



## Intellectual Capital and Sustainable Competitive Advantage: The Role of Innovation and Managerial Capability

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### Abstract

**Purpose:** The purpose of the present study is to examine the role of innovation and managerial capabilities on the relationship between intellectual capital and sustainable competitive advantage of the commercial banks in Tanzanian context. Based on three theories; the resource based view, knowledge-based view, and resources orchestration, it is hypothesized that; first, intellectual capital (human capital, structural capital, and relational capital) positively influence bank's competitive advantage; two, innovation performance significantly mediate the relationship between intellectual capital and bank's competitive advantage, and finally; managerial capability positively moderates the relationship between intellectual capital and bank's sustainable competitive advantage.

**Methods:** Survey design was deployed to collect data from commercial banks operating in Tanzania. The collected data were analyzed in three stages. First, data were analyzed using exploratory factor analysis followed by confirmatory factor analysis, and finally, hypotheses were tested using Partial least square - structural equation modeling. In total, the study utilized 406 valid cases to infer the final results.

**Findings:** The results indicate that human capital, structural capital, and relational capital have a direct, significant, and positive effect on the bank's sustainable competitive advantage. The results further indicate that innovation positively and significantly mediates the relationship between the intellectual capital and the sustainable competitive advantage of the commercial banks. Moreover, the results show that managerial capability positively moderates the relationship between structural capital and sustainable competitive advantage of the commercial banks. Besides, the results indicate that structural capital has a strongest influence over bank's sustainable competitive advantage followed by relational capital, and lastly human capital.

**Originality:** The findings of the study reveal that; sustainable competitive advantage tends to improve when managerial capabilities of the commercial banks are combined with static intellectual capital particularly structural capital. Thus, to achieve such productive combination, the commercial banks need to frequently develop the capabilities of their managers.

**Keywords:** structural capital, intellectual capital, human capital, managerial capability, relational capital, innovation, and sustainable competitive advantage.

**Paper type:** Research paper

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### Introduction

In today's uncertain and competitive business environment, business firms strive for sustainable competitive advantage (SCA). To withstand such competition, firms must develop the capability to pursue innovation through their managerial

capabilities (Shujaat et al, (2019). In competitive situation, firm's intangible resources especially the intellectual capital (IC) has a major contribution to creating and sustaining a firm's competitive advantage (Barney, 2015). In today's world, intellectual capital is considered one of the critical

sources the firm requires to gain and sustain competitive advantage. Intellectual capital according to Wee and Chua, (2016), refers to a set of intangible assets that include competencies and capabilities which increases the performance of the organization resulting to value creation. More so, Marta et al, (2018) asserted intellectual capital as non-monetary assets that eventually reap economic benefits in the future. Competitive advantage for the modern businesses is anchored on its intangible resources, particularly intellectual capital and no longer on financial and physical resources (Zhining et al, 2016). Intellectual capital is therefore firm's strategic resource required to drive sustainable competitive advantage of the firm. This denotes that, an organization that is capable of making constant innovation in form of novel business product, processes, or service and that is complemented with superior managerial capabilities is likely to develop and sustain competitive advantage over its rivals (Chatzoglou et al, 2018). The current study considers intellectual capital to be static intangible assets that comprise three dimensions namely; human capital (HC), relational capital (RC), and structural capital (SC). These static assets when triggered with innovation in collaboration with managerial capability leads into improved performance, hence value addition.

However, continual innovation that results in sustainable competitive advantage of the firm as emphasized by resource-based view requires resources that are valuable, rare, inimitable, and non-substitutable (VRIN). Nonetheless, the possession of valuable, rare, inimitable, and non-substitutable resources is a necessary but insufficient condition for sustainable competitive advantage. The resource orchestration theory accents that, to fully realize firm's sustainable competitive advantage, firm's resources should be complemented by managerial capabilities (MC) (Newbert, 2007).

Nevertheless, intellectual capital is considered a firm's static capital that cannot work out on its own, meaning that it is reliant on the managerial capabilities (Wang et al., 2016; Kianto et al., 2014). Managerial capital (MC) refers to capabilities with which managers can build, integrate, and reconfigure resources and competencies that explain differences in managerial decisions that lead to heterogeneity in firm performance. Firm's intellectual capital should be activated by managerial capabilities for it to yield the expected value otherwise it is worthless. Managerial capabilities leverage static IC resources into perceived value leading to a firm's sustainable competitive advantage (Inkinen, 2016 and Inkinen, 2015). Thus, Intellectual capital needs to be provoked to create sustainable competitive advantage. Provocation of the intellectual capital is dependent on the activities managers do when leveraging sustainable competitive advantage out of intellectual capital (Kianto et al., 2014). Whereas intellectual capital refers to intangible resources, managerial capabilities concentrates at performing whatever is considered crucial to properly utilize firm's intellectual capital to improve performance (Hsu and Sabherwal, 2012]; Kianto et al., 2014]; Wang et al., 2016]). In

a nutshell, MC represents the processes to leverage and get value out of static IC resources. It can therefore be concluded that what matters is the capability of the manager to make use of the intellectual capital they possess and not how much stock of intangibles the organization possess. An organization could have the best intellectual capital than its rivals but if all these capitals remain static without being converted into value to satisfy customers' needs, they are worthless. The conversion of static IC resources into value depends on the manager's capabilities (Novas, 2017). Firms with capable managers are likely to outperform their rivals provided that other factors remain fixed.

However, so far, according to the existing literature, there is no consensus among scholars about how each component of intellectual capital is associated with a firm's sustainable competitive advantage (Wang et al., 2016). Nor there is no agreement about which IC component is more valuable than the other. Some of the previous research ascertains that all elements of intellectual capital (HC, SC, and RC) equally enhance firm's sustainable competitive advantage (Wang et al., 2014]; Sharabati et al., 2010]). On the other hand, other scholars including Mahmoudi & Kiarazm, (2016). Ling]; Inkinen, 2015], Andreeva and Garanina, 2016];) argue that, the value of these components in influencing firm's SCA vary from one component to another. These opposing views necessitate the present study so as to examine how intellectual capital influence sustainable competitive advantage in banking industry. Further, the study examines the mediating role of innovation as well as the moderating role managerial capability in the relationship between intellectual capital and sustainable competitive advantage. Besides, justifiable shreds of evidence showing how intellectual capital and managerial capabilities intermingle to complement each other resulting into firm's sustainable competitive advantage are very rare (Wang et al., 2016).

Banking industry is among the most competitive industries regardless of the level of the country's economy. It is multifaceted and extremely innovative, full of abundant potential to outspread their financial services to the needy people and businesses in a long-lasting manner (Thomas, 2018). The phenomenon of intellectual capital in banking industry of developing countries is of great interest due to their search for solutions to address challenges facing commercial banks (Roos, 2017). Henceforth, a need arises on establishing how intellectual capital may enhance sustainable competitive advantage in banking industry, in particular, Tanzanian commercial banks.

The current study is aimed at attaining three objectives; first, to examine the relationship between intellectual capital and sustainable competitive advantage, second, to find out the mediating effect of innovation in the relationship between intellectual capital and sustainable competitive advantage, and lastly to examine the moderating effect of managerial capability in the relationship between intellectual capital and sustainable competitive advantage.

## Literature Review

The resource-based view (RBV) examines performance variances of organizations operating in the same industry grounding on their resources (Peteraf & Barney, 2003). The theory marks two focal assumptions: (i) firms operating in the same industry may differ in terms of the resources they possess, and (ii) that those resources may not be perfectly mobile across firms, and that these differences of resources may last long (Barney, 2007). The central concern of the resource-based view is that other factors remain fixed; firms in the same industry compete against one another basing on their resources. The firm with superior resources, accompanied with strong managerial capabilities, is likely to outperform the rivals for it is capable to produce better and valuable products and or services that satisfy customers more sufficiently than it would with inferior resources. Thus, the bank that possesses superior intellectual capital that is well orchestrated by superior managerial capabilities is in position to innovate leading to improved performance.

Basing on RBV, it is therefore, the view of the present study that differences in performance amongst commercial banks operating in Tanzania arise due to the fact that commercial banks own intellectual resources that are different in terms of human capital, structural and relational capital. Superior IC can innovate special processes that lower costs while improving quality of the product and service leading into perceived value on customers' side.

Bank's competitive position relative to others is based on its collection of unique resources. The bank as narrated by Barney, (2007) can have a competitive advantage if it uses a profitable, value-creating IC resource that is different from other competing banks. If competing banks are not able to copy such IC resources, then the bank is likely to have a sustainable competitive advantage (SCA) over its competitors.

### *Intellectual Capital and Sustainable Competitive Advantage*

A firm is believed to have a sustainable competitive advantage (SCA) if it is executing a value-creating strategy that is not simultaneously being executed by the current or potential rivals and when the rivals are not capable of duplicating the benefits of the strategy (Barney, J.B. (2015). Hence, the sustainability of a given competitive advantage is dependent on the possibility of its duplication by the competitor. Thus we consider a competitive advantage sustainable only if the firm continues to enjoy its benefits after the competitor's effort to duplicate it end in vain (Barney, (1991). However, the existence of sustainable competitive advantage does not depend on the period of calendar time; rather it depends on the incapability of the current and potential rivals to duplicate that strategy.

In organizations, intellectual capital occurs as a stock of knowledge resources that can potentially be applied in the process of value creation (Kianto et al., 2014). The drivers of an organizational sustainable competitive advantage in the modern competitive environment lie in a firm's intellectual capital rather than its physical and financial resources (Henri et al, (2017). According to the resource-based view, the

heterogeneous intellectual capital owned by banks is the main determinants of their sustainable competitive advantage (Anna, 2017). This is to say, the better the IC resource the bank possesses, the better chance it has to outperform the rivals. However, the effect of intellectual capital on a firm's sustainable competitive advantage is an industry as well as country-specific (Lentjušenkova and Lapina, 2016). Moreover, Guthrie and Dumay (2015), establish that, the three intellectual capital elements (HC, SC, and RC) are not equally important in influencing the competitive position of the firm. This denotes that, intellectual capital does not effectively work in the same way across different industries or countries. The subsequent sections explain how each of the three elements of intellectual capital influence firm's sustainable competitive advantage.

### *Human Capital and Sustainable Competitive Advantage*

Human capital (HC) refers to the totality of employees' competence, knowledge, skills, innovativeness, attitude, commitment, wisdom, and experience (Davey et al 2017). Human capital represents the human factor in the organization which includes; the combined intelligence, skills, and expertise that employees take with them when they leave their respective employer (Bontis, 2004). Human capital denotes what a single employee brings into the value-adding processes and encompasses professional competence, social competence, employee motivation, employee agility as well as leadership ability which altogether contribute into firm's sustainable competitive advantage (Halim, 2010).

Highly motivated and trained employees may question the already established organizational routines, and they have a critical role in creating new knowledge through the learning process and innovations which are the key determinants of firm's sustainable competitive advantage (Prajogo and Oke, 2016). Scholars have agreed in common that having a brilliant, motivated, and experienced human capital is the base of innovation leading to firm's sustainable competitive advantage (Cabrilo et al, 2014). A firm with distinguished superior human capital is likely to increase its ability to anticipate and take corrective measures against rapid changes occurring in the market in advance of its competitors which in turn sustains its competitiveness.

Human capital is associated with education, training, and other career plans to increase the level of knowledge, skills, abilities, values, and social assets of an employee, which usually result in employee satisfaction and performance improvement (Hardeep and Purnima, 2015). Moreover, human capital being the main component of all elements of intellectual capital, significantly affects a firm's radical innovative capability (Przychodzen, & Przychodzen, 2015) which in turn creates firm's sustainable competitive advantage. Hsu and Wang (2012) proclaimed that firms with high-quality and well-knowledgeable employees are not only likely to succeed at refining their internal knowledge but also to excel at absorbing external knowledge and skills.

Organizations can build up their human capital by attracting well-knowledgeable individuals with high skills from the

external labor market or by developing the existing internal present employees. However, for small firms, it is advised to develop their existing employees since it is costly to attract new and competent employees from the labor market. The present study chooses the most intuitive and logical relation between HC and SCA which argues that; creative, experienced, and skillful employees accelerate the innovation process which positively influences firm's SCA. Building on this reasoning, the current study establishes that:

*H1: Human capital positively influences the sustainable competitive advantage of the commercial banks.*

#### **Structural Capital and Sustainable Competitive Advantage**

Structural capital (SC) is a non-human storehouse of knowledge which include databases, organizational charts, process manuals, strategies, software system, hardware, company image, patents, copyright, trade mark, supply chain, and routines whose value to the organization is higher (Andreeva and Garanina, 2016). Thus, structural capital is the valuable intangible assets that employees cannot take away when getting off work or leaving the organization (Edvinsson and Malone, 1997). This is opposite to human capital in which at the end of the day an employee leaves the organization with his or her knowledge, skills, and experience. It should be noted that, regardless of how best human capital and relational capital an organization has, if it lacks structural capital its HC and RC become inefficient.

Structural capital plays an important predictive role in achieving and sustaining firm's competitive advantage. This is made possible through the provision of the supporting infrastructure that enables creative activities to take place. The SC establishes work systems, procedures, and databases that facilitate employees' performance. It provides the reporting relationship showing who reports to whom to avoid role overlapping. Further, SC offers patent right that protect inventions made by the bank from being infringed by rivals. Since structural capital remains with the firm regardless of employees' turnover; it assures the bank a sustained competitive advantage. The current study relies on the logic that, having efficient firm processes and routines, effective information systems and databases or/and organizational culture that promotes innovation behavior can tremendously constitute to firm's SCA. Hence, it is hypothesized that:

*H2: Structural capital positively influences the sustainable competitive advantage of the commercial banks.*

#### **Relational Capital and Sustainable Competitive Advantage**

Relational capital (RC) is the knowledge embedded in relationships with customers, suppliers, competitors, government, industry associations, or other stakeholders that influence organizational life, create value, and adds to enhanced organizational functioning (Shih et al. 2010). It is the sum of assets that organize and manage relationships with the environment (Han and Li, 2015; Chahal and Bakshi, 2015). Relational capital is therefore an intangible asset that is based on developing, nurturing, and maintaining high-quality relationships with other organizations, individuals, or groups that influence firm's position in the market (Dost et al,

2016). Relational capital is the knowledge embedded in the marketing channels and relationships that a firm develops over a long period of time in the course of conducting business. It enables firm to learn from its environment and understand customers' needs in order to better serve them (Giacosa et al, (2017).

Relationship if continuously improved is an important source of new knowledge and novel insights which in turn accelerates firms' innovations leading to improved performance (Martín-de Castro et al., 2013). Firms in good relationship can share their technology, knowledge, skills, and experience at cheap or no cost. Such firms in positive relations can easily reduce competition among themselves leading into profit maximization because they can collectively agree on the prices to charge. This sharing reduces operational cost while improving firm's profitability and its competitiveness.

However, empirical evidences on the influence of relational capital on employee performance have been debatable. For instance, while some found that RC positively influence firms sustainable competitive advantage (Mehdivand et al., 2012]; Mahmoudi, and Kiarazm, 2016]; Delgado-Verde et al., 2011b]), others report that RC has no direct influence on SCA (Andreeva and Garanina, 2016]). Hence, to address such conflicting results, it is now hypothesized that:

*H3: Relational capital positively influences the sustainable competitive advantage of the commercial banks.*

#### **Mediation effect of innovation**

Innovation refers to the application of inventions and discoveries through which new outcomes satisfying the customers, whether products, services, systems, or processes come into existence (Hall, 2005). Innovation can either be incremental or radical innovation (Orlikowski, 1991). Incremental innovation means improving existing products, services, and technologies or adding additional features whereas radical innovation means bringing into existence something new like products, services or technologies.

Following the intense and rapid competitive changes in business industries, Gandotra (2010) opined that firms are required to continuously make the best use of their intellectual capital to innovate products, processes, and markets for them to remain competitive. Innovation enables firms to be flexible and adaptive to different competitive environmental. Innovation that is characterized by VRIN intellectual capital is empirically linked with competitiveness and is considered a necessary strategic tool for firms wanting to remain competitive (Prajogo and Oke, 2016).

Businesses have nowadays realized that they can better gain sustainable competitive advantage through well-nurtured intellectual capital that is capable to add organizational value through innovation of products, services, processes, and markets (Buenechea-Elberdin, 2017). Hence, successful innovations requires firms need to have VRIN human capital since innovation is never the end by itself rather it is a means to competitive performance.

Further, structural capital (SC), plays a significant role in gaining sustainable competitive advantage of the firm (Rezaei and Moghanlo, 2015). A competitive structural capital is attained through innovation by developing new technologies and structures in the form of improved databases, process instructions, information systems, organizational charts, and strategies which ultimately helps an organization in value-creating and sustaining a superior position in the industry (Verma and Rao, 2016).

Moreover, organizations do not exist as independent entities; rather they depend on other organizations and other stakeholders for their survival in terms of knowledge and innovation (Anna, 2017). This is in accordance to the theory of diffusion of innovation that emphasizes that there should be a proper communication of information about innovation from one organization to another. In a given industry, firms learn from each other and such learning and transfer of technology reduces the cost that firms could have incurred in research and development (R&D). Thus firm's SCA is dependent on the relationship the firm has with other stakeholders (Bindu and Rao, 2016). From this viewpoint, it is then hypothesized that;

*H4: Innovation positively mediates the effect of human capital on the sustainable competitive advantage of the commercial banks.*

*H5: Innovation positively mediates the effect of structural capital on the sustainable competitive advantage of the commercial banks.*

*H6: Innovation positively mediates the effect of relational capital on the sustainable competitive advantage of the commercial banks.*

#### **The Moderating Effects of Managerial Capabilities**

Managerial capabilities (MCs) refer to capabilities with which managers build, integrate, and reconfigure resources and competencies that explain differences in managerial decisions leading to heterogeneity in a firm's sustainable competitive advantage (Harlow, 2017). This implies that firms differ in their competitiveness depending on the differences they have in managerial capabilities. According to resource orchestration theory, managers with strong capabilities are those who are capable in structuring, bundling, and leveraging firm's resources to create the perceived value on customers' side (Sirmon et al. 2011). According to Helfat, et (2015), organizations through managerial capabilities set goals, define strategy, mark out plans of action including resources needed to achieve objectives as well as monitoring the implementation of the plans. Among the strategies set by capable managers include having in place the right and innovative intellectual capital, effective and efficient structural capital, as well as established strong relationship with stakeholders. The higher the capability of the manager, the higher the probability of the firm to outperform its rivals, thus enjoying competitive advantage. Then, it is then hypothesized that:

*H7: Managerial capability positively moderates the effect of human capital on the sustainable competitive advantage of the commercial banks.*

*H8: Managerial capability positively moderates the effect of structural capital on the sustainable competitive advantage of the commercial banks.*

*H9: Managerial capability positively moderates the effect of relational capital on the sustainable competitive advantage of the commercial banks.*

#### **Research Design and Methods**

The present study deployed quantitative survey design where questionnaire was used to gather data from 406 employees from 34 commercial banks operating in Tanzania between December 2021 and November 2022. Purposive sampling technique was used to obtain the study sample where 5 managers and 2 senior members of staff from each bank were involved. Thus, seven respondents including managers and senior staff were found ideal to address variations in responses. This is in accordance to Field's (2006) guidelines on sample selection, that for firm representation, a minimum of five representatives is adequate. Hence, seven respondents per bank was a fair representation.

#### **Measures**

A five-point Likert scale was adopted for all items scales ranging from 1 – strongly disagree to 5 – strongly agree. The items under intellectual capital (human capital, relational capital, and structural capital) were extracted from Sharabati et al. (2010), and Choudhary (2010). The items under innovation were extracted from Slađana & Sven (2018), while measures for managerial capabilities were obtained from Homburg et al (2010). Further, the items for sustainable competitive advantage were acquired from Slađana & Sven (2018) and Kianto et al. (2014). The final questionnaire form comprises of 33 items from the six constructs of the study. These are; 16 items for intellectual capital (6 items from HC, 5 items from SC, and 5 items from RC), 5 items for MC, 5 items for IP, and 7 items for SCA.

#### **Reliability and Validity**

Content and face validity were assessed through consultation with academics and bank practitioners after which minor amendments were made to some items. Content validity is the degree to which the scale provides an adequate representation of the conceptual domain that it is designed to cover whereas face validity is established when an individual looks at the scale and sees whether, on its face, it seems a good reflection of the research construct or not (Shaikh, (2004). Since the researcher derived many of the items on the scale through a comprehensive study of relevant literature along with discussions with practitioners, the content and face validity of the instrument were ensured. Confirmatory factor analysis (CFA) was carried out using smart PLS3 to test the reliability and validity of the data.

#### **Data Analysis and Results**

Data analysis was carried out in two steps; measurement model and structural equation modeling (SEM)

**Measurement model**

Exploratory factor analysis (EFA) using Smart partial least square (smart PLS) in which the PLS algorithm was run to explore the underlying factors of the observable items and to assess the construct reliability. Further, confirmatory factor analysis (CFA) using PLS-algorithm was performed to examine the model fit and further to evaluate the validity and reliability of the constructs. At this stage data purification is done to make sure that the subsequent step of structural model is feasible. The second stage involved structural equation modeling (SEM) under which study hypotheses are tested.

**Exploratory Factor Analysis**

Exploratory factor analysis (EFA) according to Malhotra and Dash, (2010) aims at data reduction and purification. Since the data gathered are never perfect, the current study had to reduce the irrelevant and incomplete ones. Hence, EFA was deployed and during the process, items with factor loading less than 0.5 as suggested by Sharabati et al., (2010) were deleted until all factors were clean. It took around 30 iterations to clean all the factors from the six study constructs; HC, SC, RC, IP, MC, and SCA.

After EFA was performed it was found that, out of 22 items of human capital, 6 items were retained while in structural capital, 5 items were retained out of 14 items. Likewise, out of 10 items of relational capital, 5 items were retained whereas 5 items out of 10 items under innovation were retained. Besides, out of 16 items under managerial capability, 5 items were retained and finally, 7 items of sustainable competitive advantage out of 28 items were retained. The resultant factors of all the scales after EFA are as shown in Table 1.

**Table 1 Research Constructs and Respective Items after EFA**

Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Not Sure; 4 = Agree; 5 = Strongly Agree:

	Human capital (HC)	1	2	3	4	5
HC1	Our employees have required competences					
HC2	When an employee leaves the bank, we have a succession training program for his/her replacement					
HC3	Our employees can withstand pressure from work					
HC4	We have self-driven employees					
HC5	Most of business ideas are initiated by our employees					
HC6	Employees in this bank always search for knowledge					
	<b>Structural capital (SC)</b>					
SC1	The time to complete one					

whole transaction has been decreasing

- SC2 Our internal processes are clear to the users
- SC3 Our systems make it easy to access relevant information
- SC4 We have a well-defined organizational structure
- SC5 This bank promotes a culture of teamwork

**Relational capital (RC)**

- RC1 We have good network systems with our customers
- RC2 Our bank takes services nearer to our customers
- RC3 At times customers participate in deciding on the matters that affect them
- RC4 Different units and functions within our bank – such as R&D, marketing and customer service – understand each other well
- RC5 Our employees frequently collaborate to solve problems

**Managerial capabilities (MCs)**

- MC1 Our management is capable of defining and coordinating processes.
- MC2 Our management is capable of making strategic decisions.
- MC3 Our management is capable of identifying new market opportunities
- MC4 Our management discovers the strategies and tactics of competitors
- MC5 Our organizational management has international experience in management.

**Innovation performance (IP)**

- IP1 Products and services for customers
- IP2 Service methods and



	processes
IP3	Management practices
IP4	Marketing practices
IP5	Business models
<b>Sustainable competitive advantage (SCA)</b>	
SCA 1	This bank has the best market share in the industry
SCA 2	This bank provides timely services than any other bank in the industry
SCA 3	This bank provides cheaper financial services to its customers in the market
SCA 4	This bank is known for diversified services in the industry
SCA 5	Customers attach value to the services provided by this bank
SCA 6	Our bank's market has been growing
SCA 7	We provide distinctive products to our customers

**Confirmatory Factor Analysis**

After underlying factors were extracted using EFA, confirmatory factor analysis (CFA) was used to confirm the measurement of the constructs. The measurement models were tested using PLS Algorithm. During this process, items with factor loadings below 0.5 were dropped and the model was re-run till all the standardized factor loadings were significant at or above 0.5.

First, the values of  $\chi^2$ , and the Normed Fit Index (NFI) were used to test the suitability of the data. Generally, NFI values over 0.90 according to Hair et al., (2006) are acceptable values. For the present study, NFI was 0.909 exceeding the threshold of 0.90, and the Chi-square ( $\chi^2$ ) of 377.7, then it was confirmed that the goodness-of-fit indices were acceptable (table 2).

**Table 2 Model Fit**

	Saturated Model	Estimated Model
SRMR	0.0353	0.0353
d_ULS	0.3745	0.3745
d_G	0.1812	0.1812
Chi-Square	377.713	377.7130
NFI	0.909	0.9090

Secondly, convergent validity was tested using the values of the standardized factor loading, average variance extracted (AVE), and composite reliability (CR). According to Fornell and Larcker (1981), the standardized factor loading value of each item should exceed 0.7 to be accepted. Similarly, the CR values must be over 0.7 to be feasible. The values for factor loadings and composite reliabilities of all items of the present study met these standards, thus achieving convergent validity (Table 3). However, MC 5 with a factor loading of 0.65 was accepted though it is below the threshold of 0.7 because from the tests made it did not affect the significance of the variable (MC). On the other hand, CR values for the current study ranges between 0.7644 (HC) and 0.8693 (RC). Thus, they all qualify the threshold of 0.7. Furthermore, the average variance extracted (AVE) was tested with the same intention of establishing the feasibility of the structural model. According to Hair et al. (2006) and Chin, (1998), AVE values should be over 0.5 to achieve convergent validity. The results of the present study show that all the six constructs of the study qualify since AVE values are over 0.5 (table 3).

**Table 3 Construct Reliability and Validity**

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
HC	0.5385	0.5384	0.7644	0.5197
IP	0.7735	0.7786	0.8458	0.5235
MC	0.7385	0.7477	0.8358	0.5610
RC	0.7749	0.7801	0.8693	0.6893
SC	0.7253	0.7272	0.8451	0.6454
SCA	0.8046	0.8059	0.8647	0.5612

Lastly, correlation analysis was administered to test discriminant validity. For the model to be feasible, the square root of AVE should be higher than the correlation between the constructs (Fornell and Larcker (1981). All study constructs, passed this test as shown in Table 4.

**Table 4 Discriminant Validity**

	HC	IP	MC	RC	SC	SCA
HC	0.7209					
IP	0.4728	0.7235				
MC	0.5195	0.657	0.749			
RC	0.5494	0.6513	0.7084	0.8302		
SC	0.5173	0.6238	0.6807	0.7537	0.8033	
SCA	0.5805	0.7021	0.7221	0.7653	0.7526	0.7491

Henceforth, the measurement model results suggest that the analysis of the structural model is feasible.  
*The R-Square*



The R-square value for innovation is 0.475 (47.5%) which suggests that 47.5 percent of the variance in innovation can be described by HC, SC, and RC. Moreover, the R-square for sustainable competitive advantage is 0.725 (72.5%) which implies that 72.5 percent of the variance in sustainable competitive advantage (SCA) can be described by HC, SC, RC, IP, and MC. According to Cohen (1988), the R-square = 0.26 is considered substantial. Hence the R-square of IP (0.475) and SCA (0.725) indicate strong explanatory power of the model (Table 5).

**Table 5 R-Square**

	R-Square	R-Square Adjusted
IP	0.4754	0.4714
SCA	0.7252	0.7208

**Structural Model**

The structural model aims at testing the established hypotheses of the study. The partial least square-structural equation modeling (PLS-SEM) was used to examine relationship between study variables. PLS-SEM was chosen because of two reasons. First, the literature shows mixed empirical evidences which would now require an advanced model comprising both the mediator and moderator for which PLS-SEM according to Hair et al., (2012) is the appropriate approach. The second reason for choosing PLS-SEM is grounded on Van Reijssen et al. (2015) who established that, for multiple latent variables, PLS-SEM is an ideal approach.

**Hypotheses testing using smart PLS-SEM**

Structural Equation Modeling (PLS3 - SEM) was used to test the study hypotheses. Complete bootstrapping was run through confidence interval method-bias corrected and accelerated (BCa), two-tailed at the significance level of 0.05 and sub-sample of 5000. The general results as presented in figure 1 indicate that all path coefficients for the study constructs are significant.

**Path coefficients and T-statistics**

Figure 1 presents the values for path coefficients and T-statistics of all six study variables. The results show that all path coefficients were positive and significant at 5 percent confidence interval except (HC...>IP) which has a coefficient value of 0.075 and a T-value of 1.49. However, this path coefficient is significant at a 10 percent confidence interval. The rest of path coefficients have t-values above 2.0 which

show a strong influence of independent variables on the dependent variable. That is: HC.....>SCA (t = 3.611), SC.....>IP (t = 2.972), SC....>SCA (t = 4.907), and RC.....>SCA (t = 4.450).

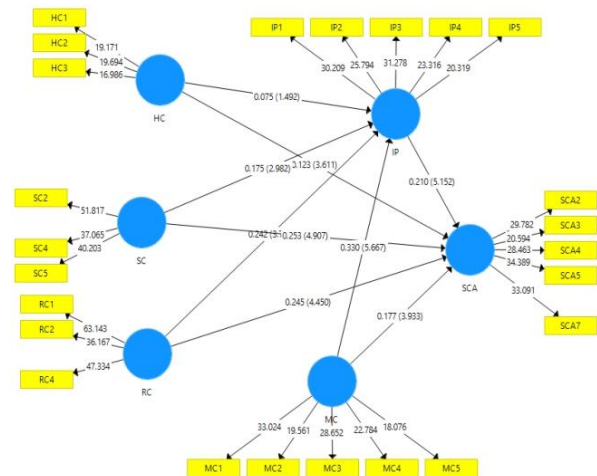


Figure 1 Path coefficients and T-statistics

**The Effects of Intellectual Capital on Sustainable Competitive Advantage**

The relationship between components of intellectual capital (HC, SC, and RC) and SCA were tested using PLS-SEM at 95 percent confidence interval, two-tailed and the results are as presented in Table 6.

Firstly, the relationship between HC and SCA shows positive path coefficient ( $\beta = 0.1249$ ) and statistically significant ( $p = 0.0004$ ) and t-value of 3.5686. This indicates that human capital has a direct positive effect on sustainable competitive advantage. Hence H1 is supported. Secondly, the relationship between SC and SCA revealed a positive path coefficient ( $\beta = 0.2541$ ) and very significant ( $p < 0.0001$ ) and t-value of 4.9948. Thus, H2 is correspondingly supported. Thirdly, the path coefficient between RC and SCA was positive ( $\beta = 0.2464$ ) and very significant ( $p < 0.0001$ ) and t-value of 4.5159. Likewise, H3 is supported. The results indicate that SC has a strongest influence over SCA ( $t = 4.9948$ ) followed by RC (4.5159), and lastly HC (3.5686). These results generally show that intellectual capital has positive and significant effects on sustainable competitive advantage of the Tanzanian commercial banks.

**Table 6 Path coefficients (5,000 sub-samples)**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Hypothesis supported
H1: HC -> SCA	0.1249	0.1268	0.035	3.5686	0.0004	Yes
H2: SC -> SCA	0.2541	0.2525	0.0509	4.9948	0.0001	Yes
H3: RC -> SCA	0.2464	0.2462	0.0546	4.5159	0.0001	Yes

**Mediating Effects of Innovation**

The mediating effect of innovation performance on the relationship between intellectual capital components (HC, SC, and RC) and SCA was tested and revealed that:



First, the path coefficient for the indirect route of HC - IP - SCA is positive ( $\beta = 0.0262$ ) and significant ( $p = 0.0300$ ) and  $t = 2.1702$ . Thus, H4 is supported. Secondly, the path coefficient for the indirect route of SC - IP - SCA is also positive ( $\beta = 0.059$ ) and significant ( $p = 0.0004$ ) and  $t = 3.531$ . Consequently, H5 is supported. Thirdly, the path coefficient for the indirect route of RC - IP - SCA is positive ( $\beta = 0.0793$ ) and very significant ( $p < 0.0001$ ) and  $t = 4.1542$ . Accordingly, H6 is supported. The results show that H4, H5, and H6 are all supported implying that innovation significantly mediates the relationship between intellectual capital and sustainable competitive advantage (Table 7).

Since the models without mediator as presented in Table 6 are significant and have higher coefficient values than the coefficient values of models with the mediator presented in Table 7, and since all mediated coefficients are significant, then this proves that there exists a partial mediation. Henceforth, it is confirmed that innovation partially mediates the relationship between intellectual capital and sustainable competitive advantage.

Table 7 Specific Indirect Effects

		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Hypothesis supported
H4	HC -> IP -> SCA	0.0262	0.0264	0.0121	2.1702	P = 0.0300	Yes
H5	SC -> IP -> SCA	0.059	0.0597	0.0167	3.531	P = 0.0004	Yes
H6	RC -> IP -> SCA	0.0793	0.0795	0.0191	4.1542	P < 0.0001	Yes

**Moderating Effects of Managerial Capability**

The moderating effect of managerial capability (MC) on the relationship between intellectual capital components (HC, SC, and RC) and sustainable competitive advantage (SCA) was tested and revealed the following results as presented in Table 8.

First, the path coefficient for the interaction between human capital (HC) and managerial capability (MC) on sustainable competitive advantage (SCA) is negative ( $\beta = -0.001$ ) and insignificant ( $p = 0.9777$ ) with  $t$ -value = 0.028. This implies that managerial capability has no moderating effect in the relationship between HC and SCA. Hence H7 is rejected. Secondly, the interaction between structural capital (SC) and managerial capability (MC) on sustainable competitive advantage (SCA) is positive ( $\beta = 0.1151$ ) and significant at 5 percent ( $p = 0.0358$ ) with  $t$ -value = 2.0999. Then, H8 is supported. Further, the interaction between relational capital (RC) and managerial capability (MC) on sustainable competitive advantage (SCA) is negative ( $\beta = -0.1085$ ) but significant at 5 percent ( $p = 0.0191$ ) and  $t$ -value = 2.3436. Hence, H9 is rejected because of its negative moderating effect. Lastly, the path coefficient for the interaction between innovation performance and managerial capability (MC) on sustainable competitive advantage is negative ( $\beta = -0.0305$ ) and insignificant even at 10 percent ( $p = 0.4809$ ) with  $t$ -value = 0.7050. Hence H10 is rejected.

Table 8 Path Coefficients for moderating effects

		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Hypothesis supported
H7	HC*MC -> SCA	-0.001	-0.0035	0.0366	0.0280	0.9777	No
H8	SC*MC -> SCA	0.1151	0.1149	0.0548	2.0999	0.0358	Yes
H9	RC*MC -> SCA	-0.1085	-0.1107	0.0463	2.3436	0.0191	No
H10	IP*MC -> SCA	-0.0305	-0.0321	0.0433	0.7050	0.4809	No

**Discussion**

**Human capital and sustainable competitive advantage**

Human capital refers to employees’ knowledge, qualifications, education, skills, attitude, innovations, aggression, and the ability to respond and change (Dzinkowski, 2000). Human capital, as opined by Davey (2017) provides the main source of developing new ideas and knowledge enhancing the firm’s sustainable competitive advantage. More so, creative, highly motivated, and trained employees are likely to question the already established bank’s relations, procedures, and information systems. It should be remembered that all sorts of bank innovations be it a product, service, process, market, and so forth are put into

actions by human capital. This is further emphasized by knowledge-based view that underpins that the differences between firms’ performance arise from differentiated knowledge-based resources and capabilities in use.

The present findings indicate a direct influence of human capital on sustainable competitive advantage of banks. These findings are in line with previous studies including Cabrilo et al (2014) that revealed that employees having a well-nurtured industrial knowledge, experience, attitude, and skills can easily identify the changes facing their bank and take right decisions on resource allocation and path-finding strategy thereby predicting the outcomes precisely. It is the view of the present study that, Tanzanian commercial banks can

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strengthen their human capital by attracting individuals with relevant skills from the external labor market or by internally developing the skills of their current employees. However, Wright et al (2014) suggest that small firms are more likely to make the best out of their existing human resources, rather than attracting new ones who are more skilled, experienced, and competent who usually demand high pay. However, Extant theory stresses that human capital is a strong source of firm's sustainable competitive advantage only if the isolating mechanism is in place preventing employees from taking their valuable knowledge, experience, and skills to rival firms (Barney, 1991). If there is no effective isolating mechanism then there is a possibility of what is considered competitive advantage for bank "A" to get transferred to bank "B" and so forth. This implies that while recruiting or developing human resources, banks should have in place the best retention strategies so that they retain such valuable employees.

#### ***Relational capital and sustainable competitive advantage***

Relational capital according to Chahal and Bakshi, (2015) is referred to as the relationships that an organization establishes with both internal and external stakeholders. This is to say an organization cannot survive on its own; it has in one way or another to depend on other stakeholders for either its inputs or outputs. So having a reputable relationship with other stakeholders is practically inevitable for the commercial banks to remain competitive. Such relationships according to Han and Li, (2015); and Chahal and Bakshi, (2015) include; the organization's relationship with its employees, customers, shareholders, suppliers, competitors, government, public institutions, and the society at large. Bank internal relationship is created between employees and management, employees and fellow employees, management and trade union, etc. On the other hand, bank's external relationship is the relationship established between the bank and its customers, suppliers, government, trade unions, and other stakeholders.

The present study affirmed that relational capital positively influences bank's competitive advantage. This confirms the third hypothesis of the current study. Good relationship facilitates interaction and collaboration between the commercial bank, customers, and other relevant stakeholders. Such a well-nurtured relationship helps in retaining the current customers while attracting the potential ones; this ensures the bank a long-lasting customer base. Martin de Castro (2014), asserted that relationships be it internal or external is the vital foundation for novel ideas as well as market opportunities which in turn accelerate innovations which is the key driver for competitive advantage. The current study discovered that due to healthy relationships between some of the surveyed banks and customers, some of these banks allow their clients to repay the loans by installments even after the due date and this has been influencing clients' loyalty to respective banks. Similarly, some banks have gone ahead by assigning customers to relations managers to guide them in decision making particularly those decisions pertaining to long-term investments, this strategy was reported to help banks in customer retention. Moreover, based on the good relationship with stakeholders, the bank's reputation and

approachability by its customers, and other stakeholders are enhanced leading to increased satisfaction on the side of customers. If the current customers are satisfied, they will stay with the current bank otherwise they might quit and join the rival banks. Good relations with the current customers according to Lara et al, (2017) are likely to attract more potential customers in the future. However, banks should ensure that their customers' loyalty is to the bank itself and not to the individual employee so that in case of turnover of employees, the organization retains its network of customers.

#### ***Structural capital and sustainable competitive advantage***

On the other hand, sustainable competitive advantage of the banks is due to its structural capital, that is; supportive organizational systems, organizational structure, and culture which to a large extent enhance organizational efficiency as well as innovation. Structural capital comprises of the knowledge that is embedded in the organization process, culture, databases, routines, information systems, patents, brands, trademarks, copyrights, and other intellectual property (Karagiannis et al, 2008). Structural capital remains with the organization even after the employee has left the organization which is not the case with human capital.

The findings of the present study show that structural capital positively influences bank's competitive advantage. The findings entail that structural capital offers the facilitating and friendly environment that enhances creativity as it gives room for human capital and relational capital to play their functions which in turn leads into sustainable competitive advantage of the banks.

The present study establishes that having efficient organizational processes and routines, effective information systems and databases, and organizational culture that commits to innovation can constitute important sources for innovative success which is a key determinant of bank's sustainable competitive advantage. Similar findings were established by Marti'n-de-Castro (2013) who reported that, at the organizational level, innovations as the collective attainments of human capital need organizational structure that supports the process of transforming individual tacit knowledge into codified and explicit organizational knowledge leading into firm's competitive edge. According to RBV, the commercial banks that superiorly differentiate themselves in terms of; processes, procedures and routines, culture, databases, information systems, patents, brands, trademarks, copyrights, and other intellectual property are likely to outperform its rivals, hence creating and sustaining and competitive advantage.

#### ***Mediating Effects of Innovation***

Innovation refers to application of inventions and discoveries by which new outcomes, whether products, services, systems, or processes come into existence (Mersiha et al 2013). Innovation can further be categorized as either incremental or radical (Ngo et al, 2012). Incremental innovation refers to improving existing products, services and technologies or to come up with additional features on the existing product while radical innovation is referred to bringing into existence

something new be it a product, service, method, or technology. Both incremental and radical innovations are the backbone of the bank's sustainable competitive advantage for banks need to improve their service packages in terms of products, services, systems, and procedures so that they benefit from the patented rights while at the same time satisfying customers thirsty through friendly and convenient services. In service firms like commercial banks, innovation is empirically linked with competitiveness and is considered a necessary strategic tool for firms wanting to remain competitive (Hardeep and Purnima, 2015).

The present study establishes that intellectual capital significantly influence competitiveness of the banks. This influence was found to improve when innovation was introduced as the mediator. Thus, innovation is confirmed to be the mediator of the relationship between intellectual capital and the sustainable competitive advantage of commercial banks. This is in line with Tai et al, (2015) who reported that the importance of innovation has been tremendously growing due to the unrest of the business competition in which innovation is considered a critical driver. Banks with greater innovative capabilities are likely to be more successful in responding to a changing environment and improving their competitiveness for they are likely to come up with a satisfying solution. The commercial banks in Tanzanian like in other developing countries operate in the contemporary competitive settings described as globalized, turbulent, uncertain, changing, and increasingly competitive (Sapienza and Teece, 2014). It is therefore argued that the commercial banks operating in Tanzania are required to continuously innovate so as to address the complaints and needs frequently raised by customers. This finding is similar to the one reported by Ferraris et al, (2017) to whom innovation is considered a sine qua non-condition for the firm's survival. Based on the diffusion of innovation theory, Tanzanian commercial banks should not relax by just having innovations at hand nor by just having patents to protect their innovations, rather they should make sure that innovations are well shared and understood by their employees and customers. If this sharing of innovation gets well done, then innovation is likely to effectively mediate the relationship between intellectual capital and sustainable competitive advantage of the given commercial bank. Bank managers therefore, may pursue market innovation through the earlier identification of potential markets, securing a first-mover advantage and always being on top of market trends. However, innovation banks depends on the human resources the firm has, meaning that the smarter the HC the bank possesses, the better the innovation results, taking into account that other factors remain fixed. This argument is grounded on the RBV which advocates that sustainable competitive advantage can be achieved through prompt exploitation of resources that are unique, valuable, rare, imperfectly imitable, and capable of being operationalized by the firm (Martín-de-Castro et al., 2013).

## Conclusion

This study examined the complex relationships amongst banks' intellectual capital, innovation, and sustainable competitive advantage. The study intends to contribute to the body of knowledge on how effectively intellectual capital can be managed to add organizational value. Due to the fact that the study had multiple latent variables and because the literature show a mixed empirical evidence an advanced model comprising of the mediator and moderator was found to be ideal, hence the study deployed the partial least square-structural equation modeling. The results show that all components of intellectual capital; human capital, structural capital, and relational capital have a direct significant effect on the sustainable competitive advantage of the Tanzanian commercial banks. The findings further show that innovation partially mediates the effects of intellectual capital on the sustainable competitive advantage of the commercial banks. Besides, the results indicate that structural capital has a strongest influence over bank's sustainable competitive advantage followed by relational capital, and lastly human capital. The findings therefore imply that; sustainable competitive advantage tends to improve when managerial capabilities of the commercial banks are combined with static intellectual capital, particularly structural capital. Thus, to achieve such productive combination, the commercial banks need to frequently develop the capabilities of their managers.

## Limitation of the Study and Future Studies

The current study concentrated on selected elements of intellectual capital; human capital, structural capital, and relational capital, leaving other elements like organizational capital, and culture untouched. Therefore, it is the view of the present study that the untouched elements get satisfactory attention in future studies. More so, since the current study examined the banking industry, further studies could be carried out in various industries like construction, SME, and information technology so as to validate the already established findings in the present study.

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