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CONFIGURAION APPROACH OF THE RELATIONSHIP BETWEEN PROCESS INNOVATION AND FINANCIAL TECHNOLOGY ON PERFORMANCE OF LICENSED CAPITAL MARKET INTERMEDIARIES IN KENYAN SECURITIES MARKET

Nyangenya Japheth Teya
Department Of Commerce and Economic Studies
Jomo Kenyatta University of Agriculture and Technology, P.O BOX 6200-00200, Nairobi - Kenya.

Kenneth Lawrence Wanjau
School of Business, Karatina University, P.O Box 1957 10101 Karatina

Willy Muturi,
School of Business, Jomo Kenyatta University of Agriculture and Technology, P.O BOX 6200-00200, Nairobi - Kenya.

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ABSTRACT

The performance of Kenyan securities market is influenced by a number of factors the main ones among them being process innovation and financial technological capabilities of licensed capital market intermediaries. The major role that the securities markets have played, and continues to play in many economies is that they promote a culture of thrift, or saving.The performance of a securities market of an economy is of interest to various parties including investors, capital markets, securities market, the public, government, licensed capital market intermediaries among others.However, there have beenpaucity of empirical research in this area and licensed capital market intermediaries have a weak understanding of process innovations, financial technological capabilities and its control measures. The purpose of this study was to determine the moderating effect of financial technological capabilities on process innovations and performance of licensed capital market intermediaries in Kenyan securities market. To better understand this relationship, this paper was guided by exploratory and cross-sectional survey approach design. Using the hierarchical and moderated multiple regression (MMR) analyses, the theoretical models and hypotheses in this paper were tested based on empirical data gathered from 97 licensed and approved capital market intermediaries in Kenyan Securities markets. The results revealed that financial technological capabilities significantly moderated the relationship between institutional innovations issues and performance of licensed capital market intermediaries in Kenya. This unique process innovations suited to the Kenyan securities markets should be developed to improve and encourage performance.

Keywords: Process innovation, Financial Technology, DU Pont, Licensed Capital Market Intermediaries, Securities Market

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1.0 Introduction

History shows that financial innovation has been a critical and persistent part of the economic landscape over the past centuries (Akamawi, 2005). Financial innovation is clearly an important phenomenon in any sector of a modern economy because it has been described as the "life blood of efficient and responsive capital markets" (Van Horne, 1985). The whole notion is being looked at with a gimlet eye in every economy. In many respects, innofusion has improved the efficiency of international financial markets, mainly by offering a broader and more flexible range of instruments both for borrowing and hedging interest and exchange rate exposures (Tufano, 2003).

The basic function of the securities market is to facilitate and to expand the distribution of resources, in space and time, towards an uncertain environment and to channel society's savings towards the most prosperous investment opportunities with a counterbalancing risk (Fabbozi, 1995). The financial system consists of the capital and money market and the stock exchange where capital markets cover the spectrum of currency demand, income, equity markets, and derivatives markets and include all financial intermediaries like investment and commercial banks that constantly offer adaptable products and services (Tufano, 2003)

Capital and money markets allow money flow and give the opportunities for investment with some risk for the investors (Van Horme, 1985). They are the source of information that helps different sectors of the financial activity take centralized or decentralized decisions (Frame & White, 2004).

African Securities Markets have also rapidly evolved over the last decade resulting in considerable development of the African capital markets (Piesse & Hearn, 2005). Prior to 1989, there were just five stock markets in Sub-Saharan Africa (SSA) and three in North Africa. Today there exist nineteen Sock exchanges in Africa (Yartey & Adjasi, 2007). Total market capitalization for African stock markets increased from US$113,423million to US$244,672million between 1992 and 2002. This rapid development of Stock markets in Africa does mean that even the most advanced African Stock Markets are mature. In most of these markets, trading only occurs in only a few stocks, which account for a considerable part of the total market capitalization (Odera, 2012). There also exist serious informational and disclosure deficiencies for other stocks. Supervision and monitoring by regulatory authorities is often far from adequate.

1.1 Statement of the Problem

Iman (2008), Fleck (1993), and Hansen, (2013) argue that the importance and sources of financial innofusion are poorly understood yet the securities market sector has experienced more or less constant growth. Financial service industry has undergone major IT transformations over the last decade (Consoli, 2005; Harris, 2001; Iman, 2008; Nielsen, 2002) and this symbiotic relationship reinforces the continuous search for new solutions and robustness of improved technology (Fonseca, 2004). However there is no rich literature available that directly investigate the role of process innovation on performance of licensed capital market intermediaries in Kenyan securities market.

1.2 Objectives of the Study

The general objective of the study was to find out whether process innovation affects performance of licensed capital market intermediaries in Kenyan securities market

1.3 Research Hypothesis

The achieve the above objective the following research hypotheses were developed;

HO_1: There is no significant relationship between process innovationand performance of licensed capital market intermediaries in Kenyan securities market

HA_1: There is a significant relationship between process innovationand performance of licensed capital market intermediaries in Kenyan securities market

2.0 Theoretical Review

An incremental innovation will involve modest FinTech Capabilities and the existing products on the market will remain competitive. A radical innovation will instead involve large technological advancements, rendering the existing products non-competitive and obsolete. It will encompass higher order innovations that serve to create new industries, products, or markets (Herbig, 1994; Meyer, Brooks, & Goes, 1990). They comprise

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technological advances so significant that no increase in scale, efficiency, or design can make older technologies competitive (Tushman & Anderson, 1986). They make obsolete the old, and permit entire industries and markets to emerge, transform, or disappear (Kaplan, 1999). Whether internally developed or externally generated, radical innovations ‘‘over time, augment, shift, and change a firm’s technological processes and open up whole new markets and product applications’’ (Henderson & Clark, 1990).

Du Pont analysis, multiply the profit margin (net income divided by sales), asset turnover (sales divided by assets) and leverage factor (total assets divided by shareholders' equity) together and the product of the net profit margin and the total asset turnover equals ROA (Osteryoung & Constand, 1992).In addition to profitability and efficiency, the way in which a firm financed its activities and its use of debt or “leverage” became a third area of attention for financial managers. The new ratio of interest was called the equity multiplier, which is determined by the equation (total assets / equity) (Soliman, 2008).

2.2 Conceptual Framework

The conceptual framework is a hypothesized model that identify the concepts under study and their relationship (Orodho, 2008). It expresses the independent variables, which influences the dependent variable, and if one variable depend or is a consequence of another variable, it is termed as dependent variable and the variable which is antecedent to the dependent or that makes it to change is termed as independent variable (Cooper and Schindler, 2008). They further explain that a moderating variable is a second independent variable that is included because it is believed to alter the strength of the casual relationship and have a significant or contingent effect on the original dependent variable and independent variable relationship (Frazier, Tix & Barron, 2004.)

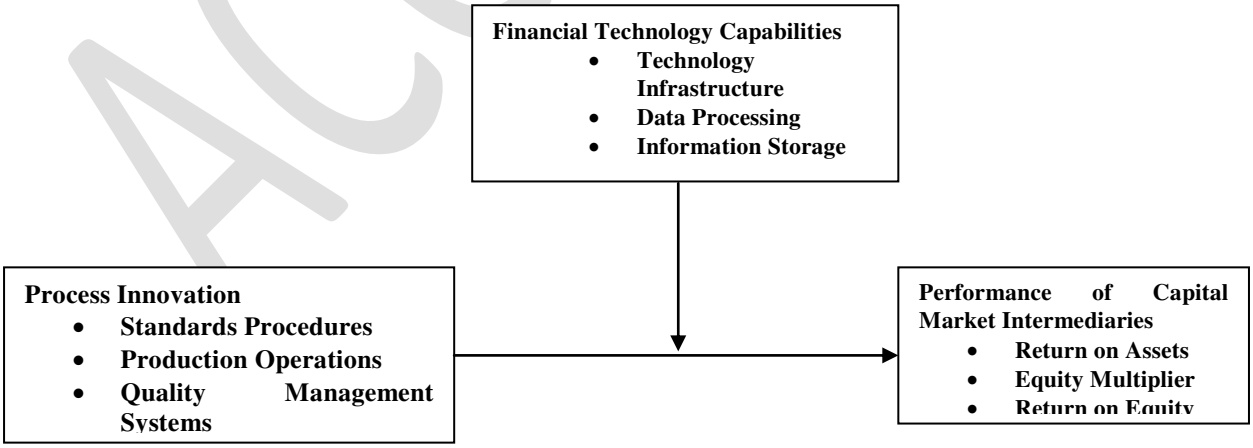

Figure 1: Conceptual Framework

2.2 Empirical Review

The objective of the study was to find out whether process innovation affects performance of licensed capital market intermediaries in Kenyan securities market.Process Innovation was

also determined through Standards Procedures, Production Operations and Quality Management Systems.Process innovation is viewed as a creation of new process or improvement which involves the implementation of a new process that significantly improve production or delivery method, it includes changes in techniques, equipment and/or software (Bi, Sun, Zheng & Li, 2006). The performance derived from the changes to organizational structure and administrative process, reward and information system, and it encompasses basic work activities within the organization which is directly related to management (Chew, 2000, Damanpour & Evan, 1984).

Process innovation typically involves changes to production operations, including task specifications, work and information flow mechanisms, and the equipment used in production (Tushman and Anderson, 1992) and it is often, even typically, associated with investments in advanced machinery and equipment. Process innovations can also be associated with 'up-skilling', coupling investments in advanced equipment with investments in human capital, so that labor and equipment can be combined more effectively (Prais, 1995; Tether et al., 2005). Process innovation has also been associated with maintaining close relations with suppliers of equipment, especially when leading edge rather than older, standardized equipment is utilized. Here, process innovators may act as the 'lead users' of innovative equipment developed by others; they are the users in user-producer inter-relations (von Hippel, 1988).

The multiple different and complex characteristics of the financial system and of its participants render the introduction of new financial innovations necessary and constantly opportune (Suzuki, 1986). Developed economies differentiate between low-risk investors in the real economy and venture capitalists that are responsible for the financial risks of the investment (Lee, 1998). Thus, this differentiation between real and paper economy is due to the comparative advantage of the financial activities (Jensen and Murphy, 1990). The main characteristic of finance is time as uncertainty that generates risk, deals with the future. For investors that despise risk, these risks represent costs (Damanpour & Evan, 1984).Therefore the study hypothesized that;

> $H0_1$: There is no significant relationship between institutional innovations and performance of licensed capital market intermediaries in Kenyan securities market

The study also hypothesized that;

> HA_1: There is a significant relationship between institutional innovations and performance of licensed capital market intermediaries in Kenyan securities market

2.3 Firm Performance

Performance is the combination of overall organizational achievements as a result of renewal and improvement efforts done considering various aspects of firm innovativeness, i.e. processes, products, organizational structure, etc. Therefore innovative performance is a composite construct based on various performance indicators pertaining, for instance, to the new patents, new product announcements, new projects, new processes, and new organizational arrangements (Hagedoorn and Cloodt, 2003). Organizations utilize numerous

models to describe how well the business is performing. DuPont model was created in the early 1900s but is still a model valid to use for assessment of the profitability (Horrigan, 1965).

DU Pont is mostly used to determine a company's strengths and weaknesses (Burson, 1998). It examines a company'sReturn on Equity (ROE) by breaking it into three main components: profit margin, asset turnover and leverage factor. By breaking the ROE into distinct parts, investors can examine how effectively a company is using equity, since poorly performing components will drag down the overall figure (Palepu & Healy, 2008).

3.0 Methodology

This study was quantitative and guided by both exploratory and cross-sectional survey approach. This design helps with hypothesis formulation and testing the analysis of the relationship between variables (Kothari, 2004). The target population of this study was licensed and approved capital market intermediaries. The accessible population was securities and investment managers of the licensed and approved capital market intermediaries in Kenya and the sampling frame was sourced from Capital Market Authority (CMA). The study used the population from this source since Capital Markets Authority is the sole regulator and licensing institution of Capital market intermediaries in Kenya (CMA, 2013).

Israel (2012) posits that although cost considerations make census technique impossible for large populations, a census is attractive for small populations of 200 or less. Since the accessible population consisted of 100 respondents, this study used the entire population as the sample. The study used a self-administered, semi-structured questionnaire to obtain primary data. Consequently 91 licensed and approved capital market intermediaries out of 97 responded.

For pilot testing, data from 5 respondents were collected, representing 5% of the population in the study. Cronbach's Alpha statistic ranged from 0.69 to 0.9, indicating high reliability of data. Mertens (2010) avers that the closer the coefficient is to 1.0, the more reliable the measurements. This study adopted construct validity. Mertens (2010) advises that factor analysis can be used to validate hypothetical constructs as it attempts to cluster items or characteristics that seem to correlate highly with each other in defining a particular construct. Eigen values criterion was used to determine the selection of factor loadings for each component. The larger the eigen value loading, the more important the associated principal component (Graham & Midgley, 2000). In this case, the varimax with Kaiser Normalization sampling adequacy with eigen value greater than 1 were used as the rotation method because the items were uncorrelated. Montgomery, Peck and Vining (2001) recommend that a minimum factor loading of 0.40 should be used when factor analysis is used to refine construct validity. All items had factor loadings ranging from 0.479 to 0.877.

IBM Statistical Package for the Social Sciences (SPSS) version 21.0 for Windows 7 and Windows 8 was used for data entry, data cleaning and running the Exploratory Factor Analysis (EFA). Other software applications used were Ms-Excel for Windows 8 for case

cleaning, variable screening and as a transit package in that the data from SPSS was saved in Ms-Excel for it to be exported to SmartPLS; Analysis of Moment Structures (AMOS) version 18, which is essentially analysis of mean and co-variance structures, for Initial EFA, Confirmatory Factor Analysis (CFA), Path Analysis and Structural Equation Modeling (SEM); SmartPLS version 2.0 for Path Analysis, SEM with moderation and model diagnostics; STATA version 12.0 for normality testing; R-GUI version 2.10.0 for building plots, for instance box-plots using the Ggplot2 package, and for univariate and multivariate testing of outliers in the dependent variable.

4.0 Measurement of Standard Procedures Factor Amongst licensed capital market intermediaries in Kenya

The results in table 1 show that, majority (92%) of respondents with average rating of .9195 and standard deviation of .27358 stated that their organizations have effective standard management process. A few (8%) of the respondents stated that the organization does not have effective standard management process. Effective standard management process involves both organizational and technological changes that are blurred and difficult to separate. This result confirmed previous literature by (Luria, 1987; Ettlie, 1988; Nabseth and Ray, 1974; Thompson, 1967), suggesting that management practices and its related FinTech Capabilities do complement financial innovation

When asked if the organization has integrated but independent standard operation procedure, majority (84%) of respondents with average rating of .8391 and standard deviation of .36959 stated that the organization has integrated but independent standard operation procedure. A few (16%) of the respondents stated that the organization does not have integrated but independent standard operation procedure. Integrated but independent standard operation procedure enables licensed capital market intermediaries to oversee, design, and control the process of production and redesigning business operations in the production of goods or services using high technology. The financial innofusion in the licensed capital market intermediaries require verifiable routines and standard procedures in place for design, manufacture, delivery, service and support in order to improve performance (Brunsson, Jacobsson, Ahrne, Furnsten, Garsten, Hennin, Sahlin - Andersson & Hallström, 2000).

In regards to the organization ability to simplify the standard working process, the majority (84%) of respondents with average rating of .8391 and standard deviation of .36959 stated that the organization has ability to simplify the standard working process. A few (16%) of the respondents stated that the organization does not simplify the standard working process. The organization ability to simplify the standard working process explicitly addresses the complementary effects of integrating new technology with bonds, notes, commercial paper, mortgages, common stocks, preferred stocks, warrants, mutual fund shares, unit trusts, and depository receipts to successfully adopt new technology for innovation. Ettlie (1988) found that better performing organizations synchronize the adaptation of administrative policies with the introduction of technology.

Fleck (1994) also recognized the necessity to adapt the management procedures to the new technology implemented. In January 2011 the NSE commenced the selection of a vendor to provide a centralized solution for a broker back office, to be operated from the Exchange. The process which employed industry best practice was rigorous and transparent and involved members through the Kenya Association of Stockbrokers and Investment Banks (KASIB), the Authority and the Central Depository and Settlement Corporation. All stakeholders agree that a centralized, standardized solution for the broker back office provides economies of scale, in terms of systems development, management and maintenance. It shall also enhance existing market surveillance functions of the Authority and the Exchange, a further assurance of investor protections for our market. It will also provide opportunities for further development of information products and services.It will also provide opportunities for further development of information products and services.

4.1 Measurement of Production Operations Factor Amongst licensed capital market intermediaries in Kenya

The results in table 2 shows that, majority (85%) of respondents with average rating of .8506 and standard deviation of .35857 stated that the organization have clear operation process. A few (14%) of the respondents stated that the organization does not have clear operation process. Licensed capital market intermediaries have developed strong and clear operation process through combination of existing routines, premises, and technology and role expectations to improve its innovation abilities. Bartunek (1983), Barley (1986) Westley (1990) opine that not necessarily, everybody does understand everything at once, but we need to understand operation process that cut across the organization. Studies demonstrate consistently that operation process affect major financial innovation and performance.

When asked if the organization has always invested on new operation process, majority (82%) of respondents with average rating of .8161 and standard deviation of .38966 stated that the organization has always invested on new operation process. A few (18%) of the respondents stated that the organization does not always invest on new operation process. The investment on new operation process or technology will encourage financial innovation and improves the performance of licensed capital market intermediaries in the long run. Specifically, technological process innovation is related to the incorporation of new capital equipment (Salter, 1960), processing machines, industrial robots or IT equipment (Edquist, 2001) or just capital embodied technology (Rouvinen, 2002) usually obtained from the purchase of advanced machinery or computer hardware and software.

In regards to the ability of the organization to conduct business process reengineering, the results in table 4.20 show that, majority (79%) of respondents with average rating of .7931 and standard deviation of .40743 stated that the organization always conduct business process reengineering. A few (21%) of the respondents stated that the organization does not always conduct business process reengineering. Business process reengineering focuses on the analysis and design of workflows and business processes within licensed capital market intermediaries. It help to fundamentally rethink about how they do their work through broad

information sourcing and internal cooperation to mobilize knowledge that supports and encourages financial innofusion. This has dramatically improved customer service, cut operational costs, and become world-class competitors.

Leiponen (2005) states that conducting business process reengineering routinely encourages new service introductions than job incremental learning. On December 2010 NSE signed an agreement with Chella Soft Ltd., of India to implement a standard Broker BackOffice (BBO) System for the Kenyan market. In September 2011, the Broker Back Office went live. The BBO system automates the entire process of transacting in shares with minimal manual intervention and is interfaced with the Automated Trading System (ATS) and Central Depository System (CDS). The system has reduced the risk of trading in securities listed on the NSE, boost investor confidence and facilitate greater access by enabling internet trading (CMA, 2013).

4.2 Measurement of Quality Management Systems Factor Amongst licensed capital market intermediaries in Kenya

The results in table 3 show that, majority (85%) of respondents with average rating of .8506 and standard deviation of .35857 stated that the organization has integrated quality policies and manuals. A few (14%) of the respondents stated that the organization does not have Integrated quality policies and manuals. Integrated quality policies and manuals provides solutions that focus on the management interlinking functions and activities in the enterprise's strategic and current operational contexts. Cooper (2008) argues that financial innofusion depends heavily on developing and applying knowledge on management systems and financial markets, customers, technology and organization's own core operating abilities.

When asked if the organization has effective management of customers' complaint the majority (87%) of respondents with average rating of .8736 and standard deviation of .33427 stated that the organization has effective management of customers' complaint. A few (13%) of the respondents stated that the organization does not have effective management of customers' complaint. Despite the challenges, the more details we get or receive from various needs, wants and attributes from customers complaints the better for of licensed capital market intermediaries financial innovation ultimate success. Customer needs and complaints may change but having effective way of handling them will increase the organization performance (Rosenberg 1982).

In regards to the organization participative working environment the results in table 4.21 show that, majority (85%) of respondents with average rating of .8506 and standard deviation of .35857 stated that the organization has participative working environment. A few (14%) of the respondents stated that the organization does not have participative working environment. Participative working environment in licensed capital market intermediaries is characterized by work teams and efficient and effective information flow system that has enabled the exchange of information top down, bottom up and leadership style that encourages innovation. Argyris and Schon (1978) argue for a complete job redesign through the creation

of informal participative and democratic self-managed work teams that foster individual financial innovation.

The securities market system is tightly coupled and interfaced with the Automated Trading System (ATS) and Central Depository System (CDS). The BBO system automates the back office and enables senior management to monitor and audit activities through suitable alerts and exception reports, Permits internet access to the system, helping Trading Participants expand their services across all forty seven counties of the Country, Supports Initial Public Offers (IPOs), portfolio management and complaints processing and, Supports internet and mobile phone trading. Overall, the system bolster existing security measures and reduce the risk of trading in securities listed on the Nairobi Securities Exchange. Facilitating internet trading has allowed Kenyan investors in the diaspora to access the local stock market without hindrance.

5.0 Data Analysis and Results

Case screening was undertaken through the examination of the missing data by running the cases counts in excel, using the standard deviations to access the level of engagement of the respondents. Records with missing cases (up to 20%) were dropped out of which 87 cases were retained. This may have been due to the perceived confidentiality of data, lack of understanding or reluctant attitude of the respondents to answer a question that they thought was irrelevant to their business operations and practices. A maximum likelihood function was used to replace those missing values (Enders & Bandaios, 2001). Babbie (1990) suggested that a response rate of 70% is very good, 60% is good, and 50% adequate for analysis. Chen (1996) argued that the larger the response rate, the smaller the non-response error. Table 4 shows high response rate of (89.69%) which was attributed to the use of self-administered approach and respondents were assured of confidentiality of the information provided.

To ensure that there was no violation of the assumptions, this study tested for outliers, normality, linearity, homoscedasticity, multicollinearity, non-response bias and common method variance. The results of the tests conformed to the respective thresholds for each test.

In this study, analyses were conducted using a two-phase process consisting of confirmatory measurement model and confirmatory structural model. This is in line with the two-phase process suggested by Anderson and Gerbing (1988). The first phase involved confirmatory factor analysis (CFA) that evaluates the measurement model on multiple criteria such as internal reliability, convergent, and discriminant validity. Prior to this was the exploratory factor analysis (EFA) whose key steps included the computation of pattern matrix, communalities and principal components analysis (PCA). EFA is used when you have a large set of variables that you want to describe in simpler terms and you have no *a priori* ideas about which variables will cluster together (Tabachnick & Fidell, 2013).

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But prior to EFA, two statistical tests, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity, were performed. The results of the two tests are shown in table 5, with indications that EFA was suitable with the data in this study.

The second phase involved latent variables structural equation modeling (SEM) to test the hypothesized relationships and to fit the structural model. Normality test on the factors produced Skewness values between -1 and +1. The outliers were tested for each of the observations, with observations farthest from the centroid, Mahalanobis distance, being taken into consideration. There were no outliers detected. The values obtained in testing the model fit indices were within the thresholds as shown in table 8.

The quotient of a model parameter and its standard deviation is asymptotically Student t distributed. The significance of model parameters and, in particular, the coefficient of the interaction term, can be determined by means of respective tables. T-statistics provided information on the significance to the relationship. T-statistics value (C.R) was used to test whether the moderating effect of FinTech Capabilities on the relationship between process innovations and performance of licensed capital market intermediaries in Kenyan Securities market. Critical value should be greater than 1.96 at .05 significance level.

Moderated effect results of FinTech Capabilities on process innovation and performance of licensed capital market intermediariesshows CR of 2.780 and p-value of .050. This implies that there is a significant positive relationship between process innovations * FinTech Capabilities and performance of licensed capital market intermediaries in Kenyan securities market since the CR of 2.780 is greater than the conventional critical value of 1.96 at .05 significance level ($p < .05$).

The finding of the study reveals that process innovations * FinTech Capabilities and performance of licensed capital market intermediaries in Kenyan securities market is positive ($\beta = .2943$) and significant ($t= 2.7802$, p-value .05). Thus null hypothesis was rejected at 95% significance level and therefore conclude that FinTech Capabilities moderates the relationship between process innovations and performance of licensed capital market intermediaries in Kenyan Securities market. It is evidenced that the technology adoption process by acquiring embodied technology is amplified when the workplace process and structure changes follows simultaneously (Boer and During, 2001)

Moderated multiple regression (MMR) analysis is defined as an inferential procedure which consists of comparing two different least-squares regression equations (Aguinis, 2004). Using MMR analysis in this study, the moderating effect of the variable (product term) was analyzed by interpreting the R^2 change in the models obtained from the model summaries, and by interpreting the regression coefficients for the product term obtained from the coefficients' tables, as shown in table 6. The results show the moderating effect of FinTech Capabilities on the relationship between process innovations influence the performance of licensed capital market intermediaries in Kenyan securities market. From table 6, Model 1 shows that $R = .039$, $R^2 = .002$ and [$F (1, 57) = .002$, $p = .771$]. The value of R^2 indicates that 0.2% of the variance of the performance of licensed capital market intermediaries in Kenyan

securities market can be accounted by process innovations scores and FinTech Capabilities. R^2 was used to show the proportion of variation in dependent variable explained by the SEM model.

Model 2 shows that R = .252, R^2 = .064 and [F (1, 56) = 3.709, p = .059]. The value of R^2 indicates that 6.4% of the variance of the performance of licensed capital market intermediaries in Kenyan securities market can be accounted by process innovations scores and FinTech Capabilities. R^2 was used to show the proportion of variation in dependent variable explained by the SEM model.

Model 3 in table 6, shows the results after the interaction term (process innovations * FinTech Capabilities) was added into the model. Table 4.57 also indicates that the inclusion of the interaction term resulted into an R^2 change of .461, [F (1, 55) = 53.347, p < 0.000], showing presence of significant moderating effect. In order to determine the function of the moderator, difference in R^2 as recommended by Carte and Russell (2003) was used.

The structural equation modeling (SEM) for the first objective for model 2 is as shown in figure . Model 2 shows the results after interaction term (process innovations * FinTech Capabilities) was introduced in the equation. Inclusion of interaction term resulted in an R^2 change of 4.61%. An R^2 change of 4.61% indicates that moderating effect explains 4.61% variances in performance of licensed capital market intermediaries in Kenyan Securities market above and beyond the variance explained by process innovations. This shows a significant presence of moderating effect of FinTech Capabilities on the relationship between process innovations and performance of licensed capital market intermediaries in Kenyan Securities market

Model 1 shows that process innovations was found to be insignificant (p = .771 < .050, Beta value = .039). This implies that a 1-unit increase in process Innovation, the performance of licensed capital market intermediaries in Kenyan securities market is predicted to have a difference by .011, on substitution of the coefficients in equation (1), we obtain:

Performance of Licensed Capital Market Intermediaries = **0.123** + **0.011** Process Innovation …… ***Equation 1***

Model 2 shows that process innovations was found to be significant (p = .820 > .050, Beta value=-.031). Technological Capability was found to be significant (p = .059 > 0.050, Beta value = .259). On substitution of the coefficients in equation (2), we obtain:

Performance of Licensed Capital Market Intermediaries = **- 0.084** - **0.009** Process Innovation + **0.108** FinTech Capabilities …… ***Equation 2***

This implies that a 1-unit increase in Process Innovation, the performance of licensed capital market intermediaries in Kenyan securities market is predicted to have a difference by -0.009, given that the FinTech Capabilities is held constant. The regression coefficient associated with FinTech Capabilities means that the difference in performance between licensed capital market intermediaries with high FinTech Capabilities and licensed capital market

intermediaries with low FinTech Capabilities is 0.108, given that process innovations is held constant.

Model 3 reveals the details of the inclusion of the interactive term in the model. Process innovations was found to be significant (p = .000 < .050, Beta value = - .801). Technological capability was found to be significant (p = .000 < .050, Beta value = 1.961), and process innovations * FinTech Capabilities was also found to be significant (p = .000 < .050, Beta value = 1.802). On substitution of the coefficients in equation (5), we obtain:

Performance of Licensed Capital Market Intermediaries = **- 0.129** - **0.231** Process Innovation + **0.818** FinTech Capabilities + **1.047** Process innovations * FinTech Capabilities …….. ***Equation 3***

This implies that for a 1-point increase in the process Innovation, the performance of licensed capital market intermediaries in Kenyan securities market is predicted to have a difference by -.231, given that technological capability is held constant. The interpretation of the regression coefficients for the interaction term in Equation (3) is that there was a 1.047 difference between the slope of performance on process innovation between licensed capital market intermediaries with low FinTech Capabilities and those with high FinTech Capabilities. The slope regressing performance on process innovation is steeper for licensed capital market intermediaries with high FinTech Capabilities as compared to licensed capital market intermediaries with low FinTech Capabilities. Results based on equation (3) led to the conclusion that there was a significant moderating effect of FinTech Capabilities. Voss (1988) explicitly addressed the complementary effects of integrating new technology with the organizational perspective in order to successfully adopt new technology for process innovation.

The point is to understand that the acquisition of new technology requires a mutual adaptation of technology and organization (Ettlie, 1988; Ettlie and Reza, 1992; Fleck, 1994; Leonard-Barton and Deschamps, 1988; Voss, 1988), that is, the adaptation of the technology transfer through the implementation process requires that managers recognize and assume responsibility for both technical and organizational change (Leonard-Barton and Deschamps, 1988). Ettlie (1988) found that better performing organizations synchronize the adaptation of administrative policies with the introduction of technology.

6.0 Discussions and Conclusions

Process innovation had a positive relationship with performance of licensed capital market intermediaries in Kenyan securities markets. Consequently, the null hypothesis was rejected. Process innovation also had a statistically significant influence on the performance of licensed capital market intermediaries in Kenyan Securities marketas. As well, Process innovation explained above average variation in performance of licensed capital market intermediaries. Out of the three factors of Process innovation, standard procedures, production operations and quality management systems all were found to have contributed

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significantly to process innovation influencing performance of licensed capital market intermediaries in Kenyan securities markets.

This corroborates an empirical study by Garman (1976) who observed an evolutionary pattern in adoption of trading system for the US stock market in response to growth in trading volume; this saw a shift from periodic to continuous trading system. Amihud et al (1997) note the tendency for emerging markets to shift from periodic to continuous trading in the revitalization process. The trading system that enhances efficiency in the price discovery process, provides liquidity at low costs, and has no excess volatility is more desirable for the development of the stock market (Bessembinder and Kaufman, 1997). High liquidity, it is observed, enhances long-term investment by reducing the required rate of return and by lowering the cost of capital to the issuers of securities. An efficient price discovery process enhances the role of the market in aggregating and conveying information through price signals, therefore making prices more informative.

This is in line with the Incremental and Radical Innovation theory. This framework argues that incumbents will be in a better position if the innovation is incremental since they can use existing knowledge and resources to leverage the whole process. Questions have been raised as to what extent dramatic growth of markets in new financial instruments will continue, and to what extent are the factors behind the rapid change temporary.

Matsushita (1996) and Greenspan (2005) contend that the momentum for the global integration of financial markets and the financial liberalization will continue to act as fertile ground for financial innovation. There are long lasting forces that support the growth and development of innovations even in a stable environment. Technological advancements, both in its hardware aspect and software aspects–sophisticated financial models and financial product designs are certainly going to continue.

Since the mid-1980s governments of various industrial countries have, to a large extent, relaxed their controls on financial institutions Tufano, (2003). Such liberalization, together with a volatility of exchange and interest rates never before experienced, generated a string of new financial instruments specially designed to handle different kinds of risks. These instruments have been widely accepted in the international financial community, and it is notable that the volume of their transactions in any period of time varies directly with the degree of turbulence in money markets. New financial instruments are issued from academic research and/or the macro finance crisis and/or the financial needs of large international companies

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APPENDIX

Table 1 Response on Administrative Process and Systems Factors

ITEM	YES	NO	MEAN	STD.DEV
The organization has documented its process	79(91%)	8(9%)	.91	.291
The organization has innovative systems	79(91%)	8(9%)	.91	.291
The organization has Innovative policy	76(87%)	11(13%)	.87	.334
The organization has Innovative culture	70(81%)	17(19%)	.80	.399

Table 2 Response on Network and Strategic Partnership Factors

ITEM	YES	NO	MEAN	STD.DEV
The organization has strategic alliance	72(83%)	15(17%)	.83	.380
The organization identifies with valuable knowledge	76(87%)	11(13%)	.87	.334
The organization understands the knowledge trends	74(85%)	13(15%)	.85	.359
The organization collects external information	72(83%)	15(17%)	.83	.380

Table 3 Response on Bench Marking Factors

ITEM	YES	NO	MEAN	STD.DEV
The organization has benchmarking strategies	70(81%)	17(19%)	.80	.399
The organization has strong benchmarking network	68(78%)	19(22%)	.78	.416
The organization has clear procedures on what to benchmark	71(82%)	16(18%)	.82	.390

Table 4 Response Rate

Details	Frequency	Percent
Distributed Questionnaires	97.00	100.00%
Returned Questionnaires	91.00	94.85%
Effective Response	87.00	89.69%

Table 5 Factor Analysis Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.713
Bartlett's Test of Sphericity	Approx. Chi-Square	601.350
	Df	153
	Sig.	.000

Table 6 Moderated Multiple Regressions Summary for Process Innovation

Model	R	R^2	Adjusted R^2	S.E.E	R^2 Change	F Change	df1	df2	Sig. F Change
1	.039[a]	.002	-.016	.24541	.002	.086	1	57	.771
2	.252[b]	.064	.030	.23978	.062	3.709	1	56	.059
3	.724[c]	.525	.499	.17239	.461	53.347	1	55	.000

Predictors: (Constant), Technology, Process b. Predictors: (Constant), Technology, Process, Process*Technology c. Dependent Variable: performance

Table 7 Moderated Multiple Regressions Coefficients for Process Innovation

Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	.123	.032		3.810	.000
	Process	.011	.038	.039	.293	.771
2	(Constant)	.084	.038		2.229	.030
	Process	-.009	.039	-.031	-.228	.820
	Technology	.108	.056	.259	1.926	.059
3	(Constant)	-.129	.040		-3.244	.002
	Process	-.231	.041	-.801	-5.603	.000
	Technology	.818	.105	1.961	7.773	.000
	Process*Technology	1.047	.143	1.802	7.304	.000

a. Dependent Variable: performance

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Table 8 ANOVA Summary for Process Innovation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.005	1	.005	.086	.771[b]
	Residual	3.433	57	.060		
	Total	3.438	58			
2	Regression	.218	2	.109	1.899	.159[c]
	Residual	3.220	56	.057		
	Total	3.438	58			
3	Regression	1.804	3	.601	20.232	.000[d]
	Residual	1.634	55	.030		
	Total	3.438	58			

a. Dependent Variable: performance b. Predictors: (Constant), Technology, Process c. Predictors: (Constant), Technology, Process, Process*Technology

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