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The Impact of Intellectual Capital on Financial Performance of Insurance Firms in Tanzania

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ABSTRACT

This paper investigated the impact of intellectual capital on the financial performance of insurance companies in Tanzania. The study used data collected from eleven (11) insurance companies from 2009 to 2018. A random effect panel regression model was used to estimate the impact of the two measures of intellectual capital, namely human capital efficiency and structural capital efficiency. We controlled for the differences in leverage and capital employed. The findings show that human capital efficiency positively and significantly influences financial performance. However, we did not find any evidence regarding the influence of structural capital on financial performance. The findings of this study imply that for any firm to excel financially, it must explore and utilise its internal capabilities, especially human and physical capital, in the best way possible.

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1.0 Introduction

A stable and well-functioning insurance sector promotes economic growth and development. It simplifies business and economic relationships by spreading risk and offering lasting investment and financial stability (Xu and Wang 2018). Good financial performance is a pre-requisite for the performance of any sector, including insurance.

Intellectual Capital (IC) is believed to be one of the key drivers of market health, enhancing any firm's competitiveness and growth (Huang and Wu 2010). According to Shahwan and Habib (2020), IC is the sum of all employee competencies and skills that generate wealth for the firm. Its role in new and emerging sectors can be more profound because knowledge, innovation, and relationships are critical in driving growth and competitiveness (Asif *et al*. 2020). IC is considered to be the value of companies beyond financial statements, which forms a substantial part of a firm's competitive advantage (Dumay *et al*., 2020).

The impact of intellectual capital on the financial performance of infant industries (new and emerging sectors) could be particularly significant due to several factors unique to these industries. Infant industries often rely heavily on innovation, agility, and building strong market relationships to establish themselves. While there is strong evidence suggesting that intellectual capital positively impacts financial performance, the extent of this impact can vary widely based on how well organisations measure, manage, and leverage their intangible assets (Janošević *et al*. 2013). This limits the generalisation and even applicability of findings from other studies to other specific contexts, like in Tanzanian firms. Moreover, since no empirical work has been conducted on the impact of IC on the financial performance of insurance firms in Tanzania, the impact of IC and its various components, if any, remains a matter of further investigation.

The insurance sector in Tanzania is considered to be in the infant stage (TIRA, 2018). According to the market performance report by TIRA (2018), there are 30 insurance firms and one (1) reinsurance company. Out of total registered companies, twenty-three (23) are privately owned with at least one third local ownership, four (4) are fully locally owned, and two (2) are 100 percent state owned, which are National Insurance Corporation and Zanzibar Insurance Company by the Government of the United Republic of Tanzania and Revolutionary Government of Zanzibar, respectively.

This research paper explores the impact of intellectual Capital (IC) and its various components on the financial performance of 11 insurance firms in Tanzania over a 10-year period. The paper is original because no previous empirical work on IC and its effects on financial performance has been carried out among insurance firms in Tanzania, which are still in their infancy stage. This study is grounded in the Knowledge-Based View (KBV) and uses random effects of panel data analysis to estimate the impact of intellectual capital on the financial performance of insurance firms in Tanzania. Knowing IC's contribution to financial performance is considered a step towards promoting sector growth and development.

2.0 Theoretical Background

2.1 The Concept of Intellectual Capital

Intellectual Capital (IC) is defined as a group of knowledge assets that are attributed to an organization and most significantly contribute to its improved competitive position by adding value to defined key stakeholders. Sambasivan *et al*. (2011) defined IC as sources of future benefits that are generated by innovation, unique organizational designs, or human resource practices. IC is also regarded as the only channel through which the organisation can retain its long-term competitive advantage (Ali *et al*., 2022; Marr *et al*., 2004). Recent studies have focused on intellectual capital as the service sector transitions to a knowledge-based model, increasing its competitiveness and dynamic nature (Oppong, Pattanayak, and Irfan, 2019).

Accurate measurement of IC aids in determining the true value of the firm. IC can be categorised into three groups: human, structural, and relational capital (Gupta *et al*. 2020; Santis *et al*. 2019; and Kujansivu and Lönnqvist 2007). According to Gupta *et al*. (2020) and Meritum (2002), Human Capital (HC) refers to the knowledge, skills, and experience that employees take with them when they leave. Some of this knowledge is unique to the individual; some may be generic. Examples are innovation capacity, creativity, know-how and previous experience, teamwork capacity, employee flexibility, tolerance for ambiguity, motivation, satisfaction, learning capacity, loyalty, formal training, and education.

Structural Capital (SC) is defined as the knowledge that stays within the firm at the end of the working day. It comprises the organisational routines, procedures, systems, cultures, databases, etc. It implies the company's ability to adhere to

procedures and structures that support employee efforts to generate the highest appropriate intellectual performance as well as increased profitability (Okpe *et al*., 2022). Organisational flexibility, a documentation service, the existence of a knowledge center, the general use of information technologies, organizational learning capacity, etc. are examples of forms of structural capital. Some of them may be legally protected and become intellectual property rights owned by the firm under a separate title.

Relational Capital (RC) is defined as all resources linked to the external relationships of the firm with customers, suppliers, or R&D partners. (Iuzzolino, Chiappetta, and Chiappetta 2018). It comprises that part of human and structural capital involved with the company's relations with stakeholders (investors, creditors, customers, suppliers, etc.), plus the perceptions that they hold about the company. This category includes image, customer loyalty, customer satisfaction, links with suppliers, commercial power, negotiating capacity with financial entities, environmental activities, and others.

A value-added intellectual capital model was used in this study. Its parts are human capital and structural capital, and it takes into account differences in value added between capital employed and leverage. The study was basically designed to measure the internal efficiency of using available capital in value creation, as in Pulic (1998) and Bontis (1998), and therefore relational capital was not included. Studies also show that relational capital is subjected to complexities in quantifiability and measurement challenges (Edvinsson & Malone 1997).

2.2 The Concept of Financial Performance

Financial performance is a measure of how well a firm uses assets from its primary mode of business to generate revenues (Harianto, Ester, and Zulkheiri, 2023). In insurance, performance is normally expressed in net premium earned, profitability from underwriting activities, annual turnover, returns on assets, and return on equity. Any business organization's improved financial performance is said to increase the firm's market value (Aisyah 2022). At the micro level, profit is the essential pre-requisite for insurance firms' survival, growth, and competitiveness, as well as the cheapest source of funds. Financial performance reflects the health of the organization's insight and foresight. (Otieno 2022). According to Landi and Sciarelli (2019), financial performance is one of the steering tools in making investment decisions for any business company.

2.3 Intellectual Capital and Financial Performance

A number of studies have assessed the relationship between IC and financial performance, especially in manufacturing, hotel industries, and commercial banks. For example, Ginesti, Caldarelli, and Zampella (2018) found the intellectual capital elements to have a positive relationship with measures of financial performance. Xu and Li (2022) investigated the impact of IC components on SMEs in China between 2012 and 2016, finding that HC and SC were the most influential drivers of performance in both non-high-tech SMEs and high-tech SMEs. Amin and Aslam (2017) conducted a study on 207 pharmaceutical firms between 2012 and 2014, concluding that IC and its components significantly enhance firms' innovation and financial performance. Other studies include Sardo and Serrasqueiro (2017), Xu and Wang (2018) (Buallay, Cummings, and Hamdan 2019), Barbosa *et al.* (2016) (Rahayu 2019). The studies by Bontis *et al*. (2018) and Ozkan, Cakan, and Kayacan (2017) are also noteworthy.

Few studies have explored the impact of IC in the insurance sector. Olarewaju and Msomi (2021) found a significant positive influence of IC on SADC insurance firms. Sreejesh, Mohapatra, and Anusree (2014) and Oppong *et al*. (2019) recommend increasing operational efficiency by investing in IC in order to improve premium income yields. None of the studies, however, have explored the impact of IC and its components on insurance firms in Tanzania, where the sector is in its infancy stage. Thus, whether IC is equally important in influencing the financial performance of infant insurance firms remains an issue for further investigation.

2.4 Measures of Intellectual Capital

The independent variables of this study are the two IC components, namely Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE). The study uses capital employed efficiency and leverage as control variables. The Value-Added Intellectual Capital (VAIC), as adopted from Pulic (2000) and applied by recent studies such as Olarewaju and Msomi (2021), Xu and Liu (2021), Singla (2020), Amin and Aslam (2017), and Asare *et al.* (2017), was employed using the five-stage method.

The first stage is assessing the value added (VA) of the business, which will be used to compute the Capital Employed Efficiency (CEE), human capital

efficiency (HCE), and Structural Capital Efficiency (SCE). The value added is equal to the summation of four items found in financial statements, namely operating profit, employee payroll costs, depreciation, and amortisation of intangible assets. Mathematically:

$$VA = OP + EC + D + A$$

Where:

OP= Operating Profit

EC=Employee payroll costs

D= Depreciation

A= Amortization of intangible asset

The second stage involves applying the VA on capital employed to determine the Capital Employed Efficiency (CEE), which represents the value added from capital employed. The use of capital in various processes is believed to contribute to business success. The CEE explains how effective the business is in controlling tangible assets. The company is expected to improve its financial performance. Capital employed is measured by the total value of assets minus the intangible asset. It includes both financial and physical capital. Mathematically, CEE is equal to VA/CE, where VA is value added and CE is capital employed.

The third stage is about measuring the human capital efficiency (HCE). That is, the value added by human capital (VAHC). Here, human capital includes all employee costs within the organization. In this research, payroll expenses were used as human capital costs. The VA coefficient explains how much each unit of money invested in employees generates income or creates value. To attain the desirable financial performance, the company should make sure it has an effective use of available human capital. The human capital efficiency (HCE) is determined by taking VA/HC, where VA represents value added and HC represents human capital.

The fourth stage is measuring the structural capital efficiency (SCE). This process involves calculating the added value that structural capital contributes. It should be noted that human capital (HC) and structural capital (SC) have a reverse proportion; hence, the formula is also different. Because the firm relies heavily on human capital, less is expected from the organisation's structural capital (Pulic 2000). This means that the higher the value generated by HC, the lower the value generated by SC (Joubert 2017). Mathematically, SCE is equal to 1-VA/HC, where SC stands for structural capital and VA stands for value added.

The fifth stage involves measuring the overall Value-Added Intellectual Capital Coefficient (VAIC). This measures how effective each component of intellectual capital has contributed to value creation. In other words, this is the overall measure of total capital value creation in the business. It shows how well the management has been utilizing various forms of capital to enhance the company's potential. The higher the VAIC, the more value the company's total intellectual capital creates.

3.0 Methodology

3.1 The Data and Descriptive Statistics

For this study, data was collected from 11 out of twenty-five (25) general insurance firms. The sample size was limited to 11 due to the availability of data and the fact that most of the firms were established after 2008. As a result, our sample included all firms with at least 2009 data. These are: Britam, Reliance, MGen, Heritage, Alliance, ZIC, Bumaco, GA, Phoenix, Jubilee, and Tanzindia.

Data was collected using the documentary review method through reading documents and compiling information from websites, databases, or catalogues of TIRA and individual insurance firms. The study covered a time period of 10 years (2009-2018). As indicated before, the 10-year period was selected because of a data availability issue. We excluded the years before 2009 due to the absence of data for certain variables or indicators. Moreover, most of the firms were established after 2008.

Descriptive analysis was conducted on the collected data, the highlight of which is presented in Table 1. Measures of financial performance used in this study were Return on Equity (ROE) and Return on Assets (ROA). The mean ratio for ROE is 0.0703 (7.03%), implying that, on average, what is invested in equity returns 7.03%. Return on Asset (ROA) is relatively on the lower side. As indicated in Table 1, the mean ROA is 0.0355 (3.55%). The minimum ROE and ROA are -2.991 and -0.2358, respectively. The maximum rates are 1.1275 and 0.5850 for ROE and ROA, respectively. These descriptive statistics indicate that, while there are firms making high returns up to 112.75% and 58.50% for ROE and ROA, respectively, there are also firms that are making losses to a tune of 29.91% and 23.58% for ROE and ROA, respectively. In total, out of 80 observations for ROE, there are 10 (12.5%) observations with a negative return. There are also 11 (13.75%) observations with negative ROA.

Table 1 also shows the standard deviation for the mean ROE and ROA.

Descriptive statistics for the components of Value Added Intellectual Capital (VAIC) are indicated in Table 1. In about six (6) out of eighty (80) observations, the structural capital efficiency was negative, indicating ineffectiveness in utilising the structural capital. Value Added Intellectual Capital (VAIC) was used to measure how effectively each component of intellectual capital has contributed to value creation. It indicates how well the intellectual capital has been used to enhance the company's potential. The higher the VAIC, the more value the company's total intellectual capital creates. Table 1 shows that the mean VAIC is 2.4278, which is positive. Out of 80 observations, only one had a negative VAIC. The lower the VAIC indicates ineffectiveness in utilising the components of intellectual capital.

Table 1

Descriptive Statistics

Variables	Observations	Mean	SD	Min	Max
Dependent					
ROE	80	0.0703	0.4133	-2.9911	1.1275
ROA	80	0.0355	0.0785	-0.2358	0.5850
Independent					
CEE	80	0.1599	0.1404	0.0298	1.0262
HCE	80	1.8778	0.6376	0.5265	3.5573
SCE	80	0.4485	0.3247	-0.8993	1.0115
VAIC	80	2.4278	0.8781	-0.3227	4.4094
Leverage	80	3.5790	3.5339	0.3353	27.6255

3.2 Empirical Model

This study used a random effect (RE) panel regression model for data analysis. The RE's suitability was tested using the standard Hausman test, in which it was compared to the fixed effect (FE) model. The Hausman test results indicated that RE was suitable for this regression model.

The variance inflation factor (VIF) was used to test for multicollinearity, and there was no multicollinearity problem. The highest VIF was 2.24, and the mean was 1.69. The following regression models were estimated:

$$ROA = \alpha i + \beta_1 VAIC + \beta_2 lnLEV + \varepsilon \quad \text{(i)}$$

$$ROE = \alpha i + \beta_1 VAIC + \beta_2 lnLEV + \varepsilon \quad \text{(ii)}$$

$$ROA = \alpha i + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 lnLEV + \varepsilon \quad \text{(iii)}$$

$$ROE = \alpha i + \beta_1 HCE + \beta_2 SCE + \beta_3 CEE + \beta_4 lnLEV + \varepsilon \quad \text{(iv)}$$

Where:

αi is a constant

VAIC is the value added Coefficient of Intellectual Capital;

LEV is Leverage, which is a control variable

HCE is Human Capital Efficiency

SCE is Structural Capital Efficiency

CEE is Capital Employed Efficiency

β_{is} measure the partial effect of independent or explanatory variables in period *t* for the unit *i* (Insurance firm)

X_{it} are the explanatory variables as indicated in Table 2; and ε is the error term.

Financial performance was the dependent variable used in this study. Financial performance has three (3) major popular measures, namely, Return on Asset (ROA), Return on Equity (ROE), and Percentage Change in Stock Price (PCSP) (Madura 2014). Since most Tanzanian insurance firms are not listed companies and therefore unable to sell shares, the PCSP was not used in the study. Therefore, the study used ROA and ROE as dependent variables.

The ROA is calculated by dividing the net income figure by the total asset value. It measures the contribution of assets employed in creating the net profit. On the other hand, ROE uses equity as a

denominator. ROE measures the return that the company's shareholders receive. The higher ROE and ROA values indicate that the insurance company's financial performance has improved.

The independent variables used in this study were Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), Capital Employed Efficiency (CEE), and leverage. For HCE, SCE, and CEE, we also used the Value-Added Coefficient of Intellectual Capital (VAIC) as the overall or combined variable. Variable measurements for both dependent and independent variables are described in Table 2. For model fitting purposes, a log transformation on leverage was used to smooth the differences among observations from the studied firms.

Table 2

Variable Measurement

Variable Type	Variable name	Variable abbreviation	Measurement Method
Dependent	Return on Assets	ROA	Net profit after tax/Total Assets
	Return on Equity	ROE	Net Profit after tax/Shareholders equity
Independent	Intellectual Capital	IC	Value Added Intellectual Capital(VAIC) estimated by summing the variables (HCE, SCE and CEE)
	Human capital efficiency	HCE	Human Capital Efficiency measured by the Value Added (VA) divided by the Employee costs. (HCE = VA/HC)
	Structural capital efficiency	SCE	Structural Capital Efficiency measured by 1-(VA/HC) or 1- HCE
Control Variable	Capital employed efficiency	CEE	Capital Employed Efficiency measured by Value Added divided by Capital Employed (VA / CE).
Control Variable	Leverage	LEV	Total debt/Total Shareholders 'Equity

4.0 Econometric Results

The study measured the influence of intellectual capital on the financial performance of insurance firms in Tanzania. Financial performance was measured by the Return on Equity (ROE) and Return on Assets (ROA), one at a time. The influence of intellectual capital was measured in two stages. First, we used a combined measure called Value Added Intellectual Capital (VAIC), which combined the three components of efficiency, namely Human Capital Efficiency (HCE), structural capital efficiency (SCE), and Capital Employed Efficiency (CEE), while controlling for differences in leverage. Second, we measured the influence of individual components of intellectual capital while controlling for the differences in capital employed and leverage. Econometric results for combined influence are presented in Table 3, while the results for individual components are indicated in Table 4. Detailed analysis is done in the following subsections.

4.1 The Combined Influence of IC (VAIC) on ROE and ROA

As indicated in Table 3, using ROE as a measure of financial performance, it was found that intellectual capital has a significant positive influence on the financial performance of insurance firms. At the 5% significance level, its coefficient was statistically significant. This suggests that the financial performance of insurance firms in Tanzania is partly dependent on value development in the form of intellectual capital. This finding supports previous studies by Ginesti *et al*. (2018), Chowdhury *et al*. (2018), and Xu and Li (2022), who found a significant positive influence of IC towards financial performance.

We also tested the impact of intellectual capital (IC) on financial performance, as measured by the return on assets (ROA). Econometric results in Table 3 show that IC strongly and positively influences financial performance. This implies that aggregate value addition in the company's capital plays an important role in the financial performance of the insurance industry in Tanzania. This is consistent with Gan and Saleh (2008), Chen *et al*. (2005), and Olarewaju & Msomi (2021), who found a significant positive impact of IC on financial performance. The findings, however, contradict the findings by Maditinos *et al*. (2011) and Firer & William, who found an insignificant relationship between VAIC and profitability in terms of ROA. As previously reported, the contradiction could be attributed to a lack of appropriate data for analysis (Maditinos *et al*. 2011), a relatively short study period, and the use of

cross-sectional data in analysis (Firer & Williams, 2003).

Table 3

Multiple Regression Results for VAIC and ROE and ROA

	ROA	ROE
	Coefficient (Std. error)	*Coefficient (Std. error)*
VAIC	0.8625**	0.8517**
	(0.1493)	(0.1849)
Leverage	-0.4235**	0.3316
	(0.2015)	(0.2448)
Overall R square	0.4799	0.3206
Wald chi2(2)	45.78	27.25
Prob > chi2	0.0000	0.0000

*** Significant at 5 percent level*

4.2 Influence of HCE and SCE on ROE

We tested the effect of each IC component on ROE. Econometric results in Table 4 show that Human Capital Efficiency (HCE) has a significant positive influence on financial performance (ROE). The results are in harmony with Ginesti *et al.* (2018) and Ozkan *et al.* (2017). The results, however, contradict the results by Nuryaman (2015) and Chowdhury *et al.* (2018), who found that human capital efficiency had an insignificant positive influence on financial performance when measured by ROE. The insignificant results could be attributed to inefficiencies in human capital utilization. When more investment in human capital is not supported by increases in efficiency, the investment will only add costs and reduce profitability.

The effects of Structural Capital Efficiency (SCE) on financial performance (ROE) were also tested. However, we did not find any evidence that SCE affects financial performance when measured by ROE. The SCE coefficient was not statistically significant. The results are consistent with those of Nuryaman (2015), who investigated the impact of IC on the manufacturing sector in Indonesia. However, the results disagree with the findings of Chowdhury *et al.* (2018b) and Ginesti *et al.* (2018), who found significant influence. The insignificant results could be due to the nature of structural capital in Tanzania's insurance industry, which is still in its infancy stage.

It is interesting to note that the physical capital, or Capital Employed Efficiency (CEE) component, had a strong positive influence on ROE. Its coefficient was statistically significant at the 5 percent level of significance. This finding supports the findings in other studies such as Afroz (2018), Ginesti *et al.* (2018), Ozkan *et al.* (2017), Al-Musali and Ku Ismail (2016), Nawaz and Haniffa (2017), and Sardo and Serrasqueiro (2017). This implies that the more physical capital is used, the better the financial performance will be.

Table 4

The Effects of Individual Components of IC on ROE and ROA

	ROE	ROA
	Coefficient (Std. error)	*Coefficient (Std. error)*
HCE	0.8641**	0.8940**
	(0.3787)	(0.2217)
SCE	0.4701	0.3020
	(0.9815)	(0.5827)
CEE	2.4676**	4.5870**
	(0.7512)	(1.0046)
Leverage	0.5275**	-0.1323
	(0.5275)	(0.1794)
Overall R square	0.3672	0.5789
Wald chi2(4)	32.28	74.65
Prob > chi2	0.0000	0.0000

*** Significant at 5 percent level*

4.3 Influence of SCE and HCE on ROA

Econometrics results indicated in Table 4 show that the impact of Human Capital Efficiency (HCE) on ROA is positive and statistically significant. This is consistent with most of the previous research, like Chen *et al.* (2021) and Olarewaju & Msomi (2021). The results indicate that the increase in value added in efficiency of human capital in insurance companies influences the increase in ROA. The findings confirm the Knowledge Based View (KBV) theory's assertion that a firm's ability to create new and unique information, such as human capital training programs for increasing internal capabilities, will eventually have a positive influence on financial performance.

With regard to Structural Capital Efficiency (SCE), we did not find any evidence that SCE drives ROA. The SCE variable's coefficient was not statistically significant. The insignificant result also supports the findings by Kamath (2008), Nuryaman (2015), and Ozkan *et al.* (2017). The results, however, are contrary to Chowdhury *et al.* (2018); Hang Chan (2009); Firer & Williams (2003); and Ginesti *et al.* (2018), who report a significant impact of SCE on ROA. Okpe *et al.* (2022) also discovered a significant negative impact of SCE on ROA. The study's insignificant results may suggest that insurance firms in Tanzania are still in their infancy and lack the ability to transform their structural systems, which

guide their daily routine jobs, towards financial performance.

Capital Employed Efficiency (CEE) had a significant positive impact on financial performance (ROA). This implies that for insurance firms in Tanzania, the value created by investments in physical assets plays a major role in boosting their financial performance. Similar results were found by Chowdhury *et al*. (2018b), Al-Musali and Ku Ismail (2016), Hang Chan (2009), Ginesti *et al*. (2018), Mehralian *et al*. (2012), and Ozkan *et al*. (2017), who reported a significant impact of CEE on ROA. The results, however, contradict the findings on Italian-listed firms by William *et al.* (2019).

5.0 Conclusion and Implications

The impact of intellectual capital on the financial performance of insurance firms was investigated in its aggregate form, as measured by VAIC, before being split down to separately examine the effect of its components. We conclude that intellectual capital positively and significantly influences the financial performance of insurance firms in Tanzania. Moreover, with regard to individual components of intellectual capital, we conclude that human capital efficiency (HCE) positively and significantly influences the financial performance of insurance firms in Tanzania as measured by ROE and ROA. In addition, capital employed efficiency (CEE) has a significant impact on financial performance. We did not find any evidence that structural capital efficiency (SCE) influences the financial performance of insurance firms in Tanzania. The study documents the contribution of intellectual capital and, more specifically, of the individual components of intellectual capital on the financial performance of insurance firms in Tanzania.

The findings of this study imply that intellectual capital is important for financial performance. Both human and physical capital should be embraced so as to continue making positive contributions. This could suggest the need to improve the development of human resources and their efficient use, as well as the efficient use of the capital that is employed. The insignificance of structural capital efficiency (SCE) calls for the need to review the relevance and effective implementation of structures, systems, and procedures to add value for better financial performance. That is, the internal systems, structures, and controls are to be tailored in order for them to add value, ultimately boosting financial growth.

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