

Effect of Board Human Capital on Innovativeness in the Banking Industry in Kenya

Sebastian Nzau Nthama

School of Business and Economics, Moi University, P.O Box 3900, Eldoret

Abstract

Extant literature shows that human capital by top management teams helps firm performance but does not explore impact of board human capital on firm innovativeness. Anchored on agency, resource dependence and human capital theories, this study sought to determine impact of human capital on innovativeness in commercial banks. Kenya has experienced significant innovations in the banking sector driven primarily by mobile technologies. Examples of innovative products in the banking sector include M-Pesa, M-Kesho M-Shwari, M-Kopa and Pesalink. On this basis, scope of the study was banking sector in Kenya. Empirical research has mixed findings, some showing board human capital positively affects innovativeness, with others showing it either has negative or no effect. Consistent with logic, the study hypothesized that human capital positively impacts firm innovativeness. Independent variables conceptualized under this study were directors' educational qualifications, experience and functional diversity. Two control variables were added, to mitigate against their confounding effect on the dependent variable, bank innovativeness. Three hypotheses were postulated under this study. A causal research design was selected to focus on specific research hypotheses aimed at generating managerially actionable results. Under the study, purposive sampling was undertaken. A questionnaire was developed and reviewed by two university faculty as well as two bank directors. Feedback obtained from the reviews was incorporated before sending questionnaires to the managing directors of the 43 banks, the commercial bank universe in Kenya. 32 questionnaires were completed and returned, constituting a response rate of 74%. Data was reviewed and analyzed using statistical software, SPSS. Assumptions made for data were tested. Robustness tests were undertaken. Descriptive and inferential statistics were computed. Pearson's correlation coefficients were calculated. Multiple regression was undertaken. The study found that there was statistically significant relationship between directors' educational qualifications, experience and functional diversity and innovativeness of banks. This study helped resolve disagreement in extant research, by concluding that educational qualifications, board experience, functional diversity drive innovativeness. This study can benefit management, in providing a selection criteria for directors where the entity has innovativeness as a principal focus area. Policy makers, in promulgating corporate governance guidelines can also benefit from this study, by suggesting a selection criteria for directors. Limitations of the study include a narrow focus on banking industry, yet future research can widen this to service sector to enhance generalizability. A second limitation is use of board as unit of analysis, rather than role played by individual directors in innovativeness, for which future research is also recommended.

Keywords: Corporate governance, Human Capital, Innovativeness, Kenya.

1. Introduction

Boards of directors play many roles including provision of resources (Pfeffer and Salancik, 1978), hiring chief executive (Masulis & Xie, 2011) and monitoring and advising management (Haynes and Hillman (2010). In discharging their responsibilities, boards utilize human capital, defined by Hillman and Dalziel (2003) as consisting experience, expertise and reputation. Board human capital constructs as operationalized later in this study include board education consistent with Wincent, Anokhin & Örtqvist (2010), Chen (2014) and Bantel & Jackson (1989); board functional diversity as operationalized in studies by Wincent et al., (2010), Yang (2014) and Jackson, May, & Whitney (1995) and board experience in line with studies by Chen (2014) and Johnson, Schnatterly & Hill (2013).

There is extensive literature on role of board capital on various firm outcomes, namely firm performance (Hillman & Dalziel, 2003), strategic change (Haynes & Hillman, 2010), CEO selection (Tian, Haleban and Rajagopalan, 2011) and firm growth (Kor & Sundaramurthy, 2008). Literature on the role of board capital on innovation as a firm outcome exists, but has inherent contradictions which are discussed in subsequent paragraphs. Innovation is comprehensively defined by Crossan & Apaydin (2010) as production or adoption, assimilation and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services and markets, development of new methods of production and establishment of new management systems and further, that it is both a process and an outcome. I support the view espoused by Ngo & O'Cass (2013) that innovation is important in firm success and performance.

Regarding studies on role of board capital on innovation that have yielded mixed results, Bantel and Jackson (1989), for instance, found that education, a form of human capital had no significant effect on administrative innovation while Dalziel, Gentry and Bowerman, (2011) found that directors' educational qualifications negatively affect research and development expenditure, a proxy of innovation. On the contrary, Subramaniam and Youndt

(2005), Chen (2014) and Wincent et al., (2010) found a strong association of directors' advanced education with innovation. This study sought to ascertain the impact of education held by members of the boards of directors on the innovativeness of firms. In so doing, the study would reconcile inconsistent study findings as discussed hereabove.

With regard to functional diversity, Wincent et al., (2010) found that functional diversity was beneficial to innovation. Effect of board functional diversity, yet another form of board human capital on innovation is unclear, with Haynes and Hillman (2010) calling for further research to determine when diversity can be beneficial and when it is not. Johnson et al., (2013) recommend further research to clarify the effect of experience, another form of board human capital on firm outcomes.

This study sought to reconcile the above findings in extant literature. Contextually, Kenya is a bedrock of innovations in the banking sector, with the most successful mobile money revolution being M-Pesa in Kenya, (Burns, 2014). This study attempted to determine the effect of board human on innovation in the banking industry in Kenya. The banking sector in Kenya is deemed a fertile ground for academic research because of the accelerated rate of adoption of banking innovations.

M-Pesa, M-Kesho M-Shwari, M-Kopa and Pesalink are some of the significant banking innovations in Kenya. M-Pesa (M for mobile and Pesa for money in Swahili, one of the two national languages in Kenya) is a small-value electronic payment and store of value system that is accessible on a mobile phone (Burns, 2015). This mobile money service provided by Safaricom, one of the telecommunications firms in Kenya, (Eijkman, Kendall & Mas, 2010) was introduced in Kenya in 2007 (Demombynes & Thegeya, 2012) and enables customers to deposit and make payments using their mobile phones. M-Kesho (M for mobile money and Kesho for tomorrow in Swahili) is the interest-bearing bank integrated mobile saving system introduced in Kenya in 2010 (Demombynes & Thegeya, 2012).

M-Shwari (M for mobile and Shwari for calm) is a bank account offering savings and loans to M-Pesa customers, (Cook & McKay, 2015). M-Kopa, (M for mobile money and Kopa for borrow in Swahili) provides micro-financed energy products in Kenya to M-Pesa customers, (Nique & Opala, 2014). In February 2017, banks unveiled a new service, Pesalink, that will enable customers to make real time payments without having to go through intermediaries. From popular press, it is understood that PesaLink payments will be processed on Mobile, Internet banking, ATM, Branch and Agency Banking platforms.

Pesalink (Pesa for money in Swahili), as reported in popular press is a real time interbank money transfer service available to bank customers effective July 2017, after four months of piloting. Transactions can be initiated from a mobile phone, internet banking, Automated Teller Machine or in a bank's branch or agency, with the end to end transaction taking less than a minute to complete. Under Pesalink, customers can transact amounts ranging from Kshs. 10 upto Kshs. 999,999 at any time. This service allows banks to share innovative infrastructure in delivery of cost effective and secure services to the banking community.

1.1 Innovativeness of the Banking Industry in Kenya

The financial sector in Kenya is well developed as demonstrated, for instance, by having forty-three licensed commercial banks, nine deposit taking micro finance institutions and over 3000 SACCOs (Omwansa & Waema, 2014). In recent times, excluding human resource costs, investments in technology by commercial banks is often the largest line item and perhaps the fastest growing (Aduda and Kingoo, 2012), perhaps all geared towards innovations. Innovations in the banking industry in Kenya include adoption of Automated Teller Machines (ATMs), smart cards, internet and mobile banking (Okiro and Ndungu, 2013). Consistent with Marfo-Yiadom and Ansong (2012), the Central Bank of Kenya observes that increase in the use of technology by banks has been driven mainly by stiff competition leading them to adopt cost effective channels in offering financial services to ensure efficiency and increase market share.

1.2 Statement of the Problem

Research on effect of human capital on firm innovativeness has yielded mixed results. For instance, Bantel and Jackson (1989) found that education, a constituent of board human capital had no significant effect on administrative innovation while Dalziel et al. (2011) found that directors' educational qualifications negatively affect research and development expenditure, a proxy of innovation. On the contrary however, Subramaniam and Youndt (2005), Chen (2014) and Wincent et al., (2010) found a strong association of directors' advanced education with innovation. Johnson et al., (2013) recommend further research to clarify the effect of experience, another form of board human capital on firm outcomes.

Effect of board functional diversity, yet another form of board human capital on innovation is unclear, with Haynes and Hillman (2010) calling for further research to determine when diversity can be beneficial and when it is not. Wincent et al., (2010) concluded that functional diversity was beneficial to innovation. Predicated on this backdrop, the study sought to address the lacunae cited in the existing literature in order to find out if board human capital has any effect on firm's innovativeness as no known study has been carried out within the Kenyan context.

1.3 Objectives

The general objective of this research was to investigate the effect of board human on innovativeness of banks. Specific objectives included investigating effect of educational qualifications, experience and functional diversity of directors on innovativeness of banks. Interaction effect of directors' experience and directors' education on innovativeness of banks was also investigated.

2. Literature Review

2.1 Innovativeness as a concept

Innovation is the process of developing new technological knowledge and putting that knowledge to productive use (Lodh, 2014). I support the view that technological developments that are not put into productive use have no utility, as this will be technology for the sake of it. The level of innovation manifests itself through rolling out new productive processes and / or new products. When innovation is viewed from the standpoint of an attribute of organisations, Bantel and Jackson (1989) refer this to innovativeness. This study, consistent with Lodh (2014) conceptualises innovativeness as an attribute of the organisations that develop new technological knowledge and puts the knowledge to productive use.

Crossan and Apaydin's (2010) study of peer reviewed journals published over a 27-year period between 1981 and 2008 result in a consolidated definition of innovation, as production or adoption, assimilation and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services and markets, development of new methods of production and establishment of new management systems and further, that it is both a process and an outcome. In so doing, Crossan & Apaydin (2010) traced the origin of innovation as a concept to Schumpeter in the late 1920's. This definition is comprehensive and singles out the concept of value-added novelty in determining whether a market player is innovative.

This study makes use of this literature by applying the definition of innovation in the banking industry in which new methods of service delivery have been developed with use of technology. Innovativeness of commercial banks is accordingly studied as the dependent variable

2.2 The Concept of Board Capital

Board human capital, as defined by Hillman and Dalziel (2003) consists of experience, expertise and reputation. Boards of directors perform four roles: hiring and monitoring managers, providing information and counsel to managers, and linking the corporation to the external environment (Carter et al., 2010). These roles are linked to the most popular theoretical frameworks used by researchers on corporate governance, namely agency and resource dependence theories. These theories are discussed in later sections. Masulis & Xie (2011) identify the core functions of a board as hiring, firing and compensation of managers. These board functions as identified by Masulis & Xie (2011) are perhaps not a true reflection of the practice in the real corporate world. The hiring of lower and middle level managers is a function of the top management team while the CEO significantly influences hiring his or her team, that is, the top management team.

Directors may differ in many important characteristics, such as educational and functional background, industry experience, social connectedness, insider status, gender and race (Ferreira, 2007). This is true especially considering that there are no formal qualifications for directorships. Hambrick et al., (2008) observe that although boards are viewed as homogenous units, anecdotal evidence and available literature show that due to various reasons, some directors have far more influence than others. The differences in director characteristics as summarised by Ferreira (2007) can be harnessed to yield competitive advantage for the focal firm. No research has determined the effect of board human capital on firm innovativeness, a core source of competitive advantage. This research pursued this gap and attempted to generate new knowledge in ascertaining the effect of board human capital on firm innovativeness.

As observed by Hambrick et al., (2008), majority of research on board of directors has been directed at board structures and review of existing literature confirms this. Board human capital, principally stock of education and experience has received scanty scholarly attention. One possible explanation of the relatively low attention paid to board capital, in contrast to board structures is the relative difficulty with which these abstract constructs can be conceptualised and measured.

Consistent with Chen (2014), it is possible that board capital has a positive effect on research and investment which is an important determinant of a firm's innovative capabilities. This researcher recommended extension of their study beyond the realm of the Taiwanese electronics they studied to include multiple industries and countries to enhance generalization of their findings. As the study relied on secondary data, the researcher also recommended alternative ways of gathering data. This research pursues extensions to research as recommended by Chen (2014): by studying board human capital in the banking industry in Kenya and using primary data. In summary, this study makes use of this literature by delineating board capital as a construct that has received inadequate scholarly attention, providing guidance on operationalization of board human capital, prising open Chen's (2014) recommendations for extension of research all of which this study considers in taking corporate

governance research forward.

2.3 Theoretical perspectives

There are numerous theoretical frameworks that scholars have used to analyze corporate governance phenomenon. Johnson et al., (2013) summarise their synthesis of diverse literature on directors' demography, human capital and social capital. Under the study, a total of 74 theoretical and empirical studies published in peer reviewed journals between 1990 and 2011 were reviewed. This meta-analysis is found useful as it consolidates the large body of literature into a parsimonious, theoretically grounded approach in understanding corporate governance phenomenon. In the meta-analysis, sixteen theories are used by various researchers with individual director as the focal point. The most prominent theories are agency, resource dependence and human capital theories. These three prominent theoretical frameworks are reviewed with a view to deepening our understanding on board human capital as it exists in the real world.

2.3.1 Agency Theory

Agency theory as articulated by Jensen and Meckling (1976) advances the idea that firm managers behave opportunistically and require monitoring and control by the board. OECD (2004) recommends that several board members be independent of management and suggests that separation of the roles of Chairman and CEO would further enhance independence. An independent board, as observed by OECD (2004) would conduct the board business more objectively, including effectively monitoring managers.

As observed by Roberts, McNulty & Stiles (2005), agency theory is increasingly being criticised for equivocal empirical findings and doubtful theoretical assumptions. A keen scholar evaluating agency theory would acknowledge that this classical theory that has had profound influence on corporate governance is not without flaws. First, the assumption of opportunistic behaviour has not been conclusively determined empirically. Second, the presumed capability by the board to monitor and control managers is perhaps premised upon symmetrical information. This assumption, when viewed against the prevalence of information asymmetry between directors and management makes the theory a fallacy and therefore unsuitable for the study of corporate governance.

There is vast literature in support of board independence as envisaged by both Jensen and Meckling (1976) and OECD (2004). However, this independence should not be viewed as a silver bullet to corporate governance challenges. A plethora of problems have been witnessed in corporate governance despite promulgation of stringent corporate governance regulations. Most notable corporate failures associated with corporate governance malpractices are Lehman Brothers that reportedly filed for bankruptcy in 2008 due to creative accounting issues and Enron Corporation whose failure is associated with inflation of earnings. Accordingly, agency theory is not the most practical lens for understanding corporate governance. Consistent with Johnson et al., (2013), increased theoretical specificity in the measurement of director characteristics is necessary with a view to moving board characteristics research stream forward. This approach would ensure researchers go beyond board independence and deepen understanding on how board decision making affects firm outcomes.

Despite the flaws, agency theory serves this study well by setting the ground for corporate governance phenomenon from which board capital, the core of this study proceeds. Accordingly, resource dependence and human capital theories are reviewed for further insights on corporate governance.

2.3.2 Resource Dependence Theory

In coming up with this theory, Pfeffer and Salancik (1978) argue that firms depend on their environment to survive and succeed and further note that boards expect a newly appointed director to support the firm with resolving challenges. This view is reinforced by Carter et al., (2010) who find boards of directors as an important link between the corporation and the external environment.

Pfeffer and Salancik (1978) present four main benefits of the external linkages, first, acquisition of information and expertise that the corporation requires in pursuit of business objectives, an example being innovation. Second, directors open channels of communication with the environment, enabling dissemination and acquisition of information that is pertinent to the organization's business success, including innovation. Third, directors help establish linkages to the entities in the environment and entities that the corporation requires in pursuit of business objectives. Fourth, directors legitimize the firm in the external environment.

Consistent with Hillman and Dalziel (2003), the limitations of resource dependence theory as articulated by Pfeffer and Salancik (1978) are apparent: the theory presents a wide range of resources that directors bring to firms but with little specificity of the resources or their potential value. Hillman and Dalziel (2003), attempt to deal with this tension by articulating board capital (sum of human and social capital of the board) as proxy for the board's ability to provide resources to the firm. These constructs are dealt with later in this chapter.

A critical evaluation of resource dependence theory reveals ambiguities. The theory is not expressly clear on the need to appoint directors. First, a firm should be able to procure required support or advice from consultants or similar service providers and thus circumvent the need for appointment of directors. Consultants, by their nature specialists in their spheres of knowledge should be able to provide superior support to the firms than directors. With proper terms of reference, one would expect to obtain superior level of advice and support from consultants

relative to directors, principally because the former are specialists in a given phenomenon while the latter are generalists sometimes appointed based on non-objective criteria. Second, the assumption that information flows in and out of the firm through directors can be faulted, principally because this role can be performed by managers in their interaction with the environment. However, the theory is not in vain as independent directors can provide new perspectives than those held by managers who may have vested interests. Resource dependence theory serves this study by setting the ground for understanding the role played by the directors in running of firms. It is imperative to turn to board human and social capital theories to assess if they are perhaps better theoretical lenses for understanding the relationship between corporate governance and innovation.

2.3.3 Human Capital Theory

Human capital theory is derived from the work of Becker (1964) that addresses the role of a person's stock of education, experience and skills that can be used to the benefit of the organisation. Johnson et al., (2013) summarise human capital characteristics as the skills and experiences that directors can bring to the decision-making process and which can be a source of competitive advantage. Human capital theory appears to be more definitive relative to resource dependence theory in the sense that it specifies what characteristics boards should consider while recruiting a director. With respect to education and consistent with logic, one would expect higher education standards attained by directors to be correlated with higher innovativeness driven by superior information processing capability.

Dalziel et al., (2011) found that advanced education was negatively related to research and development expenditure, a proxy for innovation in most existing literature. A possible explanation given by Dalziel et al., (2011) for this astounding finding is that educated directors may have been attracted to firms that already make more efficient use of research and development spending. These inconsistent findings on the effect of education standards attained by the directors on innovativeness present a tension that requires academic enquiry. Consistent with Chen (2014), educational level attained by directors as well as industry-specific experience were included as independent variables to examine the role of human capital in innovation as a measure of firm performance. This theory serves this study by supplying the key human capital predictor variables for firm innovativeness, namely director's education and experience.

2.4 Innovation in the banking industry in Kenya

Like majority of other businesses today, banks operate in difficult environments characterized by intensive competition and require deploying innovation to deliver low cost banking solutions to remain competitive, and Kenya is no exception. The direction and speed of innovation depends on the interaction of a series of factors, relating to technological opportunities, demand conditions, market structure, and the institutional environment in the adopting sector (Buzzacchi, 1995).

Bantel and Jackson (1989) studied the financial services industry in the United States because it was undergoing an 'innovation shift' from traditional to non-traditional technologies and under the study, 21 bankers interviewed defined innovation as a program, product, or practice that was in the early stage of acceptance and use in the industry. In the assessment of innovations in the banking industry, products or services would therefore require to be in the early stages of use and acceptance. Marfo-Yiadom and Ansong (2012) in their study on the innovation in Ghana's banking industry found Automated Teller Machines, telephone banking and credit cards as the new technology products used to deliver financial services.

The financial sector in Kenya is well developed as demonstrated, for instance, by having forty-three licensed commercial banks, nine deposit taking micro finance institutions and over 3000 SACCOs (Omwansa & Waema, 2014). In recent times, excluding human resource costs, investments in technology by commercial banks is often the largest line item and perhaps the fastest growing (Aduda and Kingoo, 2012), perhaps all geared towards innovations. Innovations in the banking industry in Kenya include adoption of Automated Teller Machines (ATMs), smart cards, internet and mobile banking (Okiro and Ndungu, 2013). Consistent with Marfo-Yiadom and Ansong (2012), the Central Bank of Kenya observes that increase in the use of technology by banks has been driven mainly by stiff competition leading them to adopt cost effective channels in offering financial services to ensure efficiency and increase market share.

M-Pesa, M-Kesho M-Shwari and M-Kopa are the most significant banking innovations in Kenya. M-Pesa is a small-value electronic payment and store of value system that is accessible on a mobile phone (Burns, 2015). This mobile money service provided by Safaricom, one of the telecommunications firms in Kenya, (Eijkman, Kendall & Mas, 2010) was introduced in Kenya in 2007 (Demombynes & Thegeya, 2012) and enables customers to deposit and make payments using their mobile phones. Dalton, Pamuk, van Soest, Ramrattan, & Uras (2017) in their study estimated that in Kenya, 95% households were using M-Pesa. As manifestation of wide adoption of this technology, in 2013, M-Pesa transactions amounted to US\$24 billion, more than half Kenya's GDP (Burns 2014).

M-Kesho is the interest-bearing bank integrated mobile saving system introduced in Kenya in 2010 (Demombynes & Thegeya, 2012), introduced into the market by Equity Bank and Safaricom. M-Shwari is a bank

account offering savings and loans to M-Pesa customers, (Cook & McKay, 2015). M-Kopa, provides micro-financed energy products in Kenya to M-Pesa customers, (Nique & Opala, 2014). These three products, in addition to M-Pesa are manifestations of an innovative mobile banking service in Kenya over the recent past.

Pesalink (Pesa for money in Swahili), as reported in popular press is a real time interbank money transfer service available to bank customers effective July 2017, after four months of piloting. Transactions can be initiated from a mobile phone, internet banking, Automated Teller Machine or in a bank's branch or agency, with the end to end transaction taking less than a minute to complete. Under Pesalink, customers can transact amounts ranging from Kshs. 10 upto Kshs. 999,999 at any time. This service allows banks to share innovative infrastructure in delivery of cost effective and secure services to the banking community. As the service had only recently been launched, there were no publicly available statistics on uptake of the service, specifically regarding number of customers who have commenced use of Pesalink and amounts of money transacted on Pesalink.

2.5 Board human capital and innovation

Human capital theory is derived from the work of Becker (1964) that addresses the role of a person's stock of education, experience and skills that can be used to the benefit of the organisation. Functional diversity is a related construct and we discuss here below how each of these board human capital constructs affect innovation. In the subsequent paragraphs, a summary of related empirical studies where these exist as well as a critique of the same is provided.

2.5.1 Educational qualifications of directors and innovation

Available literature suggests that directors with formal education and other investments in skills are better able to contribute to finding creative solutions in their organizations (Wincent et al., 2010). This is consistent with logic as those in possession of good education can better appraise a situation, generate and assess options and select the most appropriate option. Empirical work, however, has provided mixed results regarding role of education in innovation. Bantel and Jackson (1989) found that education level had no significant effect on certain types of innovation while Dalziel et al., (2011) found that educational degrees held by external directors negatively affect research and development expenditures, a proxy of innovation in extant literature. These findings by Bantel and Jackson, (1989) and Dalziel et al., (2011) are puzzling, especially when viewed against earlier findings by Subramaniam and Youndt (2005) as well as latter findings by Chen (2014) and Wincent et al., (2010) that associate advanced education held by the directors with a higher information-processing capability that drive innovation.

Drawing from resource based theory, it is likely that higher educational qualifications should provide the directors with higher information processing capability to deal with a vast amount of data in the banking industry. This is likely to facilitate innovative capabilities as directors provide monitoring and advisory services to the firms. This study sought to determine empirically how educational qualifications of directors affect innovativeness in the banking industry.

2.5.2 Experience of the directors and innovation

Drawing from resource dependence theory, scholars suggest that experience with in a particular industry affects the influence of a director in the board decision making process. This is logical as decision making process is understood to be influenced by a person's orientation which would be shaped by past experiences. Johnson et al., (2013) in their review of theoretical and empirical studies published between 1990 through 2011 broadly classify experience into four: experience as CEO, venture capital experience, financial expertise and experience with specific activities. In the end, they sum up that the effect of these different aspects of experience affects various firm outcomes differently and that scholars have to undertake further research to clarify the condition, functional form as well as the mechanisms of the effect. Chen (2014) observes that directors with industry-specific experience will be apt in the industry's technology, customer needs and competitive moves and will accordingly better evaluate the prospects of innovation. Mumford et al., (2002) argued that leaders must possess technical and professional expertise for them to lead in creative efforts.

Intuitively, technical and professional expertise yield from a combination of education and hands on experience and consistent with Chen (2014), it is possible that the more the experience in the banking industry, the more innovative the directors will be. There is merit in thinking that firms operating in competitive markets that forces players to leverage on innovation are likely to seek directors who have had prior experience with innovation. One hypothesis is developed to take into account directors' experience in banking industry, either as employees or directors.

2.5.3 Functional diversity in the board and innovation

Johnson et al., (2013) observe that scholars have investigated effects of board heterogeneity with conflicting conclusions. For instance, board heterogeneity can have either potential for diversity of opinions that can create board conflict or enhance a firm's access to resources. Accordingly, board heterogeneity can be a double-edged sword as it can enable a firm to either prosper or stagnate. Building on available literature on group heterogeneity (Jackson et al., 1995) which finds more heterogeneous groups to be more creative, it is likely that heterogeneous boards will have higher knowledge stocks, a prerequisite for innovation.

There is reason to support heterogeneous boards, consistent with Yang (2014) who posit that less heterogeneous boards lead to myopic thinking which impedes recognition of creative opportunities. Haynes and Hillman (2010) sum up their findings on board heterogeneity by pointing to the on-going tension between beneficial and non-beneficial heterogeneity and recommend further research to determine when diversity can be good or when it can be bad. One is persuaded to think, consistent with Wincent et al., (2010) that functional diversity is beneficial to innovation due to the benefits that can accrue from diversity of opinions and ideas enabling fast and fine-grained synthesis of complex emerging trends, as characterised by banking industry that serves an increasingly technologically-aware clientele. This study tested the effect of directors' functional diversity on innovativeness of banks.

2.6 Conceptual Framework

From review of extant literature, the independent variables, from which plausible relationships with the dependent variables are hypothesized, are shown in the conceptual framework in figure 2.1, below. The independent and dependent variables are operationalized in chapter three.

Conceptual Framework of how Board human capital affects innovativeness.

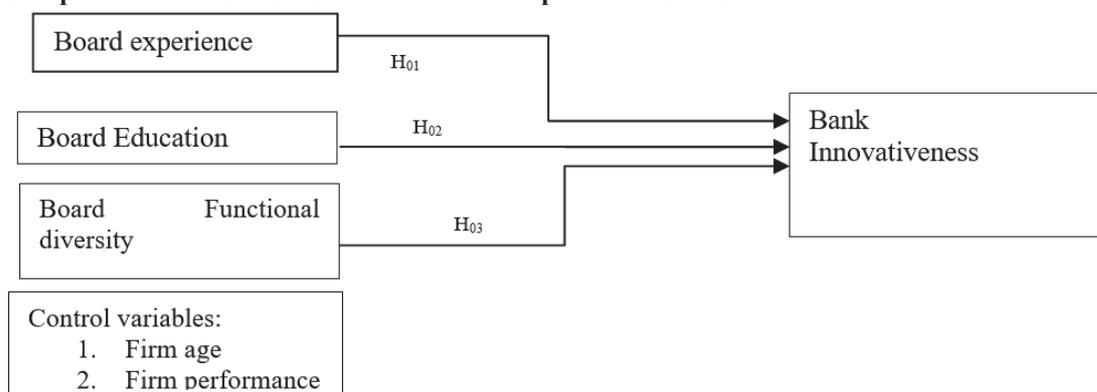


Figure 2.1: Interrelationship between variables subsumed in the study

3. Methodology

This is a causal research in which the effect of board human capital on innovativeness of commercial banks was investigated. Causal research design was preferred over exploratory or descriptive research designs as this study focused on specific research hypothesis aimed at generating managerially actionable results (Zikmund *et al.*, 2012).

3.1 Target population

Consistent with Aduda and Kingoo (2012), the target population consisted of all the commercial banks in Kenya. Under the study, board human capital of the boards as well as the innovativeness of the banks were ascertained from questionnaires completed by at least one director of the forty-three banks.

3.2 Sample size and sampling method

The sample size was forty-three and this study employed purposive sampling technique. The sample size of 43 was appropriate for multiple regression, consistent with Hair *et al.*, (2010) who opine that small samples, characterized by fewer than 30 observations are only appropriate for simple regression with a single independent variable. As the study specified three independent variables, the researcher took special care to ensure that completed questionnaires exceeded 30, the threshold for use of multiple regression analysis as espoused by Hair *et al.*, (2010). One of the tactics deployed by the researcher was to send out questionnaires to the managing directors of the forty-three banks. This way, response rate would be enhanced if questionnaires are addressed to the organisational representatives, i.e. to managing directors, rather than to individuals, consistent with Baruch (1999). Also, like the approach used by Bantel & Jackson (1989), follow up mails were sent to the respondents who had not responded within a month of sending the questionnaires out. Where responses were not obtained, telephonic follow up was made with the executive assistants of the managing directors. When the follow ups bore no fruit, the researcher chose to obtain responses from either an independent director, chairman, company secretary or chief finance officer of the banks, all of whom were deemed to be knowledgeable of the constructs under study.

3.3 Data collection

This study made use of both primary and secondary data. Table 3.1 includes definition of the data collected as well as the source. Primary data was collected mainly from managing directors of commercial banks via use of questionnaires. Following Buzzacchi *et al.*, (1995), care was taken to ensure presence in the sample of large,

medium and small tier banks. Where questionnaires were not received from some bank tiers, telephonic follow up was done. The directors were assured that the data was being collected for academic purposes only and that confidentiality will be observed. Personalized letters (see appendix 1) accompanying the questionnaires were sent to the directors using the postal addresses of the respective banks, see appendix 6. These letters stated the purposes of the research and how the results were going to be used. A research assistant was hired to help with data collection and coding. The data was collected between the months of April through to October 2016, after mailing the questionnaires earlier, in April 2016.

3.5.1 Validity and Reliability

Construct validity was achieved through initial discussions with at least two members of board of directors in the commercial banks. These two directors were not part of the final list of sampled directors. Also, discussions were held with two members of university faculty prior to sending out the questionnaires, primarily to ensure face validity, criterion validity as well as content validity. These reviews helped address clarity of the questions as well as whether the scales captured the desired information. Review by university faculty ensured that the study incorporate expert research experience accumulated in the faculty. Feedback obtained from the reviews was incorporated into the final questionnaire. Consistent with Subramaniam and Youndt (2005), reliability was tested by calculating Cronbach's alpha coefficients for each board human capital constructs. The coefficient alphas were compared with the suggested value of 0.60 in deciding whether the measures utilized in this study were acceptably reliable, (Zikmund *et al.*, 2012).

3.5.2 Measurement of Variables

There were three independent variables measuring board human capital. Two control variables were included to ensure that the findings were not confounded by the effect of either the age of the firm or firm performance. Board human capital was measured using three variables. Consistent with Bantel and Jackson (1989), Wincent *et al.*, (2010) and Dalziel *et al.*, (2011), directors' educational qualifications was one of the variables representing board human capital. Second, directors' experience was also included similar to the study by Chen (2014). Functional diversity in the board of directors was included as a variable to represent board human capital similar to studies by Haynes and Hillman (2010) as well as Wincent *et al.*, (2010).

Innovativeness, as defined by Lodh (2014) and Crossan & Apaydin (2010) was the dependent variable. Regarding the control variables, firm performance was controlled for in keeping with the studies by Jermias & Gani (2014) as well as Chen *et al.*, (2013). Firm age was controlled for consistent with Chen *et al.*, (2014).

3.5.2.1 Educational qualifications of directors

Available literature shows that information on education is easy to gather. Wincent *et al.*, (2010) operationalized board education as the total number of directors with at least a university degree. Johnson *et al.*, (2010) indicates attendance at elite schools as the other practical operationalization of director's education. Attendance at elite schools would be difficult to gather as there is no such categorization of schools in Kenya. For the purposes of this study, directors' educational qualifications were obtained from the respondents' answers to question 1d. Using a 5 point Likert scale, the respondents were asked to indicate their agreement to the statement that 'Directors of our banks' board possess at least one academic degree'. A score of 1 indicated strong disagreement with the above statement with a score of 5 indicating strong agreement. Consistent with logic, it was anticipated that the higher the boards' academic qualifications, the higher the banks' innovativeness.

3.5.2.2 Industry – specific experience of the directors

Review of extant literature indicates varied methodologies of operationalizing experience. Chen (2014) operationalized director's industry-specific experience in terms of number of posts held. Occupants of two or more posts were categorized as highly experienced while those who held one or no such post were categorized as poorly experienced or inexperienced. Director's experience was measured with use question 1a and 1b. Using a 5 point Likert scale, the respondents were asked to indicate their agreement to the statements that 'Directors of our board have experience in other banks as employees' and 'Directors of our board have experience in other banks as board members'. A score of 1 indicated strong disagreement with the above statements, with a score of 5 indicating strong agreement. Consistent with logic, it was anticipated that the higher the experience, the higher the banks' innovativeness.

3.5.2.3 Functional diversity in the board

Functional diversity has been operationalized in numerous ways chief among them a count of the number of different professions represented on the board, Wincent *et al.*, (2010). For the purposes of this study, functional diversity will be measured with use of question 1e. Using a 5 point Likert scale, the respondents were asked to indicate their agreement to the statement that 'There is functional diversity in our board due to the variety of professional backgrounds in our board of directors'. A score of 1 indicated strong disagreement with the above statement, with a score of 5 indicating strong agreement. Consistent with logic, the higher the degree of diversity, the higher the anticipation of higher innovativeness.

3.5.2.4 Dependent variable: Innovativeness

Extant literature shows various methodologies of operationalization of innovativeness as a construct. Zheng (2010)

reviewed empirical studies on the relationship of social capital and innovation and identified four measures of innovation. First, number of innovative outcomes such as patent counts. Second, subjective ratings such as evaluation by senior managers or directors. Third, efforts expended in innovative activities such as resource allocation and fourth, emphasis on innovation such as inclusion of innovation in the company vision. Considering contextual factors, we picked on the second operationalization and sought to rely on the directors' assessment of the innovativeness of the banks where they serve as directors with the use of 5 point Likert scale questions. Measurement of innovativeness by directors of the respective banks would provide better insights on the banks' innovativeness based on the belief that the respondents had sound firm level information at their disposal.

Under this study, innovativeness was ascertained by obtaining respondents' answers to question three questions: 4a through to d; 5a&b and 6 a through to c. Using 5 point Likert scale, the respondents were asked to indicate their agreement to the statements regarding whether their banks had rolled out innovative products, policies and structures to support innovation; included innovations in their strategic agenda and was actively pursuing innovations. Scores of 1 indicated strong disagreement with the above statements, with scores of 5 indicating strong agreement.

3.5.2.5 Control Variables: Firm age and Firm performance

In line with Bantel and Jackson (1989), this study was not intended to examine a complete model for innovation but rather to examine the role of board capital in firm innovativeness. Based on prior literature, there are many other variables that impact innovation. Two control variables were included in this study in keeping with the principle of parsimony. It was necessary to control for the effect of firm age and firm performance to ensure that our findings were not confounded by their effect on firm innovativeness. Consistent with Jermias and Gani (2014) as well as Chen *et al.*, (2013), firm performance was controlled for because some studies have shown that unprofitable firms reduce their research and development expenditure (a proxy for innovation) with other studies suggesting that less profitable firms experiment with innovative activity.

Following Chen *et al.*, (2013), this study also controlled for firm age measured by number of years the bank had been in existence because some studies have shown a negative relationship between a firm's age and research and development expenditure (a proxy of innovation). Firm age was sourced from corporate web sites (appendix 6) while firm performance was measured as firm's profit before tax for the year ended 2015.

3.6 Data Analysis

Consistent with Haynes and Hillman (2010), the main effect of board human capital on innovativeness as a firm outcome was tested using multiple linear regression model. Multiple regression was used to determine the presence of, and the strength of relationships between the independent and dependent variables. Modelling was done to determine the causation between human capital of the board and firm innovativeness. The effect of three predictor variables derived from human capital constructs on the single dependent variable (innovativeness) was ascertained and reported in chapter four. Data was coded and analyzed with the use of SPSS. Descriptive statistics as well as cross tabulation was used for data analysis and reporting.

With the use of Pearson product-moment correlation, beta coefficients were calculated to determine the direction and extent of relationship between the individual human capital variables and innovativeness. The matrix of coefficients was inspected for signs of multicollinearity. Further tests on multicollinearity were conducted, including calculation of Variance Inflation Factor (VIF). The values were compared to the rule of thumb's 10 or more values, the threshold indicating existence of multicollinearity (Salkind, 2007).

Consistent with Chen (2014), this study made use of lagged hierarchical regression analysis. First, the main effects variables (directors' education, experience, and functional diversity) were successively introduced and regressed against the dependent variable. Finally, the interactive effects (directors' education * directors' experience) as well as the control variables (firm age and firm performance) were introduced and regressed against the dependent variable. For each model, Shrunken or adjusted R^2 was computed to show the percentage of variance in the dependent variable explained by the independent or control variables in the model.

3.6.1 Model Specification

Review of available literature revealed that researchers continue to debate on the number of board capital variables to include in their model specifications. Inclusion of a multitude of variables gives rise to duality of problems: weighting of those variables as they are not likely to affect the dependent variable with similar intensity as well as cumulative measurement errors. Bhagat and Bolton (2008) argue that the measurement errors on simple variables such as board independence can be much less than the total measurement errors in measuring a multitude of variables. Consistent with this viewpoint, our model specification included three independent, two control variables and one dependent variable – innovativeness. The first model included the control variables, with the second incorporating the main effects, as follows:

$$\text{Model 1: } Inn = \beta_0 + \beta_1(Fa) + \beta_2(Fp) + \epsilon$$

$$\text{Model 2: } Inn = \beta_0 + \beta_1(Ed) + \beta_2(Ex) + \beta_3(Fd) + \epsilon$$

The models allowed us to estimate the effects of board human capital on the firms' innovativeness. The variables

in the model were as follows:

Inn = dependent variable, innovativeness as measured by directors of the focal firm, on a 5 point Likert scale;

β_0 = constant

β = coefficients, for variables Ed , Ex , Fd , Fa and Pp described here below:

Ed represents directors' educational qualifications;

Ex represents directors' experience, measured using a 5 point Likert-type question;

Fd represents functional diversity measured using a 5 point Likert-type question;

Two control variables were added to the main regression model, namely Firm age (Fa) and Firm performance (Fp).

Fa represents firm age in terms of the number of years the bank has been in existence. This information was obtained from the corporate web sites;

Fp is firm performance, measured by the focal firms' profit before tax for the year ended 2015, and

ϵ is the error term associated with unobservable factors driving innovativeness.

3.6.1.1 Model assumptions

Four principal assumptions were made regarding the model. During data analysis stage of this, investigations were conducted on the observed data to ensure that the underlying assumptions had not been violated. First, it had been assumed that observed variables will follow a normal distribution. Consistent with Tarus & Omandi (2013), a plot of residuals was undertaken to validate the normal distribution. Second, it had been assumed that the relationship between human and social capital of the board and firm innovativeness would be linear. Third, an assumption of independence had been made for the observed data. With use of SPSS, we undertook Durbin-Watson test to check the data for autocorrelation similar to the study by Tarus & Omandi (2013). Lastly, homoscedasticity was presumed, meaning that random errors had the same constant variance (Yan, 2009).

4. Data analysis, Interpretation and Presentation

This chapter presents the results of analysis performed on the primary as well as secondary data used for purposes of this study. Primary data was sourced from responses to questionnaires designed for this study. Secondary data was obtained from published sources. We made use of both descriptive and inferential statistics to establish the presence and strength of relationships between board human and social capital and bank innovativeness. Consistent with Haynes and Hillman (2010), the main effect of board capital on innovativeness as a firm outcome was tested using multiple linear regression model. Tests on multicollinearity were tested by calculation of Variance Inflation Factor (VIF).

4.2 Response Rate and generalizability of results

Out of the 43 questionnaires sent to selected respondents of the 43 commercial banks, 32 were completed and returned to the researcher, representing a 74.4% response rate. This response rate is deemed appropriate as it exceeded the 70% threshold rule of thumb according to Kothari (2007). The study results were deemed to be generalizable, principally based on two criteria. First, the number of observations per independent variable not only exceeded the minimum acceptable threshold of five, but attained the desirable level of between fifteen and twenty, and second, the sample was representative, Hair et al, (2010).

4.3 Robustness Tests

4.3.1 Validity Test

Prior to data collection, the instrument was subjected to face validity test. Construct validity was achieved through initial discussions with two members of board of directors in the commercial banks as well as two members of university faculty. This ensured face validity, criterion validity as well as content validity. These reviews helped to address clarity of the questions as well as concerns on whether the scales captured the desired information. The review by university faculty ensured that the study incorporates expert research experience accumulated in the faculty. Feedback obtained from the reviews was incorporated into the final questionnaire.

4.3.2 Reliability Test

Consistent with Subramaniam and Youndt (2005), reliability was tested by calculating Cronbach's alpha coefficients for each board human and social capital constructs, as can be seen in table 4.3.2.1, below. With the use of SPSS, coefficient alphas were calculated and found to be more than the rule of thumb values of 0.60 and 0.70 as suggested by Zikmund et al., (2012) and De Vaus (2001) respectively. From the results, it can be concluded that the constructs measured had the adequate threshold of reliability for the subsequent stages of analysis since all the Cronbach Alpha values were greater than 0.6.

Table 4.3.2.1: Reliability Analysis

Variables	Number of items	Cronbach Alpha
Board Human Capital	9	0.672
Innovativeness	9	0.770

4.3.3 Auto-correlation

Similar to the study by Tarus & Omandi (2013), Durbin-Watson test was calculated to check the data for autocorrelation among variables. As can be seen in table 4.3.3.1, below, the Durbin-Watson statistic at 1.856 suggests that the data is free from autocorrelation, based on Ott & Longnecker (2001)'s rule of thumb that critical values below 1.5 and above 2.5 give suspicion to positive or negative serial correlation. Based on these findings, the study concluded that linearity assumption obtained before proceeding to undertake multiple regression analysis.

Table 4.3.3.1: Durbin Watson test

Test Statistic(DW)	P-Value
1.856	0.002b

4.3.4 Test for Normality

Normality test was undertaken by plotting the residuals, consistent with Tarus & Omandi (2013). The variables were subjected to normality tests to check whether the data provided by the dependent variable (Y) was normally distributed, with the result included in appendix 8 reflecting a normal distribution, evidence that condition of normality for innovativeness is satisfied.

Further results on the test of normality using Kolmogorov-Smirnov test of normality shows negation of normality assumption since the p-value of 0.006 is less than 0.05 as shown in the table 4.3.4.1 below. This is corroborated by the Shapiro-Wilk test, with p-value at .023 that is less than the .05, an indication that the data is not from a normally distributed population. Whereas the numerical methods of testing normality are sensitive to sample sizes, from the normal distribution curve in appendix seven we discerned that the data was normally distributed and proceeded with further robustness tests.

Table 4.3.4.1 Tests of Normality:

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
innovativeness fp	.191	31	.006	.922	31	.021

4.3.5 Multicollinearity, Tolerance and VIF

Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. We tested the independent variables data for multicollinearity by generating variance inflation factors (VIF), as can be seen in table 4.3.5.1 below. We compared the VIF to the rule of thumb suggested by Zikmund (2007) that VIF above 5 indicate multicollinearity. As the VIF for the variables are in the region of 1, this study concluded there was no incidence of multicollinearity. The tolerance values are a measure of the correlation between the predictor variables and can vary between 0 and 1. The closer to zero the tolerance value is for a variable, the stronger the relationship between the two predictor variables.

Table 4.3.5.1: Multicollinearity, Tolerance and VIF

Study Variable	Collinearity Statistics	
	Tolerance	VIF
Directors' educational qualification	1.000	1.000
Directors' experience	1.000	1.000
Interactive effect (education*experience)	1.000	1.000
Functional Diversity	1.000	1.000

4.3.7 Heteroscedasticity

Heteroscedasticity means that previous error terms are influencing other error terms and this violates the statistical assumption that the error terms have a constant variance. This was checked using normal P plots and scatter diagrams and there was no evidence of heteroscedasticity. The Variance inflation factor (VIF) was checked in all the analysis and it ranged from above 1 to 4 which is not a cause of concern.

4.4 Descriptive statistics

As can be seen in table 4.4.1 below, respondents indicated that board functional diversity was high, closely followed by board education. In general, respondents reported low director status and prestige relative to the other variables. In terms of the range, maximum score was attained in all the variables except for director status and prestige whose maximum score was three out of a possible five. Descriptive statistics are summarized in the table overleaf.

Table 4.4.1: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Board education	32	2.00	5.00	4.45	.692
Board experience	31	1.00	5.00	2.54	1.053
Board functional diversity	32	2.00	5.00	4.31	.732

4.5 Correlation Analysis

Similar to the study by Tarus & Omandi (2013), this study made use of correlation analysis, the results of which are included in table 4.5.1. These results reflect a positive and significant correlation between all the variables under study and innovativeness, except for the variable regarding presence of relationships between the director and the bank or chief executive. In terms of robustness of the study, the correlation coefficients between the independent variables (education, experience, interlocks, diversity) range between -0.297 and 0.451, indicating that the correlations are not major.

Table 4.5.1

Pearson correlation matrix (n=32), (P-values in parenthesis)

	Innovativeness	Board Education	Board Experience	Functional diversity	Firm performance	Firm age
Board Education	0.831 (.001)*	1				
Board Experience	0.750 (.017)*	-.094 (.613)	1			
Functional diversity	.663 (.000)*	.068 (.712)	.150 (.420)	1		
Firm performance	.453 (.010)	.209 (.251)	.069 (.710)	.167 (.361)	1	
Firm age	.263 (.154)	.128 (.487)	.023 (.902)	.024 (.898)	.395 (.025)	1

* Correlation is significant at the 0.05 level (2-tailed).

4.6 Regression Analysis

Consistent with Haynes and Hillman (2010), the main effect of board human capital on innovativeness was tested using both Pearson correlation and linear regression. In the case of regression analysis, the study utilized the lagged hierarchical regression analysis, similar to the approach used by Chen (2014), whereby impact of the independent variables on the dependent variable was ascertained one variable after the other. Shrunken or adjusted R^2 was computed to show the percentage of variance in the dependent variable explained by the independent or control variables in the model. The results are presented in table 4.6.1. Model 1 presents study results of the effect of control variables on the dependent variables. Model 2 presents the main effects.

4.6.1 Control variables

Model 1 revealed an R value (coefficient of determination) of 0.458, implying that the control variables explain 45.8% of the variability of the dependent variable, innovativeness. The F critical at 5 percent level of significance was 2.27. Since F calculated is greater than the F critical (value =3.852) as shown in Table 4.6.1, this shows that the overall model was significant. The significance is less than 0.05, indicating that the control variables explain variation in the dependent variable, innovativeness.

With respect to impact of firm performance on innovativeness, the regression coefficient is 0.030. This implies that firm performance accounts for 3% of bank's innovativeness. With p-value of 0.010, this is evidence that there is significant relationship between firm performance and bank innovativeness. Regarding the second control variable, firm age, the regression coefficient is 0.020. This implies that firm age accounts for 2% of bank's innovativeness. With p-value of 0.154 which is higher than 0.05, this implies that there is no significant positive relationship between firm age and innovativeness.

4.6.2 Main effects

Model 2 revealed an R value (coefficient of determination) of 0.747, implying that board education, board experience and functional diversity account for 74.7% of bank innovativeness. In effect, the main effects as outlined explain 74.7% of the variability of the dependent variable, innovativeness. The F critical at 5 percent

level of significance was 2.27. Since F calculated is greater than the F critical (value =5.262) as shown in Table 4.6.1, this shows that the overall model was significant. The significance is less than 0.05, as demonstrated by p-value of .001, indicating that the main effects explain variation in the dependent variable, innovativeness.

This study has tested the hypotheses of this study. First, with regard to hypothesis 1 that educational qualifications of directors have a significant effect on bank innovativeness, results in table 4.6.1 support this hypothesis. This finding helped to reconcile disagreement in extant literature. Wincent et al., (2010), Chen (2014) and Subramaniam and Youndt (2005) had found that educational qualifications of directors drive innovation while studies by Bantel & Jackson (1989) and Dalziel et al., (2011) had reported contradictory results. The regression coefficient for this variable, at 1.546 and p-value of .035 is evidence that there is significant relationship between educational qualifications of directors and bank innovativeness.

With respect to hypothesis 2 regarding impact of experience of directors on innovativeness, the results in table 4.6.1 support this hypothesis, consistent with the findings by Chen (2014). The regression coefficient for this variable, at 0.228 and p-value of .001 is evidence that there is significant relationship between experience of directors and bank innovativeness.

Hypothesis 3 dealt with functional diversity of directors and its associated impact on innovativeness of banks. The results in table 4.6.1 support this hypothesis. This study helped resolve controversy in extant literature, where Jackson et al., (1995), Yang (2014) and Wincent et al., (2010) found that functional diversity positively impacted innovativeness unlike Johnson et al., (2013) who observed that board heterogeneity can have potential for diversity of opinions that can create board conflict. The regression coefficient for this variable, at 3.557 and p-values of .004 is evidence that there is significant relationship between functional diversity of directors and bank innovativeness.

Table 4.6.1: Regression Results

Variable	Model 1 Control variable	Model 2 Main effects
Intercept	34.11 (1.69)	19.006(7.005)
Board education		1.546(1.028)*
Board experience		.228(.677)*
Functional diversity		3.557(1.137)*
Firm performance	.030(.050)*	
Firm age	.021(.039)	
R	.458	.747
R Square	.210	.558
Adjusted R Square	.155	.452
F	3.852*	5.262*

Figures represent unstandardized coefficients. Values in parenthesis are standard errors. * indicate variable is significant at 5%

Dependent Variable: innovativeness_fp

4.7 Missing Data

Two separate research questions were unanswered by two different respondents. This incidence of missing data, well below ten percent, is an acceptable low level of missing data that did not warrant further diagnosis, Hair et al., (2010).

5.0 Summary, Conclusion and Recommendations

5.1 Summary

The general objective of this research was to investigate the effect of board human capital on innovativeness of banks. Specific objectives in this study were four. First, to investigate the effect of educational qualifications of directors on innovativeness of banks. Second, to assess the effect of directors' experience on innovativeness of banks. Third, to investigate the effect of functional diversity of directors on innovativeness of banks. Finally, the interaction effect of directors' education and experience on innovativeness of banks were also investigated.

So as to achieve the objectives of the study, primary data was collected using a questionnaire that was developed and sent to managing directors of commercial banks in Kenya. Telephonic and mail follow up was done to enhance response rate. Data was coded and analyzed using statistical software. Secondary data was obtained from the CBK website.

Data collected was subjected to statistical tests with a view to validate that assumptions made obtained. Specifically, data was tested for reliability with the use of Cronbach alpha. Auto correlation was tested using Durbin-Watson test while normality was tested vide Kolmogorov-Smirnov and Shapiro-Wilk tests. Variance inflation factors were computed to test data for multicollinearity as well as heteroscedasticity. Descriptive statistics

were computed and used in data analysis. Pearson correlation and linear regression was used to ascertain effect of board capital on innovativeness of commercial banks.

5.2 Conclusion

This study examined impact of human capital on innovativeness of banks. The findings help resolve tensions in extant literature on the role of human capital on innovativeness of banks. Also, the findings help to reconcile disagreement in extant literature. The first objective regarding the effect of educational qualifications of directors on innovativeness of banks had a corresponding hypothesis that educational qualifications of directors have no statistically significant effect on innovativeness of commercial banks. The regression coefficient for this variable, at 3.886 and p-value of .001 is evidence that there is significant relationship between educational qualifications of directors and bank innovativeness. The controversy found in extant literature regarding impact of educational qualifications of directors on innovativeness of banks indicated for instance has thus been resolved. For instance, findings by Wincent et al., (2010), Chen (2014) and Subramaniam and Youndt (2005) suggesting that educational qualifications of directors drive innovation and which had been contradicted by findings by Bantel & Jackson (1989) and Dalziel et al., (2011) has been reconciled by this finding.

The second objective aimed to assess the effect of directors' experience on innovativeness of banks and had a corresponding hypothesis that experience of directors has no statistically significant effect on innovativeness of commercial banks. The regression coefficient for this variable, at 0.482 and p-value of .017 is evidence that there is significant relationship between experience of directors and bank innovativeness.

The third objective sought to investigate the effect of functional diversity of directors on innovativeness of banks and had a corresponding hypothesis that functional diversity of directors has no statistically significant effect on innovativeness of commercial banks. The regression coefficient for this variable, at 3.921 and p-values of .000 is evidence that there is significant relationship between functional diversity of directors and bank innovativeness.

5.3 Limitations and recommendations for future research

This study was not without limitations. First, although response rate was 74%, the absolute number of observations, at 32 is marginally above the threshold of small samples, Hair et al., (2010). Small samples inherently give rise to sampling errors and it is imperative for future research to increase the sample size perhaps by studying the service industry in multiple sectors, rather than undertaking a sector specific study. This would enhance generalizability of the study findings.

Secondly, the unit of analysis in this study was the board of directors. Accordingly, the contribution of individual directors was not considered. Tian et al., (2011) advocate for research aimed at finding out how independent directors can contribute to the focal company. It is imperative that future research is undertaken to ascertain the role played by individual directors on innovativeness of the focal company.

5.4 Policy Recommendations

This study has provided important insights that can be leveraged on by policy makers. First, the corporate governance codes, for instance in Kenya, do not pronounce themselves on matters regarding educational qualifications of directors yet this variable seems to impact firm outcomes, e.g. innovativeness significantly. This study therefore can benefit policy makers and management alike, by providing useful insights on inclusion of educational qualifications as part of the criteria to be considered in the appointment of directors. Second, banks seeking to be innovative can also consider functional diversity and board member expertise, as these have empirically been shown to positively impact innovativeness in this study.

REFERENCES

- Aduda, J., & Kingoo, N. (2012). The relationship between electronic banking and financial performance among commercial banks in Kenya. *Journal of Finance and Investment Analysis*, 1(3), 99-118.
- Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: does the composition of the top team make a difference?. *Strategic Management Journal*, 10(S1), 107-124.
- Baruch, Y. (1999). Response rate in academic studies-A comparative analysis. *Human relations*, 52(4), 421-438.
- Becker, G. (1964). *Human capital*. Chicago, IL: University of Chicago Press.
- Bhagat, S. & Bolton, B. (2008). Corporate Governance and Firm Performance. *Journal of Corporate Finance*, 14, 257-273.
- Burns, S. (2015). Mobile Money and Financial Development: The Case of M-PESA in Kenya. Available at SSRN: <https://ssrn.com/abstract=2688585> or <http://dx.doi.org/10.2139/ssrn.2688585>
- Buzzacchi, L., Colombo, M. G., & Mariotti, S. (1995). Technological regimes and innovation in services: the case of the Italian banking industry. *Research Policy*, 24(1), 151-168.
- Carter, D. (2010), 'The Gender and Ethnic Diversity of US Boards and Board Committees and Firm Financial Performance', *An International Review*, 2010, 18(5):396-414

- Cook, T., & McKay, C. (2015). How M-Shwari works: the story so far. Consultative Group to Assist the Poor (CGAP) and Financial Sector Deepening (FSD).
- Chen, H. (2014), 'Board Capital, CEO Power and R&D Investment in Electronics Firms', *An International Review*, 2014
- Crossan, M.M & Apaydin, M. (2010), 'A multi-Dimensional Framework of Organisational Innovation: A Systematic Review of the Literature'. *The Journal of Management Studies*, 47:6
- Dalton, P., Pamuk, H., van Soest, D., Ramrattan, R., & Uras, B. (2017). Technology Adoption by Small and Medium Businesses: Experimental Evidence from Mobile Money in Kenya. DFID Working Paper.
- Dalziel, T., Gentry, R. J. and Bowerman, M. (2011), An Integrated Agency-Resource Dependence View of the Influence of Directors' Human and Relational Capital on Firms' R&D Spending. *Journal of Management Studies*, 48:1217-1242.
- Demombynes, G., & Thegeya, A. (2012), Kenya's Mobile Revolution and the Promise of Mobile Savings. World Bank Policy Research Working Paper No. 5988. Available at SSRN: <https://ssrn.com/abstract=2017401>
- De Vaus, D. A. (2002). *Surveys in social research*, Allen and Unwin. Crows Nest, NSW.
- Eijkman, F., Kendall, J., & Mas, I. (2010). BRIDGES TO CASH: THE RETAIL END OF M-PESA. *Savings and Development*, 34(2), 219-252. Retrieved from <http://www.jstor.org/stable/41406519>
- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis: A global perspective* (Vol. 7). Upper Saddle River, NJ: Pearson.
- Hambrick, D. C., Werder, A. V., & Zajac, E. J. (2008). New directions in corporate governance research. *Organization Science*, 19(3), 381-385.
- Haynes, K. T. & Hillman, A. (2010), 'The Effect of Board Capital and CEO Power on Strategic Change'. *Strategic Management Journal*, 31: 1145-1163
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management review*, 28(3), 383-396.
- Jackson, S. E., May, K. E., & Whitney, K. (1995). Understanding the dynamics of diversity in decision-making teams. *Team effectiveness and decision making in organizations*, 204, 261.
- Jensen, M. & Meckling, W. (1976). Theory of the firm: Managerial behaviour, agency costs, and ownership structure. *Journal of Financial Economics*, 3, 305-360.
- Jermias, J. & Gani, L. (2014). The impact of board capital and board characteristics on firm performance. *The British Accounting Review*, 46, 135-153.
- Johnson, S., Schnatterly, K., Bolton, J. F., & Tuggle, C. (2011). Antecedents of new director social capital. *Journal of Management Studies*, 48(8), 1782-1803.
- Johnson, S.G., Schnatterly, K., & Hill, A.D. (2013). Board composition Beyond Independence: Social Capital, Human Capital and Demographics. *Journal of Management*, 39:232
- Kor, Y. Y., & Sundaramurthy, C. (2008). Experience-based human capital and social capital of outside directors. *Journal of Management*.
- Lodh, S. (2014). Innovation and Family Ownership: Empirical Evidence from India. *Corporate Governance: An International Review*, 2014, 22(1): 4-23
- Marfo-Yiadom, E., & Ansong, A. (2012). Customers' Perception of Innovative Banking Products in Cape Coast Metropolis, Ghana. *International Journal of Business and Management*, 7(3), p162.
- Masulis, A and C. FeiXie (2012), 'Globalizing the boardroom - The effects of foreign directors on corporate governance and firm performance', *Journal of Accounting and Economics*, June 2012, Volume 53, Issue 3, pp 527-554.
- Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading creative people: Orchestrating expertise and relationships. *The Leadership Quarterly*, 13(6), 705-750.
- Nique, M., & Opala, K. (2014). The synergies between mobile, energy and water access: Africa. *Energy*, 32(34), 36.
- Ngo, L. V., & O'Cass, A. (2013). Innovation and business success: The mediating role of customer participation. *Journal of Business Research*, 66(8), 1134-1142.
- O'Connor, M and M. Rafferty (2012), 'Corporate Governance and Innovation', *Journal of Financial and Quantitative Analysis*, Vol. 47, No. 2, Apr. 2012
- Okiro, K and Ndungu, J (2013), The impact of mobile and internet banking on performance of financial institutions in Kenya, *European Scientific Journal*, Vol. 9, No. 13
- Omwansa, T. K., & Waema, T. M. (2014). Deepening financial inclusion through collaboration to create innovative and appropriate financial products for the poor. KBA Centre for Research on Financial Markets and Policy Working Paper Series.
- Ott, R. L., & Longnecker, M. T. (2001). *An introduction to statistical methods and data analysis*. Cengage Learning.
- Pfeffer, J and Salancik, G (1978), *The external control of organisations: a resource dependence perspective*. New York: Harper and Row.

- Rass, M., Dumbach, M., Danzinger, F., Bullinger, A. C., & Moeslein, K. M. (2013). Open innovation and firm performance: The mediating role of social capital. *Creativity and innovation management*, 22(2), 177-194.
- Roberts, J., McNulty, T., & Stiles, P. (2005). Beyond agency conceptions of the work of the non executive director: Creating accountability in the boardroom. *British Journal of Management*, 16(s1), S5-S26.
- Rosenberg, N. (2004). *Innovation and economic growth*. Innovation and Economic Growth.
- Salkind, N. J. (Ed.). (2007). *Encyclopedia of measurement and statistics*. (Vols. 1-3). Thousand Oaks, CA: SAGE Publications, Inc. doi: <http://dx.doi.org/10.4135/9781412952644>
- Subramaniam M, & Youndt, M.A. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities *ACAD MANAGE J* June 1, 2005 48:3 450-463;
- Sundaramurthy, C., Pukthuanthong, K., & Kor, Y. (2014). Positive and negative synergies between the CEO's and the corporate board's human and social capital: A study of biotechnology firms. *Strategic Management Journal*, 35(6), 845-868..
- Tarus, D. K., & Omandi, E. M. (2013). Business Case for Corporate Transparency: Evidence from Kenya. *European Journal of Business and Management*, 5(3).
- Tian, J. J., Haleblan, J. J., & Rajagopalan, N. (2011). The effects of board human and social capital on investor reactions to new CEO selection. *Strategic Management Journal*, 32(7), 731-747.
- Wincent, J., Anokhin, S., & Örtqvist, D. (2010). Does network board capital matter? A study of innovative performance in strategic SME networks. *Journal of Business Research*, 63(3), 265-275.
- Yan, X. (2009). *Linear regression analysis: theory and computing*. World Scientific.
- Yang, C. W. (2014). Implementing hospital innovation in Taiwan: the perspectives of institutional theory and social capital. *The International Journal of Health Planning and Management*
- Zheng, W. (2010). A social capital perspective of innovation from individuals to nations: Where is empirical literature directing us?. *International Journal of Management Reviews*, 12(2), 151-183.
- Zikmund, W., Babin, B., Carr, J., & Griffin, M. (2012). *Business research methods*. Cengage Learning.