performance remains untested Mabrouk & Mamoghli, (2017). A research by De Young et al., (2017) adopts an approach to innovation performance relations that does not take into consideration the antecedents of innovation inside and outside banking institutions, both of which may affect this relationship.

Previous studies such as Francesca and Claeyes, (2017), Batiz-Lazo and Woldesenbet, (2016) and Mwania and Muganda, (2018) have provided mixed findings on the effect of financial innovations on bank performance. In their report, Francesca and Claeyes, (2017) concluded that financial innovation had the least impact on bank performance, while Batiz-Lazo and Woldesenbet, (2016) and Mwania and Muganda, (2018) concluded that financial innovation had a substantial contribution on bank results. It is at the core of such mixed results that it has generated and necessitated the need to carry out an analysis from the South Sudanese perspective in order to determine the influence of bank developments on the efficiency of commercial banks. KCB South Sudan, African Nation bank, Ecobank-South Sudan, CFC stanbic Bank-South Sudan, Commercial Bank of Ethiopia-South Sudan and Ivory Bank have started to spend extensively in technology-based creativity and staff preparation in the handling of emerging innovations. As of June 2021, Central Equatoria State, South Sudan had 120 automated teller machines in operation. The number of ATMs available in the country has been fluctuating in the period examined, with an overall decreasing tendency. In June 2019 522 cash points were active. The researcher’s dilemma was when commercial banks perennially records huge profit margins and equities in their balance sheet yet branches are not many.
1.3 Objectives of the Study
The study was guided by both general and specific objectives:

1.3.1 General Objective
The general objective of the study was to determine the influences of technological innovations on financial performance of commercial banks in Central Equatorial State, South Sudan.

1.3.2 Specific Objectives
The specific objectives of this study were:

i. To determine how agency banking influence financial performance of commercial banks in Central Equatorial State, South Sudan.

ii. To determine how mobile banking influence financial performance of commercial banks in Central Equatorial State, South Sudan.

iii. To determine how Automated Teller Machines influence financial performance of commercial banks in Central Equatorial State, South Sudan.

iv. To determine how debit and credit cards influence financial performance of commercial banks in Central Equatorial State, South Sudan.

1.4 Research Questions

i. How does agency banking influence financial performance of commercial banks in Central Equatorial State, South Sudan?

ii. How does mobile banking influence financial performance of commercial banks in Central Equatorial State, South Sudan?

iii. How does Automated Teller Machines influence financial performance of commercial banks in Central Equatorial State, South Sudan?

iv. How does debit and credit cards influence financial performance of commercial banks Central Equatorial State, South Sudan?

1.5 Scope of the Study
This research was limited to investigating the influence of technological innovations on financial performance of KCB South Sudan, African Nation bank, Ecobank-South Sudan, CFC stanbic Bank-South Sudan, Ethiopian Commercial Bank-South Sudan and Ivory bank. The geographical scope of the study was limited to Central Equatorial State, South Sudan. The research study covered issues relating to Internet banking, agency banking and mobile banking and general factors on financial performance of intended commercial banks in Central Equatoria, South Sudan. The research study covered period between August 2016 to January 2022.

2.0 Literature Review

2.1 Theoretical Review

2.1.1 Agency theory
Agency theory explores the relationship between principals and agents, where principals delegate decision-making authority to agents. This theory is applicable in various contexts, such as employer-employee, country-high commissioner, and company-lobbyist relationships. The theory examines the challenges and merits of this relationship, including the potential misalignment of objectives. Agency theory has its roots dating back to Adam Smith in the 18th century but gained prominence in the 1970s with contributions from Ross and Mitnick. It addresses the principal's challenge of motivating the agent, the agent's dilemma of acting in the principal's interest or their own, and the use of policing
mechanisms and incentives to align interests. While it creates costs for principals, these mechanisms are rational if the benefits outweigh the costs.

2.1.2 Agency Costs of Free Cash flow Theory

The agency theory extends to the concept of agency costs of free cash flow, where excess cash flow is managed to prevent misuse and ensure efficient resource allocation. This theory advocates for the substitution of dividends for debt to force managers to distribute excessive cash flows to investors. Leveraged buyouts (LBOs) are also used to reduce agency costs and improve resource allocation.

2.1.3 Schumpeter's theory of innovation

Schumpeter's theory of innovation highlights the role of innovation in driving long-term business success. He distinguishes between invention and innovation, emphasizing the importance of entrepreneurship and seizing opportunities for income growth. Schumpeter sees innovation as a creative destruction process that fuels economic growth and distinguishes between early thinking that depended on exceptional individuals and later thinking that recognized innovation as a broader force. Financial innovation involves creating and popularizing new financial instruments and technologies, aiming to improve economic progress and competitiveness. It is driven by globalization and market competition, leading to increased sophistication in the financial sector. Various innovations like electronic money, agent banking, and online services have transformed the banking industry.

Understanding the factors that drive innovation is crucial for adapting to the changing business environment and bringing about positive change.

2.2 Conceptual Framework

**Independent variables**

**Agency banking:**
- Cash withdrawal
- Bills payment
- Cash deposits

**Mobile banking:**
- Funds transfer
- Balance enquiry
- Account information

**Automated Teller Machines:**
- Cash point
- Number of Transactions
- Withdrawal

**Debit and credit cards:**
- Borrow money
- Prepaid

**Dependent Variable**

**Financial performance**
- Return on Assets
- Return on Investments

Figure 1.1: Conceptual framework
2.3 Empirical Review

This section looks at the global and local information, that is available majorly on the this specific topic, to highlight a thorough understanding of the topic and how other scholars have responded within different perspectives but in the same line and school of thought.

2.3.1 Influence of Agency Banking on Financial Performance

The growth of mobile and agency banking in Kenya has led to increased market penetration and a greater number of transactions, along with the offering of loan products to the mass market (Cytonn Investments, 2020). Research on the financial performance of Savings and Credit Co-operative Societies in Kenya, specifically Kakamega Teachers Co-operative Society Limited, showed that financial innovation factors do not account for a 100% change in financial performance. Market share and return on investment were found to be crucial factors influencing the performance of retail banking services (Wang et al., 2020).

Financial innovations, such as agency banking, online banking, mobile phone banking, and ATM banking, positively influenced the financial performance of the retail banking industry in a 5-year period from 2009 to 2013. However, a study noted that the introduction of new mobile banking products negatively affected financial performance, as it incurred costs related to acquiring mobile banking operating systems, hardware, and personnel expenses (M’mata, 2022).

Banks are shifting their focus from efficiency to revenue growth, market share expansion, customer retention, and targeting specialized customer segments, such as institutions, retirees, the youth, civil servants, and small and medium-sized enterprises. The use of agency banking allows banks to reach customers directly, offering services like account opening, deposits, and withdrawals, ultimately increasing market share and revenue generation. This approach leverages the convenience of banking at the neighborhood level, reducing the need for customers to queue in banking halls (Linyiru & Rutto, 2017).

2.4.2 Influence of Mobile Banking on the Financial Performance

The first study by Thio & Yusniar (2021) investigates the impact of mobile banking, company size, and credit risk on the financial performance of Indonesian banks. They found that mobile banking had no significant effect, but company size and credit risk (measured by NPL) had a significant impact on financial performance (ROA, ROE, BOPO).

Another study in Greece focuses on the impact of internet banking services on Greek banks' performance. It reveals a positive relationship between the adoption of internet banking services and reduced operating expenses, but no significant effect on profitability (Ouma & Ndede, 2020).

In Iran, research on mobile banking adoption highlights the cost of using and bank profitability as influential factors for customers. Users ranked these factors as crucial in their decision to use mobile banking.

Bank performance is a vital aspect in the banking sector, often measured through financial ratios and CAMEL framework analysis. The introduction of mobile banking facilities, as stated by Shevlin, enhances consumer interest and convenience.

A study in Saudi Arabia uses the innovation diffusion framework to analyze the adoption of mobile banking. It finds that factors like relative advantage, complexity, compatibility, perceived risk, and trial-ability significantly influence adoption.
South Sudan experienced a shift in the money transfer industry due to mobile banking, leading to reduced costs for banks and increased commission income. Mobile banking has become a popular means of transacting, leading to efficient cash circulation in the economy.

2.4.3 Influence of Automated Teller Machines on the Financial Performance
Automated Teller Machines (ATMs) have been playing a pioneering and pivotal role in the advancement of this technological transformation of the banking scene. At the same time, bank marketing managers need to assess continuously the customer’s decision-making process as well as the formation of attitudes, preferences and satisfaction with these new automated services. The research found low maintenance costs for ATMs; and investment in ATMs was mainly driven by bank income. The study concluded that agency banking had the greatest influence on the financial results of Tier One commercial banks in Kenya, mobile banking was followed by Automated Teller Machine (ATM) banking, while internet banking had the least effect on the financial performance of Kenya Tier One commercial banks (Kala Kamdjoug et al., 2020).

The study suggests that all tier one commercial banks should take advantage of lower internet rates to reduce their transaction costs, which in return would attract potential customers, thereby building consumer loyalty a key. They found out that first mover initiative in product innovation improves profitability while process initiative has a positive effect on profitability and efficiency. Banks that imitate are less profitable and less efficient than first movers.

It was found that the main reason for using the ATM was accessibility. The user group believed that the ATM improves quality of service, reduces cost, presents no risks to customers, and is fast and easy to use. The non-users saw no advantage to using the ATM and preferred dealing with humans. The user group was generally more educated. It is apparent that financial institutions must develop different strategies for user and non-user groups. Non-users should be educated on how to operate the machines. Human tellers, while offering personalized service, could demonstrate the functions of the ATM. In addition, the machine could be placed inside the bank near the human teller in order to entice usage. However, while these new technologies may offer significant advantages to the consumers, many are unwilling to adopt them. A large number of consumers are resistant to new ways of doing their banking, especially when the new way represents loss of personal contact.

A study on ATMs and service delivery in Kenya found a high degree of customer complaints with ATM downtime, cash out, high charges and sometimes, poor service recovery efforts when customers have problems. It appears the bank managers have very little understanding of customer’s expectations with the ATMs. The study addresses these research gaps and makes two contributions to the e-banking service quality literature. The study proposes “ATMQual” as a scale for measuring the dimensions of ATM service quality. Second, the study evaluates the relative importance of these dimensions based on the perceptions of customers and provides insight into ATM service quality in a region often under-researched in academic discourse and inquiry. The study among others will enable bank managers to focus on and address issues critical to the increasing number of customers who perform their banking transactions through the ATM.

2.4.4 Influence of Debit and Credit Cards on the Financial Performance
Credit cards have become a fact of life for the most consumers and are a part of the consumer culture. Staggering credit card statistics provide evidence of their pervasiveness. As of 2011, seventy-seven
percent of the US adults owned at least one credit card, with a total of 1.4 billion cards in circulation. The average cardholder owned 7.7 cards and uses a credit card 119 times a year charging an average of $88 per transaction or $10,500 annually (my FICO, 2012). By the end of 2011, with the unfolding of America’s economic crisis, the average household credit card debt reached $16,420 (Federal Reserve G.19 March, 2012).

Despite signs of growth, the economy is still emerging from the worst recession in the recent memory, a phenomenon that hit the credit card issuers hard. With consumers spending less regulatory pressures constraining fees and interest rates. Credit card issuers have experience a material impact on income coupled with increases in delinquencies and charge-offs, card issuers have had to weather nearly unprecedented turbulence. A common challenge faced by the global credit card industry is compacting attrition and diminishing wallet share, particularly as consumers exhibit an increasing preference for debit over credit card. To cope with this, the credit card issuers are implementing aggressive anti-attrition, pro- retention strategies.

The use of the credit cards in the society has affected not only traditional consumers, but also vulnerable groups, such as college students, senior citizens, and disabled citizens. College students have grown up in the age of credit, becoming independent consumers earlier in life, and constantly exposed to new products and services available through credit cards. Along with technology and the expansion of the internet, they become an appealing demographic group for credit card companies and financial institutions for a variety of reasons. Solicitation on college campuses has caused concern among college officials, consumer advocacy groups and legislators. Past investigations on the credit card usage have acknowledged the role that the credit cards play on the financial performance of commercial banks. The study on the effect of the credit cards on the performance of commercial banks portfolio in South Sudan particularly in Juba town acknowledges the fact that the credit cards have a positive effect on the financial performance of the commercial banks in South Sudan. Kamal in the study on the effect of the electronic credit card usage on bank’s profitability agrees with that there is a positive effect between the number of the credit cards, the net income from the credit cards and the profitability of the commercial banks. In this study the effects of financial innovation on financial performance of commercial banks found out that some banks in South Sudan had adopted some forms of financial innovation like the credit cards, mobiles and agency banking and these had a great impact on the financial performance of commercial banks.

2.5 Knowledge Gap

Although studies have been done on banking innovations, there is still knowledge gap that needs to be filled. For example a study done by (Olwande & Ngaba, 2019) on innovation adoption and management of innovation acknowledge found out that the best technology does not constantly turn out to be the most extensively accepted. While the specialists in innovation economy find that technological trajectories make some innovation trails more probable than others, the complex relationships between market demand and technological supply cannot be taken severely with allusion to the technology nature. Even in the organization structure and elements of technology that has contended for the strongest relations between the organizational forms and nature of technology, there is a gratitude that technological change is a time for restructuring, and the technology can at times dissimilar organizational results. This study did not cover the effect of ATM and debit and credit cards on the financial performance of banks.

An extensive array of technological innovation study by Linyiru and Rutto, (2017) proposes that the innovation process varies between ages of comparative stability and times of comparative variation.
This study does not cover commercial banks. Study on business strategy and innovation specifically has contended that the nature of innovation varies as time passes by. Times of more incremental innovation, in which technology appears to develop along well understood tracks, are then abruptly followed by periods of more radical innovation, in which the certainties of the past era are abandoned. Ultimately, a radical innovation turn out to be more extensively recognised, and settles back into moderately well comprehended incremental innovation. The economists of innovation denote to times of alteration in which the way of technological innovation alternates in the lifecycle of a technology This study did not cover the influence of agency and mobile banking on the financial performance of commercial banks that this study covers.

3.0 Research Methodology

The study employed a descriptive research design to achieve its objectives, which involved outlining a group of issues related to technological innovations' causal effects on financial performance in commercial banks. The research site was limited to six commercial banks in South Sudan, including KCB South Sudan, African Nation Bank, Ecobank-South Sudan, CFC Stanbic Bank-South Sudan, Ivory Bank, and Commercial Bank of Ethiopia-South Sudan in Juba City, Central Equatorial State. These banks were chosen due to their established structures and long-standing presence in the system.

The target population comprised these six commercial banks, and purposive sampling, a non-probability sampling method, was used to select them. Organizational structures and departmental information were obtained from the banks’ HR departments. Secondary data from financial statements, including Return on Equity (ROE) and total transaction values through various banking channels, were collected for analysis. Data analysis involved organizing, coding, editing, and cleaning the data before processing using SPSS version 23 (Charles, & Benson 2023). Before conducting regressions on critical variables, diagnostic tests were performed to check for normality, homoscedasticity, and multicollinearity. Normality ensured that residuals followed a normal distribution, homoscedasticity assessed the equal distribution of residuals, and multicollinearity examined the correlation between predictor variables. The researcher aimed to ensure the validity of regression results and accurate inferences by addressing these issues.

4.0 RESULTS AND DISCUSSIONS

4.1 Descriptive Statistics

The general objective of the study was to determine the influences of technological innovations on financial performance of commercial banks in Central Equatorial State, South Sudan. This section presents descriptive statistics for agency banking, mobile banking, Automated Teller Machines, debit and credit cards and financial performance of commercial banks.

4.1.1 Agency Banking

The study sought to determine how agency banking influence financial performance of commercial banks in Central Equatorial State, South Sudan. The agency banking was measured using total value of transactions conducted through agents. The findings for various banks are shown in Table 4.1.

<table>
<thead>
<tr>
<th>Table 4.1: Agency Banking Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agency Banking (Million South Sudanese pounds)</strong></td>
</tr>
<tr>
<td>Min.</td>
</tr>
<tr>
<td>KCB South Sudan</td>
</tr>
<tr>
<td>African National bank</td>
</tr>
<tr>
<td>Ecobank-South Sudan</td>
</tr>
</tbody>
</table>
From the findings in Table 4.1, the average value of transactions conducted through agents between 2016 and 2020 for KCB South Sudan was 1318.57 Million South Sudanese pounds, for African National bank was 345.74 Million South Sudanese pounds and for Ecobank-South Sudan was 763.62 Million South Sudanese pounds. Further, the average value of transactions conducted through agents between 2016 and 2020 for CFC stanbic Bank-South Sudan was 704.57 Million South Sudanese pounds, for Equity bank was 525.76 Million South Sudanese pounds and Commercial Bank of Ethiopia-South Sudan was 475.36 Million South Sudanese pounds. KCB South Sudan recorded the highest transactions through agents followed by Ecobank-South Sudan and the least was African National bank. The transactions through agency banking formed a significant proportion of the entire banking transactions in all targeted banks in South Sudan. The findings agrees with Linyiru and Rutto (2017) who argued that agency banking gives banks an opportunity to reach out to customers’ right at the doorstep, and this can be achieved by riding on the infrastructure of small and medium enterprises. Cytonn Investments (2020) noted that with the growth of mobile and agency banking, penetration in the market has increased and this led to a greater number of transactions as well as offer loan products to the mass market.

4.1.2 Mobile Banking

The study sought to determine how mobile banking influence financial performance of commercial banks in Central Equatorial State, South Sudan. The mobile banking was measured using total value of mobile banking transactions. The findings for various banks are shown in Table 4.2.

Table 4. 2: Mobile Banking Findings

<table>
<thead>
<tr>
<th>Mobile banking (Million South Sudanese pounds)</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KCB South Sudan</td>
<td>755.68</td>
<td>952.11</td>
<td>849.54</td>
<td>75.24</td>
</tr>
<tr>
<td>African National bank</td>
<td>304.56</td>
<td>391.01</td>
<td>357.07</td>
<td>39.62</td>
</tr>
<tr>
<td>Ecobank-South Sudan</td>
<td>765.48</td>
<td>9004.88</td>
<td>2496.26</td>
<td>3639.10</td>
</tr>
<tr>
<td>CFC stanbic Bank-South Sudan</td>
<td>796.75</td>
<td>1012.00</td>
<td>897.55</td>
<td>80.45</td>
</tr>
<tr>
<td>Equity bank</td>
<td>506.50</td>
<td>800.75</td>
<td>587.05</td>
<td>123.82</td>
</tr>
<tr>
<td>Commercial Bank of Ethiopia-South Sudan</td>
<td>321.50</td>
<td>541.70</td>
<td>437.06</td>
<td>102.80</td>
</tr>
</tbody>
</table>

From the findings in table 4.2, the average value of mobile transactions for KCB South Sudan was 849.54 Million South Sudanese pounds, African National bank was 357.07 Million South Sudanese pounds and for Ecobank-South Sudan was 2496.26 Million South Sudanese pounds. Further, the average value of mobile transactions for CFC stanbic Bank-South Sudan was 897.55 Million South Sudanese pounds, for Equity bank was 587.05 Million South Sudanese pounds and that of commercial Bank of Ethiopia-South Sudan was 437.06 Million South Sudanese pounds. Ecobank-South Sudan had the highest mobile banking transactions while African National bank had the least. It was clear that mobile banking transactions contributed to a significant proportion of the entire banking transactions in all targeted banks. The findings agree with Ouma and Ndende (2020) who found that mobile banking lowered transaction costs by removing the need for customers visiting banks branches; mobile banking transactions transferring funds between customer-related accounts
was simple and efficient; m-banking transactions increased the customer base; and customers were able to check an account balance or check recent transactions on their mobile phone devices. Thiyo and Yusniar (2021) noted that mobile banking has no significant effect on the financial performance of Indonesian banks.

### 4.1.3 Automated Teller Machines

The study sought to determine how Automated Teller Machines influence financial performance of commercial banks in Central Equatorial State, South Sudan. The automated teller machines banking was measured using total value of automated teller machines banking transactions. The findings for various banks are shown in Table 4.2.

#### Table 4.3: Findings for Automated Teller Machines

<table>
<thead>
<tr>
<th>Automated Teller Machines (Million South Sudanese pounds)</th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KCB South Sudan</td>
<td>197.99</td>
<td>456.57</td>
<td>326.93</td>
<td>116.75</td>
</tr>
<tr>
<td>African National bank</td>
<td>105.95</td>
<td>180.01</td>
<td>140.31</td>
<td>30.10</td>
</tr>
<tr>
<td>Ecobank-South Sudan</td>
<td>207.78</td>
<td>490.00</td>
<td>312.15</td>
<td>111.09</td>
</tr>
<tr>
<td>CFC stanbic Bank-South Sudan</td>
<td>290.50</td>
<td>578.90</td>
<td>408.54</td>
<td>115.48</td>
</tr>
<tr>
<td>Equity bank</td>
<td>195.60</td>
<td>304.69</td>
<td>254.26</td>
<td>45.47</td>
</tr>
<tr>
<td>Commercial Bank of Ethiopia-South Sudan</td>
<td>151.00</td>
<td>246.00</td>
<td>193.40</td>
<td>34.88</td>
</tr>
</tbody>
</table>

As per the results in Table 4.3, the average transaction through ATMs for KCB South Sudan was 326.93 Million South Sudanese pounds, for African National bank was 140.31 Million South Sudanese pounds and for Ecobank-South Sudan was 312.15 Million South Sudanese pounds. Further, the average transaction through ATMs for CFC stanbic Bank-South Sudan was 408.54 Million South Sudanese pounds, for Equity bank was 254.26 Million South Sudanese pounds and for Commercial Bank of Ethiopia-South Sudan was 193.40 Million South Sudanese pounds. Based on average, it was clear that transactions through ATMs contributed significantly towards the overall revenue generated by the banks. The findings agree with Kala Kamdjoug et al. (2020) who noted that Automated Teller Machines (ATMs) have been playing a pioneering and pivotal role in the advancement of this technological transformation of the banking scene. At the same time, bank marketing managers need to assess continuously the customer’s decision-making process as well as the formation of attitudes, preferences and satisfaction with these new automated services. The findings correlate with Francesca and Claeys (2017) who found that the main reason for using the ATM was accessibility. The user group believed that the ATM improves quality of service, reduces cost, presents no risks to customers, and is fast and easy to use. The non-users saw no advantage to using the ATM and preferred dealing with humans. The user group was generally more educated. It is apparent that financial institutions must develop different strategies for user and non-user groups. Non-users should be educated on how to operate the machines (Momanyi, Juma, & Kenyanya, 2023).

### 4.1.4 Debit and Credit Cards

Further, the study sought to determine how debit and credit cards influence financial performance of commercial banks in Central Equatorial State, South Sudan. The banking through debit and credit cards was measured using total value of transactions done through debit and credit cards. The findings for various banks are shown in Table 4.4.
Table 4.4: Findings for Debit and Credit Cards

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KCB South Sudan</td>
<td>115.79</td>
<td>246.85</td>
<td>199.45</td>
<td>53.49</td>
</tr>
<tr>
<td>African National bank</td>
<td>89.50</td>
<td>180.00</td>
<td>140.84</td>
<td>38.31</td>
</tr>
<tr>
<td>Ecobank-South Sudan</td>
<td>181.50</td>
<td>289.70</td>
<td>223.62</td>
<td>43.40</td>
</tr>
<tr>
<td>CFC Stanbic Bank-South Sudan</td>
<td>370.50</td>
<td>431.50</td>
<td>404.33</td>
<td>29.19</td>
</tr>
<tr>
<td>Equity bank</td>
<td>174.50</td>
<td>275.05</td>
<td>219.98</td>
<td>39.88</td>
</tr>
<tr>
<td>Commercial Bank of Ethiopia-South Sudan</td>
<td>175.00</td>
<td>254.05</td>
<td>203.01</td>
<td>30.44</td>
</tr>
</tbody>
</table>

From the findings in Table 4.4, the average values of transactions done through debit and credit cards for KCB South Sudan was 199.45 Million South Sudanese pounds, for African National bank was 140.84 Million South Sudanese pounds and for Ecobank-South Sudan was 223.62 Million South Sudanese pounds. Further, the average values of transactions done through debit and credit cards for CFC Stanbic Bank-South Sudan was 404.33 Million South Sudanese pounds, for Equity bank was 219.98 Million South Sudanese pounds and for commercial Bank of Ethiopia-South Sudan was 203.01 Million South Sudanese pounds. The findings showed that CFC Stanbic Bank-South Sudan had the highest transactions through debit and credit cards with African National bank having the least. My FICO (2012) noted that credit cards have become a fact of life for the most consumers and are a part of the consumer culture. Staggering credit card statistics provide evidence of their pervasiveness. The findings are in line with Mutua (2010) who noted that the use of the credit cards in the society has affected not only traditional consumers, but also vulnerable groups, such as college students, senior citizens, and disabled citizens. College students have grown up in the age of credit, becoming independent consumers earlier in life, and constantly exposed to new products and services available through credit cards.

4.1.5 Financial Performance
The study sought data for the aspects of financial performance for commercial banks in Central Equatorial State, South Sudan including return on equity. The findings are shown in Table 4.5.

Table 4.5: Return on Equity Results

<table>
<thead>
<tr>
<th></th>
<th>Min.</th>
<th>Max.</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KCB South Sudan</td>
<td>14.40</td>
<td>22.00</td>
<td>19.02</td>
<td>2.96</td>
</tr>
<tr>
<td>African National bank</td>
<td>11.80</td>
<td>23.80</td>
<td>17.74</td>
<td>5.23</td>
</tr>
<tr>
<td>Ecobank-South Sudan</td>
<td>10.60</td>
<td>22.10</td>
<td>16.18</td>
<td>5.36</td>
</tr>
<tr>
<td>CFC Stanbic Bank-South Sudan</td>
<td>11.70</td>
<td>19.20</td>
<td>15.12</td>
<td>2.94</td>
</tr>
<tr>
<td>Equity bank</td>
<td>17.40</td>
<td>27.70</td>
<td>22.94</td>
<td>3.96</td>
</tr>
<tr>
<td>Commercial Bank of Ethiopia-South Sudan</td>
<td>10.40</td>
<td>20.30</td>
<td>14.06</td>
<td>3.99</td>
</tr>
</tbody>
</table>

From the findings, the average return on equity for KCB South Sudan was 19.02%, for African National bank was 17.74% and for Ecobank-South Sudan was 16.18%. Further, the average return on equity for CFC Stanbic Bank-South Sudan was 15.12%, for Equity bank was 22.94% and for commercial Bank of Ethiopia-South Sudan was 14.06%. This shows that Equity bank performed better financially than other commercial banks in South Sudan. Khatik and Nag (2014) noted that while institutions have been successful in leveraging technology to achieve their objectives, primarily...
as a cost reduction strategy, there is a change in focus towards an alternative strategic coin, where technology is no longer perceived as a cost saver but as a revenue generator.

4.2 Diagnostic Test
Regression diagnostic tests are statistical techniques used to assess the quality of regression models and identify potential issues or violations of model assumptions. The diagnostic tests conducted included normality, linearity, homoscedasticity and multicollinearity.

4.2.1 Test for Normality
The normality tests checks if the residuals follow a normal distribution. The study used Kolmogorov-Smirnov and Shapiro-Wilk test and the results were presented in Table 4.6.

Table 4. 6: Results for Normality Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>Sig.</td>
</tr>
<tr>
<td>Agency Banking</td>
<td>.181</td>
<td>.204</td>
</tr>
<tr>
<td>Mobile Banking</td>
<td>.217</td>
<td>.059</td>
</tr>
<tr>
<td>Automated Teller Machines</td>
<td>.276</td>
<td>.233</td>
</tr>
<tr>
<td>Debit and Credit Cards</td>
<td>.212</td>
<td>.248</td>
</tr>
<tr>
<td>Financial performance</td>
<td>.167</td>
<td>.298</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

As per the results in Table 4.6, the p-values for all the variables were greater than 0.05. Therefore, the residuals of for both the dependent and independent variables followed a normal distribution, which ultimately facilitated the prediction in regression model.

4.2.2 Test for Homoscedasticity
The homoscedasticity assumes that the variance of the residuals is constant across all levels of the independent variables. The study used ANOVA for testing homoscedasticity and the results are presented in Table 4.7.

Table 4. 7: Homoscedasticity Test Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>501.326</td>
<td>4</td>
<td>125.332</td>
<td>17.941</td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Residual</td>
<td>174.641</td>
<td>25</td>
<td>6.986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>675.967</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Financial Performance (ROE)
b. Predictors: (Constant), Debit and Credit Cards, Agency Banking, Mobile Banking, Automated Teller Machines

As per the results in Table 4.8, the significance value was less than 0.05. This implies that that variance is equal across all the variables and hence the data is homoscedastic.

4.2.3 Multicollinearity Test
The study employed collinearity statistics to determine if there is a strong causal relationship between the independent variables by assessing their level of correlation. The results are presented in Table 4.8.

Table 4. 8: Collinearity Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>Agency Banking</td>
<td>1.000</td>
</tr>
<tr>
<td>Mobile Banking</td>
<td>1.000</td>
</tr>
</tbody>
</table>
As per the results in Table 4.8, agency banking, mobile banking, automated teller machines and debit and credit cards had a VIF values of 1. Since VIF values for all the predictor variables were less than 5, the multicollinearity will not be a problem in the regression model.

4.3 Regression Analysis

The study conducted regression analysis to establish the effects of agency banking, mobile banking, automated teller machines and credit and debit banking on performance of commercial banks in Central Equatoria State, South Sudan. The results are presented in Table 4.9, 4.10 and 4.11.

Table 4.9: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.861a</td>
<td>.742</td>
<td>.700</td>
<td>2.643</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Debit and Credit Cards, Agency Banking, Mobile Banking, Automated Teller Machines

As per the findings in Table 4.6, the R-square was 0.742 which implies that 74.2% of the variations in performance of commercial banks in Central Equatoria State, South Sudan are explained by agency banking, mobile banking, automated teller machines and credit and debit banking.

Table 4.10: ANOVAa

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>501.326</td>
<td>4</td>
<td>125.332</td>
<td>17.941</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>174.641</td>
<td>25</td>
<td>6.986</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>675.967</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Financial Performance

b. Predictors: (Constant), Debit and Credit Cards, Agency Banking, Mobile Banking, Automated Teller Machines

As per the results in Table 4.10, the p-value was 0.000 and the F-computed was 17.941. The F-computed (17.941) was greater than F-critical (2.4336) and p-value was less than 0.05. This implies that the regression model was significant.

Table 4.11: Regression Coefficientsa

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.871</td>
<td>.108</td>
<td>8.065</td>
</tr>
<tr>
<td></td>
<td>Agency Banking</td>
<td>.811</td>
<td>.118</td>
<td>.726</td>
</tr>
<tr>
<td></td>
<td>Mobile Banking</td>
<td>.608</td>
<td>.109</td>
<td>.411</td>
</tr>
<tr>
<td></td>
<td>Automated Teller Machines</td>
<td>.756</td>
<td>.112</td>
<td>.377</td>
</tr>
<tr>
<td></td>
<td>Debit and Credit Cards</td>
<td>.631</td>
<td>.134</td>
<td>.218</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Financial Performance

Based on the regression coefficients, the equation was

\[ Y = 0.871 + 0.811X_1 + 0.608X_2 + 0.756X_3 + 0.631X_4 \]

Where:

\[ Y = \text{Financial Performance}; \]
\[ X_1 = \text{Agency Banking}; \]
As per the results in Table 4.8, a unit change in agency banking would lead to 0.811 changes in performance of commercial banks in Central Equatoria State, South Sudan. Cytonn Investments (2020) noted that with the growth of mobile and agency banking, penetration in the market has increased and this led to a greater number of transactions as well as offer loan products to the mass market. The study also revealed that a unit change in mobile banking would lead to 0.608 changes in performance of commercial banks in Central Equatoria State, South Sudan. The findings disagrees with Thio and Yusniar (2021) who noted that mobile banking has no significant effect on the financial performance of Indonesian banks.

The study established that a unit change in automated teller machines would lead to 0.756 changes in performance of commercial banks in Central Equatoria State, South Sudan. Kala Kamdjoug et al. (2020) noted that Automated Teller Machines (ATMs) have been playing a pioneering and pivotal role in the advancement of this technological transformation of the banking scene.

Finally, the study found that a unit change in debit and credit cards would lead to 0.631 changes in performance of commercial banks in Central Equatoria State, South Sudan. The findings are in line with Mutua (2010) who noted that the use of the credit cards in the society has affected not only traditional consumers, but also vulnerable groups, such as college students, senior citizens, and disabled citizens.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings
This section highlights the summary of the results illustrated in chapter four to address the study objectives.

5.1.1 Agency Banking and Financial Performance
The study sought to determine how agency banking influence financial performance of commercial banks in Central Equatorial State, South Sudan. The study found that agency banking significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.811; p=0.000). The transactions through agency banking formed a significant proportion of the entire banking transactions in all targeted banks in South Sudan. The findings agrees with Linyiru and Rutto (2017) who argued that agency banking gives banks an opportunity to reach out to customers’ right at the doorstep, and this can be achieved by riding on the infrastructure of small and medium enterprises.

5.1.2 Mobile Banking and Financial Performance
The study sought to determine how mobile banking influence financial performance of commercial banks in Central Equatorial State, South Sudan. The study revealed that mobile banking significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.608; p=0.000). It was clear that mobile banking transactions contributed to a significant proportion of the entire banking transactions in all targeted banks. Ouma and Ndede (2020) ound that mobile banking lowered transaction costs by removing the need for customers visiting banks branches; mobile banking transactions transferring funds between customer-related accounts was simple and efficient.
5.1.3 Automated Teller Machines and Financial Performance
The study sought to determine how Automated Teller Machines influence financial performance of commercial banks in Central Equatorial State, South Sudan. The study established that automated teller machines significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.756; p=0.000). It was clear the transactions through ATMs contributed significantly towards the overall revenue generated by the banks. Kala Kamdjoug et al. (2020) noted that Automated Teller Machines (ATMs) have been playing a pioneering and pivotal role in the advancement of this technological transformation of the banking scene.

5.1.4 Debit and Credit Cards and Financial Performance
Further, the study sought to determine how debit and credit cards influence financial performance of commercial banks in Central Equatorial State, South Sudan. The study found that debit and credit cards significantly influences performance of commercial banks in Central Equatoria State, South Sudan (β= 0.631; p=0.000). The findings showed that CFC Stanbic Bank-South Sudan had the highest transactions through debit and credit cards with African National bank having the least. All the targeted commercial banks exhibited high transactions through debit and credit cards.

5.2 Conclusions
The study concluded that 74.2% of the changes in performance of commercial banks in Central Equatoria State, South Sudan could be attributed to technological innovations in terms of agency banking, mobile banking, automated teller machines and credit and debit banking. The study concluded agency banking significantly influences financial performance of commercial banks in Central Equatorial State, South Sudan. The study also concluded that mobile banking significantly influences financial performance of commercial banks in Central Equatorial State, South Sudan. It was also concluded that automated teller machines significantly influences financial performance of commercial banks in Central Equatorial State, South Sudan. Adoption of debit and credit cards were also established to significantly influence financial performance of commercial banks in Central Equatorial State, South Sudan.

5.3 Recommendations
The study recommended that commercial banks in South Sudan should ensure that bank agents guarantees security of data and information that is operated on the agency banking platform. This will enhance the customers’ confidence with agency banking and hence increase customer base. The study recommends that commercial banks in South Sudan should work with regulatory authorities to establish a clear and comprehensive regulatory framework for agency banking including guidelines on risk management, customer protection, and agent licensing. There is need for commercial banks in South Sudan to expand their agency banking networks into underserved areas in Central Equatorial State to improve financial inclusion, especially among rural and unbanked populations.
The study recommends that commercial banks in South Sudan should create more awareness on its mobile banking platforms among its customers in order to create a sustainable adoption of the technology as well as the platform. The study also recommends that commercial banks in South Sudan should encourage its customer base to make use of their mobile banking platforms which is more convenient as opposed to physical banking in the banking halls. The study also recommends that commercial banks should seek ways of growing the asset base in order to make it possible to invest in mobile banking as well as support the platforms in an efficient manner.
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The study also recommends that commercial banks in South Sudan should implement stringent security protocols and fraud prevention mechanisms for ATMs. There is need for collaboration between law enforcement agencies and the banking industry to detect and mitigate ATM-related fraud, including card skimming and ATM hacking. This would enhance customer satisfaction and in turn improve financial performance.

The study recommends that bank should also enhance the debit and credit cards since it positively influence financial performance of commercial banks. This can be done by liaising with the customers to get their suggestions on how to improve the debit and credit cards.

There is also need for commercial banks to expand the market segments for consumers who are qualified to use credit cards. Banks should also enhance credit risk management by incorporating high technology to mitigate cases of fraud and credit loss provisions.

5.4 Suggestions for Further Research

The study only focused on commercial banks in Central Equatoria State, South Sudan. The study therefore recommends that future researchers should be extended to cover all banks in South Sudan and establish how technological innovations influence financial performance. The study also recommends that future researchers should look at how other technological innovations such as online banking and blockchain technology influences the financial performance of commercial banks in Central Equatorial State, South Sudan.

References

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