RESEARCH ARTICLE

# Mobile Banking and Commercial Bank Performance Nexus in Zimbabwe (2011-2021): Impact and Implications

*Shepard Makurumidze*[1*]   *Dorcas Rwodzi*[2]

[1] *Department of Finance and Accounting, University of Zimbabwe, MP 167, Zimbabwe*
[2] *Graduate Business School, Chinhoyi University of Technology, 7724, Zimbabwe*

## ABSTRACT

The study investigated mobile banking and commercial banks' performance nexus in Zimbabwe for the period 2011-2021. The investigation employed a pragmatic approach and a descriptive design. Primary data as well as secondary data were used to achieve the study objectives. Questionnaires, interviews and documentary guides were used to collect primary and secondary data respectively. There were 108 questionnaires distributed to staff members and customers of 6 sampled commercial banks in Zimbabwe having mobile banking experience. The interview guide was administered to bank managers to get a deeper understanding of the topic under research and as a mitigation strategy for addressing the flaws of the questionnaires. Analysis of quantitative data utilised descriptive analysis tools, correlations analysis tools as well as regression analysis tools whereas theme analysis was used for qualitative data. SPSS version 26 was used for this purpose. The study implications established that mobile banking and commercial banks' performance nexus in Zimbabwe was significant and also enhanced mobile banking security capabilities and strengthened commercial banks' performance. The investigation concluded that mobile banking's success in enhancing commercial banks' performance hinged on its ability to allow the user to get easier, cheaper and timely access to services. However, the study results showed that the cost of mobile banking services, government policies and intense competition inhibited the uptake of banking services. Commercial banks are recommended to continue strengthening the security of mobile banking services and to boost their uptake by bank customers in Zimbabwe.
*Keywords:* Mobile banking; Commercial banks; Performance

# 1. Introduction

There is a plethora of mobile banking services by most financial institutions to customers in recent years as a way of boosting performance [1]. A lot of interest has now been generated as a result of the rollout of these services in developing countries among various players in the financial services sector of the economy. Most financial institutions in Zimbabwe have taken a lead in the adoption and development of mobile banking technology and have integrated it into their operations for the attainment of a competitive advantage over fellow players in the industry. Mobile banking has the advantage that it offers millions of people a potential solution particularly in the emerging markets that have access to a cell phone, but are excluded from the financial mainstream. Over the years, the financial services sector has been developing innovative products and offering a wide range of financial services with the view of increasing efficiency and overall bank performance. While there are many innovative products that have been introduced in the banking landscape, mobile banking is perhaps the most spectacular product to have ever emerged.

Olweny and Sipho [2] define mobile banking as the accessing of banking services, products as well as facilities through the utilisation of electronic mobile devices that include mobile phones and personal digital assistants. Kingoo [3] furthermore asserts that it is the provision as well as availing of banking or financial services through mobile telecommunication devices. Recent studies have shown that mobile banking poses a significant impact on the financial performance of commercial banks across the entire globe. According to Kigen [4], commercial banks' financial performance refers to the soundness or the overall well-being of the banking system where depositors' funds are in safe custody. The soundness of commercial banks varies from country to country, and it may range from strong or unsatisfactory performance. Gakure and Ngumi [5] identified exogenous factors as contributing significantly to the soundness of commercial banks. Banks' external stakeholders evaluate commercial banks on the basis of their performance [6]. Therefore, bank performance is a reflection of the performance of the economy.

The Zimbabwean financial sector has evolved over time going through four distinct phases since the attainment of independence in 1980: The post-independence era (1980-1990), the reform era (1991-1999), the crisis period (2000-2008) and the multicurrency period (2009-2014). In the post-independence period (1980-1990) the financial sector was heavily regulated and liberalised in 1991. The Zimbabwean financial system was foreign-owned and the sector was well developed with a relatively sophisticated range of financial markets and institutions established in the 1960s [7]. The Fourth Industrial revolution ushered in new banking delivery channels on the Zimbabwean financial market that included Automated Teller Machines (ATMs), ATM cards, Point of Sale Machines (POS), Internet banking, Telephone banking followed by Mobile banking, SMS banking and Credit cards. Before the advent of technology, people carried huge sums of cash in their bags and pockets and this has since been replaced by plastic cards, internet or mobile phones. There is now a competition between traditional financial institutions and mobile-communication companies in winning the souls of the unbanked. Mobile-communication services seem to be more attractive than banks' offerings. E-wallet services are the fastest growing in Zimbabwe and are offered as shown in **Table 1** below:

**Table 1.** E-Wallet services in Zimbabwe.

| E-wallet service | Company |
| --- | --- |
| Ecocash | Econet |
| Telecash | Telecel |
| One-wallet | Telone |

Smartphones for mobile banking and SMS banking are now in use. Statistics show more than 4.5 million people are internet subscribers, representing 35% of the country's population [8]. There is scanty research on mobile banking and bank performance nexus though, hence the motivation for the investigation.

The current economic environment is in distress

and thus not sparring the financial sector. It is against this background that the traditional brick-and-mortar model of the banking system is slowly demising. Consequently, commercial banks are forced to leverage technological innovations such as mobile banking to circumvent liquidity challenges and boost their performance. Mobile banking services provide opportunities to commercial banks through an increase in clientele base, revenue amount and improvement of service delivery. Competition between banks and mobile-communication firms forced the financial sector to introduce mobile banking as an avenue for enhancing their products, image, competitive advantage, customer retention and new customer attraction. Eventually this would reduce their operating costs. There has been heavy investment in mobile banking by financial sector but it remains unclear if this has significantly affected the performance of commercial banks in Zimbabwe. While there are scant studies that have attempted to establish the relationship between mobile banking and financial performance of the banking sector, the investigation sought to fill this empirical gap by examining the link between mobile banking and commercial bank performance in Zimbabwe.

## 2. Research objectives

### 2.1 Main objective

The main objective of the study is to examine the linkage between mobile banking and the financial performance of commercial banks in Zimbabwe.

### 2.2 Specific objectives

The investigation sought to:
- Evaluate the mobile-banking adoption by commercial banks in Zimbabwe.
- Analyze the performance of Zimbabwean commercial banks.
- Establish the linkage between mobile banking and the financial performance of Zimbabwe's commercial banks.

## 3. Research hypotheses

The study would be based on the following hypotheses set out in the null form:

$H_1$: Mobile banking has a significant positive effect on the performance of commercial banks in Zimbabwe.

$H_2$: Mobile banking services costs have a significant effect on the performance of commercial banks in Zimbabwe.

$H_3$: Mobile banking system security has a significant bearing on the performance of commercial banks in Zimbabwe.

$H_4$: Mobile banking services speed has a significant influence on the performance of commercial banks in Zimbabwe.

$H_5$: Mobile banking services skills requirements have a significant impact on the performance of commercial banks in Zimbabwe.

## 4. Literature review

Mbiti & Weil [9], defined mobile banking as a platform enabling customers access to financial services, while Burgessy & Wong [10] opined that mobile banking is the ability to carry out banking transactions utilising mobile devices or terminals. In its broadcast sense, it is the application of mobile commerce which enables customers to access their bank accounts through mobile devices. Customers are able to conduct and complete bank-related transactions such as balances checks, accounts statements, money transfers or stock trading [11]. Thus, mobile banking would be taken as an innovative method for accessing banking services through channels whereby customers interact with their banking institutions using mobile devices [12]. Customers can access services including deposits, withdrawals, and money transfers as well as making payments using mobile platforms. Several factors affect mobile banking adoption by commercial banks and these include; service costs, security, speed and skills requirements for mobile banking services [13].

Alsheikh & Bojei [14], identified the main advantage of the usage of cell phones as lying in their

capabilities of reaching out to customers geographically dispersed and has the potential of transforming the fundamental economics of service delivery by reducing banking transactional costs. It is beyond any scope of reasonable doubt that mobile banking has the potential of delivering financial services to a billion people worldwide since the majority have mobile phones [15]. Apart from breaking constraints caused by geographical boundaries, mobile banking also provides other distinct advantages that include immediacy, security and efficiency [12]. Courtesy of mobile banking, commercial bank customers can perform numerous banking transactions as well as cater to their day-to-day basic needs in the comfort of their homes or offices and in real-time. In other words, the more individuals perceive the relative advantages of mobile banking, the individual would tend to have a more positive attitude toward it [16]. Consequently, this is important in reducing consumers' social and psychological risks perception toward mobile banking services.

Tchouassi [1], identified some risks associated with mobile banking and these include, insecure information when accessing services as the platform requires the submission of personal information through a text messaging platform. This can attract hackers who can try to access personal information through insecure Wi-Fi hotspots [15]. The other risks could be under-investment in technology by the bank to ensure adequate encryption security of the customer's personal information.

Traditionally, banks measured their performance largely on the basis of financial indicators such as profits, sales and return on investment. Wilson et al., [17] noted that this approach has resulted in companies emphasizing financials to the detriment of other important performance indicators. In recent years, many banks have adopted the use of a balanced scorecard to measure performance; an approach that Wilson et al., [17] consider to be holistic and more comprehensive in measuring performance. Wilson et al., [17] further confirm that the balanced scorecard is a comprehensive set of measures that consider both financial and non-financial measures in the fi-

nancial sector or any other organization. Performance can be tracked and measured in multiple dimensions that include financial performance, customer service, social responsibilities, employee stewardship using the balanced scorecard approach. Thus, Wilson et al. [17] assert that the balanced scorecard brings together, in a single management report, performance elements that were previously in separate reports, thus enabling senior managers to consider all important performance measures together and providing a holistic view of a bank's performance.

Financial innovation can significantly result in bank performance improvement through increased market share, expanded products range as well as customized products. This in turn improves service delivery, reduces banks' overheads and transaction related costs as well as increases the geographical presence which all contribute to the bank's profitability. Asongu [18] asserts that the application of information and communication technology concepts, techniques, policies and implementation strategies have become key concerns to all banks and requirements for local and global competitiveness banking. The level of competition in the banking sector is of concern for the provision of financial services, the quality of financial products as well as the depth of innovation in the financial sector. There is a need for capital adequacy by commercial banks as well as being diversified enough for the absorption of major shocks which may arise. Commercial banks should ensure that they improve their customer network coverage as well as having quality connections. Competitive advantage can only be achieved through cost reduction in the marketplace [4]. The Fourth Industrial Revolution's growth has made the provision of banking services more efficient and cheaper. However technological investments have taken a larger share of bank resources. Regardless of the concerns and costs of banking innovations, mobile banking provides answers to commercial banks' financial performance.

Mobile banking enables economic units to create economic value through the exchange of information, payments facilities by avoiding physical inter-

actions [19]. Furthermore, mobile banking necessitates the attraction of mobile customers thus offering tremendous profit potential. Numerous financial institutions were motivated in mobile banking implementation by the need to maximise their earnings through increased market share as well as improved customer relationships [20]. This is due to product delivery convenience and service customization. Credit card usage proliferation is credited to mobile banking as customers can shop worldwide without having the need to carry physical cash.

*Theoretical framework*

The predominant theories that informed the study included the financial intermediation theory based upon the core functions of banking institutions of intermediating between the deficit and the surplus units for sustainable economic prosperity. The market power theory states that increased external market forces result in market power [21]. The efficiency structure theory (ES) is yet another informing theory that advocates that enhanced managerial and scales efficiency results in higher concentration leading to higher profitability. The innovation diffusion theory on the other hand explains how an innovation moves amongst users over time.

The financial intermediation theory states that the role of banking institutions is essentially the creation of specialized financial services for buyers and sellers. According to Bonface & Ambrose [22], an intermediary will produce a financial service if it can sell it for a price expected to cover all costs of its production, both direct costs and opportunity costs.

Diniz et al. [23] defined market power as the ability and capacity of a financial institution to increase its service fees without losing all its clients. Market power can take the form of differentiation of products and services, or ease of search. A trade-off exists between differentiation and loss of legitimacy and these two concepts are optimized at a strategic balance point. Similarly, there is a trade-off between ease of search and security. The market power theory classifies Information Communication and Technology (ICT) investments into market-power-driven

initiatives [23]. In addition, there is a hypothesis that firms with large market shares and well-differentiated portfolios win their competitors and are able to earn monopolistic advantages.

According to the Efficiency Structure theory (ES), enhanced managerial and scale efficiency would result in higher concentration and profitability. Olweny and Shipho [2], examined the balanced portfolio theory and added another dimension to the study of bank performance. The dimension states that the portfolio composition of the financial institution, its profit and the return to the shareholders are the results of the management decisions as well as the overall policy decisions.

Bradley and Stewart [24] promulgated the innovation diffusion theory and affirmed that firms engaging in the diffusion process order to gain competitive advantage, reduce costs as well as protect their strategic positions. However, the innovation diffusion theory put forward by Rogers in 1962 explains how innovation is diffused among users over time [25]. The theory assists firms in appreciating customers' behavior in the adoption or non-adoption of an innovation [22]. The theory is depicted through a bell-shaped distribution curve divided into five parts to categorize users in terms of innovativeness [26]. The classified users included innovators, early adopters, early majority, late majority and laggards [11]. The adoption and use of mobile banking have the potential of extending the limited nature and reach of the formal financial sector to the marginalized population in Africa.

# 5. Research methodology

Research methodology set out how the study area is investigated and is dependent upon the research philosophy adopted. It is about how the world and the processes that operate in it (realities) are viewed [27]. There are two main research philosophies, positivism and anti-positivism. The study adopted a mixed approach to achieve the investigation objectives.

## 5.1 Population and the sampling strategy

The investigation was premised on a target popu-

lation of 150 randomly selected staff and customers of six (6) registered commercial banks operating in Zimbabwe obtained from the RBZ websites as of June 2019 [28]. These include; FBC bank, CBZ bank, ZB bank, NMB bank, Stanbic bank and Steward bank. A purposive sampling technique was adopted in selecting the banking staff and simple random sampling for the bank customers. Therefore, the sample size of the study was computed from the targeted population of 150 respondents in line with Equation (1) below developed by Krejcie and Morgan [29].

$$s = Z^2 NP(1-P) \div d^2(N-1) + Z^2 P(1-P) \qquad (1)$$

where, **s** is the required sample size, **Z** denotes the **Z**-value, **P** is the population proportion, **d** epitomizes the degree of accuracy expressed as a proportion (0.05). Since the targeted population of the current study was 150 respondents and where the **P** is equivalent to 0.5, **d** equal to 0.05 and **Z**-value is equal to 1.96 for a 95% confidence interval and the expected total sample size for the study based on the formula expressed in the expression above is as follows:

$$S = (1.96)^2 \times 150(0.5)(1-0.5) \div (0.05^2(150-1))$$
$$+ (1.96^2 0.5(1-0.5)) \qquad (2)$$

$S = 108$ *respondents*

### 5.2 Research instruments

Research instruments are tools that are used to collect data in the research [30]. The survey questionnaires were used in the research to investigate and quantify the existing linkage between mobile banking and commercial banks' performance in Zimbabwe. Primary data were collected through the questionnaire so as to ensure the confidentiality of the respondents. As part of the primary data collection, the researcher handed out a total of 108 questionnaires to fifty-four (54) bank staff members and fifty-four (54) bank customers of the six sampled commercial banks in Harare and at various intervals. The researcher also developed an interview guide and conducted interviews with bank branch managers for each of the six (6) sampled banks to probe for qualitative insights about the linkage between mobile banking and performance by commercial banks.

### 5.3 Data analysis and presentation

Tables were utilised to show the descriptive analysis statistics that included percentages, means and standard deviations summarising the respondent opinions in order to address the research objectives. The statistical significance level was set at a 95% confidence interval (probability value ≤ 0.05). The Analysis of Variance (ANOVA) was employed to determine differences between the categories in the samples used in the study. Regression analysis was used to quantify and ascertain the relationship that exists between mobile banking and commercial banks' performance. Hypotheses were tested by comparing the probability value and the level of significance of 0.05.

Since commercial banks' performance is a function of mobile banking services which comprised of the cost of mobile banking services, its security, speed and skills required in its discourse therefore, the model specification used in the current study was as follows:

$$CBP = \beta_0 + \beta_1 Cost + \beta_2 Security + \beta_3 Speed + \beta_4 Sills + \beta_5 GP + \beta_6 MC + u_t \qquad (3)$$

where *CBP* denotes the Commercial Banks' Performance, *Cost* indicates the cost of mobile banking services, *Security* is the security of mobile banking services, *Speed* denotes the speed of mobile banking services, *Skills* refers to the skills requirements of mobile banking services, *GP* epitomises the government policies and *M*C stands for market competition. In the same vein, $\beta_0$ is the constant, $\beta_1$ …………$\beta_6$ are the slope coefficients (betas) to be estimated whereas $u_t$ is the stochastic error term which is normally distributed.

## 6. Results and discussion

### 6.1 Response rate

Out of a total of 108 questionnaires distributed to commercial banks' staff and customers in Harare, the provincial capital of Zimbabwe, only 103 were returned. The response rate results from the study are indicative of the fact that the majority of the ques-

tionnaires (94.5%) were returned compared to 5.5% that was not returned as illustrated by **Table 2** below.

<p style="text-align:center">**Table 2.** Response rate.</p>

| Questionnaires administered | Valid Questionnaires obtained | Response rate |
|---|---|---|
| 108 | 103 | 95.4 % |

Source: Researchers' computations from survey data (2022).

The response rate of 94.5% showed the respondents' interest in the problem being investigated. A 100% response rate was achieved on the interview guide. A response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent [31]. Willimack (2002) cited by Snijkers [32], opined that response rates in the range of 50%-65% are considered credible for analysis of the data. On the other hand, Baruch [33] posited that there are no agreed norms as to what may be considered a reasonable response rate (RR). The response rate was considered credible for further statistical analysis as it was above the minimum threshold of 60% recommended by Mugenda and Mugenda [31] and Willimack (2002)

cited by Snijkers [32].

## 6.2 Mobile banking and performance

The participants were subjected to several normative statements related to variables such as mobile banking, commercial banks' performance, government policies and market competition to discern valuable insights into the exact linkage between these variables.

The results from **Table 3** show a mean cumulative majority (60.44%) of the respondents confirmed that mobile banking services were easily accessible, have lower transaction fees and minimised travelling costs while only 12.53% thought otherwise. However, a cumulative total of 72.9% alluded to the fact of mobile banking being accessible. Only 36.4% of the respondents who participated in the investigation indicated that mobile banking had lower transaction costs compared to transactions done over the counter. There appeared to be an insignificant cost difference between the two modes of transacting.

The results from **Table 4** were subjected to normative statements related to mobile banking security.

<p style="text-align:center">**Table 3.** Cost of mobile banking services.</p>

| Dimensions or traits | N | Strongly Disagree | Disagree | Unsure | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| (a) Mobile banking channels are used because of lower transactions fees compared to OTC transactions. | 103 | 9.7% | 8.7% | 25.2% | 35% | 1.4% |
| (b) Mobile banking services are easily accessible. | 103 | 5.8% | 5.8% | 15.5% | 37.9% | 35% |
| (c) Mobile banking minimizes travelling cost to visit commercial banks' branches. | 103 | 3.9% | 3.9% | 19.4% | 35% | 37% |
| Mean score | | 6.47% | 6.13% | 20.03% | 35.97% | 24.47% |

Source: Researchers' computations from survey data (2022).

<p style="text-align:center">**Table 4.** Security of mobile-banking system.</p>

| Dimensions or traits | N | Strongly Disagree | Disagree | Unsure | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| (d) People use mobile banking because it is secure and guarantees privacy. | 103 | 5.8% | 7.8% | 25.3% | 23.3% | 37.9% |
| (e) I expect not to lose any amount of money during mobile banking transaction. | 103 | 11.7% | 16.5% | 28.2% | 22.3% | 21.4% |
| (f) There is minimal technology failure in mobile money transactions delivery and loss is negligible | 103 | 3.9% | 12.6% | 28.2% | 35% | 20.4% |
| Mean score | | 7.13% | 12.3% | 27.23% | 26.87% | 26.57% |

Source: Researchers' computations from survey data (2022).

Based on findings, a cumulative mean of 53.44% of the respondents were of the opinion that mobile banking was secure compared to 19.43% who opined otherwise. Cumulatively, 61.2% of the respondents felt mobile banking was more secure and guaranteed the privacy of the transacting customers and 43.7% agreed to the notion that mobile banking transacting preserved values and did not result in any monetary loss.

Results presented in **Table 5** showed that the majority (48.5%) cumulatively agreed that their respective banks quickly resolved problems encountered with mobile banking transactions even though 25.2% of the respondents disagreed. In addition to the above mentioned facts, a cumulative proportion equivalent to 49.5% of the respondents vowed that mobile banking provided better real-time access to banking services than traditional banking. On the other hand, 57.3% of the respondents confirmed that mobile banking has a good connection speed. Therefore, the combined results validated that the speed of mobile banking services has far-reaching implications on commercial banks' performance in Zimbabwe since the mean score (26.20%) of the respondents who strongly agreed on various traits of mobile banking speed was found to be superior to the scores of all other categories of the Likert scale.

Cumulatively 59.2% of the respondents asserted that mobile banking has increased the return on assets and improved the market share of financial institutions in Zimbabwe as indicated in **Table 6**. Therefore, the results of the study indicated that mobile banking had a strong bearing on commercial banks' performance as validated during the survey since the cumulative mean score (57.03%) of the respondent in agreement with the traits of commercial banks' performance eclipsed the mean scores of all other categories as indicated by the table.

**Table 5.** Speed of M-banking services.

| Dimensions or traits | N | Strongly Disagree | Disagree | Unsure | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| (g) Mobile banking transaction problems are quickly resolved which encountered. | 103 | 8.7% | 16.5% | 26.2% | 29.1% | 19.4% |
| (h) Mobile banking provides greater real-time access to banking services than traditional banking. | 103 | 7.8% | 13.6% | 29.1% | 17.5% | 32% |
| (i) Mobile banking has a good connection speed. | 103 | 7.8% | 20.4% | 14.6% | 30.1% | 27.2% |
| Mean score | | 8.10% | 16.83% | 23.30% | 25.57% | 26.20% |

Source: Researchers' computations from survey data (2022).

**Table 6.** Commercial banks' performance.

| Dimensions or Traits | N | Strongly Disagree | Disagree | Unsure | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| (a) Return on assets among commercial banks have increased upon the adoption of mobile banking transactions | 103 | 13.6% | 10.7% | 16.5% | 32% | 27.2% |
| (b) Mobile banking have increased the quality of services offered by commercial banks. | 103 | 10.7% | 8.7% | 28.2% | 29.1% | 23.3% |
| (c) Commercial banks have seen improved market share position as a result of mobile banking. | 103 | 8.7% | 7.8% | 24.3% | 33% | 26.2% |
| (d) Customer satisfaction among commercial banks' customers have increased courtesy of mobile banking services. | 103 | 10.7% | 11.7% | 20.4% | 26.2% | 31.1% |
| Mean score | | 10.93% | 9.73% | 22.35% | 30.08% | 26.95% |

Source: Researchers' computations from survey data (2022).

## 6.3 Multiple regression

The multiple regression techniques were employed in the research to quantify the linkage and mobile banking and commercial banks' performance in Zimbabwe and the estimation results are presented in **Table 7**.

The results shown in **Table 7** confirmed that the slope coefficient of the Cost variable ($\beta_1 = -0.233$) in the multiple regression model was negative and statistically significant at a 5% level of significance. The result confirmed that, holding all other explanatory variables in the model constant, a one percent increase in the Cost of mobile banking services would lead to a decrease in Commercial banks' performance by a magnitude of 0.233 units all things being equal. The statistical significance of the cost variable was indicative of the dependence of cost and bank performance. The observed inverse link between the cost on mobile banking services and performance was also substantiated by Al-Jabir [13], who opined that when carrying out banking through

a mobile phone attracts an associated cost of buying a handset and getting a service provider connection. Moreover, this result was strongly consistent with Alsheikh & Bojei [14], who discovered that the major impediment to mobile banking's widespread usage was the cost. Therefore, the result confirmed the second research hypothesis ($H_2$) that the costs of mobile banking services have a significant effect on the performance of commercial banks in Zimbabwe.

On the other hand, the coefficient of the Security of mobile services variable indicated by the parameter $\beta_2$ (= 0.1) was positive and statistically significant at a 5% level. The empirical evidence signifies that a 1% increase in the security of mobile services will lead to a corresponding increase in Commercial banks' performance by approximately 0.1 units holding all things constant. The empirical findings connote those advancements in technology such as the development of sophisticated mobile devices with GPS and biometric-based security capabilities which would not only boost the security of mobile

**Table 7.** Multiple regression model results.

| Variable | Dimensions | Notation | Parametization | Coefficient | p-value |
|---|---|---|---|---|---|
| Mobile banking (M-banking) | Mobile banking services costs | Cost | $\beta_1$ | −0.233** (0.104) [−2.245] | 0.027 |
| | Mobile banking services security | Security | $\beta_2$ | 0.100 ** (0.101) [3.003] | 0.019 |
| | Mobile banking services speed | Speed | $\beta_3$ | 0.083** (0.108) [3.827] | 0.010 |
| | Mobile banking services skills requirement | Skills | $\beta_4$ | 0.053 (0.099) [0.542] | 0.589 |
| Government policies | | GP | $\beta_5$ | −0.180** (0.098) [4.850] | 0.007 |
| Market competition | | MC | $\beta_6$ | −0.192*** (0.097) [4.982] | 0.000 |
| Constant | | | $\beta_0$ | 0.000 (0.095) [0.000] | 1.000 |

Note: superscripts ***, **, * denotes statistical significance at 1%, 5% and 10% level of significance. An estimated coefficient is statistically significant at 5% level if its p-value is less than 0.05.

Source: Researchers' computations from survey data (2022).

banking services (assist bank customers to mitigate fraud in real-time) but would also strengthen commercial banks' performance. The result empirically confirmed the findings of Wang et al. [34] and Puschel & Mazzon, [16] who established that using mobile phones in banking service provision can be trusted. Based on the result, sufficient statistical evidence exists at the 5% level to validate the third research hypothesis (H$_3$) that the security of mobile banking systems had a significant bearing on the financial performance of commercial banks in Zimbabwe.

Furthermore, the beta coefficient of the speed of mobile banking services variable ($\beta_3 = 0.083$) in the regression model was positive and statistically significant at 5%. The result indicated the existence of evidence from a statistical background to support the fact that a 1% increase in the speed of mobile banking services yielded an 8.3% surge in Commercial banks' performance *ceteris paribus*. The results validated Olweny & Shipho's [2] analysis and indicated that the success of mobile banking in enhancing commercial banks' performance hinges on its ability to allow users to get timely access and shortcut frequently used transactions in real-time [2]. Consequently, the findings confirmed the fourth research hypothesis (H$_4$) that the speed of mobile banking services significantly influences the performance of commercial banks in Zimbabwe.

The research results also established that the skills required of mobile banking services variable have an insignificant effect on commercial banks' performance in Zimbabwe since the estimated regression coefficient denoted by (= 0.053) is positive but not statistically significant at a 5% level. However, this result provided no empirical validation to the opinion posited by Puschel & Mazzon [16] that the diverse staff available to administer, monitor and support mobile banking services need to be skilled enough to provide support effectively and seamlessly. Consequently, the result validated that there is not enough evidence from a statistical background to support the fact that an increase in the Skills requirement of mobile banking services by 1% will ignite an upsurge in Commercial banks' performance of about 0.053 units all things being equal. Thus, the results partially confirmed the fifth research hypothesis (H$_5$) that the skills requirements for mobile banking services have a significant impact on the performance of commercial banks in Zimbabwe.

Research findings also authenticated that the coefficient of the Government Policies (GP) variable ($\beta_5 = -0.18$) is negative at a 5% level of significance. This result connoted that a change in government policy targeting mobile banking resulted in a decline in commercial banks' performance by approximately 0.2 units *ceteris paribus*. This result validated the existence of an inverse relationship between government policies targeting mobile banking and commercial banks' performance in Zimbabwe. The results inferred that a complex regulatory and policy environment often cuts across various regulatory domains that included mobile banking platforms (for instance the 2% electronic transaction tax in Zimbabwe) could dampen the development of mobile banking services, retard its uptake and curtail commercial banks' performance.

Similarly, the beta coefficient of the Market Competition (CM) variable denoted by $\beta_6$ (= −0.192) is negative. It confirms that a 1% increase in market competition amongst commercial banks would result in a reduction in commercial banks' performance by a magnitude of approximately 0.2 units all things being equal. The findings suggested that policies creating competition in the banking sector have not resulted in new innovative technologies for cost savings among commercial banks. According to Norreklit & Mitchell [35], market share is characterized by sales relative to those of other competitors in the market, the results of the research confirmed Lin, [36] that increased market competition reduces market share and leads to an unfavorable performance in commercial banks. This result validated the sixth research hypothesis (H$_6$) that government policies and market competition have a significant moderating effect on the linkage between mobile banking and the performance of commercial banks in Zimbabwe. There is always a connection between policies by government authorities and banking innovation [37].

The intercept ($\beta_0 = 0.000$) of the regression model is null. This implied that holding all other explanatory variables in the model constant, the average commercial banks' performance was null. This result strongly suggested that mobile banking is indispensable in enhancing commercial bank performance. Mobile banking and banking performance appear inseparable [38]. Generally, the empirical findings established that mobile banking was significantly explaining commercial banks' performance and hence confirmed the first research hypothesis ($H_1$). Therefore, data generating process for the fitted regression model is as shown in Equation (4) below:

$$CBP = -0.233\ \textbf{Cost} + 0.1\ \textbf{Security} + 0.083\ \textbf{Speed} + 0.53\ \textbf{Skills} - 0.18\ \textbf{GP} - 0.192\ \textbf{CM} \tag{4}$$

where *CBP* denotes the Commercial Banks' Performance, *Cost* indicates the cost of mobile banking services, *Security* is the security of mobile banking services, *Speed* denotes the speed of mobile banking services, *Skills* refer to the skills requirements, *GP* epitomises the government policies and *MC* stands for market competition.

The results in **Table 8** showed that the correlation coefficient (R = 0.762) showed a significant positive linear association between the dependent variable (commercial banks' performance) and all explanatory variables (mobile banking, government policies and market competition). There was a strong connection between bank performance and innovations in the banking sector as well as government policies and market competition [39]. The coefficient of determination measured by the R-Squared statistic of 0.731 measures the validity of the regression model. The fact that the coefficient is closer to 100% showed that commercial bank performance in Zimbabwe was adequately explained by the independent variables identified. On the other hand, the Durbin Watson statistic (2.173) is close to 2 implying that the fitted regression model does not suffer from misspecification errors (the model is correctly specified).

## 6.4 Pearson variable correlation results

The correlation analysis examined the degree of linear association between variables used in the current research. **Table 9** shows the Pearson correlation coefficients for the variables employed in the regression model estimation. The results presented below showed that there was a statistically significant correlation between commercial banks' performance (CBP) and security (0.036) and speed (0.039).

**Table 8.** Goodness-of-fit test results.

| Model | R | R-Squared | Adjusted R-Squared | Durbin-Watson |
|---|---|---|---|---|
| 1 | 0.762 | 0.731 | 0.667 | 2.173 |

Note: R denotes the Regression correlation coefficient.

Source: Researchers' computations from survey data (2022).

**Table 9.** Pearson variable correlation results.

| Variables | CBP | | Cost | Security | Speed | Skills | GP | MC |
|---|---|---|---|---|---|---|---|---|
| | CBP | 1.000 | | | | | | |
| | Cost | −0.216** | 1.000 | | | | | |
| | Security | 0.036** | 0.227 | 1.000 | | | | |
| Pearson Correlation | Speed | 0.039** | 0.214 | −0.046 | 1.000 | | | |
| | Skills | −0.022 | 0.074 | −0.147 | −0.114 | 1.000 | | |
| | GP | −0.222*** | −0.212** | 0.001*** | −0.065 | −0.050 | 1.000 | |
| | MC | −0.184*** | 0.057** | −0.001 | 0.152*** | −0.129 | 0.000 | 1.000 |

Note: superscripts ***, **, * denotes statistical significance at 1%, 5% and 10% level of significance. An estimated coefficient is statistically significant say at 1% if its probability value (p-value) or significance value (sig.) is less than 0.01 while an estimate is deemed statistically significant at 5% if its p-value is less than 0.05 and the same conditions also hold in the case of 10% level of significance.

Source: Researchers' computations from survey data (2022).

Moreover, statistically significant positive linear associations were also revealed between the cost of mobile banking services and market competition (0.057), between the speed of mobile banking services and market completion (0.152) as well as between the security of mobile banking services and government policies (0.001). Another statistically significant correlation was found between the cost of mobile banking services and government policies (0.212). This implied that too many government policies increase the cost burden of mobile banking which eventually weighed down on the performance of Zimbabwe's commercial banks [40]. On the contrary, some negative and statistically significant correlations were also found between the dependent variable (commercial banks' performance) and variables such as cost of mobile banking services (–0.216), government policies (–0.222) and market competition (–0.184). These combined results provided strong statistical evidence to confirm the alluded hypothesis that mobile banking services are closely linked to commercial banks' performance in Zimbabwe.

Although some positive and negative correlations were found based on the Pearson correlation coefficients presented in **Table 9**, none of the estimated correlation coefficients exceeded a threshold of 0.8. The results implied that the variables were essentially uncorrelated and that the model neither suffered from the problem of multi-collinearity nor the auto relation of the explanatory variables.

# 7. Conclusions

In view of the findings of the investigation, the following practical, policy and theoretical conclusions can be derived:

- Policies by financial regulators should consider mobile banking as technological development as well as the expected transition from physical branch networks to technologically supported banking services are the way to do banking business. Mobile banking technologies are being used to improve financial operations in commercial banks as they continue to strengthen the security of mobile banking services to boost their uptake by customers in Zimbabwe.

- Zimbabwean commercial banks should partner with proactive and reliable mobile services providers such as Econet in order to improve the speed of conducting banking business. Commercial banks must utilize social media platforms available at their disposal to advertise the traits of mobile banking to their customers to achieve the ultimate goal of improving organizational performance.

- The government should relax some of the retrogressive policy reforms that inflate the cost burden of using mobile banking services by commercial banks and their customers. Policymakers should weigh up the possibility of awarding tax rebates to commercial banks and customers actively pursuing mobile banking services as a way of resuscitating the already dwindling uptake of mobile banking services in Zimbabwe.

# Conflict of Interest

There is no conflict of interest.

# References

[1] Tchouassi, G., 2012. Can mobile phones really work to extend banking services to the unbanked? Empirical lessons from selected Sub-Saharan Africa countries. International Journal of Development Societies. 1(2), 70-81.

[2] Olweny, T., Shipho, T.M., 2011. Effects of banking sectoral factors on the financial performance of commercial banks in Kenya. Economic and Finance Review. 1(5), 1-30.

[3] Kingoo, H., 2011. The relationship between electronic banking and financial performance of commercial banks in Kenya [Master's thesis]. University of Nairobi: Kenya.

[4] Kigen, K.P., 2010. The impact of mobile banking on transaction costs of microfinance institutions [Master's thesis]. University of Nairobi:

Kenya.

[5] Gakure, R., Ngumi, P., 2013. Do bank innovations influence profitability of commercial banks in Kenya? Prime Journal of Social Science (PJSS). 2(3), 237-248.

[6] Flamini, V., McDonald, C., Schumacher, L., 2009. The determinants of commercial bank profitability in Sub-Saharan Africa. IMF Working Papers 09(15). doi: 10.5089/9781451871623.001.

[7] Brownbridge, M., Harvey, C., 1998. Banking in Africa. The impact of financial sector reform since independence. Foundation Publishers: Kampala.

[8] Reserve Bank of Zimbabwe, 2016. Monetary Policy Statement: Harare.

[9] Mbiti, I., Weil, D., 2011. Mobile Banking: The Impact of M-Pesa in Kenya [Internet]. Available from: https://www.nber.org/papers/w17129.

[10] Burgessy, R.P., Wong, G., 2005. Banking the poor: Evidence from India. Journal of the European Economic Association. 3(1), 2-3.

[11] Ching, M.C., Chuan, A.T., Sim, J.J., et al., 2011. Factors affecting Malaysian mobile banking adoption: An empirical analysis. International Journal of Network and Mobile Technologies. 2(3).

[12] Chikoko, L., Mangwendeza, P., 2012. Financial inclusion by Zimbabwean commercial banks in a liquidity constrained environment. Journal of Economics and International Finance. 4(10), 252-259.

[13] Al-Jabir, I.M., 2012. Mobile banking adoption: Application of diffusion of innovation theory. Journal of Electronic Commerce Research. 13(4).

[14] Alsheikh, L., Bojei, J., 2014. Determinants affecting customer's intention to adopt mobile banking in Saudi Arabia. International Arab Journal of e-Technology. 3(4), 210-219.

[15] Cruz, P., Neto, L.B.F., Munoz-Gallego, P., et al., 2010. Mobile banking rollout in emerging markets: Evidence from Brazil. International Journal of Bank Marketing. 28(5), 342-371.

[16] Puschel, J., Mazzon, J.A., 2010. Mobile banking: Proposition of an integrated adoption intention framework. International Journal of Bank Marketing. 28(5), 389-409.

[17] Wilson, A., Zeithmal, V.A., Bitmer, M.J., et al., 2012. Services Marketing—Integrating customer focus across the firm, Second European Edition. Mc Graw Hill Education: UK. pp. 49-108.

[18] Asongu, S.A., 2012. How has mobile banking stimulated financial development in Africa? MPRA Paper No. 38576. Germany: University Library of Munich.

[19] King, M., 2012. Is mobile banking breaking the tyranny of distance to bank infrastructure? Evidence from Kenya [Internet]. Avaiable from: http://www.tcd.ie/iiis/documents/discussion/pdfs/iiisdp412.pdf.

[20] Kathuo, S.M., 2015. Effect of mobile banking on the financial performance of banking institutions in Kenya. Strategic Journal of Business & Change Management. 2(98), 1440-1457.

[21] Cudjoe, A.G., Anim, P.A., Nyanyofio, J., 2015. Determinants of mobile banking adoption in the Ghanaian banking industry: A case of access bank Ghana limited. Journal of Computer and Communications. 3, 1-19.

[22] Bonface, R.M., Ambrose, J., 2015. Mobile banking and financial performance of commercial banks in Kenya. International Journal of Finance and Current Business Studies. 4(12), 16-31.

[23] Diniz, E., Birochi, R., Pozzebon, M., 2012. Barriers and triggers to financial inclusion: The use of branchless, ICT-based banking in an Amazon county. Electronic Commerce Applications & Research. 11(5), 484-494.

[24] Bradley, L., Stewart, K., 2003. The diffusion of online banking. Journal of Marketing Management. 19(9-10), 1087-1109.

[25] Mutua R.W., 2013. Effects of mobile banking on the financial performance of commercial banks in Kenya [Master's thesis]. Kenya: University of Nairobi.

[26] Munaye, H., 2009. The application of mobile banking as a strategic response by equity bank Kenya limited to the challenge in the external environment [Master's thesis]. Kenya: Universi-

ty of Nairobi.

[27] Mouton, J., 2001. How to succeed in your master's and doctoral studies: A south African guide and resource book. New Voices 7(2), 148-152.

[28] Reserve Bank of Zimbabwe, 2021. Monetary Policy Statement: Harare.

[29] Krejcie, R.V., Morgan, D.W., 1970. Determining sample sizes for research activities. Educational and Psychological Measurement. 30, 607-610.

[30] Saunders, M., Lewis, P., Thornhill, A., 2009. Research methods for business students, 3rd Edition. Pearson Education Ltd: London.

[31] Mugenda, M.O., Mugenda, A.G., 2003. Research methods: Qualitative and quantitative approaches. Nairobi, Kenya: African Centre of Technology Studies.

[32] Snijkers, G. (editor), 2008. Getting data for business statistics: A response rate model. European Conference on Quality in Official Statistics. 2008 Jul 9-11; Rome, Italy.

[33] Baruch, Y., 1999. Response rate in academic studies—A comparative analysis. Human Relations. 52(4), 421-438.

[34] Wang, Y.S., Lin, H.H., Luarn, P., 2006. Predicting consumer intention to use mobile service. Information Systems Journal. 16(2), 157-179.

[35] Norreklit, H., Mitchell, F., 2007. The balanced scorecard in issues in management accounting. Pearson Education Ltd: Essex England.

[36] Lin, H., 2011. An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. International Journal of Information Management. 31(3), 252-260.

[37] Porteous, D., 2006. The Enabling Environment for Mobile Banking in Africa [Internet]. Available from: https://www.findevgateway.org/sites/default/files/publications/files/mfg-en-paper-the-enabling-environment-for-mobile-banking-in-africa-may-2006_0.pdf.

[38] Anyasi, F.I., Otubu, P.A., 2009. Mobile phone technology in banking system: Its economic effect. Research Journal of Information Technology. 1(1), 1-5.

[39] Donner, J., Tellez, A.C., 2008. Mobile banking and economic development: Linking adoption, impact, and use. Asian Journal of Communication. 18(4), 318-322.

[40] Idowu, A.A., Ngumi, P., Muturi, W., 2016. Financial innovation adoption and turnaround time. Journal of Research in Economics and International Finance. 5(2), 014-028.