Influence of Information Communication Technology Innovations on Performance of Kenya Commercial Bank Ltd.

Abstract: The objective of the study was to determine the influence of information communications technology innovations on the performance of Kenya Commercial Bank Ltd. The study used multiple linear regression analysis to test the statistical significance of the various independent variables (technology innovations, product innovations, market innovations and process innovations) on the dependent variable performance of Kenya Commercial Bank Ltd. The results of the study established that technology innovations, process innovations and market innovations had a positive and significant effect on performance of Kenya Commercial Bank Ltd with t-values of 2.302, 2.065 and 2.175 respectively at significance levels of less than 0.05 while product innovations had a positive influence on performance of Kenya Commercial Bank Ltd with the t-value of 0.195 but its influence was not statistically significant since the p-value was 0.846 which is greater than 0.05.

Keywords: Technology innovations, Product innovations, Market innovations, Process innovations, Performance.
1. Introduction:

1.1. Literature Review:

The concept of innovation is increasingly viewed as the single most important factor in developing and sustaining competitive advantage (Tidd, 2001). Much emphasis has been placed on building innovative organizations and the management of the innovation process, as essential elements of organizational survival (Brown, 1997). Innovation consists of firms developing new products or new production processes so as to better perform their operations, which implies that the new products could be a result of new processes (Lawrence, 2010). According to Nofie (2011), innovations in the financial sector is the arrival of new or better products and/or processes that lowers the cost of producing existing financial services. Lerner(2002) puts forward that innovations are not just critical for firms in the financial services industries, but also affect other companies; for instance, enabling them to raise capital in large amounts and at lower cost than they could otherwise and that innovation is an important phenomenon in any sector of modern economy.

Goetzmann (2009) noted that innovation has been an integral component of economic activity for several millennia. About six thousand years ago, the Sumerian city of Uruk blossomed as tradable debt contracts emerged to facilitate a diverse assortment of intertemporal transactions underlying increased specialization, innovation and economic development (Goetzmann, 2009). In ancient Rome, private investors steadily developed all of the features of limited liability companies, including freely traded shares, an active stock exchange, and corporations that owned properties and wrote independent contracts of individual shareholders. The creation of these corporations eased the mobilization of capital for innovative, large-scale mining technologies (Malmendier, 2009). To finance the construction of vast railroad systems in the 19th and 20th centuries, financial entrepreneurs developed highly specialized investments banks, new financial instruments, and improved accounting systems to foster screening by distant investors (Malmendier, 2009).

A highly turbulent environment leads to successful innovation creating a unique competitive position and competitive advantage and lead to a superior performance (Roberts and Amit, 2003). This is only possible to maintain by ceaseless innovation and improvement of the product and the process (Porter, 2004). A high degree of foreign investment in the banks’ capital is associated with a high level of competitiveness. This leads to improved quality and differentiation of their products and stimulates financial innovation by introducing modern
skills, management techniques and technologies (Yildirim and Philippatos, 2007). Anbalagan, (2011) finds that some types of financial innovations are driven by improvements in computer and telecommunication technology and argues that for most people the creation of the ATM was greater financial innovation that asset backed securitization.

Higgins, (1995), noted that in the current world, innovation performance is a crucial determinant of competiveness and organization at progress. In many countries, the pace of change in banking industry is dramatic. Frequently reported trends are blurring of industry boundaries, deregulation, and globalization, pressures from new and existing competitors, rapidly advancing information technology, and increased customer sophistication. The telecommunication providers worldwide are becoming increasingly interrelated. New types of corporate and business strategies are being explored: industry consolidation, better market segmentation, expanded product offerings and changed delivery channels (Brooks, 1987). Joint ventures and strategic alliance between companies have proliferated.

Information technology (IT) has been recognized as a key enabler of change and is also becoming a driver of change with new products such as electronic data interchange (EDI), debit cards and smart cards (Bradley, Bross, Carrie and McDevitt, 1993). Turbulent industry conditions are accompanied by many attempts at radical organizational change. These run from hiring a new CEO and top management team to product innovation, business process re-engineering, and TQM/continuous improvement.

Information Communication Innovations have led to a revolution in the way the banking business is conducted as found by Padachi, Rojid and Seetanah (2008) who observed that the two main banks; Mauritius Commercial Bank and the State Bank of Mauritius improved their financial performance on implementation of new technology. In India, Pooja and Singh (2009) conclude that internet banks were larger, more profitable, had higher asset quality, lower administrative expenses and were more efficient compared to the non-internet banks. Mabrouk and Mamoghli (2010) found that return on assets is positively and significantly associated with the first mover and imitation of product innovations in the Tunisia banking industry.

Noyer (2007) points out that innovation brings risks and uncertainties, more so with the complexities they pose to the monetary policy conduct. He points out that central banks only operate monetary policy efficiently only in the short term and after sometime, when new instruments are introduced to the market, new challenges emerge which disrupts the conduct
of monetary policy. Moreover, new developments in the financial systems also require new regulation to ensure the effectiveness of monetary policy is not compromised (Iris and Grimes, 2003).

1.2. Research Objective:

The general objective of the study was to establish the influence of information communication technology innovations on performance of Kenya Commercial Bank Ltd.

2. Methodology:

This study used descriptive survey research design. Orodho (2003) and Kothari (2004) describe a descriptive survey design as a design that seeks to portray accurately the characteristics of a particular individual, situation or a group. According to Polit and Beck (2003), in a descriptive study, researchers observe, count, delineate, and classify. They further describe descriptive research studies as studies that have, as their main objective, the accurate portrayal of the characteristics of persons, situations, or groups, and/or the frequency with which certain phenomena occur. Lavrakas (2008) describes a descriptive survey research design as a systematic research method for collecting data from a representative sample of individuals using instruments composed of closed-ended and/or open-ended questions, observations, and interviews. It is one of the most widely used non-experimental research designs across disciplines to collect large amounts of survey data from a representative sample of individuals sampled from the targeted population.

The target population comprised six hundred and eight staff working at Kenya Commercial Bank Ltd headquarters in Nairobi. The six hundred and eight staff also formed the accessible population which was conveniently sampled. The sampling frame for this study was derived from five departments currently based at the head office as at 2013. The sample units were five departments which exist at Kenya Commercial Bank headquarters (operations, credit, finance, marketing and audit). The departments were selected because Kenya Commercial Bank strategies emanate from these departments before the bank can implement the strategies.

The study stratified the top, middle and low management employees of these departments and carried out a stratified random sampling for distribution of questionnaires to each department.
Within the three strata of top, middle and low level management employees, simple random sampling was used to specifically identify the individual respondents. Each department was issued with questionnaires issued to the top, middle and low level management employees. Questionnaires were used to obtain qualitative data for analysis. Primary data was collected through the administration of questionnaires to top, middle and low level management employees. Secondary data was obtained from the Central Bank of Kenya and Kenya Commercial Bank Ltd.

The study used multiple linear regression analysis to test the statistical significance of the various independent variables (technology innovations, product innovations, market innovations and process innovations) on the dependent variable of performance. Performance was measured in Kenya shilling earnings on income while the influence of innovations was measure on a likert scale questionnaire.

3. Findings And Discussion:

The objective of the study was to determine the influence that information communication technology have on performance of Kenya Commercial Bank Ltd. The objective was assessed by use of statements which were on the questionnaire where the respondents indicated their degree of agreement with the statements.

3.1. Technology Innovations:

Data on table 1 show responses on statements regarding the influence of technological innovation on performance of Kenya Commercial Bank Ltd. The data show that 73.3% (n=44) of the respondents agreed that technological innovations affected fees based income of the banks positively while 26.7% (n=16) disagreed and none of the respondents was neutral on whether technology innovations had a positive effect on commission income of Kenya Commercial Bank Ltd. Regarding whether technology innovations influenced the interest incomes of banks positively, 90% (n=54) agreed, 10% (n=6) strongly disagreed while none of the respondents had a neutral opinion.
Technological innovations have had a positive effect of increasing commission fee based income. | 6.7 | 20 | 0 | 50 | 23.3 | 3.83 | 1.01
--- Technological innovations have influenced positively the increase of interest based income | 10 | 0 | 0 | 53.3 | 26.7 | 4.16 | 0.58
--- Technological innovations have expanded the income generating potential of the bank. | 50 | 0 | 0 | 0 | 50 | 4.5 | 0.5
--- Technological innovations have enabled the bank to reduce risk and frauds | 6.7 | 13.3 | 0 | 50 | 30 | 4.03 | 0.84
--- Technological innovations have had a positive effect on customer acquisition and retention. | 10 | 0 | 0 | 43.3 | 46.7 | 4.36 | 0.66
--- Average | 4.176 | 0.79

**Table 1: Technology innovations**

Product innovations have had a positive effect of increasing commission fee based income. | 23.3 | 0 | 0 | 36.7 | 40 | 4.16 | 0.78
--- Product innovations have influenced positively the increase of interest based income | 0 | 6.7 | 0 | 53.3 | 40 | 4.33 | 0.6
--- Product innovations have expanded the income generating potential of the bank. | 0 | 0 | 0 | 50 | 50 | 4.5 | 0.5
--- Product innovations have enabled the bank to reduce risk and frauds | 10 | 23.3 | 0 | 40 | 26.7 | 3.83 | 0.94
--- Product innovations have had a positive effect on customer acquisition and retention. | 13.3 | 46.7 | 0 | 0 | 40 | 4.27 | 0.69
--- Average | 4.21 | 0.702

**Table 2: Product innovations**
On whether technology innovations in general improved the income generating potential of commercial banks, 50% (n=30) were in agreement while 50% (n=30) disagreed. On whether technology innovations have reduced risks and frauds, 80% were in agreement while 20% disagreed. Regarding whether technology innovations have affected customer acquisition and retention 90% of the respondents were in agreement, 10% disagreed while none of the respondents had a neutral opinion. The mean score of responses regarding technology innovation was 4.176 which on a scale of 1 to 5 indicate that majority of the respondents are of the opinion that technology innovations helped to improve Kenya Commercial Bank performance.

3.2. Product Innovations:

Product innovations were seen to influence commission fee income by 76.7% (n=46) of the respondents while 23.3% (n=14) strongly disagreed as laid on table 2. On whether product innovations influenced the income generating potential of Kenya Commercial Bank Ltd, 50% (n=30) agreed, 50% (n=30) strongly while none of the respondent did not disagree nor had a contrary opinion. The mean score of the responses was 4.21 which indicate that majority of the respondents agreed with the statements on the assertion that product innovations had the potential of improving performance of Kenya Commercial Bank Ltd.

3.3. Market Innovations:

Table 3 shows that 73.3% (n=44) agreed with the assertion that market induced innovations increase Kenya Commercial Bank Ltd commission income, 26.6% (n=16) disagreed while none of the respondents had a neutral opinion. Also 83.4% (n=50) agreed that market innovations improved Kenya Commercial bank income generating potential while only 16.7% (n=10) disagreed. The mean score of the responses is 4.24 which show that market innovations influence positively performance of Kenya Commercial Bank Ltd.
<table>
<thead>
<tr>
<th>Statement</th>
<th>% Strongly Disagree</th>
<th>% Disagree</th>
<th>% Neutral</th>
<th>% Agree</th>
<th>% Strongly Agree</th>
<th>Mean</th>
<th>sdev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market innovations have had a positive effect of increasing commission fee based income.</td>
<td>3.3</td>
<td>23.3</td>
<td>0</td>
<td>40</td>
<td>33.3</td>
<td>4.03</td>
<td>0.84</td>
</tr>
<tr>
<td>Market innovations have influenced positively the increase of interest based income</td>
<td>3.3</td>
<td>13.3</td>
<td>0</td>
<td>36.7</td>
<td>46.7</td>
<td>4.27</td>
<td>0.82</td>
</tr>
<tr>
<td>Market innovations have expanded the income generating potential of the bank.</td>
<td>16.7</td>
<td>0</td>
<td>0</td>
<td>26.7</td>
<td>56.7</td>
<td>4.4</td>
<td>0.76</td>
</tr>
<tr>
<td>Market innovations have enabled the bank to reduce risk and frauds?</td>
<td>3.3</td>
<td>13.3</td>
<td>0</td>
<td>50</td>
<td>33.3</td>
<td>4.13</td>
<td>0.77</td>
</tr>
<tr>
<td>Market innovations have had a positive effect on customer acquisition and retention.</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>43.3</td>
<td>46.7</td>
<td>4.37</td>
<td>0.66</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.24</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Table 3: Market innovations.

3.4. Process Innovation:

The mean score of 4.29 shown on table 4 indicates that majority of the respondents agreed that process innovations has the ability to influence Kenya Commercial Bank performance positively. For example 83.4% (n=50) agreed that process innovations influenced positively commission fee incomes of Kenya Commercial Bank Ltd while 16.7% (n=10) disagreed. Process innovation was seen to influence positively the Kenya Commercial Bank Ltd income generating capacity by 93.3% (n=56) of the respondents while 6.7% (n=4) disagreed.
<table>
<thead>
<tr>
<th>Statement</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>Mean</th>
<th>sdev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process innovations have had a positive effect of increasing commission fee based income.</td>
<td>16.7</td>
<td>0</td>
<td>0</td>
<td>46.7</td>
<td>36.7</td>
<td>4.2</td>
<td>0.71</td>
</tr>
<tr>
<td>Process innovations have influenced positively the increase of interest based income</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>50</td>
<td>40</td>
<td>4.3</td>
<td>0.65</td>
</tr>
<tr>
<td>Process innovations have expanded the income generating potential of the bank.</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
<td>53.3</td>
<td>40</td>
<td>4.33</td>
<td>0.6</td>
</tr>
<tr>
<td>Process innovations have enabled the bank to reduce risk and frauds?</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>46.7</td>
<td>43.3</td>
<td>4.33</td>
<td>0.66</td>
</tr>
<tr>
<td>Process innovations have had a positive effect on customer acquisition and retention.</td>
<td>3.3</td>
<td>3.3</td>
<td>0</td>
<td>50</td>
<td>43.3</td>
<td>4.33</td>
<td>0.7</td>
</tr>
<tr>
<td>Average</td>
<td>4.29</td>
<td>0.664</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
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</table>

Table 4: Process innovations

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>0.508</td>
</tr>
<tr>
<td>R Square</td>
<td>0.258</td>
</tr>
<tr>
<td>Std. Error of the Estimate</td>
<td>0.89757</td>
</tr>
</tbody>
</table>

Table 5: Model fitness - Performance ICT innovations

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>15.423</td>
<td>4</td>
<td>3.856</td>
<td>4.786</td>
<td>0.002</td>
</tr>
<tr>
<td>Residual</td>
<td>44.31</td>
<td>55</td>
<td>0.806</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>59.733</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6: ANOVA – Performance and ICT innovations

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Beta</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology innovations</td>
<td>0.27</td>
<td>0.117</td>
<td>2.302</td>
<td>0.025</td>
</tr>
<tr>
<td>product innovations</td>
<td>0.032</td>
<td>0.165</td>
<td>0.195</td>
<td>0.846</td>
</tr>
<tr>
<td>process innovation</td>
<td>0.305</td>
<td>0.148</td>
<td>2.065</td>
<td>0.044</td>
</tr>
<tr>
<td>market innovation</td>
<td>0.391</td>
<td>0.18</td>
<td>2.175</td>
<td>0.034</td>
</tr>
</tbody>
</table>

Table 7: Regression Coefficients – Performance and ICT innovations.
3.5. Regression Analysis – Performance And ICT Innovations:

To determine the influence of Information Communication Technology Innovations on performance of Kenya Commercial Bank Ltd, a regression equation model was used in the form of \( \text{Performance} (Y) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon \). The indicators of the model fitness are shown in table 5. The coefficients indicate that the correlation coefficient (R) between the independent variables and dependent variable (performance) is 0.508 which shows a moderate association between the independent variables and dependent variable. The coefficient of determination (R Square) of 0.258 indicates that the model can explain 25.8% of the variations or changes in the dependent variable performance. In other words technology innovations, product innovations, market innovations and process innovations can explain 25.8% of performance of Kenya Commercial Bank Ltd. The remaining part is absorbed by the error term.

Table 6 presents the analysis of variance (ANOVA) on the influence of ICT innovations on performance of Kenya Commercial Bank Ltd. The results indicate that the model is statistically significant in explaining the impact of ICT innovations on performance on Kenya Commercial Bank Ltd. Put differently; it means that the ANOVA results indicate that the combined effect of ICT innovations is statistically significant in explaining variations in Kenya Commercial Bank Ltd at a level of significance of 0.02.

Table 7 shows the coefficients on the influence of the individual independent variables on the dependent variable. The Beta coefficients indicate the extent to which Kenya Commercial Bank performance changes due to a unit change in the independent variable. The positive Beta coefficients indicate that a unit change in the independent variable leads to a positives change in Kenya Commercial Bank performance. For example a unit change in technology innovations led to 0.270 units of positive change in KCB performance indicating a positive relationship between the two variables. Also a unit change in product innovations led to 0.032 units of positive change in KCB performance indicating a positive relationship between the two variables.

Table 7 also presents the level of significance also called the p value. This is the coefficient that is used to test hypothesis and the significance of the independent variables. The level of significance for this study is 0.05 and therefore if the p value is less that 0.05 then it means that the variable is statistically significant and vice versa if the p value is greater than 0.05. From the table, the results showed mixed findings. The t and p value for technology
innovations, process innovations and market innovations were (t=2.302, p<0.05; t=2.065, p<0.05; t=2.175, p<0.05) respectively. Therefore technology innovations, product innovations and market innovations had positive influence on performance and the findings were all statistically significant. The t and p value for product innovation were (t=0.195, p>0.05), therefore product innovations showed a positive influence on KCB performance but the influence was not statistically significant.

These findings are consistent with a study conducted in the US by Hendrickson and Nicholas (2011) which concluded that banks perform better when they adopt innovations across their several branches. These sentiments are shared by Rafael and Francisco (2007) in their study on the impact of various regional banking sector developments and innovations during 1986-2001 in Spain. Iftekhar, Schmiedel and Song (2009) also assert that if a bank joins in an ATM network, it can generate income from other banks’ customers that use its ATM machines (technology innovation) or from third parties that cooperate with it. Kemppainen (2003 and 2008) in a study done among the European Union concluded that relationship between innovations is stronger in countries with more retail payment transaction equipment, like ATMs and POS terminals.

Contradictory results were found by Mabrouk and Mamoghli (2010) in their study on Dynamics of Financial Innovation and Performance of Banking Firms: Contexts of an Emerging Banking Industry, 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 the banks. Their analysis included two adoption behaviours, first movers in adoption of the financial innovation and the imitator of the first movers. They found out that first mover initiative in product innovation improves profitability while process initiative has a positive effect on profitability and efficiency.

For example according to CBK(2012) during the period ending June 30, 2012, the sector registered Ksh.53.2 billion pre-tax profits, an increase of 30.4 percent from Ksh 40.8 billion as at June 2011. Similarly, total income stood at Ksh. 176.4 billion being an increase of 60.0 percent from Ksh.110.3 billion registered at the end of June 2011, this is mainly attributed to services delivered through innovative channels, . These numbers support the findings of this
study in terms of the level of significance of ICT innovations on performance of Kenya Commercial Bank Ltd.

4. Conclusion:

The findings reveal that ICT innovations have a moderate association with the performance of Kenya Commercial Bank Ltd. This finding is supported by correlation coefficient (R) of 0.508 between the independent variables and dependent variable (performance). The influence of Kenya Commercial Bank ICT innovations on performance is also statistically significant since the p value of the regression is less that 5%. This means that the influence is not by chance. Kenya Commercial Bank has been using ICT induced innovations to grow their business and subsequently improve their performance.

5. Recommendations:

Kenya Commercial Bank should continue investing in ICT induced innovations more so in delivery like ATMs, Mobile banking and internet banking since this will enable them control their costs more efficiently and much better that having many physical branches. The volumes of transactions that can be processed on channels like the internet and mobile are high as compared to delivering such transactions using manual processes. This helps to minimize the cost per unit of service and hence better returns to the bank. Kenya Commercial Bank should explore more and better ways of maximizing their utilization and returns from card payment systems, ATMs, mobile banking and internet banking.

Since information communication technology innovations are aggressively and continuously adopted in Kenya, Kenya Commercial Bank should allocate more resources towards research and development to researchers who would continue to invest their time and skills in discovering more ICT induced innovations. It is recommended that Kenya Commercial Bank also pursue a strategy to provide incentives for technology transfer from more developed economies in order to promote adoption of more superb top class ICT innovations. Better performance for Kenya Commercial Bank due to ICT innovations translates to an improved profit before tax. A further study can therefore be conducted to investigate the effect of ICT innovations on all commercial banks in Kenya.
References:


