

Research Paper

## Human Capital, Innovation and Performance: Evidence from Commercial Banks in Kenya

Submitted in June 11, 2019

Accepted in September 25, 2019

Evaluated by a double blind review system

PETER NDERITU GITHAIGA<sup>1</sup>

### ABSTRACT

**Purpose:** The objective of this paper was to examine the effect of human capital on performance, and the mediating role of innovation among commercial banks in Kenya.

**Design/Methodology/Approach:** A survey research design approach was adopted. The population of the study consisted of all the licensed banking institutions in Kenya. However, due to the availability of data only 31 banks qualified for analysis. Panel data set for the period between 2008- 2017 was extracted from the individual bank's audited reports and the Central Bank of Kenya annual bank supervision reports. Data was analyzed through descriptive and inferential statistics. The hypotheses were tested through the hierarchical regression analysis technique and the choice between fixed effect and random effect regression was guided by the Hausman test.

**Findings:** Evidence obtained from the analysis confirmed that human capital had a positive and significant effect on banks' performance ( $\beta= 0.175, \rho < 0.05$ ). The results also revealed that innovation had a significant effect on performance ( $\beta= 0.084, \rho < 0.05$ ). Further, the findings indicated that innovation significantly mediated the relationship between human capital and performance ( $\beta= 0.016, \rho < 0.05$ ). For the control variables; firm size ( $\beta= -0.306, \rho > 0.05$ ) and lending strategy ( $\beta= -0.014, \rho > 0.05$ ) had insignificant effect on performance, while market power had a significant effect on performance ( $\beta= 0.522, \rho < 0.05$ ).

**Research limitations:** This study had two limitations. First, though the financial sector cuts across banks, insurance companies, and microfinance institutions, the study used a sample of 31 banks which may be regarded as small. Second, the study concentrated on a Kenyan economy, which is a developing country, thus the result may vary in other economies.

**Practical implications:** Based on the findings, the study recommends that bank management should leverage their human capital through innovation for competitive advantage and improved performance.

**Originality/Value:** To the best of the researcher's knowledge, no study has been conducted to investigate the relationship between human capital, innovation, and performance in a developing economy. Thus, the study partly contributes to the inconclusive debate on human capital and performance nexus by arguing that human capital has an indirect effect through innovation, which is more important in explaining performance.

**Keywords:** Human Capital; Competitive Advantage; Performance; Innovation

---

<sup>1</sup> Department of Accounting and Finance, Moi University, Kenya. E-mail: kgithaiga@gmail.com

## 1. Introduction

In recent years world economies have increasingly shifted from being production-based to knowledge-based owing to technological revolutions and globalization (Clarke & Gholamshahi, 2018; Mahdi et al., 2019). Thus, physical capital is no longer a source of competitive advantage. In the 1960s, Becker (1964) revealed that the traditional factors of production explained only a small part of the growth in income and wealth of nations. Later in the 1990s, Drucker (1993) claimed that traditional factors of production were freely accessible to competitors hence of little strategic importance. Consequently, firms are focusing on intellectual capital for sustained competitive advantage and long-term profitability (Edvinsson & Malone, 1997; Abualoush et al., 2018). Among all the other elements of intellectual capital (innovation capital, innovation capital and relational capital) researchers and management practitioners consider human capital as the most important dimension. Empirical literature shows that human capital is a source of organizational renewal, innovation and creativity which drive organizational performance (McDowell et al., 2018; Crook et al., 2011; Benevene et al., 2019). Perhaps, this explains why nations allocate massive budgetary resources on human capital development aimed at wealth creation (Gennaioli et al., 2011; Pelinescu, 2015; Eggoh et al., 2015). Becker (2009) claims that human capital accounts for roughly three-quarters of the wealth of nations. Moreover, studies also show that human capital facilitates the development and application of other knowledge resources (Wang & Chang, 2005; Shivdas & Ray, 2017). Thus, expenditure on human capital development is an investment rather than an expense since improved employees' efficiency and effectiveness boost productivity (Bontis et al., 2015; Scafarto et al., 2016). Though scholars have extensively examined the relationship between human capital and organizational performance, their findings are largely contentious. A strand of studies claims a positive relationship (Crook et al., 2011; Seleim et al., 2007; Shrader & Siegel, 2007), while another a negative association (Smriti & Das, 2017; Kor & Mahoney, 2005; Firer & Williams, 2003). Yet, Khalique et al., (2015) assert that human capital does not affect firm performance. There are two probable explanations for the mixed findings. First, human capital has an indirect effect on performance which is attributable to its influence on a wide range of organizational dimensions; in particular human capital is the key input in firm innovation (Becker, 1964; Gradstein & Justman, 2000; Dakhli & De Clercq, 2004). Through training programs, a firm can enhance employees' skills and abilities that improve its innovative capacity and in long-run productivity. Second, the importance of the different types of knowledge resources differs across industries and firms due to the heterogeneity in business processes and resources profile (Seleim et al., 2007; Megna & Mueller, 1991). Specifically, human capital is vital to service industries, such as banks, where competitive advantage hinges on innovation and service quality (Young et al., 2009). Furthermore, banks maintain minimal physical assets, thus more dependent on human capital for competitive advantage. Accordingly, banks allocate enormous resources to human capital development for long-term sustainability (Noe et al., 2017; Chicu et al., 2019; Gabriel, 2016; Chen & Huang, 2009).

It is from this background that this study seeks to investigate the effect of human capital on the performance of the commercial bank and whether firm innovation mediates that relationship. Moreover, most of the existing studies focused on manufacturing firms in developed and emerging economies that is, the U.S., Europe and Asia (Crook et al., 2011; Dakhli & De Clercq, 2004) this study centers on a developing country which might shed more light on the human capital and performance causality. Besides, while most of the

earlier studies measured human capital through perceptual measures that are prone to biases (Khalique et al., 2015) this study will adopt a quantitative metric.

## **2. Literature Review**

### *2.1 Theoretical Underpinning*

The resource-based view of the firm conjectures that firm resources are the sole source of competitive advantage and superior performance (Hatch & Dyer, 2004). These resources are characterized as valuable, rare, imperfectly imitable and non-substitutable (Barney, 1986; Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984; Maditinos et al., 2011). However, over time intangible resources have replaced tangible resources as the sources of sustained competitive advantage (Mahdi et al., 2019). This view is corroborated by Itami (1987) who stated that “intangible assets, such as a particular technology, accumulated consumer information, brand name, reputation, and corporate culture are invaluable to the firm's competitive power. These invisible assets are often the only real source of the competitive edge that can be sustained over time”. In management and finance literature, intangible resources are collectively referred to as intellectual capital (Attar et al., 2019). According to Stewart (1997), intellectual capital denotes intellectual material, information, knowledge, intellectual property, experience, and relationships, all of which are used in making a company successful. The dimensions of Intellectual capital are human capital, structural capital and customer (relational) capital (Edvinsson & Malone, 1997; Roos et al., 1997). Among the said sub-constructs of intellectual capital, there is a universal consensus among researchers that human capital has the most pronounced influence on performance (Hall, 1992).

### *2.2 Human Capital*

Human capital has received considerable research attention (Sahari et al., 2019; Ulrich & Kryscynski et al., 2019). Srivastava (2001) claims that "the power and product of the human mind, is the supreme source of competitive advantage in an era of knowledge economies". Also, some studies claim that human capital supports the development and application of all forms of organizational knowledge (Wang & Chang, 2005; Benhabib & Spiegel, 2005; Bontis et al., 2018; Bratianu, 2018) postulate that human capital nurtures other forms of organizational knowledge. Moreover, Han et al., (2014) claim that human capital drives innovativeness and complement other elements of intellectual capital. The superiority of human capital is attributable to its flexibility, adaptability, and self-regeneration.

Extant literature shows diverse definitions of human capital. Halim (2010) views human capital as “what a single employee brings into value-adding processes, consisting of professional competence, social competence, employee motivation, and leadership ability”. Sveiby (1997), contends that human capital is the capacity of employees to act in varied situations in a manner that create both tangible and intangible assets. Additionally, Schultz (1961) avers that human capital consists of knowledge, skills, and abilities of an organization’s workforce. Thomas et al., (2013) describe human capital as people, their abilities and performance in an organization. While Reichenberg and Andreassen (2018) state that human capital is “the qualities of the individuals, their qualifications and competencies”. Davenport and Prusak (1998) contend that human capital embodies intangible resources of abilities, effort, and time that workers bring and invest in their work. In general terms, human capital symbolizes an organization’s

collection of employees' skills, abilities, attitudes, and experiences that create and deliver value.

Generally, it is believed that human beings possess certain abilities, knowledge, skills, and expertise which organizations and nations can leverage for competitive advantage and ultimately optimize outcomes (Bapna, 2013). The value of human capital is twofold. First, the ability to create goods and services that earns a firm inimitable competitive advantage. Second, its contribution to the firm's innovativeness and long-term sustainability. Over the years, the influence of human capital on national and organizational outcomes has elicited a lot of research interest.

Seleim et al., (2007) studied 38 software companies, out of a population of 107 companies that constitute the membership of the Software Industry Chamber of Egypt. The findings of this study confirmed that human capital had a positive and significant effect on performance. Besides, the study found that human capital influenced firm innovativeness. Bae and Lawler (2000) examined the association between human capital and firm performance. The study used a sample of 40 Korean firms and primary data collected through 142 questionnaires administered to employees and non-managers of the selected firms. The results revealed that human capital had a positive and significant effect on performance. Smriti and Das (2017) assessed the relationship between human capital and organizational performance. The study used a panel dataset drawn from 121 pharmaceutical and drug companies listed in the Bombay stock exchange for the years 2005-2016. The findings of this study showed that human capital had a negative effect on performance.

Hitt et al., (2001) investigated the moderating role of human capital on strategy-firm performance relationships among professional firms in the U.S. In total 252 observations from 93 top law firms with panel data for the period 1987 to 1991 was used. The study found that an early investment in human capital had a negative effect on financial performance, however, performance improved progressively over time as firms increased their investment in human capital suggesting path dependency. Further, the study established that human capital moderated the relationship between firm strategy (diversification) and financial performance. Other studies suggest that human capital has an influence on economic growth (Fleisher et al., 2010), growth (Colombo & Grilli, 2005), regional productivity (Gennaioli et al., 2011), foreign direct investment inflow (Noorbakhsh et al., 2001), competitive advantage (Bae & Lawler, 2000), innovation (Dakhli & De Clercq, 2004), technology diffusion (Benhabib & Spiegel, 2005; Link & Siegel, 2007) and entrepreneurial success (Martin et al., 2013). Based on the empirical literature, this study hypothesizes that

*H1: Human capital has a significant influence on performance.*

### 2.3 Innovation

With increased globalization, shortened product lifecycle and fierce competition, innovation are viewed as an important driver of sustained competitive advantage and superior performance (Kijek, 2012). Thus, firms must develop new products and/or services and markets or modify the existing ones to compete profitably in an evolutionary market. Furthermore, Santarelli and Tran (2016), claim that firms that are well-endowed with technological and innovation resources are likely to record improved performance. Researchers associate innovation with new ideas, methods or devices or the processes of introducing something new (Gopalakrishnan & Damanpour, 1997). West and Farr (1990)

suggest that innovation is the deliberate introduction and implementation, within an organization, of ideas, processes, products or procedures, new to the unit of adoption, aimed to significantly benefit the firm or/ and the wider society. Damanpour and Evan (1984), classifies innovation into technological and administrative innovations. According to OECD (2003), innovation is of four types; product innovation, process innovation, marketing innovation, and organizational innovation. Where product innovation is the introduction of a good or service that is new or significantly improved characteristics or intended uses. Process innovation is the implementation of a new or significantly improved production or delivery method or techniques, equipment and/or software. Marketing innovation entails developing a new marketing method or changes in product design or packaging, product placement, product promotion or pricing. Organizational innovation is the introduction of a new organizational method in the firm's business practices, workplace organization or external relations. However, with the intensification of globalization and competition, scholars have extended the innovation taxonomy to open innovation and networked innovation (Cabrilo et al., 2014).

The significance of innovation to firm performance appears extensively in the empirical literature. Using a sample of 312 high-technology manufacturing and 204 low technology manufacturing Taiwanese firms, Yang and Kang (2008), examined the relationship between innovation and organization performance. Yeh-Yun Lin & Yi-Ching (2007), sought to examine the relationship between innovation and performance of SMEs in Taiwan. The researcher interviewed 877 firms and the findings show that the relationship was positive, though weak. Van Auken et al., (2008) studied 1,091 Spanish manufacturing SMEs. The results of their study showed that innovation had a positive impact on the performance of low and high technology industries.

*H2: Innovation has a significant effect on performance.*

#### *2.4 Human Capital, Innovation and Performance*

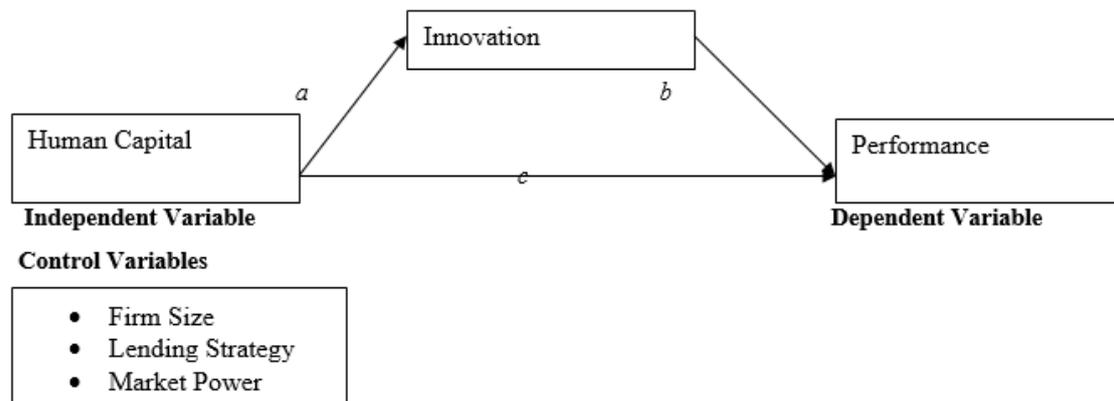
In knowledge-based economies, competitive advantage and superior performance are pegged on intellectual capital (Edvinsson & Malone, 1997; Drucker, 1993) and the ability to innovate (Shipton et al., 2005). Human capital is considered as the most important dimension of intellectual capital (Herman, 2010). This implies that human capital and innovation are a source of economic value. The relationship between human capital, innovation and performance is grounded in what Bourdieu (1986) termed as 'conversions', that is, different forms of capital can be converted into strategic resources and other forms of the organizational outcome. In general, the argument is that individuals who are highly educated, experienced, and invest more in self-development have an added advantage in securing higher benefits for themselves, their families and at the same time contribute to the general welfare of the society. Moreover, Nelson and Phelps (1966) suggest that education improves the capacity to innovate and to adapt to new technologies, which implies higher diffusion and absorption of new technology in an economy. A study by Dakhli & De Clercq (2004), among 65 countries, found that human capital had a positive influence on innovation. Further, the findings of this study showed that, though the impact of human capital on economic growth and productivity varied across countries, its overall effect innovation remained positive. Cognizant of the importance of innovation to wealth creation firms invest heavily in organizational renewal strategies to be innovation-driven. These strategies are aimed at achieving a sustained competitive advantage, profitability, and utilization of human capital. Furthermore, Li et al., (2005) found that employee training, immaterial motivation and

process control have a positive effect on technological innovation. Conversely, Antons and Pillar (2015) posit, though the conventional view is that human capital has a positive influence on innovation, employees' attitude (not invented here) can disrupt and prevent firm innovative capability. These findings provide evidence on the inextricable relationship between innovation and human capital. Thus, human capital and innovation form a complementary loop that creates firm value, implying they constitute the organization's vertebrae. The contribution of innovation to organizational outcomes and national economies has been studied extensively as shown in extant literature (Zahra et al., 2000; Shefer & Frenkel, 2005; Van Auken et al., 2008). Furthermore, Lawson and Samson (2001) contend that innovation enhances quality, efficiency, speed, and flexibility, which are performance outcomes. From a resource-based view of the firm which emphasize that superior performance emanates from firm resources (Barney 1991), and the dynamic capabilities theory (Teece & Pisano, 1994; Teece et al., 1997) which postulates that in a dynamic environment firms need capabilities to reinvent, transform and reconfigure their constituent knowledge resources; its apparent that innovation is vital to firms seeking to achieve sustained competitive advantage and long-term profitability. Firm innovativeness also enables the workforce to adjust and adapt to changing customer demands and other external shocks (Kim & Ployhart, 2014).

Based on the arguments above, we propose the following:

*H3: Innovation significantly mediates the relationship between human capital and performance.*

**Figure 1 – Theoretical Framework**



### 3. Research Methodology

The population consisted of all the banking institutions in Kenya that are licensed by the Central Bank of Kenya. Presently, there are 43 commercial banks and 1 mortgage finance company. However, after a thorough scrutiny of the financial reports only 31 banks qualified for analysis since some of the banks were not in operation over the entire period, were under statutory management or had undergone reorganizations.

The study used a panel dataset that consisted of firm-level data for 31 commercial banks that operated during the 2008 to 2017 period. The data was extracted from the individual bank's annual reports and the Central Bank of Kenya's bank supervision annual reports. In total, the study used 310 yearly observations. The period covered by our panel is

selected for two primary reasons. Firstly, data was available with the passing of the Finance Act (2008) that required all banks to file reports, including foreign subsidiaries, with the Central Bank of Kenya. Secondly, the banking sector embarked on a transformation exercise with the implementation of the Microfinance Act (2006) on May, 2008, the operationalization of The Banking (Credit Reference Bureau) Regulations, 2008 and the unveiling of Kenya's Vision 2030 which aim at creating a vibrant and globally competitive financial sector, driving high levels of savings and financing Kenya's investment needs.

### *3.1 Measurement of Variables*

Research variables ought to be measurable for the hypotheses to be tested and inferences made. Therefore, how variables are operationalized is the cornerstone of empirical research. The study had six variables comprising of the dependent variable, the independent variable, the mediator and three control variables.

#### *3.2.1 Dependent Variable*

The main objective of the study was to empirically examine the impact of human capital on performance and the mediating effect of innovation among commercial banks in Kenya. Hence, the dependent variable of the study was the performance of commercial banks, which was measured as the return on asset (ROA). ROA is the ratio of net earnings to the total assets. ROA shows how effective a firm is in generating profits with its available assets. This proxy of performance has been used in previous studies (Chiorazzo et al., 2008; Shrader & Siegel, 2007; Wang & Chang, 2005).

#### *3.2.2 Independent Variable*

Human capital was the study's independent variable. The proxy for this variable was the bank's total annual investment on employees (Scafarto et al., 2016; Chu et al., 2008). Investment in employees includes salaries, wages, training costs, pension, and other employee benefits. Expenditures on employees are aimed at improving the quality of a firm's employees through increased motivation and creativity (Pulic 2000; Stähle et al., 2011). This proxy is justifiable on three grounds. First, from a strategic view employee costs are not expenses but investments since human capital plays a critical role in value creation (Young et al., 2009; Edvinsson & Malone, 1997; Pulic, 2000; Pucar, 2012; Al-Musali & Ku Ismail, 2016). Second, a firm's investment in its employees depicts the quality of its human capital (Hahn, 2009). Third, firms rarely disclose employees' level of education and annual investment on human capital development in their annual financial reports implying that such information is the domain of primary data which is not as objective as secondary data.

#### *3.2.3 The Mediator*

Innovation was the study's mediator. A firm's innovation includes patents, copyrights, trademarks, and knowhow (Hsu & Fang, 2009). A firm's expenditure on R&D is a widely used measure of innovation (Koroglu & Eceral, 2015). The main components of innovation expenditure in service industries, such as banks, are R&D on the acquisition of knowledge, technical assistance through consultancy, design, testing of new services

and processes, purchase and development of software. Thus, the bank's total investment in intangible assets (R&D stock over total assets) was used as the measure of firm innovation (Crass & Peters, 2014; Rathnayake et al., 2019).

### 3.2.4 Control Variables

To control for sample heterogeneity and isolate the effect on human capital and innovation on the performance of banks, the study controlled for firm size, bank lending strategy, and market power. Due to economies of scale large banks are likely to report higher profits than small ones (Jahan, 2012). Firm size was measured as the logarithm of total assets (Wan & Zhang, 2018; Chiorazzo et al., 2008). Market power controls for other benefits that have accumulated to the bank over time, such as increased customer loyalty, economies in production and marketing which might influence performance. The measure for market power was market share, which is computed as a composite index of net assets, deposits, total shareholders' funds, number of loan accounts and number of deposit account. Bank's lending strategy is incorporated to control for risk-adjusted returns of the composition of banks' asset portfolio performance (Chiorazzo et al., 2008).

### 3.3 Empirical Model Specification

The study's empirical model is illustrated as follows; The relationship between variables was examined through hierarchical regression equations as suggested by Baron and Kenny (1986).

Step 1: The first model entails testing the effect of the control variables on the dependent variable as shown below.

$$P_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LS_{it} + \beta_3 MP_{it} + \varepsilon_{it} \quad (\text{Model 1})$$

Step 2: Testing the effect of the independent variable on the dependent variable. This is also referred to as the direct effect, path c, and the regression equation is illustrated below.

$$P_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 LS_{it} + \beta_3 MP_{it} + \beta_4 HC_{it} + \varepsilon_{it} \quad (\text{Model 2})$$

Step 3: Testing the effect of the independent variable on the mediator variable, which is referred to as path a.

$$IN_{it} = \beta_0 + \beta_1 HC_{it} + \beta_2 FS_{it} + \beta_3 LS_{it} + \beta_4 MP_{it} + \varepsilon_{it} \quad (\text{Model 3})$$

Step 4: Regressing the dependent variable on the predictor variable and the mediator to establish path b.

$$P_{it}^* = \beta_0^* + \beta'_1 HC_{it} + \beta'_2 IN_{it} + \beta'_3 FS_{it} + \beta'_4 LS_{it} + \beta'_5 MP_{it} + \varepsilon_{it} \quad (\text{Model 4})$$

Step 5: Testing for mediation. At this stage, the mediating effect is measured by taking into account the beta coefficients and standard error of the variables in model 3 and those of the mediator in model 4 and measuring the significance of the mediation using the Preacher and Hayes's (2004) Sobel test calculator, where

$P_{it}$  = Performance of bank  $i$  for  $t$  years;

$HC_{it}$  = Human Capital of bank  $i$  for  $t$  years;

$IN_{it}$  = Innovation of bank  $i$  for  $t$  years;

$MP_{it}$  = Market Power of bank  $i$  for  $t$  years;

$FS_{it}$  = Firm Size of bank  $i$  for  $t$  years;

$LS_{it}$  = Lending Strategy of bank  $i$  for  $t$  years;

$\varepsilon_{it}$  = Error term;

$\beta_0, \dots, \beta_n$  are the beta coefficients.

### 3.4 Data Analysis

The entire variables were log-transformed to reduce the impact of outliers and to obtain a linear relationship, which an assumption on regression analysis. A variety of panel data diagnostic tests were also conducted to determine the appropriateness of the data for regression analysis. Explicitly, the tests included normality tests, stationarity tests, multicollinearity tests, heteroskedasticity tests, and autocorrelation tests.

**Table 1 – Variance Inflation Factor (VIF) statistics**

Variable	VIF	1/VIF
Market Power	3.37	0.296408
Firm Size	2.96	0.337562
Human Capital	1.30	0.768712
Innovation	1.11	0.902180
Lending Strategy	1.03	0.967904
Mean VIF	1.96	

**Table 2 – Heteroskedasticity Tests**

White's	test for Ho:	Homoscedasticity
	against Ha:	unrestricted heteroscedasticity
	chi2(44)	72.15
	Prob > chi2	0.057

The entire tests established that the data was suitable for further statistical analysis. Data was analyzed through descriptive and inferential statistics. Specifically, the data was summarized through mean, standard deviation, minimum values, and maximum values statistics while pairwise correlation analysis was used to ascertain the nature and strength of the relationship between the research variables. The research hypothesis was tested hierarchical multiple regression analysis. The choice of either fixed effect or random effect regression was pegged on the Hausman test and the results are shown below each model in Table 7.

**Table 3 – Wooldridge Test for Autocorrelation**

Wooldridge	test for autocorrelation	in panel data
H0: no first order autocorrelation		
	F( 1, 30) =	0.803
	Prob > F =	0.3773

**Table 4 – Unit Root Tests**

	Levin-Lin-Chu	Breitung	Fisher's
Performance	-8.32 (0.00)	-2.88(0.00)	2.50(0.00)
Human capital	-20.84(0.00)	0.99(0.00)	8.94(0.00)
Innovation	-12.03(0.00)	-2.12(0.00)	4.82(0.00)
Market Power	-4.74(0.00)	-0.12(0.00)	3.35(0.00)
Firm Size	-14.87(0.00)	-0.63(0.00)	4.12(0.00)
Lending Strategy	-4.48(0.00)	-0.63(0.00)	10.08(0.00)

#### 4. Results and Discussion

Table 5 shows the descriptive statistics for the research variable. Based on the table, the average bank performance for the period 2008-2017 was 3% (minimum= 0.0003 and maximum = 0.96; standard deviation =0.01). The the mean human capital was 8789.96 (minimum= 1048.96 and maximum = 41750.9; standard deviation =5944.80). The average innovation was 483.62 (minimum= 2.29 and maximum = 3569.99; standard deviation =589.92). Further, the average bank market power was 3.09% (minimum= 0.002 and maximum = 20.62; standard deviation = 4.60). The mean bank size was Ksh 76.6 billion (minimum=22.89 and maximum = 556.00; standard deviation =96.2) while lending strategy was 0.57 (minimum= 0.02 and maximum = 0.86; standard deviation = 0.12).

**Table 5 – Descriptive Statistics of the Research Variables**

Variable	Obs	Mean	Std. Dev.	Min	Max
Performance	310	0.03	0.01	0.0003	0.096
Human Capital	310	8789.96	5944.80	1048.96	41750.07
Innovation	310	483.62	589.92	2.29	3569.99
Market Power	310	3.09	4.60	0.002	20.62
Lending Strategy	310	0.57	0.12	0.02	0.86
Firm Size	310	76.6	96.2	22.89	556.00

Table 6 shows the results of the pairwise correlation analysis. Human capital and performance had a weak positive correlation ( $r=0.242$ ,  $\rho<0.05$ ). Similarly, innovation and performance had a weak positive relationship ( $r=0.036$ ,  $\rho > 0.05$ ). Market share and performance exhibited a strong positive correlation ( $r=0.6119$ ,  $\rho<0.05$ ) while firm size and performance revealed a fairly strong positive association ( $r=0.4683$ ,  $\rho<0.05$ ). However, lending strategy and performance demonstrated a weak negative correlation ( $r= -0.120$ ,  $\rho<0.05$ ). Firm size and market power revealed an important correlation ( $r= 0.723$ ,  $\rho<0.05$ ).

**Table 6 – Results of pairwise Correlation Analysis**

	P	HC	MP	IN	LS	FS
Performance (P)	1.0000					
Human Capital (HC)	0.2422*	1.0000				
Market Power (MP)	0.6119*	0.0864	1.0000			
Innovation (IN)	0.0361	0.0352	0.1393*	1.0000		
Lending Strategy (LS)	-0.1197*	-0.2350*	0.0154	-0.0052	1.0000	
Firm Size (FS)	0.4683*	0.1746*	0.723*	0.2546*	0.0432	1.0000

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

The results of the hierarchical regression are presented in Table 7. Model 1 shows the results of the regression of the dependent variable on the control variables; Model 2 the direct effects (path c); Model 3 results for the regression of the mediator on the independent variable (path a); Model 4 regression of the dependent variable on the independent variable while controlling for the mediator and Model 5 shows the mediated effect (path c'). Going by the results of Model 1, firm size ( $\beta = -0.306$ ,  $\rho > 0.05$ ) and lending strategy ( $\beta = -0.014$ ,  $\rho > 0.05$ ) had a negative effect on performance, while market power had a positive and significant influence on performance ( $\beta = 0.522$ ,  $\rho < 0.05$ ). Large firms suffer from structural inertia and bureaucracies that limit the decision maker's ability to effect necessary organizational change that boosts performance. The negative relationship between lending strategy and performance indicates overreliance on interest income hence susceptibility to income volatility (DeYoung & Rice, 2004). The Structure Conduct-Performance (SCP) model, that concentration lowers competition and the Relative Market Power (RMP) hypothesis, which claims that firms controlling large market shares are more efficient and are likely to make a supernormal profit, explains the positive and significant association between market power and performance.

The study had three objectives, the first hypothesis stated that: H1. Human capital has a significant effect on performance. This hypothesis was tested based on the regression results presented in model 2 of Table 3. Based on the findings ( $\beta = 0.175$ ,  $\rho < 0.05$ ), human capital had a positive and significant effect on performance, which implies that the hypothesis was not rejected. These findings are supported by the resource-based view theory proposition that competitive advantage and superior performance emanate from intangible resources. Moreover, the results are consistent with those of Crook et al., (2011), Felício et al., (2014) and Bae and Lawler (2000). However, they contradict those of Wright et al., (1999) who content human capital has no effect on performance while Firer and Williams (2003) Smriti and Das (2017) and Kor and Mahoney (2005) who reported a negative association. The inconsistency in findings can be attributed to measurements and units of analysis. Unlike these studies that measured human capital qualitatively, this study measure human capital from a quantitative approach which is more objective. Further, the mentioned studies focused on manufacturing firms where structural capital is more important than human capital. Conversely, this study centered on the banking industry, where competition is based on the quality of human capital and innovation.

The second object was formulated as H2. Innovation has a significant effect on performance. The hypothesis was tested based on the results presented in model 4 ( $\beta = 0.084$ ,  $\rho < 0.05$ ). Give these results, the hypothesis was not rejected and the conclusion was that innovation had a positive and significant effect on performance. The findings are

supported by Jiménez-Jiménez and Sanz-Valle (2011), Van Auken et al., (2008). The study's third hypothesis was stated as; H3. Innovation significantly mediates the relationship between human capital and performance. Model 5 was used to test this hypothesis. The beta coefficients of model 5 were computed as (a x b), while the  $\rho$ -values were determined using Preacher and Hayes (2004) Sobel test calculator. Based on the results ( $\beta = 0.016$ ,  $\rho < 0.05$ ), the hypothesis was not rejected inferring that mediation was present. These findings are supported by Montes et al., (2005), Li et al., (2006) and Calantone et al., (2002). Similarly, Chen and Huang (2008) observed that human resources practices had an indirect effect on performance through improved firm innovative capacity. While Wang and Chang (2005) found that human capital had an indirect effect on firm performance through process capital and innovation capital. Consistent with dynamic capabilities theory, banks can leverage their human capital through innovation for competitive advantage and improved performance.

Additionally, Model 5 shows that innovation capital mediated the relationship between firm size and performance ( $\beta = -0.041$ ,  $\rho < 0.05$ ) as well as market power and performance ( $\beta = 0.033$ ,  $\rho < 0.05$ ) and performance. Large firms have resources, such as skilled employees, and necessary systems that can nurture innovation and cushion the firm against losses arising from unsuccessful innovation (Shefer & Frenkel, 2005). Monopolists have greater incentives, from the current and expected market, to develop or acquire innovations as opposed to prospective entrants as the total industry profits diminish when more firms share the market. Thus, monopolists are likely to innovate more as the market evolves as creative destruction of competition.

**Table 7 – Results of Hierarchical Regression Analysis**

Variable	Model	Model	Model	Model	Model
Performance/Innovation	1	2 (path c)	3 (path a)	4 (path b)	5 (c')
Firm Size	-0.306 **	-0.190 **	0.486**	-0.319 **	-0.041**
Lending Strategy	-0.014	-0.047	0.123	-0.041	0.010
Market Power	0.521 **	0.512 **	0.394**	0.423 **	0.033**
Human Capital	-	0.175 **	0.193**	0.175**	0.016**
Innovation	-	-	-	0.084**	-
__cons	0.755	-0.017	-2.148	0.018	-
Rsquared	0.66	0.5220	0.624	0.1293	0.6501
No of Observations	310	310	310	310	310
Hausman test Chi2		15,51	12.21	13.09	8.65
p-value		0.0014	0.0158	0.011	12.34

\*\* significant at  $p < 0.05$

## 5. Conclusion

The study sought to investigate the relationship between human capital and firm performance in the banking sector. Empirically, the study found that human capital had a positive and significant effect on firm performance thus validating the propositions of

resource-based view theory. Banks operate in a highly competitive environment coupled with unprecedented growth in financial innovation and regulatory surveillance. Thus, banking institutions must invest heavily in their human capital for innovativeness and customer satisfaction to create sustained competitive advantage for survival and enhanced performance. This entails leveraging human capital and other knowledge assets to solve customers' problems for competitive advantage. Furthermore, an investment in recruitment, training, and retention of employees contributes to the creation of long-term value.

### 5.1 Managerial Implications

The results of this study can be used by banks' management to better understand the effect of the indirect effect of human capital on organizational performance. In the knowledge era, any human capital development strategies should be aimed at enhancing firm innovation which is crucial for organizational performance. From this understanding, managers can find creative ways of leveraging human capital through innovation to optimize firm performance. Despite the novelty of the findings, the study has several limitations. First, the study used a sample of 31 commercial banks which is small bearing in mind in various institutions that constitute the financial sector (Microfinance institutions, Saccos, insurance companies, and others) therefore future studies can consider other subsectors. Second, the study was longitudinal which implies that the data was secondary and quantitative. Besides, all variables were measured using proxies computed from income statements and balance sheets. Future studies can consider a qualitative approach. Finally, the study focused on a developing country thus the findings may not be replicated in developed countries due to variations of country-specific factors.

## References

- Abualoush, S., Masa'deh, R. E., Bataineh, K., & Alrowwad, A. (2018). The role of the knowledge management process and intellectual capital as intermediary variables between knowledge management infrastructure and organization performance. *Interdisciplinary Journal of Information, Knowledge, and Management*, 13, 279-309.
- Al-Musali, M. A., & Ku Ismail, K. N. I. (2016). Cross-country comparison of intellectual capital performance and its impact on financial performance of commercial banks in GCC countries. *International Journal of Islamic and Middle Eastern Finance and Management*, 9(4), 512-531.
- Antons, D., & Piller, F. T. (2015). Opening the black box of "Not Invented Here": Attitudes, decision biases, and behavioral consequences. *Academy of Management Perspectives*, 29(2), 193-217.
- Attar, M., Kang, K., & Sohaib, O. (2019). Knowledge Sharing Practices, Intellectual Capital and Organizational Performance. In *Proceedings of the 52nd Hawaii International Conference on System Sciences*.
- Bae, J., & Lawler, J. J. (2000). Organizational and HRM strategies in Korea: Impact on firm performance in an emerging economy. *Academy of management journal*, 43(3), 502-517.
- Bapna, R., Langer, N., Mehra, A., Gopal, R., & Gupta, A. (2013). Human capital investments and employee performance: an analysis of IT services industry. *Management Science*, 59(3), 641-658.
- Barney, J. B. (1986). Organizational culture: can it be a source of sustained competitive advantage?. *Academy of management review*, 11(3), 656-665.

- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173.
- Becker, G. (1964). *Human Capital*, University of Chicago press. NY
- Becker, G. S. (2009). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press.
- Benevene, P., Kong, E., Lucchesi, M., & Cortini, M. (2019). Intellectual capital management among Italian non-profit socio-cooperatives. *Journal of Workplace Learning*, 31(1), 17-3
- Benhabib, J., & Spiegel, M. M. (2005). Human capital and technology diffusion. *Handbook of economic growth*, 1, 935-966.
- Bontis, N., Ciambotti, M., Palazzi, F., & Sgro, F. (2018). Intellectual capital and financial performance in social cooperative enterprises. *Journal of Intellectual Capital*, 19(4), 712-731.
- Bontis, N., Janosevic, S., and Dzenopoljac, V. (2015). Intellectual capital in Serbia's hotel industry. *International Journal of Contemporary Hospitality Management*, 27(6), 1365-1384.
- Bourdieu, P. (1986). The forms of capital. In: Richardson, J.G. (ed.) *Handbook of theory and research for the sociology of education*. New York: Greenwood.
- Bratianu, C. (2018). Intellectual capital research and practice: 7 myths and one golden rule. *Management & Marketing*, 13(2), 859-879.
- Cabrilo, S., Grubic Nestic, L., & Mitrovic, S. (2014). Study on human capital gaps for effective innovation strategies in the knowledge era. *Journal of Intellectual Capital*, 15(3), 411-429.
- Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial marketing management*, 31(6), 515-524.
- Chen, C. J., & Huang, J. W. (2009). Strategic human resource practices and innovation performance—The mediating role of knowledge management capacity. *Journal of business research*, 62(1), 104-114.
- Chicu, D., del Mar Pàmies, M., Ryan, G., & Cross, C. (2019). Exploring the influence of the human factor on customer satisfaction in call centres. *BRQ Business Research Quarterly*, 22(2), 83-95.
- Chiorazzo, V., Milani, C., & Salvini, F. (2008). Income diversification and bank performance: Evidence from Italian banks. *Journal of Financial Services Research*, 33(3), 181-203.
- Chu, P. Y., Hsiung, H.-H., Huang, C.-H., and Yang, C.-Y. (2008). Determinants of the valuation of intangible assets - a contrast between Taiwanese and American IC design houses. *International Journal of Technology Management*, 41(3-4), 336-358
- Clarke, T., & Gholamshahi, S. (2018). Developing human capital for knowledge-based economies. In *Innovation in the Asia Pacific* (pp. 247-270). Springer, Singapore.
- Colombo, M. G., & Grilli, L. (2005). Founders' human capital and the growth of new technology-based firms: A competence-based view. *Research Policy*, 34(6), 795-816.
- Crass, D., & Peters, B. (2014). Intangible assets and firm-level productivity. *ZEW-Centre for European Economic Research Discussion Paper*, (14-120).
- Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J., & Ketchen Jr, D. J. (2011). Does human capital matter? A meta-analysis of the relationship between human capital and firm performance. *Journal of applied psychology*, 96(3), 443.

- Dakhli, M., & De Clercq, D. (2004). Human capital, social capital, and innovation: a multi-country study. *Entrepreneurship & regional development*, 16(2), 107-128.
- Damanpour, F. & Evan, W.M. (1984). Organizational innovation and performance: the problem of organizational lag. *Administrative Science Quarterly*, Vol. 29, 392-409.
- Davenport, T., & Prusak, L. (1998), *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, MA.
- DeYoung, R1., & Rice, T. (2004). Noninterest income and financial performance at US commercial banks. *Financial Review*, 39(1), 101-127.
- Drucker, P. (1993) *Post-Capitalist Society*, New York: Harper Business.
- Edvinsson, L., & Malone, M. S. (1997). *Intellectual capital: The proven way to establish your company's real value by finding its hidden brainpower*. Piatkus.
- Eggho, J., Houeninvo, H., & Sossou, G. A. (2015). Education, health and economic growth in African countries. *Journal of Economic Development*, 40(1), 93.
- Felício, J. A., Couto, E., & Caiado, J. (2014). Human capital, social capital and organizational performance. *Management Decision*, 52(2), 350-364.
- Firer, S., & Mitchell Williams, S. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of intellectual capital*, 4(3), 348-360.
- Fleisher, B., Li, H., & Zhao, M. Q. (2010). Human capital, economic growth, and regional inequality in China. *Journal of development economics*, 92(2), 215-231.
- Gabriel, A. S., Cheshin, A., Moran, C. M., & van Kleef, G. A. (2016). Enhancing emotional performance and customer service through human resources practices: A systems perspective. *Human Resource Management Review*, 26(1), 14-24.
- Gennaioli, N., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2012). Human capital and regional development. *The Quarterly journal of economics*, 128(1), 105-164.
- Gopalakrishnan, S., & Damanpour, F. (1997). A review of innovation research in economics, sociology and technology management. *Omega*, 25(1), 15-28.
- Gradstein, M., & Justman, M. (2000). Human capital, social capital, and public schooling. *European Economic Review*, 44(4-6), 879-890.
- Hahn, F. R. (2009). A note on management efficiency and international banking. Some empirical panel evidence. *Journal of Applied Economics*, 12(1), 69-81.
- Halim, S. (2010). Statistical analysis on the intellectual capital statement. *Journal of Intellectual Capital*, 11(1), 61-73.
- Hall, R. (1992). The strategic analysis of intangible resources. *Strategic Management Journal*, 13(2), 135 -144.
- Han, J., Han, J. and Brass, D.J. (2014) Human capital diversity in the creation of social capital for team creativity. *Journal of Organizational Behaviour*. Vol 35, No 1. pp54 71.
- Hatch, N. W., & Dyer, J. H. (2004). Human capital and learning as a source of sustainable competitive advantage. *Strategic management journal*, 25(12), 1155-1178.
- Herman, A. (2010). Intellectual capital and its measurements. *Economics & Business Administration Journal*, 2, 7-16.
- Hitt, M. A., Bierman, L., Shimizu, K., & Kochhar, R. (2001). Direct and moderating effects of human capital on strategy and performance in professional service firms: A resource-based perspective. *Academy of Management journal*, 44(1), 13-28.

- Hsu, Y. H., & Fang, W. (2009). Intellectual capital and new product development performance: The mediating role of organizational learning capability. *Technological Forecasting and Social Change*, 76(5), 664-677.
- Itami, H., (1987). *Mobilizing Invisible Assets'* Harvard Uni. Press, Cambridge Mass.
- Jahan, Nusrat. 2012. Determinants of bank's profitability: Evidence from Bangladesh. *Indian Journal of Finance* 6: 32-8.
- Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of business research*, 64(4), 408-417
- Khalique, M., Bontis, N., Abdul Nassir bin Shaari, J., & Hassan Md. Isa, A. (2015). Intellectual capital in small and medium enterprises in Pakistan. *Journal of Intellectual Capital*, 16(1), 224-238.
- Kijek, T. (2012). Innovation Capital and its Measurement. *Journal of Entrepreneurship, Management and Innovation (JEMI)*, 52-68.
- Kim, Y., & Ployhart, R. E. (2014). The effects of staffing and training on firm productivity and profit growth before, during, and after the Great Recession. *Journal of Applied Psychology*, 99(3), 361.
- Kor, Y. Y., & Mahoney, J. T. (2005). How dynamics, management, and governance of resource deployments influence firm-level performance. *Strategic Management Journal*, 26(5), 489-496.
- Koroglu, B. A., & Eceral, T. O. (2015). Human capital and innovation capacity of firms in defense and aviation industry in Ankara. *Procedia-Social and Behavioral Sciences*, 195, 1583-1592.
- Lawson, B., & Samson, D. (2001). Developing innovation capability in organisations: a dynamic capabilities approach. *International journal of innovation management*, 5(03), 377-400.
- Li, Y., Zhao, Y., & Liu, Y. (2006). The relationship between HRM, technology innovation and performance in China. *International journal of manpower*, 27(7), 679-697.
- Link, A.N. & Siegel, D.S. (2007). *Innovation, entrepreneurship, and technological change*. Oxford: Oxford University Press.
- Maditinos, D., Chatzoudes, D., Tsairidis, C., & Theriou, G. (2011). The impact of intellectual capital on firms' market value and financial performance. *Journal of intellectual capital*, 12(1), 132-151.
- Mahdi, O. R., Nassar, I. A., & Almsafir, M. K. (2019). Knowledge management processes and sustainable competitive advantage: An empirical examination in private universities. *Journal of Business Research*, 94, 320-334.
- Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2), 211-224.
- McDowell, W. C., Peake, W. O., Coder, L., & Harris, M. L. (2018). Building small firm performance through intellectual capital development: Exploring innovation as the "black box". *Journal of Business Research*, 88, 321-327.
- Megna, P., & Mueller, D. C. (1991). Profit rates and intangible capital. *The review of economics and statistics*, 632-642.
- Montes, F. J. L., Moreno, A. R., & Morales, V. G. (2005). Influence of support leadership and teamwork cohesion on organizational learning, innovation and performance: an empirical examination. *Technovation*, 25(10), 1159-1172.

- Nelson, R., Phelps, E., 1966. Investment in humans, technological diffusion, and economic growth.
- Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2017). *Human resource management: Gaining a competitive advantage*. New York, NY: McGraw-Hill Education.
- Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human capital and FDI inflows to developing countries: New empirical evidence. *World Development*, 29(9), 1593-1610.
- OECD (2003) Creativity, Innovation and Economic Growth in the 21st Century. Business and Industry Advisory Committee to the OECD
- Pelinescu, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance*, 22, 184-190.
- Penrose, E., & Penrose, E. T. (2009). *The Theory of the Growth of the Firm*. Oxford university press.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic management journal*, 14(3), 179-191.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717-731.
- Pucar, S. (2012). The influence of intellectual capital on export performance. *Journal of Intellectual Capital*, 13(2), 248-261.
- Pulic, A. (2000), MVA and VAIC™ Analysis of Randomly Selected Companies from FTSE 250, Austrian Intellectual Capital Research Center, Graz – London. Available online at: <http://www.measuring-ip.at/Papers/ham99txt.htm>
- Rathnayake, D., Kassi, D. F., Louembé, P. A., Sun, G., & Ding, N. (2019). Does Corporate Ownership matter for Firm Performance? Evidence from Chinese Stock Exchanges. *International Journal of Economics and Financial Issues*, 9(1), 96-107.
- Reichenberg, M., & Andreassen, R. (2018). Comparing Swedish and Norwegian teachers' professional development: How human capital and social capital factor into teachers' reading habits. *Reading Psychology*, 39(5), 442-467.
- Roos, J., Edvinsson, L., & Dragonetti, N. C. (1997). *Intellectual capital: Navigating the new business landscape*. Springer.
- Sahari, S., Nichol, E. O., & Yusof, S. M. (2019). Stakeholders' Expectations on Human Capital Disclosure vs. Corporate Reporting Practice in Malaysia. *International Business Research*, 12(1), 148-155.
- Santarelli, E., & Tran, H. T. (2016). Diversification strategies and firm performance in Vietnam: Evidence from parametric and semi-parametric approaches. *Economics of Transition*, 24(1), 31-68
- Scafarto, V., Ricci, F., and Scafarto, F. (2016). Intellectual capital and firm performance in the global agribusiness industry. The moderating role of human capital. *Journal of Intellectual Capital*, 17(3), 530-552.
- Schultz, T.W. (1961). Investment in human capital. *American Economic Review*. Vol 51. pp1–17.
- Seleim, A., Ashour, A., & Bontis, N. (2007). Human capital and organizational performance: a study of Egyptian software companies. *Management Decision*, 45(4), 789-801.
- Shefer, D. and Frenkel, A. (2005). R&D, firm size and innovation: an empirical analysis. *Technovation*, Vol. 25, pp.25–32.

- Shipton, H., Fay, D., West, M., Patterson, M., and Birdi, K., (2005) “Managing People to Promote Innovation”, *Creativity and Innovation Management*, Vol. 14, No. 2, pp. 118-128.
- Shivdas, A., & Ray, S. (2017). Resource utilization by pharmaceutical companies in India: Emphasis on R&D, labor and capital. In *2017 International Conference on Data Management, Analytics and Innovation (ICDMAI)* (pp. 19-23). IEEE.
- Shrader, R., & Siegel, D. S. (2007). Assessing the relationship between human capital and firm performance: Evidence from technology-based new ventures. *Entrepreneurship Theory and Practice*, 31(6), 893-908.
- Smriti, N., & Das, N. (2017). Impact of intellectual capital on business performance: evidence from Indian pharmaceutical sector. *Polish Journal of Management Studies*, 15.
- Srivastava, K. B. (2001). Intellectual Capital Development and Management of Knowledge in Knowledge-Based Economy. *Indian Journal of Industrial Relations*, 36(3), 355-362.
- Ståhle, P., Ståhle, S., & Aho, S. (2011). Value-added intellectual coefficient (VAIC): a critical analysis. *Journal of Intellectual Capital*, 12(4), 531-551.
- Stewart, T.A. (1997), *Intellectual Capital*, Nicholas Brealey, London
- Sveiby, K. E. (1997). *The new organizational wealth: Managing & measuring knowledge-based assets*. Berrett-Koehler Publishers
- Teece, D. and Pisano, G. (1994). The dynamic capabilities of firms: an introduction. *Industrial and Corporate Change*, 3, 537–556
- Teece, D.J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18, 509–533.
- Thomas, H., Smith, R. R., & Diez, F. (2013). *Human capital and global business strategy*. Cambridge University Press.
- Ulrich, D., & Kryscynski, D. (2015). Winning in challenging markets requires stronger attention to human capital. *LSE Business Review*.
- Van Auken, H., Madrid-Guijarro, A., & Garcia-Perez-de-Lema, D. (2008). Innovation and performance in Spanish manufacturing SMEs. *International Journal of Entrepreneurship and Innovation Management*, 8(1), 36-56.
- Wan, G., & Zhang, Y. (2018). The direct and indirect effects of infrastructure on firm productivity: Evidence from Chinese manufacturing. *China Economic Review*, 49, 143-153
- Wang, W. Y., & Chang, C. (2005). Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan. *Journal of intellectual capital*, 6(2), 222-236
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic management journal*, 5(2), 171-180.
- West, M.A. and Farr, J.L. (1990), “Innovation at work”, in West, M.A. and Farr, J.L. (Eds), *Innovation and Creativity at Work*, JohnWiley & Sons, Chichester. pp. 3-13.
- Wright, P. M., McCormick, B., Sherman, W. S., & McMahan, G. C. (1999). The role of human resource practices in petro-chemical refinery performance. *International Journal of Human Resource Management*, 10(4), 551-571.
- Yang, S., & Kang, H. H. (2008). Is synergy always good? Clarifying the effect of innovation capital and customer capital on firm performance in two contexts. *Technovation*, 28(10), 667-678.

- Yeh-Yun Lin, C., & Yi-Ching Chen, M. (2007). Does innovation lead to performance? An empirical study of SMEs in Taiwan. *Management Research News*, 30(2), 115-132.
- Young, C.-S., Su, H.-Y., Fang, S.-C., & Fang, S.-R. (2009). Cross-country comparison of intellectual capital performance of commercial banks in Asian economies. *The Service Industries Journal*, 29(11), 1565-1579.
- Zahra, S.A., Ireland, R.D., & Hitt, M.A. (2000). International expansion by new venture firms: International diversity, mode of market entry, technological learning and performance. *Academy of Management Journal*, 43, 925–950.