Mobile Banking Services, Risk Management, 
Firm Characteristics, and Performance 
of Commercial Banks in Kenya

Jenispher Jepchirchir Korir, Winnie Nyamute, Kennedy Okiro, and Peterson Magutu

ABSTRACT

An increasing number of banks in Kenya are launching newer mobile banking platforms which has led to increase in competition in the banking sector, where each commercial bank is penetrating to ensure that they keep in their competitive perspective and attract more likely customers by bringing the services of mobile banking next to their doorsteps. However, it is not clear how characteristics of a firm and management of risks influence the relationship the services of mobile banking and performance of banks in Kenya. The main objective of this research was to find out the relationships among the services of mobile banking, management of risks, characteristics of firms and performance of banks in Kenya. The specific objectives were: to evaluate the effect of mobile banking services on performance of banks, to institute the effect of risk management on the state between mobile banking services and performance of commercial banks, to investigate the effect of firm characteristics on the relationship between mobile banking services and performance of commercial bank and finally, to determine the combined effect of mobile banking services, risk management and firm characteristics on performance of banks. This study used the CAMELS Model evaluation system that examines capital adequacy, asset quality, management capacity, income, and liquidity of banks and therefore establishes the overall unsoundness of banks to measure operation. The study used a positivism research philosophy and descriptive research design. The study consisted of 43 commercial banks and utilized correlation and regression analysis to institute the relationship among mobile banking services and performance of bank. The Baron and Kenny (1986) formulation was used to test the intervening and moderating effect of management of risks and firm characteristics respectively on the relationship between mobile banking services and performance of banks. Finally, the multiple regression analysis was used to test the joint result of mobile banking services, risk management, and firm characteristics on the banks performance. Results indicate that a significant relationship between account-to-account transfer, mobile money, and the performance, H62 indicate that the relationship between mobile banking services, liquidity risk and bank performance is statistically significant whereas the relationship between mobile banking services, market risk and performance is not statistically significant. H63 indicate that the size of a firm have no significant effect on the relation between mobile banking services and performance of banks and H64 indicate that mobile banking services, risk management and firm characteristics have significant effect on the performance of commercial banks. The study is contributing to the theory of information systems since it has shown how increase in the use of mobile banking services which leads to improved performance of banks. The study recommend to regulators to ensure management of risks is adhered to in mobile banking services by commercial banks in Kenya to better operation.

Keywords: CAMELS model, firm size, mobile banking, risk management.

I. Introduction

A. Background

Mobile banking services of any commercial bank allow consumers to perform banking services such as account management, mobile money transfer and mobile brokerage using their mobile devices (Barnes & Corbitt, 2003). Mobile banking services are a facility which provides transfer of funds, enquiring balances, payment of bills through the mobile phone device and account management (Reynolds & Stair, 2010). The mobile fund transfers and brokerage services are accessed via wireless application protocol
(WAP) enabled mobile phones. Days are gone when customers queue in the banking halls waiting to pay bills, transfer funds and manage their bank accounts. They can now do this at their convenience by using mobile banking services. Mobile banking services are among the latest financial services technologies provided by commercial banks and other financial institutions (Shaikh & Karjaluoto, 2015). According to Oliveira et al. (2014), customers access banking services remotely through mobile banking applications on 24 hours. Mobile banking enables access to bank accounts via mobile devices to conduct bank transactions (Tam & Oliveira, 2017). Access to services through mobile banking reduces the cost of transactions for banks, hence increasing financial performance.

Mobile banking, if not well managed, comes with its risks, which can negatively affect performance. Vance et al. (2008) argue mobile banking services continue to struggle to find consumer acceptance; they face challenges such as a lack of consumer trust and their perception of risk in the wireless technology, thus affecting the commercial bank's performance. Laforet and Li (2005) argue that the perception risk impedes the adoption of mobile banking services. The banks must, therefore, carefully manage their risks to remove the fear from the customers. Laforet and Li’s (2005) study indicates that the way the mobile banking risk is managed concerns customers. However, they concur mobile banking provides good prospects for banks and other financial service providers to grow. The use of mobile banking services by commercial banks improves the quality of service and effectiveness of their clients. Shaikh and Karjaluoto (2015) argue that banks that successfully leverage technology and automate their processes realize revenues and profits and transform their customers' experiences. Banks may lack the liberty to introduce mobile banking services, and practitioners believe that future advancement of mobile banking is pegged on the consumer perspective (Koenig-Lewis et al., 2010).

Mobile banking services have enabled users to be connected to the servers while allowing them to perform authorization and authentication, confirm the completed transactions, and subsequently make mobile payments (Kim & Mirusmonov, 2010). Kim and Prabhakar (2004) state that mobile banking improves customer recognition and creates their initial and future transactions confidence. Banks attain a competitive advantage by providing mobile banking services to customers (Ramdhony & Munien, 2013). The association that exists between commercial banks and their stakeholders, the stakeholders have a responsibility to ensure that the commercial banks are managed effectively. Empirical findings on the impact of risk management in using mobile banking services by banks have received mixed results from different scholars. Jensen and Meckling (1976) stated that the management of banks impacts the capability of handling risks.

B. Problem Statement

Commercial Banks require mobile banking services for effective performance. The main proponent of commercial banks’ performance is mobile banking services, which contribute to sustainable commercial bank performance (Upton & Kim, 1998). Mobile banking services contribute to banks’ performance, mainly through adoption and usage (Kithaka, 2014). On the other hand, high risks can trigger the adoption of mobile banking services, which can slow down usage and lead to low sustainable performance of commercial banks (Pooja & Balwinder, 2009). Despite these strong views, the performance of commercial banks concerning mobile banking services, management of risks and characteristics of firms remains unclear.

Mobile banking services, risk management, bank characteristics and performance are concepts among commercial banks. Mobile banking services have a direct relation to the performance of banks. Commercial banks that can adapt to a technologically changing environment despite risks and challenges have guaranteed survival. In recognition of this factor, different interventions have been developed to manage the weaknesses in risk management and mobile banking services frameworks in commercial banks. The Committee adopted several accords on the supervision of Banks. The initial Basel I was issued in 1988, focusing on credit or default risk; Basel II came forth in 2004, laying out the direction on the adequacy of capital and management of risk as well as revealing postulate. Finally, Basel III was issued in 2004 to build a more resilient banking system with a focus on four crucial parameters, namely capital, funding and liquidity, to articulate commercial banks’ weaknesses in mobile banking services and risk management practices. The Central Bank of Kenya outlines various regulations developed by the Deposit Insurance Corporation and amended in the Banking Act (Cap 91 and 488), encompassing increasing the minimum requirements capital gradually.

Pooja and Balwinder’s (2009) study objective described the current state and implication of mobile banking services for the Indian banking industry. The study used information drawn from the survey of 85 scheduled commercial banks. The study used univariate analysis and multiple regressions. The findings were that the banks that used mobile banking services had very high ratios of operating efficiency compared with the banks that did not use mobile banking services; also, mobile banking services have a significantly negative influence on the risk of banks. The critique of the study is that the study findings relating to mobile banking services are not clear on the effect of risk management on commercial banks’ performance.

Aduda and Kingoo (2012) explored the relation between e-banking performance among Kenyan banks. The study sought to analyze whether an affiliation exists between electronic banking and financial performance as computed using return on assets. The research used inferential statistics, and the study findings indicate a significant relationship between the return on assets and electronic banking. Okiro and Ndungu (2013) established the effect of mobile and Internet banking on the performance of financial institutions. The objective was to determine the mobile and internet banking use levels.

II. LITERATURE REVIEW

A. Theoretical Review

Technology acceptance theory is an anchoring theory of
the study. It was advanced by Davis (1989), and the goal was to institute what makes people embrace or reject new technology. The technology assumes that when users realize that a type of technology is helpful and easy to use, they will be ready to use it. Accordingly, the more employees acknowledge that the systems will make their work easier to perform, the higher the chances of accepting and using the new technology (Dilllon & Morris, 1996). Furthermore, the theory previses that customers’ cognition about the sensed usefulness of innovation and intentions to use explicitly the degree to which “a person believes that the system will improve performance (Venkatesh & Davis, 2000).

According to this theory, mobile banking services contribute to banks’ performance (Torres & Gethart, 2019). However, it focuses on the individual, with the concept of perceived usefulness with extension to bring in more sections to explain how a user perceives usefulness and disregards social processes of the development of the system and implementation (Hai & Alam Kazmi, 2015). Chandio et al. (2017) indicated that the theory is insufficient to explain users’ acceptance of new technology especially in the context of e-government. Moreover, the study found that although previous studies perceived usefulness as an important predictor in technology acceptance theory, this was not always true, especially in online technology for entertainment purposes and not for solving technology difficulties.

Technology acceptance theory contributes to this study by expounding the link between risk management, firm characteristics and its effects on the performance of banks. This theory provides itself accordant to this study because it elaborates on how a user accepts and utilizes new technology. There are itches in using technology despite it being accepted. This theory entails how to accept technology finding out its advantages and disadvantages. The performance is, therefore, affected by the attitude and perception of adopting a technology (Hojjati & Khodakarami, 2016).

Diffusion of Innovation Theory was introduced by Rogers (1962), stating the four main factors that can affect the spread of the ideas that are new. These include the social system, invention, and time. The theory states that the rate of adoption of the new technology fully depends on relative advantage, compatibility, triability, and observation, which are used to explain the adoption process. According to Rodgers, this theory does not focus on invention but rather on how these innovations are spread to organizations and within organizations but not between individuals. This classification includes innovators, early adopters, early majority, late majority, and finally, laggards. In each adopter category, individuals are similar in terms of their innovativeness. For Rogers (1962), innovativeness helps in understanding the desired and main behavior in the innovation-decision process. Thus, it categorizes the adopters based on innovativeness, and the distribution of adopters is a normal distribution.

The theory contributes to this study by serving the actual users as well as their process of making findings and the important factors in making decisions. The theory also helps to elaborate on how the mobile banking sector influences banks’ monetary operation and the way new mobile banking services affect the performance of the banking sector. The innovation-decision process entails information seeking and processing where a person is keen on reducing the doubtfulsness related to an innovation (Rogers, 1962). The innovation adoption process involves five steps: knowledge, persuasion stage, decision stage, enforcement, confirmation, and acceptance stage. The application of the theory to the study is that since the size and structures of commercial banks are different, there must be an optimal way of using mobile banking services to improve performance.

Transaction Cost Theory was introduced by Cyert and March (1963). The theory was later expanded by Williamson (1996). According to this theory, firms are viewed as organizations comprising people with different views. The theory assumes that firms become large, which, in effect, substitutes for the market by determining the optimal allocation of resources. Transaction cost theory focuses on the minimization of cost. It understates and neglects the cost of organizing.

Resource View Theory was innovated by Wernerfelt (1984). It concentrates on the importance and management of firm resources. The theory suggests that organizations represent technology and expertise resources. The theory emphasizes that the resources of a firm are essential, thus affecting performance and competitive advantage. The theory stresses that different resources and their application allow for growth rates. The theory has become one of the most influential and cited theories.

It aspires to explain the internal sources of a firm’s sustained competitive advantage (SCA). Its central proposition is that if a firm is to achieve sustained competitive advantage, it must acquire and control valuable, non-substitutable resources and capabilities. Given its simplicity and immediate face validity, the theory’s core message is appealing, easily grasped and easily taught. Galbreath (2005) critiques this theory in that it focuses on establishing the association among firm assets, capabilities and firm performance without expanding to tangible and intangible assets. The RBV assumptions are that firms could be diverse depending on the resources under their control. Literature shows that the theory is a critical tool for measuring the association between banks’ performance.

B. Conceptual Framework

The conceptual framework (Fig. 1) summarizes the conceptual model that formed the basis of this study on the relationships between mobile banking services, risk management, firm characteristics, and performance. The framework includes independent, intervening, moderating and dependent variables, all drawn from the literature review. The framework explains the direct relationship between mobile banking services and the bank’s performance determined by the CAMELS. The study suggests the use of account-to-account transfers and mobile money transfers, which shall be used as a proxy for performance. The study also incorporates risk management as an intervening variable in the association between mobile banking services and the performance of commercial banks. Empirically, the level of mobile banking services between commercial banks explains the degree of the relationship between mobile banking services and the performance of
banks. In this study, liquidity and market risks were utilized to determine their effects on the bank’s performance.

III. METHODOLOGY

A. Data

The study utilized secondary panel data on the variables, namely, mobile banking services, management risks, characteristics of firms and performance of banks from 2010 to 2019. The activity of mobile banking was rolled out in the year 2007, and since then, commercial banks have systematically captured the right data and submitted it to the Central Bank, on which this study relies.

The research data collection form was used to collect and summarize the secondary research data. Data on account-to-account transfers, mobile money transfers, liquidity risk, market risk, firm size and performance indicators were downloaded from the Central Bank website.

Data collected was then coded in readiness for entry into the statistical analysis software. The Central Bank database was chosen because it is an official institution regulating commercial banks in Kenya.

B. Data Analysis

Both the SPSS and EViews analytical software were used. Regression analysis was conducted to indicate the relation among the variables. A comparative analysis of the banks was performed to inform deductions. Descriptive statistics for the variables were performed to realize the model’s statistical properties before running the estimations. Fisher and Marshall (2009) define descriptive statistics as the graphical and numerical techniques applied to organize and analyze data.

These include the mean, standard deviation, maximum, minimum, Kurtosis and Skewness for a given set of variables. Regression analysis was performed to understand the direction of the relationship among the variables. (Baron & Kenny, 1986). Hierarchical regression was used to test the joint effect of the variables in the model. Multiple regression analysis was applied to understand the direction of the relationship among the variables. (Baron & Kenny, 1986). Hierarchical regression was used to assess the moderating effects. Baron and Kenny (1986) define an intervening variable as a variable that measures the interaction between two variables. The intervening effects among the variables were measured using the panel path causal procedure. Multiple regression analysis was applied to test the joint effect of the variables in the model.

The panel regression model was stated in Equation (1):

$$FP_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_{it}$$

In the second step, risk management was regressed on mobile banking services, and the significance of the coefficient of risk management was noted.

Adopting the Baron and Kenny (1986) approach for testing mediation and moderation, the panel regression analysis models used in the present study are given in Table I.

<table>
<thead>
<tr>
<th>TABLE I: MODEL REGRESSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Type</td>
</tr>
<tr>
<td>Mediation</td>
</tr>
<tr>
<td>Model 2  $X_{2it} = \beta_0 + \beta_1 X_{1it} + \varepsilon_{it}$</td>
</tr>
<tr>
<td>Model 3  $FP_{it} = \alpha + \beta_1 X_{1it} + \varepsilon_{it}$</td>
</tr>
<tr>
<td>Model 4  $FP_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \varepsilon_{it}$</td>
</tr>
<tr>
<td>Moderation</td>
</tr>
<tr>
<td>Model 2  $FP_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{3it} + \varepsilon_{it}$</td>
</tr>
<tr>
<td>Model 3  $FP_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{3it} + \beta_3 (MBS \times FC)<em>{it} + \varepsilon</em>{it}$</td>
</tr>
</tbody>
</table>

where:

$FP_{it}$ = Composite index of the commercial bank’s performance of Bank $i$ at time $t$,

$\beta_1, \beta_2, \beta_3$ = Regression coefficients,

$\alpha$ = Constant (y intercept),

Characteristics of bank $i$ at time $t$,

$X_{1it}$ = Composite score of Mobile Banking Services of bank $i$ at time $t$,

$X_{2it}$ = Composite score of Risk Management of bank $i$ at time $t$,

$X_{3it}$ = Composite score of Firm Characteristics of bank $i$ at time $t$,

$MBS*FC$ = Interaction term,

$\varepsilon_{it}$ = Error term.
TABLE II: DESCRIPTIVE STATISTICS FOR CAMELS INDICATORS

<table>
<thead>
<tr>
<th>CAMELS Indicators</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness Statistic</th>
<th>Kurtosis Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Adequacy</td>
<td>247</td>
<td>0.35</td>
<td>884.78</td>
<td>16.68</td>
<td>79.19</td>
<td>7.43</td>
<td>0.155</td>
</tr>
<tr>
<td>Asset Quality</td>
<td>247</td>
<td>0.04</td>
<td>3.83</td>
<td>0.48</td>
<td>0.58</td>
<td>4.02</td>
<td>0.155</td>
</tr>
<tr>
<td>Earning Ability</td>
<td>247</td>
<td>0.018</td>
<td>313.77</td>
<td>7.40</td>
<td>36.09</td>
<td>7.26</td>
<td>0.155</td>
</tr>
<tr>
<td>Liquidity</td>
<td>247</td>
<td>0.02</td>
<td>0.43</td>
<td>0.06</td>
<td>0.08</td>
<td>2.92</td>
<td>0.155</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>247</td>
<td>0.00</td>
<td>0.86</td>
<td>0.042</td>
<td>0.09</td>
<td>4.78</td>
<td>0.155</td>
</tr>
<tr>
<td>Management Capacity</td>
<td>247</td>
<td>0.01</td>
<td>6.73</td>
<td>0.82</td>
<td>0.79</td>
<td>4.09</td>
<td>0.155</td>
</tr>
</tbody>
</table>

TABLE III: DESCRIPTIVE STATISTICS FOR CAPITAL ADEQUACY

<table>
<thead>
<tr>
<th>Capital Adequacy Indicators</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness Statistic</th>
<th>Kurtosis Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Shareholders’ equity/Total Risk Weighted Assets</td>
<td>247</td>
<td>0.00</td>
<td>8.57</td>
<td>0.36</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Capital /Total Risk Weighted Assets</td>
<td>247</td>
<td>0.00</td>
<td>1270.59</td>
<td>8.73</td>
<td>83.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liabilities / Equity</td>
<td>247</td>
<td>0.51</td>
<td>928.47</td>
<td>22.91</td>
<td>97.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deposits / Equity</td>
<td>247</td>
<td>0.09</td>
<td>3223.49</td>
<td>34.74</td>
<td>226.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE IV: DESCRIPTIVE STATISTICS FOR ASSET QUALITY

<table>
<thead>
<tr>
<th>Asset Quality Indicators</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness Statistic</th>
<th>Kurtosis Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Income / Total Assets</td>
<td>247</td>
<td>0.00</td>
<td>3.15</td>
<td>0.15</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deposits / Total Assets</td>
<td>247</td>
<td>0.01</td>
<td>10.51</td>
<td>1.06</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed Assets / Equity</td>
<td>247</td>
<td>0.01</td>
<td>1.96</td>
<td>0.24</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE V: PEARSON PRODUCT-MOMENT CORRELATIONS AMONG FIRM PERFORMANCE INDICATORS, RISK MANAGEMENT INDICATORS, FIRM CHARACTERISTICS, AND MOBILE BANKING SERVICES

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Capital Adequacy</td>
<td>-0.102</td>
<td>-0.287**</td>
<td>-0.053</td>
<td>-0.072</td>
<td>-0.203**</td>
<td>0.254**</td>
<td>0.236**</td>
<td>-0.159</td>
<td>-0.125**</td>
<td>0.197**</td>
<td></td>
</tr>
<tr>
<td>2. Asset Quality</td>
<td>-0.034</td>
<td>-0.107</td>
<td>0.334**</td>
<td>-0.060</td>
<td>-0.103</td>
<td>-0.055</td>
<td>0.366**</td>
<td>-0.039</td>
<td>-0.124</td>
<td>0.0**</td>
<td></td>
</tr>
<tr>
<td>3. Management Capacity</td>
<td>0.292**</td>
<td>0.102</td>
<td>0.041</td>
<td>-0.083</td>
<td>-0.062</td>
<td>0.359**</td>
<td>-0.081</td>
<td>0.064</td>
<td>0.0**</td>
<td>0.0**</td>
<td></td>
</tr>
<tr>
<td>4. Earning Ability</td>
<td>-0.209**</td>
<td>-0.159</td>
<td>-0.349**</td>
<td>-0.303**</td>
<td>0.111</td>
<td>-0.249**</td>
<td>-0.402**</td>
<td>0.0**</td>
<td>0.0**</td>
<td>0.0**</td>
<td></td>
</tr>
<tr>
<td>5. Liquidity</td>
<td>0.057</td>
<td>0.178**</td>
<td>0.170**</td>
<td>0.291**</td>
<td>0.203**</td>
<td>0.109</td>
<td>0.110</td>
<td>0.078</td>
<td>-0.015</td>
<td>0.177**</td>
<td>0.089</td>
</tr>
<tr>
<td>6. Sensitivity</td>
<td>0.917**</td>
<td>0.144**</td>
<td>0.148**</td>
<td>0.435**</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
</tr>
<tr>
<td>7. Mobile Money Services</td>
<td>1</td>
<td>-0.082</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
<td>0.389**</td>
<td>0.094</td>
</tr>
<tr>
<td>8. Account to Account Transfers</td>
<td>1</td>
<td>-0.116</td>
<td>-0.204**</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
</tr>
<tr>
<td>9. Liquidity Risk</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
</tr>
<tr>
<td>10. Market Risk</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
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<tr>
<td>11. Firm Characteristics</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
<td>0.143**</td>
<td>1</td>
</tr>
</tbody>
</table>

*p < 0.05; **p < 0.01.

IV. RESULTS AND DISCUSSION

To provide an overall trend about the data for all the variables, the mean, standard deviation, minimum and maximum observations are all included in Tables II, III, and IV.

The total units of observations were 247 for 43 commercial banks since the outliers were excluded from the data set before further analysis. The capital adequacy scale ranged from 0.35 to 884.78 with a mean of 16.68, a standard deviation of 79.19, a skewness value of 7.432 and a kurtosis value of 66.23. Further, the mean of earning ability was 7.40, with a standard deviation of 36.09, a skewness value of 7.26, a standard error of 0.155, and a kurtosis value of 54.80.

Table IV indicates that the mean of bank income to total assets was 0.15 with a standard deviation of 0.38, and deposits to total assets was 1.06 with a standard deviation of 1.65. The standard deviation of bank income to total assets and deposits to total assets was larger than the mean. This indicates a high variability of the ratios among the banks in Kenya.

In Table V, non-statistically significant weak negative relationships are presented between capital adequacy and asset quality (r = -0.102, p > 0.05), asset quality and earnings ability (r = -0.107, p > 0.05), asset quality and sensitivity analysis (r = -0.060, p > 0.05), management capacity and mobile money transfer (r = -0.083, p > 0.05), sensitivity analysis and liquidity risk (r = -0.015, p > 0.05), account to account transfer and liquidity (r = 0.082, p > 0.05), management capacity and market risk (r = 0.062, p > 0.05), liquidity risk and market risk (r = -0.116, p > 0.05) and asset quality and firm characteristics (r = -0.124, p > 0.05).

V. CONCLUSION AND RECOMMENDATIONS

The study concludes that mobile banking services and the variables, namely account-to-account transfers, and mobile money transfers, have different causal factors in the levels of performance among commercial banks in Kenya. Specifically, account-to-account transfers positively affect performance, and the relationship is statistically significant. Mobile money transfer also positively affects performance. The findings confirm the positive effects of mobile money transfers and account-to-account transfers where commercial banks in Kenya invest in mobile money services to plough back the returns through consumers’ adoption and usage.

The findings confirm the positive contribution of the MBS to the achievement of performance. Commercial banks should, therefore, develop an appropriate policy framework that embraces mobile banking services. In addition, develop suitable policies to ensure the development of mobile banking services structures in Kenya. A well-developed mobile banking service structure will enable commercial

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banks to improve their performance. Account-to-account transfer and mobile banking services have different implications on commercial banks’ performance. The impact of different mobile banking service attributes is significant and valuable on the performance of banks. Commercial banks should control through a suitable policy framework and create an environment that encourages the adoption of mobile banking services and performance relationships. The banks should pay attention to trends such as accountability, political stability, risks, government effectiveness, corruption, and the rule of law and adhere to regulations to realize the desired goals of mobile banking services. Furthermore, the results will inform policy decisions in the area of mobile banking.

VI. LIMITATIONS

Necessary steps were taken to address the limitations listed below, which are prone to arise in any study. The research applied secondary data, CBK bank annual supervisory reports and end-year reports of the commercial banks. The reliability of the data extracted from these reports may be questionable hence may have a bearing on the uniformity of the results. The descriptive research design was used as it facilitated a clear statement of the hypotheses and presentation of research questions. The design, however, presents a disadvantage in that it does not present the relation between the variables. Furthermore, the research may constitute the direction and association among variables, but it also fails to show the relation between the constructs. The research used two attributes of mobile banking services and two attributes of risk management, given the confidentiality of the data. The study’s findings are confined to the variables considered in the research. The study could have incorporated many other attributes that may hamper the relationship but were unavailable to the researcher as a result of confidentiality by commercial banks.

VII. SUGGESTIONS FOR FUTURE RESEARCH

Given the positive and negative effects of different elements of mobile banking services on performance, there could be other commercial banks’ specific factors that influence mobile banking services adoption. Research should be premised on the ideal combination of mobile banking services and the departure at which the positive implications of mobile banking services convert to negative. It was noted from the study that mobile banking services positively contribute to performance, but the nexus was statistically insignificant. Future research may model mobile banking services adoption to ascertain whether such scenarios will translate to the performance of commercial banks in Kenya.

More so, further studies could be conducted by introducing different or more variables for measuring both intervening and moderating effects of mobile banking services on banks’ performance. Future studies may also consider a blend of both quantitative and qualitative measures of performance to expand the scope of the present study. A similar study may also be conducted on other financial institutions other than commercial banks. The study may also be conducted in other regional or global jurisdictions to validate the findings of the present scrutiny.

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