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**The Effect of Financial Innovations on the Financial Performance
of Commercial Banks in Kenya**

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Abstract

Purpose: The study sought to investigate the effect of financial innovations on financial performance of commercial banks in Kenya. The main problem was that there is an increase in the number of financial innovations, but whether the innovations in banking industry are the main determinants of financial performance is a hard to tell. Despite the significance of financial innovation, the effect of innovation on financial performance is still misunderstood.

Methodology: The study adopted an explanatory research design. The population of the study was all the 43 commercial banks operating in Kenya in the study period. The study conducted a census on all the 43 commercial banks. The study used primary data. An ordinary linear regression model was used. The regressions were conducted using statistical package for social sciences (SPSS) version 20.

Results: The study findings indicated that there is a negative and significant relationship between product innovation and ROA. The relationship between service innovation and ROA and also organizational innovation and ROA was found to be positive and significant. Based on the findings, the study concluded that commercial banks in Kenya in the study period had unsteady trends in ROA despite the fact that more financial innovations were taking place in the sector. The study also concluded that the relationship between product innovation and financial performance of commercial banks is negative and significant. Based on the study findings, the study also concluded that the relationship between service innovation and ROA and also organizational innovation and ROA is positive and significant.

Unique contribution to theory, practice and policy: The study recommended that Commercial banks should implement effective product innovation strategies that won't increase their operational risks which in turn affects their financial performance. The study also recommended that commercial banks should focus more and invest more in both service and organization innovation as the two will lead to better financial performance.

Keywords: *financial innovations, financial performance, commercial banks.*

1.0 Introduction

Innovation fosters an organization to grow, prosper and transform in synchronization with the changes in the environment, both internal & external. Banking is no exception to this. The banking sector has witnessed radical transformation of late, based on many innovations in products, processes, services, systems, business models, technology, governance and regulation. The pervasive influence of information technology has revolutionaries in banking (Kumar, 2011). Financial markets have been liberalizing in both financial and non-financial technologies. Commercial banks were previously faced with financial crises ranging from peaks in nonperforming loan ratio, loose credit, inferior capital adequacy ratio, over banking due to excessive competition, less profitability and lack of innovation. The modern commercial banks are trying to improve their financial performance by innovating in products, governance and services among other innovations. Gorton and Metrick (2010) states that the main reasons that have led to an increase in the innovations are reduction in bankruptcy costs, tax advantages, reduction in moral hazard, reduced regulatory costs, transparency and customization.

In the Kenyan financial markets, all profit seeking enterprises are constantly seeking new and improved products, services and organizational structures that can reduce their costs of production, satisfy their customers' needs better and yield higher profits. Bank customers demand for variety, convenience and new services. They want products that can meet their precise, individual needs. Technology boom in the past decades have helped banks to respond to this challenge. Competition has also emerged between traditional commercial banks and other financial institutions. The development and globalization of financial markets have intensified the need for modifying the current structure and condition of the financial system. Financial regulations have been modified, usually towards reducing or eliminating constraints on financial activity, such as interest rate liberalization. All this are done by commercial banks in order to be at par and not lag behind in competition (Gitau, 2011).

Performance may be defined as the reflection of the way in which the resources of a company are used in the form which enables it to achieve its objectives. According to Heremans (2007), financial performance is the employment of financial indicators to measure the extent of objective achievement, contribution to making available financial resources and support of the bank with investment opportunities. Adhiambo (2014) states that financial innovation is used by commercial banks to be able to compete in financial markets and as a result it can improve their performance and maintain their effectiveness in market.

1.2 Problem Statement

The developments in the financial sector and especially in the Kenyan commercial banks has not only led to the increase in the number of financial institutions, but also the development in level of sophistication with new payment systems and asset alternatives to holding money. It is very true that radical developments have taken place in banking industry. But whether the innovations in banking industry are the main determinants of financial performance is a million dollar question. Despite the significance of financial innovation, the effect of innovation on financial performance is still misunderstood for two main reasons, first, there is inadequate understanding about the drivers of innovation and secondly innovations impact on banks financial performance remains lowly untested (Mabrouk and Mamoghli, 2010). Despite its significance, financial innovation's effect on financial performance of commercial banks is viewed as a double edged sword. Otoo

(2013) notes that financial innovations have come with disadvantages that may affect financial performance of the commercial banks in Kenya. The nature of the global market and competitions in the banking sector exposes the commercial banks in Kenya to operational challenges like cybercrime and other internet related frauds including identity thefts. The impact of such crimes is detailed as opportunity costs and losses by the commercial banks and individuals. Expenditures to curb these risks increase operational costs which affects financial performance. On the other hand, Mwanja and Muganda (2011) reiterates that the benefits of financial innovations far outweighs the disadvantages and hence financial innovation has significant contribution to financial performance. Empirical scrutiny of previous studies' outcome on effect of financial innovation on performance has been empirically inconclusive. Previous studies have produced mixed results regarding the effect of financial innovations on bank's financial performance. Studies by Pooja and Singh (2009) and Franscesa and Claeys (2010) concluded that financial innovations had least impact on financial performance. Studies by Adhiambo (2014) and Mwanja and Muganda (2011) concluded that financial innovation had significant contribution to financial performance. It is at the center of such mixed conclusions that motivated and necessitated the need to carry out a study from a Kenyan context to establish the effect of financial innovations on financial performance of commercial banks. The study generally sought to answer the question, what is the effect of banking innovation on the performance of commercial banks in Kenya?

1.3 Specific Objectives

1. To establish the effect of product innovations on the financial performance of commercial banks in Kenya
2. To determine the effect of service innovations on the financial performance of commercial banks in Kenya
3. To investigate the effect of organizational innovations on the financial performance of commercial banks in Kenya

2.0 Theoretical Review

This section provided a review of Schumpeter Theory of Innovation and Innovation Diffusion Theory which informs the theoretical background of the research subject matter.

2.1 Schumpeter Theory of Innovation

Schumpeter (1928) argued that entrepreneurs can create the opportunity for new profits with their innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. Schumpeter (1934) emphasized the role of entrepreneurship and the seeking out of opportunities for novel value generating activities which would expand and transform the circular flow of income, but it did so with reference to a distinction between invention or discovery on the one hand and innovation, commercialization and entrepreneurship on the other. This separation of invention and innovation marked out the typical nineteenth century institutional model of innovation, in which independent inventors typically fed discoveries as potential inputs to entrepreneurial firms. The author further saw innovations as perpetual gales of creative destruction that were essential forces driving growth rates in a capitalist system.

The theory distinguished between the entrepreneurs whose innovations create the conditions for profitable new enterprises and the bankers who create credit to finance the construction of the new

ventures (Schumpeter, 1939). Schumpeter's brief discussions of historical episodes of innovations in the field of banking might appear to suggest a positive role for financial innovations in financing the entrepreneurial ventures that produce the primary wave growth spurts. The spread of joint stock banking was cited as one of the most important innovations that occurred in the early 1800s (Schumpeter, 1939). For all his insight on the role of innovation, Schumpeter still did not really explain the source of innovation. He was able to point to its importance and its role but did not address its source. The importance of innovation was highlighted by researchers like Abramovitz (1956) and Solow (1957) who were able to demonstrate how little neoclassical economics was able to explain. Based on data on the United States economy from 1909-49, Solow showed that only 12.5 percent of the increase of per capita output could be traced to increased use of capital. This left a surprisingly large 87.5 percent residual that Solow attributed to technical change. Schumpeter's assertions have been supported by Porter (1992) that innovation is vital for a country's long-run economic growth and competitive advantage. Innovation and upgrading come from sustained investment in physical as well as intangible assets.

2.2 Innovation Diffusion Theory

Innovation Diffusion Theory (IDT) by Rogers (2003) has been employed in studying technology adoption. According to the theory, four elements of diffusion including innovation, time, communication channels, and social systems affect adoption of innovation. Rogers, (2003) states that an individual's technology adoption behavior is determined by his or her perceptions regarding the relative advantage, compatibility, complexity, trialability, and observability of the innovation, as well as social norms. Rogers (1983) identified five general attributes that consistently influenced the adoption of innovations which are; Relative Advantage-The degree to which an innovation is perceived as being better than its precursor(Rogers,2003),CompatibilityThe extent to which the innovation is perceived as being in line with values, needs and experiences of perspective adopters (Hernandez and Mazzon, 2006),Complexity-The degree to which an innovation is perceived as difficult to understand and use (Rogers,2003),ObservabilityThe degree to which the results of an innovation are visible to others (Rogers,2003).Trialability and the extent to which the innovation can be experienced before its actual adoption (Hernandez and Mazzon, 2006).

2.3 Empirical Review

In the global context, Shirley and Sushanta (2006) carried out a study to investigate the impact of information technology on the banking industry in the United States. The study theoretically and empirically analysed how information technology related financial innovations like internet banking, electronic payments, security investments and information exchanges can affect bank profits via competition in financial services that are offered by the banks. The study used a panel of 68 US banks for a period of over 20 years to estimate the impact of IT related financial innovations on profitability of banks. The study findings found out that though IT might lead to cost saving, higher IT spending can create network effects lowering bank profits. They further contend that the relationship between IT expenditures and bank's financial performance is conditional to the extent of network effect. They say that if network effect is too low, IT expenditures are likely to; reduce payroll expenses, increase market share, and increase revenue and profit.

Another study was conducted in India by Malhotra and Singh (2010)to examine the impact of financial innovations specifically internet banking on banks' performance .The study also sought to understand whether, among banks offering internet banking, those that have offered it for a

relatively long time outperformed those that only recently began to offer it. Using data on financial performance of 82 scheduled commercial banks, during the period of 1998-2007, the univariate analysis results from multiple regression indicated that experienced internet banks are larger banks and have better operating efficiency ratios and rely less on traditional source of financing in comparison to inexperienced internet banks as well as non-internet banks. In almost all other variables, there existed no statistically significant difference in the performance of experienced and inexperienced internet banks. The multiple regression results also reveal that the profitability and experience in offering of internet banking does not have any significant association. Hence, in the Indian banking context, experience in financial innovations by offering internet banking does not have any impact on banks' performance.

Mabrouk and Mamoghli (2010) carried out a study on Dynamics of Financial Innovation and Performance of Banking Firms: Context of an Emerging Banking Industry. The study analyzed the effect of the adoption of two types of financial innovations namely; product innovation (telephone banking and SMS banking etc.) and process innovation (Magnetic strip card (debit, ATM and credit card), Automatic cash dispenser; (Automatic teller machine; Electronic payment terminal etc.) on the performance of banks. The study analysis included two adoption behaviors, first mover in adoption of the financial innovation and imitator of the first movers. The study findings revealed 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.

In the Kenyan context, Kimingi (2010) conducted a study to investigate the effects of technological innovations on the financial performance of the commercial banks in Kenya. The study used a descriptive survey. The population of the study comprised commercial banks in Kenya. The study used both primary and secondary data. The study used both quantitative and qualitative data hence both descriptive and content analysis techniques were employed. Content analysis was used to analyze the qualitative data collected while descriptive methods were used to analyze quantitative data. The study concluded that the banks had employed various technological innovations like ATM services, mobile phone transactions and internet based banking services. The study also concluded that technological innovations had led to improved financial performance of commercial banks in Kenya through increased bank sales, profits increment and return on equity. The study recommended that for banks to be highly competitive, they need to employ modern technological innovations such as internet based banking services.

Korir (2014) sought to establish the effect of financial innovations on financial performance of commercial banks in Kenya. The study used secondary data. The target population included all the 44 commercial banks in Kenya. Regression and correlation analysis was used to analyze the relationship between the dependent and the independent variables of the study. The study findings revealed a strong relationship between financial innovations and financial performance. The value of the cheese cleared, the value of EFTs cleared and the value of the RTGS transfer explains 92.8% of the variability in the financial performance of the commercial banks. The study concluded that financial innovations positively affected financial performance.

3.0 RESEARCH METHODOLOGY

The study adopted an explanatory research design. The population of the study was 43 commercial banks in Kenya as at December 2014. The total population of the respondents was 43 Heads of consumer banking and product development. The study conducted a census of the 43 commercial banks instead of adopting a sampling methodology. Primary data was collected using a self-administered questionnaire. The questionnaire was factual questions aimed at avoiding perceptions and bias. The questionnaire was subjected to a pilot test. Specifically, 3 heads of consumer banking and product development were requested to fill the questionnaire. Data from the 6 filled questionnaires was entered into SPSS and Cronbach alpha statistics calculated. Data analysis was done through descriptive and inferential statistics. The tool of analysis will were the statistical Package for Social Science (SPSS V.20). This study applied a multiple regression model to establish the relationship between the dependent variable and the independent variables.

The model took the following format:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where Y – Financial Performance, as measured by Return on Assets

X₁ – Product innovations

X₂ – Service innovations

X₃ – Organizational innovations

Constant

β₁, β₂ and β₃ – Parameters to be estimated

RESULTS AND DISCUSSIONS

Descriptive Statistics

The descriptive statistics in Table 1 gives the mean, standard deviation, minimum value and maximum value of the study variables.

Table 1 Descriptive Statistics

| | Mean | Std. Deviation | Minimum | Maximum |
|---------------------------|----------|----------------|---------|---------|
| Product Innovation | 13.53172 | 2.98254 | 6.4 | 19.2 |
| Service innovation | 94.79307 | 15.90213 | 71.848 | 121.2 |
| Organizational Innovation | 25.89837 | 16.10874 | 0 | 79.58 |
| ROA | 0.02028 | 0.019757 | -0.065 | 0.054 |

Source: Research Data

The mean number of products innovated in the study period among the commercial banks was 13.5. The standard deviation was 2.98 which indicated a small variation in the number of products innovated among the commercial banks. The minimum number of products innovated was 6 while

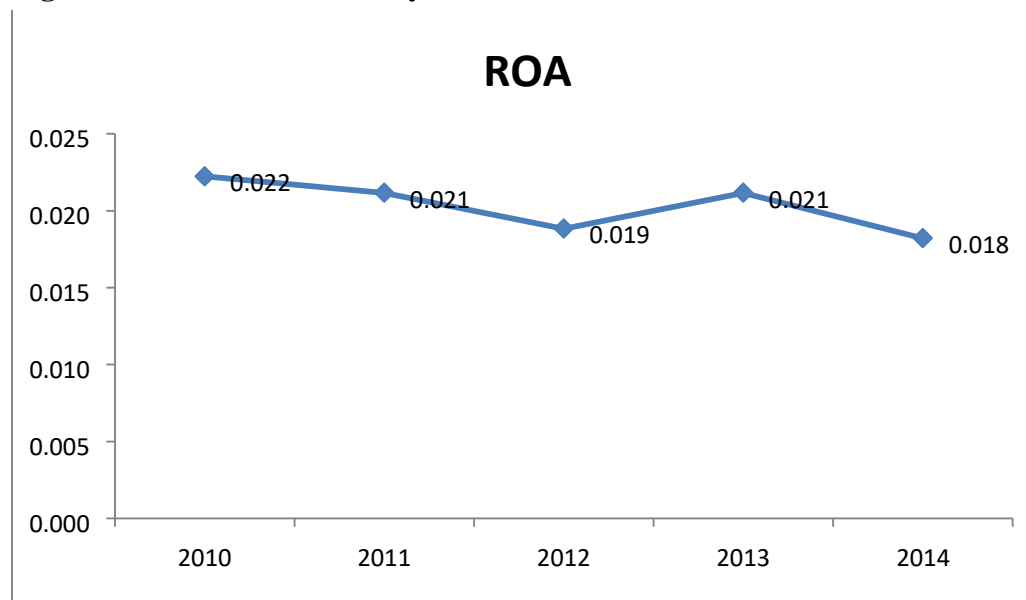
the maximum was 19. The mean expenditure dedicated to service innovation was 94.79 Million Kenya shillings with a standard deviation of 15.90 which indicated a small variation in the expenditure in service innovation among the commercial banks operating in Kenya in the study period. The minimum expenditure was 71.84 Million and the maximum was 121.2 Million.

The results also indicated that commercial banks in Kenya between the year 2010 and 2014 spend an average of 25.89 Million on organizational innovation. The standard deviation in organizational expenditure was 16.10 which indicated a wide variation in organizational innovation expenditure among the commercial banks. The highest amount spend was 79.58 Million. ROA recorded an average of 2.0% in the study period with a standard deviation of 1.9% which indicated a wide variation in ROA among the commercial banks operating in Kenya in the study period. The minimum value of ROA recorded in the study period was -6.5% while the maximum was 5.4%.

4.3 Trend Analysis

This section analyzed the demographic characteristics/summary statistics for the commercial banks. The results in figure 1 indicated the mean ROA of commercial banks in Kenya to be 2.2 % in the year 2010. The mean value of ROA decreased to 1.9% in the year 2012 before showing a slight increase in the year 2013 and later decreasing to 1.8% in the year 2014.

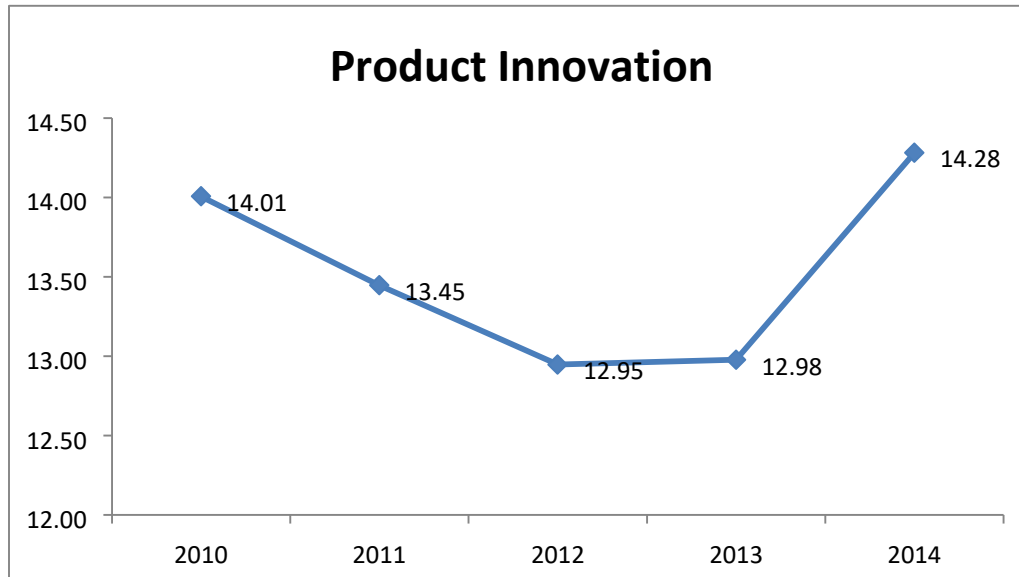
Figure 1: ROA-Year 2010 to year 2014



Source: Research Data

The results in figure 2 indicated that the mean number of products introduced by commercial banks in Kenya decreased gradually from 14.01 in 2010 to 12.95 in 2012. The year 2014 saw an increase in the mean number of products to 14.28

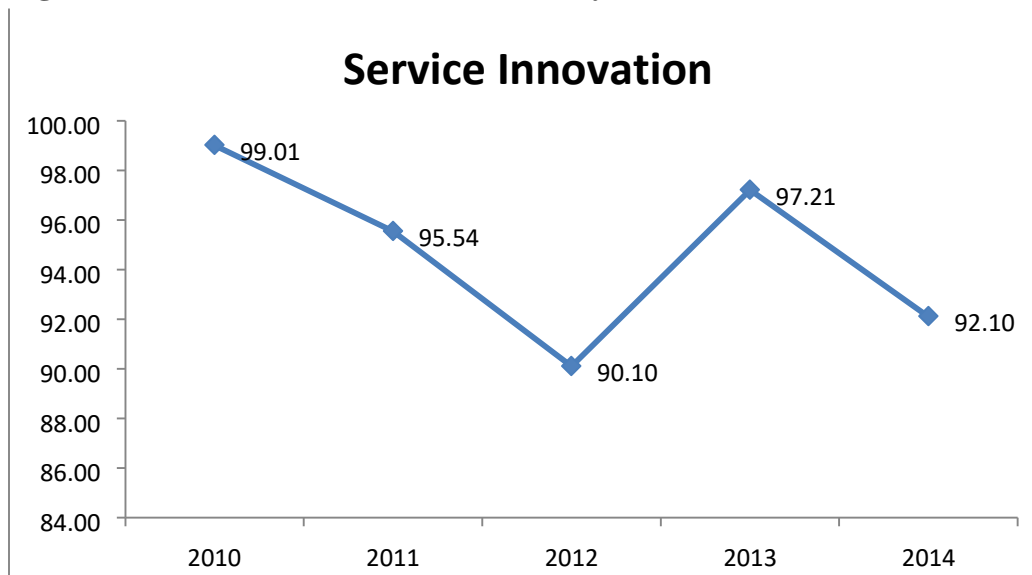
Figure 2: Product Innovation-Year 2010 to year 2014



Source: Research Data

The results in figure 3 indicated that the mean expenditure on service innovation among the commercial banks operating in Kenya in the study period was 99.01 Million in the year 2010. The amount allocated to service innovation decreased gradually to 90.10 Million in the year 2012 before increasing to 97.21 Million and later decreasing to 92.10 Million.

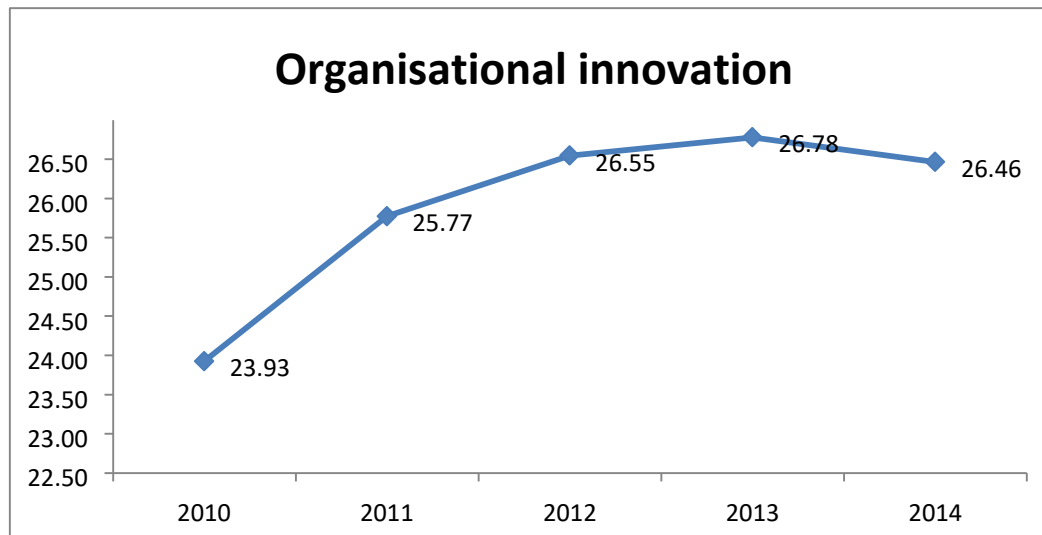
Figure 3: Service Innovation-Year 2010 to year 2014



Source: Research Data

The results in figure 4 indicated that the mean amount of expenditure dedicated to organizational innovation among the commercial banks operating in Kenya in the study period increased gradually from 23.93 Million in the year 2010 to 26.78 Million in the year 2013 before decreasing to 26.46 Million in the year 2014.

Figure 4: Organizational Innovation-Year 2010 to year 2014



Source: Research Data

4.4 Inferential Statistics

This section presented the correlation and regression analysis results.

4.4.1 Correlation Analysis

Correlation analysis was conducted and presented as in Table 4.2.

Table 2: Correlation Results

| | | Product Innovation | Service innovation | Organizational Innovation | ROA |
|---------------------------|---------------------|--------------------|--------------------|---------------------------|--------|
| Product Innovation | Pearson Correlation | 1 | 0.054 | 0.188 | -0.199 |
| | Sig. (2-tailed) | | 0.733 | 0.227 | 0.202 |
| Service innovation | Pearson Correlation | 0.054 | 1 | 0.011 | .340* |
| | Sig. (2-tailed) | 0.733 | | 0.946 | 0.026 |
| Organizational Innovation | Pearson Correlation | 0.188 | 0.011 | 1 | .367* |

| | | | | | |
|--|---------------------|--------|-------|-------|-------|
| | Sig. (2-tailed) | 0.227 | 0.946 | | 0.016 |
| ROA | Pearson Correlation | -0.199 | .340* | .367* | 1 |
| | Sig. (2-tailed) | 0.202 | 0.026 | 0.016 | |
| * Correlation is significant at the 0.05 level (2-tailed). | | | | | |

Source: Research Data

Results in Table 2 reveal that the correlation between product innovation and ROA is negative but insignificant. This implies that an increase in product innovation is associated with a decrease in ROA. The findings also reveal that the correlation between service innovation and ROA is positive and significant. This implies that an increase in service innovation is associated with an increase in ROA. Organizational innovation was also found to be positively and significantly associated with ROA implying that an increase in organizational innovation is associated with an increase in ROA.

4.4.2 Regression Analysis

The relationship between the predictor variables (product innovation, service innovation and organizational innovation) and the dependent variable was investigated using a regression analysis.

The regression analysis results presented in Table 3 indicates that the coefficient of determination (R squared) was 0.332 which implies that 33.2% of the changes in ROA is explained by the independent variables (product innovation, service innovation and organizational innovation) while 66.8 % of the variations in ROA are explained by other factors not included in the model.

Table 3: Coefficient of Determination

| Model Summary | | | | |
|---------------|-------|----------|-------------------|----------------------------|
| | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .576a | 0.332 | 0.281 | 0.016755 |

Source: Research Data

The regression coefficients and their associated t statistics and p values are presented in table 4.

Table 4: Regression Coefficients

| Coefficients | B | Std. Error | t | Sig. |
|--------------------|--------|------------|--------|-------|
| (Constant) | -0.008 | 0.019 | -0.413 | 0.682 |
| Product Innovation | -0.002 | 0.001 | -2.22 | 0.032 |
| Service Innovation | 0.001 | 0.000 | 2.685 | 0.011 |

| | | | | |
|---------------------------|-------|-------|-------|-------|
| Organizational Innovation | 0.001 | 0.000 | 3.143 | 0.003 |
| a Dependent Variable: ROA | | | | |

Source: Research Data

ROA = -0.008 – 0.002Product Innovation +0.001 Service Innovation + 0.001 Organizational Innovation

The results indicate that there is a negative and significant relationship between product innovation and ROA. This finding was supported by a regression coefficient of -0.002 and a p value of 0.03. The reported p value was less than the critical p value of 0.05. A regression coefficient of -0.002 implies that a one unit increase in product innovation leads to a 0.002 units decrease in ROA.

The results also indicate that there is a positive and significant relationship between service innovation and ROA. This finding was supported by a regression coefficient of 0.001 and a p value of 0.011. The reported p value was less than the critical p value of 0.05. A regression coefficient of 0.001 implies that a one unit increase in service innovation leads to a 0.001 units increase in ROA. Organizational innovation was also found to be positively and significantly related to ROA as supported by a beta coefficient of 0.001 and a P-value of 0.003 implying that a one unit increase in organizational innovation leads to a 0.001 increase in ROA.

4.4.3 Analysis of Variance

Results in Table 5 indicate that the overall model was significant. The reported F statistic of 6.466 was larger than the F critical (F tabulated). The reported p value was lower than the critical p value of 0.05. The findings imply that the independent variables are good joint predictors of ROA.

Table 5: Analysis of Variance

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---------------------------|------------|----------------|----|-------------|-------|-------|
| 1 | Regression | 0.005 | 3 | 0.002 | 6.466 | 0.001 |
| | Residual | 0.011 | 39 | 0.000 | | |
| | Total | 0.016 | 42 | | | |
| a Dependent Variable: ROA | | | | | | |

Source: Research Data

CONCLUSIONS AND CONTRIBUTION TO POLICY PRACTICE AND THEORY

The trend analysis indicated a decrease in mean ROA of commercial banks in Kenya from 2.2 % in the year 2010 to 1.9% in the year 2012 before showing a slight increase in the year 2013 and

later decreasing to 1.8% in the year 2014. The mean number of products introduced by commercial banks in Kenya on the other hand decreased gradually from 14.01 in 2010 to 12.95 in 2012 before increasing to 14.28 in the year 2014. The mean expenditure on service innovation among the commercial banks operating in Kenya in the study period was 99.01 Million in the year 2010. The amount allocated to service innovation decreased gradually to 90.10 Million in the year 2012 before increasing to 97.21 Million and later decreasing to 92.10 Million. The also indicated that the mean amount of expenditure dedicated to organizational innovation among the commercial banks operating in Kenya in the study period increased gradually from 23.93 Million in the year 2010 to 26.78 Million in the year 2013 before decreasing to 26.46 Million in the year 2014.

Further results indicated a negative and insignificant association between product innovation and ROA but a positive correlation between both service innovation and ROA and also organizational innovation and ROA. The regression results on the other hand indicated that there is a negative and significant relationship between product innovation and ROA. The relationship between service innovation and ROA and also organizational innovation and ROA was found to be positive and significant.

The findings of the current study confirms the findings of a study by Waweru(2012) which concluded that financial innovations have exposed commercial banks in Kenya to various risks including credit risk, liquidity risk, strategic risk, interest rate risks, country risk, compliance risk and reputational risk and all these risks should therefore inform overall risk management of the institutions through a realistic risk index factor at any one period. Thus, financial innovations have a negative effect on financial performance of commercial banks in Kenya.

The findings of the current study also confirms the findings of a study by Shirley and Sushanta (2006) which found out that though IT might lead to cost saving, higher IT spending can create network effects lowering bank profits. They further contend that the relationship between IT expenditures and bank's financial performance is conditional to the extent of network effect. The study finding of a negative relationship between product innovation and ROA confirms this study. The findings also confirms the findings of a study by Francesca and Claeys (2010) which found out that the performance of banking groups with an internet bank is poor. The initial investment in technology has proved higher than any consequent cost saving, especially on labor. The study concluded that Internet banks fail to create synergies with other banking activities hence financial innovations in the internet banking does not improve banks financial performance.

5.3 Conclusions

The study concluded that commercial banks in Kenya in the study period had unsteady trends in ROA despite the fact that more financial innovations were taking place in the sector.

The study also concluded that the relationship between product innovation and financial performance of commercial banks is negative and significant.

Based on the study findings, the study also concluded that the relationship between service innovation and ROA and also organizational innovation and ROA is positive and significant.

5.4 Recommendations for Policy and Practice

The study recommends that Commercial banks should effect effective product innovation strategies that won't increase their operational risks which in turn affects their financial performance.

The study also recommends that commercial banks should focus more and invest more in both service and organization innovation as the two will lead to better financial performance.

5.6 Areas for Further Studies

The study suggests that further areas of study should focus on a longer time span than what the current study used. This would clarify whether the observed relationship changes over the years. Further studies can be conducted to establish the other factors which explain changes in ROA apart from the factors used in this study since the factors in the model used in this study explains only 33.2% of changes in ROA.

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