Heliyon 7 (2021) e06712

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Intellectual capital and financial performance of South African development community's general insurance companies

Odunayo Magret Olarewaju *, Thabiso Sthembiso Msomi

Department of Management Accounting, Faculty of Accounting and Informatics, Durban University of Technology, South Africa

ARTICLE INFO

Keywords:
Endogeneity
Value Added Intelligent Coefficient
Static panel
Dynamic panel
Intellectual capital
Financial performance

ABSTRACT

The effect of intellectual capital on financial performance was investigated in this paper for the period 2008 to 2019. A total of 696 observations were generated from data collected from 56 general insurance companies in 12 years. The Value Added Intelligent Coefficient Model was used and data was analysed using both static (two stage least square, fixed and random effect) and dynamic panel regression analysis (two step system generalised method of moments). The findings showed a significant and direct relationship between lagged return on assets, intellectual capital and financial performance of insurers in the South African Development Community. Out of the components of intellectual capital, human capital and structural capital are significantly and directly related with return on assets while capital employed is inversely and insignificantly related with return on assets. The control variables-underwriting risk, insurer size and leverage are all inversely and significantly affecting return on assets. Thus, a U-shape relationship exists between intellectual capital and financial performance in general insurance companies in the South African Development Community. Thus, the policy makers-cum-insurers' managers should maximise their intellectual capital as this creates competitive advantage that leads to financial performance drive and wealth generation. The Model used in this study is an important model decision-makers can use to assimilate intellectual capital in their decision-making procedures. This will inadvertently permit insurers to scale themselves according to the intellectual capital efficiencies and advance in strategies that will boost their company's financial performance.

1. Introduction

A stable insurance industry promotes economic growth and development because a well-functioning insurance sector simplifies business and economic relationships by spreading risk and offers lasting investment and financial stability (Wang et al., 2017). Intellectual capital is now one of the main factors in the market climate that promotes growth and competitiveness (Lamond et al., 2010). An intangible asset is Intellectual Capital, and it can be difficult to assess its worth. In order to identify and explain Intellectual Capital, it is necessary to take into account value development, competitive advantage and organisational success (Obeidat, Tarhini, Masa'deh and Aqqad, 2017). Undoubtedly, Intellectual Capital encourages wealth creation and high valued properties (Allameh, 2018). According to Santis et al. (2019), there are three components of Intellectual Capital, namely relational capital, human capital and structural capital. Both of these foretell the novelty of running business operations that have a significant effect on the company's future. As a result, the success of organisations, including insurance firms, is highly dependent on the maximisation of Intellectual Capital that is part of the organisational efficiency.

In developing nations like the Southern African Development Community (SADC), economic growth is a crucial strategy for reducing poverty. The financial sector has deteriorated over time, which is incompatible with SADC's low economic growth. Furthermore, financial systems are fundamentally chaotic and undeveloped. The insurance sector within SADC has a lot of challenges that require an innovative approach such as Intellectual Capital to address (Nkotsoe, 2018). Challenges such as restricted low penetration, low wages, lack of understanding and confidence, high levels of financial exclusion, lack of infrastructure and distribution channels, lack of domestic skills as well as lack of information, minimal opportunity to extend coverage, significant barriers to individualisation of retail, reforms increasing regulatory burdens, regulators not keeping pace with innovation and poor industry coordination, can be addressed by the proper use of human, relational and structural capital. Human capital centres on the skills and creativity of employees. This potential is improved by training programmes which

* Corresponding author.
E-mail address: odunayoo@dut.ac.za (O.M. Olarewaju).

https://doi.org/10.1016/j.heliyon.2021.e06712
Received 6 January 2021; Received in revised form 25 March 2021; Accepted 31 March 2021

can improve company efficiency if the employees are more effective. In the same manner, Daum (2003) posits that structural capital includes non-human assets such as patents, copyrights, rules, procedures and decision-making policies of the organisation. Investment in this kind of capital will definitely enhance performance. According to Subramaniam and Youndt (2005), relational capital is also relationships the firm keeps with external stakeholders such as trust, experience and knowledge. This capital prevents stakeholders like customers from forsaking the profitable relationship (Daum, 2003).

Previous studies such as those by Sardo and Serrasqueiro (2017), Xu and Wang (2018), Buallay (2019), Rahayu and Ramadhanti (2019), Barbosa et al. (2016), Bontis et al. (2018), Ozkan et al. (2017) and Scafarto et al. (2016) have established substantial affiliation between components of Intellectual Capital as well as organisational performance in various sectors such as banks, agribusiness, tourism, health, manufacturing, social cooperative enterprise, automobile industry, public companies, higher education, social cooperatives etc. While there are few studies on the insurance sector in this context, scholars such as Asare et al. (2017) and Oppong et al. (2019) have conducted studies on Intellectual Capital and insurance sector performance in some African countries.

However, there has been no known regional study on SADC in this context. The only evident study on the SADC insurance sector was on the determinant of penetration by Nkotsoe (2018) which is just one of the challenges of the SADC insurance sector that proper implementation of the components of Intellectual Capital could have solved. Since the majority of studies on Intellectual Capital focused on the developed economies such as China, Europe, Asia, Australia and North America, this research will bridge this research gap and contribute to existing knowledge by considering the three components of Intellectual Capital using the Value Added Intellectual Coefficient in the SADC insurance sector, particularly in general insurance companies. This study is necessary and very relevant to SADC as SADC comprises of developing economies that struggle with economic growth. The role of insurance in economic growth across the globe cannot be overemphasised. Sub-Saharan Africa's insurance sector, SADC inclusive, is faced with the challenges of severe constraint of incomes, a prevalent lack of awareness and trust of insurance, excessive financial exclusion, poor infrastructure limits, shortage of agent networks, skills deficit and data shortage, partial incentive to enlarge coverage, considerable barriers to launch into individualised retail, higher entry barriers, pack of innovation by regulators and deficient industry coordination[1]. Despite these challenges, insurance still matters and should be improved as it does spur the capital market development of any economy. As has been identified by Amiri et al. (2015), one of the ways to improve the performance is to ensure the intellectual capital is well managed because the disparity in companies' performance is a result of the fact that the successful ones have a well-managed strategic capital (human, relational and structural) that their competitors lack. The effectiveness and efficiency of this sector will definitely improve the economic growth by enhancing financial stability. It has long been affirmed that insurance development and stability is strongly correlated to economic growth (Lee, 2019). This study is therefore important since Intellectual Capital has been asserted to be capable of enhancing company profitability and consequently economic growth (Mačerinskienė and Survilaitė, 2019). Thus, in an economy such as SADC, this study is justified, necessary and needed. While studies have been conducted on Intellectual Capital across several sectors, the findings on the effect of Intellectual Capital on the profitability/performance of these sectors is equivocal. Moreover, the deep understanding of the effects of the components of Intellectual Capital on performance of these sectors is eminent.

This paper is organised in such a way that the next section offers an overview of the insurance industry in SADC, the third section discusses previous relevant studies and hypotheses development. The fourth section explains the methodology, section five shows the model estimation, interpretation and discussion of findings, and in the last section, the paper is concluded.

2. Overview of SADC insurance sector

SADC was assembled in 1992 with 16 countries (Mlambo, 2020). In Southern Africa by growth in the economy as well as peace and stability, SADC is dedicated to regional economic integration and poverty eradication (Masimirembwa, 2018). SADC is made up of many underdeveloped and emerging economies, with growth in the insurance sector remaining largely astounding (Asongu, 2020). Overall economic development in the area over the past years, nevertheless, has been able to gradually generate growth opportunities for the region's insurance industry. The emergence of many growing markets has been one of the major aspects driving the insurance sector in Southern Africa (Asongu and Odhiambo, 2020). Insurance penetration in SADC is extremely poor, suggesting a major increase in the runway (Nhabinde and Heshmati, 2020). Regulatory barriers are usually lower and laws are less burdensome, although there are a few exceptions. The health of the SADC countries' population is improving and Southern Africa also has a strong young population. However, the possible negative risks of doing trade with SADC can never be overlooked (Nhabinde and Heshmati, 2020).

It does not seem to overshadow good traits, but political uncertainty, corruption, weak infrastructure, bureaucracy, government regulations and stagnation pose real risks all across the country. According to a Finmark Trust (2019) report, the insurance sector has the tremendous potential for growth as 94.5 per cent of the region's population is not formally self-insured. In the region, South Africa has the best developing markets, including an increasingly organised stock exchange and a large bond market (Alhassan and Biekpe, 2017). Africa is increasingly heading towards a stable future and overwhelming support for the insurance sector for the sustainability and development of the economy. This encourages savings and spending, job creation, development in capital and financial markets. The insurance sector in Africa remains one of the most challenged, but at the same time industry representatives continue to develop and make adjustments to take full advantage of the many opportunities for growth which are also emerging (Padayachee et al., 2019).

Throughout the years since the global economic crisis, the economic and political complexities of the region have slowed down investment and insurance expansion. Even then, the insurance sector in SADC is the least penetrated in the world and the prospects for development are immense (Padmore, 2019). The SADC insurance market is facing more uncertainty than any other sector, raising threats to others and providing potential growth prospects for others (Burkhanov, 2020). The pace of progress in the insurance sector has been greater than initially predicted and will encourage more progress. As a result, the insurance sector plays an important role in handling investments for diverse firms, adding significant inflows to financial and economic growth (Alhassan and Biekpe, 2017). The insurance sector is seen as ingrained during the off chance that it has the capacity to resolve the economic crisis associated with that money, thereby reinforcing the economic structure of each country (Lee, 2019).

South Africa is doing very well and has the fourth biggest insurance sector in the developing economies community (Chinaka, 2016). The South African insurance sector is underpinned by a stable regulatory environment, a diversification multi-channel distribution and a strong degree of local competitiveness (Mushunje and Mashasha, 2020). South Africa has the highest insurance penetration of the developing economies under analysis at 12.89 per cent, well above China at 4.2 per cent, which placed second on this index (Asongu and Odhiambo, 2020). The border markets of Namibia are an excellent country with a penetration rate of 7.25 per cent, while the rate of Tunisia is 2.14 per cent. Overall, Zimbabwe witnessed healthy overall premium growth in 2018. Unfortunately, other SADC countries have seen little meaningful progress in

[1] https://cenfri.org/articles/the-role-of-insurance-for-growth-in-africa/.

recent years. Investment researchers also look at the reported average insurance premiums (GPW) when comparing insurance companies from various regions across the globe. According to a Deloitte report in 2020, Africa's GPW constitutes 1.56 per cent of the world's GPW. South Africa is the continent's king, responsible for 0.93 per cent of the world's GPW.

3. Reviews of prior related studies and hypotheses development

Value Added Capital Employed (VACA): Value added capital employed reflects the book value of the company's net assets. Habibah and Riharjo (2016) revealed a clear and positive effect of the value added equity used for financial results, which means that companies with efficient operating procedures will have an ideal market and consumer environment. Every dollar invested in human resources capital is a contribution which is generated to provide value to the business (Habibah and Riharjo, 2016). VA created by a physically active capital unit is the VACA. This ratio demonstrates the contribution each capital employed (CE) unit makes to the value added organisation (Yudawisastra et al., 2018; Safitriani, 2018). In the same manner, Habibah and Riharjo (2016) averred that the value added capital used in the creation of an Intellectual Capital system positively and significantly related with and affects the financial overall performance of the organisation.

H01. Capital employed has no effect on financial performance of SADC general insurance companies.

Value Added Human Capital (VAHC): Due to human interaction, human capital (HC) is a major pillar of Intellectual Capital, a vital source of intangible value in the intellectual century (Guest, 2017). Human resources are generally seen in management as like other factors of output, such as machines. Management views workers as being quickly replaced by new staff if they are unable to do their job correctly (Fernando et al., 2019). Resource management is designed to provide every worker with fair treatment. Differences are overlooked in terms of learning and function, as are differences in needs and family and personal circumstances (Shore et al., 2018). VAHC demonstrates how much value added funds spent on labour can be produced. This ratio demonstrates the contribution each dollar invested in HC makes to the value added to the business (Sudiyatmoko, 2018). A study conducted by Habibah and Riharjo (2016) shows that VAHC is of great importance to the financial performance of Indonesian food companies, while analysis conducted based on Devi et al. (2017) has confirmed that VAHC does not have any major effect on the financial performance of a company.

H02. Human capital has no effect on financial performance of SADC general insurance companies.

Value Added Structural Capital (SCVA): Structural capital (SC) is the capability of an entity or corporation to fulfill the standard processes and systems of the company that help the efforts of workers to deliver intellectual output as well as organisational performance such as organisational culture, production processes, management philosophy as well as other company-owned intellectual property (Ahmad et al., 2019). A person can have a high degree of intellectuality, but if the organisation has weak systems and processes, then it is difficult to achieve optimum efficiency with Intellectual Capital and the capacity cannot be maximised (Urban and Joubert, 2017). Moreover, Xu and Wang (2018) noted that SC encompasses all information storehouses inside the organisation that are not human. Databases, procedure manuals, organisational maps, routines, methods and all that renders the company's worth greater than its material worth are included in this scenario. SC derives from the structures and principles of the business, representing external emphasis and value creation for the future (Bellucci et al., 2020). Studies by Habibah and Riharjo (2016), Silvia and Maftukhah (2018) and Ulfi et al. (2019) affirmed that SCVA has a positive and vital effect on the financial performance and firm value of the business.

H03. Structural capital has no effect on financial performance in SADC general insurance companies.

Value Added Intellectual Coefficient (VAIC™): It is intended to provide information on the productivity of the value production of tangible assets and intangible assets held by the organisation. This approach is used to assess the efficacy of essential resources that provide the business with added value, mainly Intellectual Capital and employed capital centered on systemic capital and HC (Ulum et al., 2017). Arslan and Kizil (2019) claimed that VAIC™ is meant for relevant management, shareholders and stakeholders to perform effective monitoring as well as assessment of the overall resources of the value added efficiency business and each portion of the key resources of the company. This model begins with the ability of the organisation to generate value added (VA). The most comprehensive metric for measuring market performance and demonstrating the ability of the organisation to generate value is VA. The VA is measured as an input and output difference (Ermawati et al., 2017). Tan et al. (2007) and Clarke et al. (2011) report that output (OUT) reflects income and covers all services sold on the market, while inputs (IN) represent all revenue expenses. According to Arslan and Kizil (2019), the fact that labour costs are not shown in IN is significant for this model. Intellectual capacity (represented by labour costs) is not measured as cost and is not included in the IN variable because of the role of the active party in the value creation process. Throughout the VAIC™, it is one of the financial assessments that centres on value creation.

Empirical literature has generally provided critical evidence of a positive relationship between Intellectual Capital and corporate performance (Al-Musali and Ismail, 2016), development of new products and breakthrough results (Wu et al., 2008). Intellectual Capital is a shared knowledge which is embedded in employees, company routines and internal networking connections (Jordão and Novas, 2017). Intellectual Capital has been recognised as a critical source for companies to expand and also to achieve a sustainable competitive advantage (Zakery and Saremi, 2020). The economic value of three types of intangible business assets, which together include Intellectual Capital, operating capital and Structural Capital, can be defined as intellectual assets (Osinski et al., 2017). Strategic analysts conclude that sustainability growth only can occur if Intellectual Capital differs from business capital such that most companies cannot benefit from it.

H04. Intellectual capital has no effect on financial performance in SADC general insurance companies.

3.1. Theoretical underpinning: knowledge-based view

Knowledge-Based View (KBV) is an evolution of the Company's Resource-Based View (RBV) which offers good strategic support for intellectual resources (Nikolaou, 2019). KBV emerged in RBV and showed that knowledge is in different ways in the interests of people (Maijanen, 2020). The fundamental principles of the knowledge-based philosophy of the business come from knowledge-based viewpoints. Nevertheless, the RBV of the organisation does not allow for the acknowledgment of sufficient information. KBV's strategy is the foundation for creating HC engagement in the company's daily operations (Boon et al., 2018). This is accomplished by growing the contribution of staff to the company's organisational and long-term goals. From a knowledge-based viewpoint, businesses are creating new knowledge that is important for the gain of a particular combination of expertise (Vardarlıer, 2016). In today's age of innovation, businesses also compete by creating new information that is quicker than their rivals.

4. Research method

Taking a cue from Hatane et al. (2019), Bassetti et al. (2019) and Sunariyanto (2020), the VAIC model is used to examine the effects of Intellectual Capital on the financial performance in the SADC general

insurance sector for 2008 to 2019. The year 2008 was chosen because Africa's insurance sector has been besieged since the 2008 Global Financial Crisis. SADC is a Regional Economic Community that comprises 16-member countries and the focus of this study is on the general insurance sector of these countries. Secondary data extracted from S&P CapitallQ and Refinitiv Eikon was used. The panel data of 696 observations (t = 12, i = 58) from 13 SADC countries was used. The remaining three countries (Comoros, Lesotho and Eswatini) have paucity of data and data is not available. Data was analysed using the static panel analysis (two stage least square, fixed effect, random effect) and dynamic panel analysis (two-step System Generalised Method of Moments). This further makes the study unique apart from being the first of its kind in the selected region - SADC. It is worthy to note that previous studies on Intellectual Capital have either been static or dynamic, but this study estimates the model using both static and dynamic panel regression concurrently. Adequate post estimation tests were conducted to justify the fitness of the models.

4.1. Model specification

VAIC™ has been widely used in measuring Intellectual Capital (Pedro et al., 2018; Phusavat et al., 2011; Xu and Wang, 2018). To use the model, five essential phases have been followed as proposed by Pulic (2000) and employed by several recent studies such as Asare et al. (2017), Nourani et al. (2018), Arslan and Kizil (2019), Xu and Liu (2020) and Singla (2020). Furthermore, this study is unique in using this model as no known study has been carried out on Intellectual Capital in the selected region (SADC) as a regional study and none has tested this model on that region not to mention of insurance companies to the best of the researchers' knowledge.

To use this model, the flowing steps have to be followed. Firstly, assessment of the business's value added (VA). The assessment of the business's VA is defined as the difference between the company's production and the company's input, as follows: OUT-IN = VA. Production (OUT) is earnings from all the goods and services sold on the market. IN is all expenditures or costs, excluding labour costs, that fall into the business (Massa et al., 2017). This is expressed mathematically as: $VA = OP + EC + D + A$ where OP stands for operating profit, EC stands for employee cost, D stands for depreciation and A stands for amortisation.

Secondly, integrating the VA and the capital used, particularly physical capital and financial capital. VACA shows how much additional value is produced by the single unit of capital employed (the book value of the company's net assets) invested (Vo, 2018). VACA explains how effective a business is using tangible assets. Intellectual property includes the ability to control properties, both tangible and asset properties, in order to be competitive with other businesses. The capacity of a company to control capital asset resources is a type of VACA. Through proper management of capital assets, it is presumed that the company will increase the company's value and efficiency (Gorda et al., 2018). Mathematically, this is expressed as: $VACA = \frac{VA}{CA}$ where, CA stands for capital employed which is equal to book value of total assets minus intangible asset.

Thirdly, linking value added to human capital (HC). The payroll expenses are used as the human resources counterpart. VA coefficient of HC indicates how much added value a unit of money invested in workers generates (Anwar and Siddiqui, 2020). In order to succeed, the organisation needs high-quality HC based on the RBT model. In fact, firms are able to control the quality of services to the fullest in order to produce added value as well as the competitive edge of the organisation that will eventually increase the company's financial results (Ayub et al., 2017). This is expressed as: $VAHC = \frac{VA}{HC}$ where HC stands for the total employee cost.

Fourthly, connecting VA with structural capital (SC). The coefficient of SC value added demonstrates the value development of the SC firm (De Matos Pedro et al., 2020). As HC is in the value creation process, SC is not an independent measure. In other words, the greater the contribution of HC to value formation, the poorer the contribution of SC in that case (Urban and Joubert, 2017). This is expressed as: $SCVA = \frac{SC}{VA}$ where $SC = VA - HC$.

Fifthly, measure how effective each resource engagement is to VA. The efficacy of the value development of the business is indicated by VAIC™. The larger the value of VAIC™, the greater the productivity of the added value of the total capital of the organisation in question. The VAIC™ method's key assumption is to conclude that the labour burden is an advantage, not an expense. This labour strain is known as human resources when it is viewed as an asset. Hence, to express the model in mathematical form: $VAIC^{TM} = VACA + SCVA + VAHC$. Thus, the model to be used for investigating the effect of Intellectual Capital on firm performance in SADC insurance company is specified as follows:

$$ROA_{it} = \beta_i + \beta_1 VAIC^{TM}_{it} + \beta_2 Risk_{it} + \beta_3 Size_{it} + \beta_4 Lev_{it} + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \beta_i + \beta_1 ROA_{it-1} + \beta_2 VAIC^{TM}_{it} + \beta_3 Risk_{it} + \beta_4 Size_{it} + \beta_5 Lev_{it} + \varepsilon_{it} \quad (2)$$

$$ROA_{it} = \beta_i + \beta_1 VACA_{it} + \beta_2 SCVA_{it} + \beta_3 VAHC_{it} + \beta_4 Risk_{it} + \beta_5 Size_{it} + \beta_6 Lev_{it} + \varepsilon_{it} \quad (3)$$

$$ROA_{it} = \beta_i + \beta_1 ROA_{it-1} + \beta_2 VACA_{it} + \beta_3 SCVA_{it} + \beta_4 VAHC_{it} + \beta_5 Risk_{it} + \beta_6 Size_{it} + \beta_7 Lev_{it} + \varepsilon_{it} \quad (4)$$

Model 2 and 4 is the dynamic form of models 1 and 3. Explicitly, ROA is chosen as the dependent variable and it is a proxy for the insurer's financial performance and it is expressed as $ROA_{it} = \frac{Operating\ profit}{Total\ asset}$; ROA_{it-1} is the lagged insurer's financial performance. VA stands for value added and mathematically $VA = OP + EC + D + A$, where OP is the operating profit, EC is the employee cost, D is the depreciation and A is the amortisation cost. $VACA = \frac{VA}{CA}$, CA stands for capital employed which is equal to book value of total asset minus intangible asset. $SCVA = \frac{SC}{VA}$, $SC = VA - HC$, SC is the structural capital and HC is the human capital cost (sum of all employee-related cost); $VAHC = \frac{VA}{HC}$, HC is the total employee related cost. The control variables: Risk is the underwriting risk which is measured as $\frac{Claim\ paid}{Net\ premium\ received}$, Size stands for the logarithm of Total Assets of the insurer. LEV is the leverage ratio and is measured as $\frac{total\ debt}{total\ asset}$. β_i, $\beta_1 - \beta_7$ represents the presumed parameters, i is the number of insurance companies, t is the number of years, while ε_{it} stands for the error term.

5. Data analysis and result discussion

5.1. Preliminary analysis

The descriptive and correlation analysis was done to reveal the features of the data and the relationship among the variables.

Table 1 above shows the descriptive results of the relationship between the Intellectual Capital, Intellectual Capital components and the financial performance of insurance companies in SADC. The Intellectual Capital was captured by Value Added Intellectual Coefficient and the Intellectual Capital components were captured by Value Added Capital Employed, Value Added Human Capital and Value Added Structural Capital. While underwriting risk, leverage and insurer's size are control variables used for the study, Return on Assets was used to measure the financial performance of insurance companies under investigation. The result revealed on average that the Return on Assets, Value Added Intellectual Coefficient, Value Added Human Capital and Value Added Structural Capital, underwriting risk, leverage and size to be 0.041, 59.825, 1.164, 57.638, 0.927, 0.603, 0.690 and 3.269 respectively. The maximum and the minimum ratio for the Return on Assets, Value Added

Table 1. Descriptive analysis.

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	686	0.041	0.047	0.000	0.446
VAIC™	674	59.825	136.050	-33.284	1405.155
VACA	686	1.164	3.797	-68.344	3.199
VAHC	676	57.638	135.817	2.124	1402.415
SCVA	688	0.927	0.092	0.5292	1
RISK	590	0.603	0.870	0.004	8.532
LEV	686	0.690	0.196	0.081	1.539
SIZ	686	3.269	1.240	0.872	5.625

Note that Obs stands for number of observation, Std. Dev stands for standard deviation, Min stands for Minimum values and Max stands for Maximum values. VAIC™ is the Value Added Intellectual Coefficient, VACA is the Value Added Capital Employed, VAHC is the Value Added Human Capital, SCVA is the Value Added Structural Capital, RISK is the underwriting risk, LEV is the leverage ratio and SIZ stands for insurer's size.

Intellectual Coefficient, Value Added Capital Employed, Value Added Human Capital and Value Added Structural Capital, underwriting risk, leverage and size were 0.000 and 0.446, -33.284 and 1405.155, -68.344 and -3.199, 2.124 and 1402.415, 0.529 and 1.000, 0.004 and 8.532, 0.081 and 1.539 and 0.872 and 5.625 respectively. The standard deviation of the variables ratio of 0.047, 136.050, 3.797, 135.817, 0.092, 0.870, 0.196 and 1.024 revealed the rate at which the Return on Assets, Value Added Intellectual Coefficient, Value Added Capital Employed, Value Added Human Capital and Value Added Structural Capital, underwriting risk, leverage and size deviated from their respective expected ratio.

The correlation coefficients presented in Table 2 show the degree of relationship that exists between the Intellectual Capital and financial performance of insurance companies in SADC. From the result presented in this table, it was discovered that Value Added Intellectual Coefficient, Value Added Human Capital, Value Added Structural Capital, underwriting risk, leverage ratio and insurer's size were negatively correlated with Return on Assets which is the measure of the insurance companies' performance under study with correlation coefficient of -0.41, -0.41, -0.41, -0.16, -0.66 and -0.61 respectively. While Value Added Capital Employed was found to be positively correlated with Return on Assets with correlation coefficient of 0.31. However, it was found that the negative correlations between the Intellectual Capital components and the financial performance of insurance companies under consideration were statistically insignificant while the negative correlation that the underwriting risk, leverage and size have on the performance of the general insurance companies in SADC were significant at the 1 per cent level.

5.2. Regression results: static and dynamic panel analysis

Both static and dynamic regression was used to estimate the unbalanced panel data and models of this study. In static regression, two stage least square (2SLS), fixed and random effect (FE and RE) were used while the two-step System Generalised Method of Moment technique (2SYS-GMM) was used for the dynamic panel analysis.

The results presented in Table 3 showed the results on the Intellectual Capital and the performance of insurance companies in SADC. From the result it was discovered that Value Added Intellectual Coefficient was directly related to the Return on Assets of the insurance companies in SADC as revealed by all the aforementioned techniques. The Z-statistic values 1.96, 2.69, 2.62 $\geq$ 1.96 for the Value Added Intellectual Coefficient which is the Intellectual Capital efficiency positively and significantly affects Return on Assets at 5 per cent significance level in all the identified techniques except the 2SYS-GMM established the statistical significance of Value Added Intellectual Coefficient in assessing the performance of insurance companies in SADC. From the static regression results, it denotes that Intellectual Capital is an important driver of SADC insurance companies' performance. This finding endorsed the knowledge-based theory which states that businesses are creating new knowledge that is important for the gain of a particular combination of expertise (Vardarlıer, 2016). This finding further affirms the study by Nadeem et al. (2018) in Australia, Zeghal and Maaloul (2010) in the United Kingdom, Lu et al. (2014) in China and Haris et al. (2019) in Pakistan, to mention a few. However, the previous value of Return on Assets, a measure of dynamism of the technique adopted, revealed a direct influence on the performance of the insurance companies and it was statistically significant at 1 per cent and a Z-statistic value of 3.03 $>$ 2.58. This confirms the dynamic nature of the model.

From the findings of the control variables, underwriting risk was inversely related with the Return on Assets as indicated from the result obtained from all the techniques used in this study except two stage least square where underwriting risk was directly related with the Return on Assets, a measure of performance for the selected insurance companies. This contradicts the traditional finance theory which postulated higher return from higher risk. This finding implies that losses which emanate from underwriting risk erode performance of SADC insurers. This is

Table 2. Correlation analysis.

	ROA	VAIC™	VACA	VAHC	SCVA	RISK	LEV	SIZ
ROA	1							
VAIC™	-0.410	1						
VACA	0.309	-0.134	1					
VAHC	-0.406	0.991***	-0.170	1				
SCVA	-0.406***	0.991***	-0.170	0258	1			
RISK	-0.157	0.277	-0.246	0.284	0.284***	1		
LEV	-0.660***	0.508***	-0.293***	0.524***	0.524***	0.195***	1	
SIZ	-.0607***	0.495***	-0.354	0.499***	0.499***	0.247***	0.723***	1

Note: *p<10%; **<5%; ***<1%. VAIC™ is the Value Added Intellectual Coefficient, VACA is the Value Added Capital Employed, VAHC is the Value Added Human Capital, SCVA is the Value Added Structural Capital, RISK is the underwriting risk, LEV is the leverage ratio and SIZ stands for insurer's size.

Table 3. Model 1 and 2 estimation: ROA, VAIC™, RISK, LEV, SIZ.

Variables	2SLS (ROA)	FE (ROA)	RE (ROA)	2SYS-GMM (ROA)
Constant	0.095*** (21.22)	0.103*** (5.16)	0.090 *** (12.75)	0.056 *** (5.20)
ROA_{t-1}				0.328*** (3.01)
$VAIC^{TM}$	0.000** (1.96)	0.000** (2.69)	0.000** (2.62)	2.37E-06 (0.42)
RISK	0.000 (0.10)	-0.003 (-1.13)	-0.001 (-0.54)	-0.000 (-0.11)
LEV	-0.047*** (-5.63)	-0.015 (-1.08)	-0.031*** (-2.80)	-0.013 (-0.63)
SIZ	-0.008*** (-6.57)	-0.017*** (-2.99)	-0.010*** (-5.27)	-0.007*** (-3.39)
Adj R^2	0.268	0.481	0.516	
F	55.04***	5.43***		
Wald chi^2			78.55***	490.11***
No of Instrument				21
No of Group		56	56	56
AR1 (p-value)				0.005
AR2 (p-value)				0.304
Hausman Test (p-value)			0.1896	
Hansen test (p-value)				0.107
N	596	589	589	538

Note: *p<10%; **p<5%; ***p<1%; $Z_{0.1} = 1.65$; $Z_{0.05} = 1.96$; $Z_{0.01} = 2.58$ t/z values are in parentheses. Adj R^2 stands for adjusted R-squared, AR stands for Arellano Bond test, F is the F- statistics, N is the number of observations, VAIC™ is the Value Added Intellectual Coefficient, VACA is the Value Added Capital Employed, VAHC is the Value Added Human Capital, SCVA is the Value Added Structural Capital, RISK is the underwriting risk, LEV is the leverage ratio and SIZ stands for insurer's size.

consistent with the findings by Akotey et al. (2013) and Alhassan et al. (2016). Although, in this study, the identified techniques revealed the insignificance of underwriting risk in determining the performance of insurance companies based on Z-statistic values of 0.10, 1.13, 0.54, 0.11 < 1.96. Similarly, Leverage was also discovered to inversely influence the Return on Assets of the insurance companies as evidently established by all the adopted techniques. This confirms the findings of Alipour (2012) in Iranian insurance companies, Malik (2011) in Pakistan and Alhassan et al. (2016) in emerging markets. This implies that the more insurance business in SADC is geared, the lesser their performance. It further implies that inability of SADC insurers to maximise returns on their investment activities form the leverage provided by their clients. The Z-statistic values 5.63 and 2.80 > 1.96 obtained from the two stage least square (2SLS) and random effect (RE) showed the statistical significance.

The insurer size showed its inverse relation to the Return on Assets of the insurance companies from SADC and the Z-statistic values 6.57, 2.99, 5.27 3.39 > 1.96 revealed the statistical significance of size in examining the performance of insurance companies under consideration. This confirms the study of Alhassan et al. (2016). This finding implies that the larger the companies, the greater opportunity to diversify, but the negative effect shows the mismanagement of diversification activities, hence the surge in the variability of revenue flows. The finding further denotes mismanagement of resources which might be due to the heartfelt adverse impact of climate changes and other natural disasters on the activities of insurance business. The Adjusted R-squared values 0.27, 0.48 and 0.52 revealed that the Intellectual Capital and other control variables used in the study explained 27, 48 and 52 per cent variations in the performance of insurance companies of SADC as established by the 2SLS, FE and RE panel regression techniques adopted for this study. The F-statistic value 55.04 and 5.43 > 3.32 established the statistical significance at 1 per cent level for the 2SLS and FE panel regression techniques adopted in this study. Also, the Wald chi^2 values 78.55 and 490.11 $>$ 13.28 established the statistical significance at 1 per cent level for RE panel regression and SY-GMM techniques in determining the existing relationship between the Intellectual Capital and performance of insurance companies in SADC. The P-value 0.1896 obtained from the Hausman test for the RE panel model revealed a non-systematic variation of difference coefficients Intellectual Capital of the model in examining the performance of insurance companies.

It is worthy to note the 2SYS-GMM was considered and applied for in this study to cater for the unnoticed endogeneity and heteroscedasticity menace as affirmed by Baltagi (2008). Therefore, the first and second order serial correlation test was conducted and Hansen test for instrument validity was also conducted to prove the validity of the instruments whose insignificant p-values certifies the validity and the exogeneity of the instrument of the model. The P-value 0.107 > 0.1 obtained from the Hansen test of the dynamic model revealed that the adopted 2SYS-GMM technique was moderately specified in assessing the influence of Intellectual Capital on the financial performance of insurance companies under consideration. The insignificant p-value of AR2 reveals that disturbances are uncorrelated serially, and the fact that the number of instruments is less than the number of groups affirms the reliability of the 2SYS-GMM estimation.

The results presented in Table 4 showed the model estimation of the three components of Intellectual capital (Structural capital, Capital employed and Human Capital) and the financial performance of insurance companies in SADC. The model was estimated using 2SLS, FE and RE panel regression as well as a 2SYS-GMM. In this study, Value Added Intellectual Coefficient was captured by Value Added Capital Employed, Value Added Human Capital and Value Added Structural Capital. Thus, it was discovered that Value Added Human Capital and Value Added Structural Capital have a direct relationship with the insurers' financial performance (Return on Assets) in SADC as revealed by the adopted techniques used in this study. The Z-statistic values 1.95 and 2.29 for Value Added Human Capital obtained from 2SLS and RE panel regression techniques established its statistical significance in assessing the performance of insurance companies in SADC at a 10 and 5 per cent level respectively. This is consistent with Mondal and Ghosh (2012), Alipour (2012), Habibah and Riharjo (2016), Asare et al. (2017) and Haris et al. (2019) who completed a study on Human Capital and financial performance in emerging markets in India, Iran, Jordan and Pakistan. They found that there is a significant and positive effect of human resource on productivity and profitability. This finding implies that the accumulation of human skills, knowledge and experience spurs the firms' capabilities and resources. The positive and significant effect of Value Added Human Capital can be further explained as the combined knowledge assists firms to gain competitive advantage, hence this results in better performance. Following the assertions of Royal and O'Donnell (2008) and Chadha and Parimoo (2017), Human Capital is the most crucial in positively spurring on a firm's performance. The positive and significant effect of Value Added Human Capital on SADC general insurers' financial performance is consistent with the findings of studies across the world.

Table 4. Model 3 and 4 estimation: ROA, VACA, VAHC, SCVA, RISK, LEV, SIZ.

Variables	2SLS (ROA)	FE (ROA)	RE (ROA)	2SYS-GMM (ROA)
Constant	0.085*** (7.12)	-0.056*** (-1.45)	0.049 ** (2.50)	0.031 (1.24)
ROA_{t-1}				0.576*** (2.85)
VACA	-0.001*** (-3.55)	-0.001** (-2.45)	-0.001*** (-3.03)	-0.001*** (-4.12)
VAHC	0.000* (1.95)	0.000 (1.46)	0.000** (2.29)	0.000 (1.13)
SCVA	0.020 (1.32)	0.201*** (5.12)	0.064*** (2.64)	0.009 (0.44)
RISK	0.000 (0.10)	-0.003 (-1.13)	-0.001 (-0.41)	-0.009* (-1.74)
LEV	-0.062*** (-6.55)	-0.050*** (-2.93)	-0.057*** (-4.34)	-0.026* (-1.76)
SIZ	-0.008*** (-5.87)	-0.017*** (-3.10)	-0.010*** (-4.78)	-0.001 (-0.24)
Adj R^2	0.283	0.278	0.484	
F	39.73***	8.94***		
Wald chi^2			91.90***	1984.92***
No of Instrument				27
No of Group		56	56	56
AR1 (p-value)				0.013
AR2 (p-value)				0.199
Hausman Test (p-value)			0.001***	
Hansen test (p-value)				0.279
N	596	589	589	538

Note: *p<10%; **p<5%; ***p<1%; $Z_{0.1} = 1.65$; $Z_{0.05} = 1.96$; $Z_{0.01} = 2.58$, Z values are in parentheses. Adj R^2 stands for adjusted R-squared, AR stands for Arellano Bond test, F is the F- statistics, N is the number of observations, VAIC™ is the Value Added Intellectual Coefficient, VACA is the Value Added Capital Employed, VAHC is the Value Added Human Capital, SCVA is the Value Added Structural Capital, RISK is the underwriting risk, LEV is the leverage ratio and SIZ stands for insurer's size.

Also, the Z-statistic values 5.12 and 2.64 for Value Added Structural Capital obtained from the FE and RE panel regression techniques respectively revealed the significance of Structural Capital in examining the financial performance of insurance companies under investigation at a 1 per cent level. This is consistent with studies by Sardo et al. (2018), Habibah and Riharjo (2016) and Scafarto et al. (2016) but negates the findings of Haris et al. (2019). Value Added Structural Capital's positive and significant effect on SADC insurers' performance implies that increased investment in non-physical components (procedures and systems) does lead to increased efficiency, profitability and performance.

Further, from the analysis it was discovered that Value Added Capital Employed was inversely related with the performance of insurance companies in SADC. The Z-statistic values 3.55, 2.45, 3.03 and 4.12 for Value Added Capital Employed obtained from all the adopted methods showed its statistical significance at a 1 per cent level except for the result from the FE panel technique which was significance at a 5 per cent level. However, the previous value of Return on Assets which is a measured of dynamism of the technique adopted revealed its direct influence on the performance of the insurance companies and it was statistically significant as revealed by the Z-statistic value $2.85 > 2.58$ at a 1 per cent level. The P-value $0.279 > 0.1$ obtained from the Hansen test of the dynamic model revealed that the adopted 2SYS-GMM technique specified in assessing the relationship between the Intellectual Capital and the performance of insurance companies under consideration was not over identified and as such was moderate. The negative effect of Value Added Capital Employed on insurers' financial performance in SADC opposes the findings of Nawaz and Haniffa (2017) and Sardo et al. (2018) which state that the increase in Capital Employed prompts financial capital growth. This finding implies that SADC insurers are inefficient in using their financial assets to enhance their profitability.

Basically, the three components of Intellectual Capital significantly affect the financial performance of the SADC insurance sector. This is consistent with the study conducted in Australia, China and the Arab region by Joshi et al. (2013), Lu et al. (2014) and Dzenopoljac et al. (2017) respectively. Their findings showed that Intellectual Capital, primarily Human Capital, financial capital and Structural Capital have a substantial effect on firm operational performance.

From the control variables, underwriting risk had an inverse relationship with the Return on Assets as revealed from the results of all the techniques used in this study except the 2SLS estimate where underwriting risk had a direct relationship with the Return on Assets as a measure of performance of the insurance companies under investigation. In the study, the identified techniques revealed the statistical insignificance of underwriting risk in determining the performance of insurance companies except in 2SYS-GMM which was significance at a 10 per cent level as revealed by the Z-statistic value $1.74 > 1.65$. Also, Leverage ratio was found to be inversely related with the Return on Assets as a measure of financial performance of the insurance companies and was evidently established by all the adopted techniques. The Z-statistic values 6.55, 2.93 and $4.34 > 2.58$ indicated the statistical significance at a 1 per cent level for Leverage from all the methods used except the 2SYS-GMM in which it was significant at a 10 per cent level as indicated by the Z-statistic value $1.74 > 1.65$. Insurer's size showed an inverse relationship with the ROA of the insurance companies in SADC under study and the Z-statistic values 5.87, 3.10 and $4.78 > 2.58$ revealed the statistical significance of the insurer's size at a 1 per cent level for all the techniques used. Conversely, the 2SYS-GMM revealed the statistical insignificance of insurer's size in examining the financial performance of SADC insurance companies.

The Adjusted R-squared values 0.28, 0.28 and 0.48 revealed that the Intellectual Capital and other control variables used in the study explained 28, 28 and 48 per cent variations in the performance of insurance companies of SADC as established by the 2SLS, FE and RE panel regression techniques adopted for this study. The F-statistic value 39.73 and $8.94 > 3.32$ established the statistical significance at a 1 per cent level for the 2SLS and FE panel regression techniques adopted in this study. Moreover, the Wald chi^2 values 91.90 and $1984.92 > 13.28$ established the statistical significance at a 1 per cent level for RE panel regression and 2SYS-GMM techniques in the estimation of the existing relationship between the Intellectual Capital and performance of insurance companies in SADC. The Hausman test with null hypothesis of difference in coefficients not systematic has 0.001 P-value for the RE panel model. This leads to rejection of the null hypothesis and thereby reveals a systematic variation of different Intellectual Capital coefficients in the model used in examining the performance of insurance companies. Thus, the influence of

Intellectual Capital on financial performance of insurance companies varies across SADC.

6. Concluding remark

Intellectual Capital majorly triggers businesses' competitive advantage. Based on the fact that the world is growing fast and there is an increasing need for knowledge and information in all sectors, only the firms that outrun and see ahead of others can recognise their Intellectual Capital and grow it. Thus, management of Intellectual Capital is a crucial competence in this knowledge-based era and this study attempts to examine the effect of Intellectual Capital and its three components on the financial performance of the SADC insurance sector with a focus on general insurance. This study provides the clear understanding of these components (Value Added Capital Employed, Value Added Human Capital and Value Added Structural Capital) in the SADC insurance sector using the Value Added Intellectual Coefficient Model for the period 2008 to 2019.

The estimation of model 3 and 4 is explicit enough to conclude this study. Thus, the direct and significant effect of Value Added Human Capital and Value Added Structural Capital on the financial performance of SADC insurers and the inverse and significant effect of Value Added Capital Employed on the financial performance of SADC general insurers affirms the relevance of KBV theory in SADC insurance sectors. KBV's strategy is the foundation for creating HC engagement in the company's daily operations (Boon et al., 2018). This is accomplished by rising contribution of staff to the company's long-term goals which leads to the increase in the capability of the corporation to fulfil the standard processes and systems of the company that help the efforts of workers to deliver intellectual output.

Based on these findings, it is recommended that:

i. Managers should concentrate more on training and developing staff such that customers' needs can be identified, provide full services to customers and enhance customer orientation and expectation regarding just-in-time response to their demands.
ii. Managers and insurers should concentrate on factors that enhance the maximisation of structural capitals. Some of which include regulations, enforcement of strategies, appraising human resource productivity, evaluating IT facilities, deregulation, and using an open system in the companies such that opinions of employees and outsiders can be received. The effective use of these factors enhances the achievement of developed competitive advantage and increased penetration which later on attracts valuable customers and leads to better financial performance.
iii. The competitive advantage accumulated by Capital Employed should be enhanced as it negatively impacts the SADC insurers' financial performance. Factors such as specialty, high skills, innovative service and experienced labour force should be productively engaged to increase the insurance coverage. All these lead to quality products and results in higher competitive advantage, increase in customer patronage and insurance penetration.
iv. Bancassurance should be encouraged because insurers are enhancing the customers' financial stability by preserving and minimising risks of households and firms. Finally, disclosure of the components of Intellectual Capital in the integrated reporting should be encouraged and monitored in an organisation. Having all these recommendations implemented will further stabilise the financial market in SADC.

It is thereby concluded that all the null hypotheses in this study are rejected and for general insurance business in SADC, Intellectual Capital significantly affects the financial performance. Thus, a U-shape relationship exists between Intellectual Capital and financial performance which consequently informs the policy makers, and insurers' managers should take note that Intellectual Capital significantly spurs on financial performance with urgent attention and management of the relation capital. Since Intellectual Capital contributes significantly to the performance of insurance, efficient and effective management of Intellectual Capital will spur financial market stability because insurers are huge investors in the financial market.

The only limitation of this study is the inability to use data from general insurance companies of all the 16 countries in SADC as data from only 13 countries was available and used. This study focused on the general insurance sector in SADC and future studies can extend to all divisions of insurance business such as life, property, liability, guarantee etc. Also, this study used Value Added Intellectual Coefficient Model to measure Intellectual Capital, further studies can use other models so that it can be seen if different results will emanate. Also, the same study can be repeated on other economic regions of the African continent with the inclusion of germane factors that affect insurance businesses such as climate change, economic instability and government regulations as the control variable.

Declarations

Author contribution statement

Odunayo Magret Olarewaju: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

Thabiso Sthembiso Msomi: Performed the experiments; Contributed reagents, materials, analysis tools or data.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

Ahmad, R., Bin Mohammad, H., Nordin, S.B., 2019. Moderating effect of board characteristics in the relationship of structural capital and business performance: an evidence on Pakistan textile sector. J. Stud. Soc. Sci. Humanit. 5 (3), 89–99.

Akotey, J.O., Sackey, F.G., Amoah, L., Manso, R.F., 2013. The financial performance of life insurance companies in Ghana. J. Risk Finance 14 (3), 286–302.

Al-Musali, M.A., Ismail, K.N.I.K., 2016. Cross-country comparison of intellectual capital performance and its impact on financial performance of commercial banks in GCC countries. Int. J. Islam. Middle E Finance Manag. 9 (4), 512–531.

Alhassan, A.L., Asare, N., Adcroft, A., Murphy, P., 2016. Intellectual capital and bank productivity in emerging markets: evidence from Ghana. Manag. Decis. 54 (3), 589–609.

Alhassan, A.L., Biekpe, N., 2017. Liberalization outcomes and competitive behaviour in an emerging insurance market. Afr. Dev. Rev. 29 (2), 122–138.

Alipour, M., 2012. The effect of intellectual capital on firm performance: an investigation of Iran insurance companies. Meas. Busin. Exc. 16 (1), 53–66.

Allameh, S.M., 2018. Antecedents and consequences of intellectual capita. J. Intellect. Cap. 19 (5), 858–874.

Amiri, A.N., Zadeh, A.H., Sheikholeslami, E., 2015. Studying effect of intellectual capital on insurance demand increase (Case Study: Asia insurance company). Int. Lett. Soc. Humanist. Sci. 55, 17–23.

Anwar, W., Siddiqui, D.A., 2020. Effect of intellectual capital performance on profitability of conventional and islamic banks in Pakistan: a comparative analysis based on value added intellectual coefficient (VAIC) (august 28, 2020). Available at SSRN: https://ssrn.com/abstract=3682816. (Accessed 17 November 2020).

Arslan, M.L., Kizil, C., 2019. Measuring intellectual capital of Turkish banks listed on borsa istanbul banking index (BIST XBANK) with the market value/book value

method and value added intellectual coefficient (VAIC) model. Emerg. Mark. J. 9 (1), 101–116.
Asare, N., Alhassan, A.L., Asamoah, M.E., Ntow-gyamfi, M., 2017. Intellectual capital and profitability in an emerging insurance market. J. Econ. Adm. Sci. 33 (1), 2–19.
Asongu, S.A., 2020. Technology, education, life and non-life insurance in Africa. Int. J. Publ. Adm. 43 (110), 915–925.
Asongu, S.A., Odhiambo, N.M., 2020. Information asymmetry and insurance in Africa. J. Afr. Bus. 10 (1), 1–17.
Ayub, U., Kausar, A.R., Qadri, M.M., 2017. Linking human capital and organisational innovative capabilities of financial institutions: evidence from a developing country of South Asia. J. Inf. Knowl. Manag. 16 (4), 1750042–1750045.
Baltagi, B., 2008. Econometric Analysis of Panel Data. *John Wiley & Sons.* Southern Gate, West Sussex.
Barbosa, S., Vale, J., Teixeira Vale, V., Castelo Branco, M., 2016. Intellectual capital and performance in higher education organizations. In: Proceedings of the International Conference Theory and Application in the Knowledge Economy (TAKE 2016), Aveiro, Portugal, 6-8 July 2016, pp. 670–681.
Bassetti, T., Dal Maso, L., Liberatore, G., MazzI, F., 2019. A critical validation of the Value Added Intellectual Coefficient: use in empirical research and comparison with alternative measures of intellectual capital. J. Manag. Govern. 24, 1115–1145.
Bellucci, M., Marzi, G., Orlando, B., Ciampi, F., 2020. Journal of Intellectual Capital: a review of emerging themes and future trends. J. Intellect. Cap.
Bontis, N., Ciambotti, M., Palazzi, F., Sgro, F., 2018. Intellectual capital and financial performance in social cooperative enterprises. J. Intellect. Cap. 19 (4), 712–731.
Boon, C., Eckardt, R., Lepak, D.P., Boselie, P., 2018. Integrating strategic human capital and strategic human resource management. Int. J. Hum. Resour. Manag. 29 (3), 34–67.
Buallay, A., 2019. Intellectual capital and performance of Islamic and conventional banking. J. Manag. Dev. 38 (7), 518–537.
Burkhanov, A., 2020. Practice of investment funds development in developed countries. Архив научных исследований 60 (4), 275–284.
Chadha, S., Parimoo, D.D., 2017. Human capital management in banking sector-A conceptual framework. Int. J. Manag. 8 (6), 44–55.
Chinaka, M., 2016. Blockchain technology–applications in improving financial inclusion in developing economies: case study for small scale agriculture in Africa (Doctoral dissertation, Massachusetts Institute of Technology).
Clarke, M., Seng, D., Whiting, R.H., 2011. Intellectual capital and firm performance in Australia. J. Intellect. Cap. 12 (4), 505–530.
Daum, J.H., 2003. Intangible Assets and Value Creation. John Wiley & Sons, Southern Gate, West Sussex.
De Matos Pedro, E., Leitão, J., Alves, H., 2020. Bridging intellectual capital, sustainable development and quality of life in higher education institutions. Sustainability 12 (2), 1–27.
Devi, B.E., Khairunnisa, K., Budiono, E., 2017. The influence of intellectual capital on the company financial performance. JAK (Jurnal Akuntansi): Kajian Ilmiah Akuntansi 3 (2), 15–26.
Dzenopoljac, V., Yaacoub, C., Elkanj, N., Bontis, N., 2017. Impact of intellectual capital on corporate performance: evidence from the Arab region. J. Intellect. Cap. 18 (4), 884–903.
Ermawati, Y., Noch, M.Y., Zakaria, Z., Ikhsan, A., Khaddafi, M., 2017. Reconstruction of financial performance to manage gap between value added intellectual coefficient (VAIC^{TM}) and value of company in banking company listed in Indonesia stock exchange. Int. J. Econ. Financ. Issues 7 (4), 537–549.
Fernando, W.H.M., Yusoff, S.K.M., Khatibi, A., Azam, S.F., 2019. A review on human capital; two principal ideas predominantly generic human capital and specific human capital for organizational performance. Eur. J. Econ. Fin. Res. 3 (5), 33–47.
Gorda, A.O.S., Romayanti, K.N., AnggreswarI, N.P.Y., 2018. Social capital, spiritual capital, human capital, and financial capital in the management of child welfare institutions. Int. J. Soc. Sci. Humanit. 2 (1), 12–20.
Guest, D.E., 2017. Human resource management and employee well-being: towards a new analytic framework. Hum. Resour. Manag. J. 27 (1), 22–38.
Habibah, B.N., Riharjo, I.B., 2016. Pengaruh intellectual capital terhadap kinerja keuangan pada perusahaan manufaktur. Jurnal Ilmu dan Riset Akuntansi (JIRA) 5 (7), 1–16.
Haris, M., Yao, H., Tariq, G., Malik, A., Javaid, H.M., 2019. Intellectual capital performance and profitability of banks: evidence from Pakistan. J. Risk Financ. Manag. 12 (2), 56–60.
Hatane, S.E., Agustin, M., Kana, V.R., Dautrey, J.M., 2019. Do value added intellectual coefficient and corporate governance contribute to firm's economic value added. Petra Int. J. Busin. Stud. 2 (2), 96–108.
Jordão, R.V.D., Novas, J.C., 2017. Knowledge management and intellectual capital in networks of small-and medium-sized enterprises. J. Intellect. Cap. 18 (3), 667–692.
Joshi, M., Cahill, D., Sidhu, J., Kansal, M., 2013. Intellectual capital and financial performance: an evaluation of the Australian financial sector. J. Intellect. Cap. 14 (2), 264–285.
Lamond, D., Huang, Y.C., Wu, Y.C.J., 2010. Intellectual capital and knowledge productivity: the Taiwan biotech industry. Manag. Decis. 48 (4), 580–599.
Lee, H., 2019. Insurance development and economic growth. Fin. Stat. J. 1 (4), 1–17.
Lu, W.-M., Wang, W.-K., Kweh, Q.L., 2014. Intellectual capital and performance in the Chinese life insurance industry. Omega 42 (1), 65–74.
Mačerinskienė, I., Survilaitė, S., 2019. Intellectual capital in the listed companies of the baltic states. In: Paper Presented at the International Scientific Conference "Whither Our Economies - 2019". Conference Proceedings, 09 December 2019, Mykolo Romerio Universitetas. Available at: https://repository.mruni.eu/handle/007/16035. (Accessed 20 October 2020).
Maijanen, P., 2020. 3 Approaches from strategic management: resource-based view, knowledge-based view, and dynamic capability view. Manag. Econ. Commun. 30 (1), 47.
Malik, H., 2011. Determinants of insurance companies' profitability, an analysis of insurance sector of Pakistan. Acad. Res. Int. 1 (3), 315.
Masimirembwa, G., 2018. *An Analysis of the Impact of Cultural Imperialism to Regional Economic Integration Initiatives, A Case Study of the Southern African Development Community* (SADC) 1992-2015. Master of Science Degree at the University of Zimbabwe.
Massa, L., Tucci, C.L., Afuah, A., 2017. A critical assessment of business model research. Acad. Manag. Ann. 11 (1), 73–104.
Mlambo, D.N., 2020. The quest for post-colonial regional integration: examining the Southern African Development Community (SADC) in Southern Africa post-1992. J. Afr. For. Aff. 7 (1), 23–48.
Mondal, A., Ghosh, S.K., 2012. Intellectual capital and financial performance of Indian banks. J. Intellect. Cap. 13 (4), 515–530.
Mushunje, L., Mashasha, M., 2020. Application of the extended gompertz model in analyzing insurance growth. J. Adv. Stud. Fin. 11 (1), 9–17.
Nadeem, M., Gan, C., Nguyen, C., 2018. The importance of intellectual capital for firm performance: evidence from Australia. Aust. Account. Rev. 28 (3), 334–344.
Nawaz, T., Haniffa, R., 2017. Determinants of financial performance of Islamic banks: an intellectual capital perspective. J. Islam. Account. Busin. Res. 8 (2), 130–142.
Nhabinde, S., Heshmati, A., 2020. The Extractive Industry's Impact on Economic Growth in SADC Countries. IZA Institute of Labor Economics. IZA Discussion Paper No. 13586. Available at SSRN: https://ssrn.com/abstract=3674307. (Accessed 22 November 2020).
Nikolaou, I.E., 2019. A framework to explicate the relationship between CSER and financial performance: an intellectual capital-based approach and knowledge-based view of firm. J. Knowl. Econ. 10, 1427–1446.
Nkotsoe, L.M., 2018. Determinants of Life Insurance Penetration in SADC. Doctoral Dissertation. University of Cape, Town.
Nourani, M., Chandran, V., Kweh, Q.L., Lu, W.M., 2018. Measuring human, physical and structural capital efficiency performance of insurance companies. Soc. Indicat. Res. 137 (1), 281–315.
Oppong, G.K., Pattanayak, J.K., Irfan, M., 2019. Impact of intellectual capital on productivity of insurance companies in Ghana. J. Intellect. Cap. 20 (6), 763–783.
Osinski, M., Selig, P.M., Matos, F., Roman, D.J., 2017. Methods of evaluation of intangible assets and intellectual capital. J. Intellect. Cap. 18 (3), 470–485.
Ozkan, N., Cakan, S., Kayacan, M., 2017. Intellectual capital and financial performance: a study of the Turkish Banking Sector. Borsa Istanbul Rev. 17 (3), 190–198.
Padayachee, N., Rothberg, A.D., Truter, I., Butkow, N., 2019. Utilization of over-the-counter analgesics in two private medical insurance schemes in South Africa. Drug Healthc. Patient Saf. (11), 37–40.
Padmore, G., 2019. Africa and World Peace. Routledge, New York, NY.
Pedro, E., Leitão, J., Alves, H., 2018. Intellectual capital and performance. J. Intellect. Cap. 19 (2), 407–452.
Phusavat, K., Comepa, N., Sitko-lutek, A., Ooi, K.B., 2011. Interrelationships between intellectual capital and performance. Ind. Manag. Data Syst. 111 (6), 810–829.
Pulic, A., 2000. VAIC™ – an accounting tool for IC management. Int. J. Technol. Manag. 20 (1), 702–714.
Rahayu, S.M., Ramadhanti, W., 2019. Corporate governance, intellectual capital, and performance of Indonesian public company. J. Econ. Busin. Account. Vent. 21 (3), 323–332.
Royal, C., O'Donnell, L., 2008. Differentiation in financial markets: the human capital approach. J. Intellect. Cap. 9 (4), 668–683.
Safitriani, Y., 2018. Pengaruh value added capital employed, value added human capital. In: Dan Structural Capital Value Added Terhadap Profitabilitas. Studi Kasus PT. Mekar Unggul Sari Periode 2007-2016. Doctoral Dissertation. Universitas Mercu Buana Jakarta.
Santis, S., Bianchi, M., Incollingo, A., Bisogno, M., 2019. Disclosure of intellectual capital components in integrated reporting: an empirical analysis. Sustainability 11 (1), 62–66.
Sardo, F., Serrasqueiro, Z., 2017. A European empirical study of the relationship between firms' intellectual capital, financial performance, and market value. J. Intellect. Cap. 18 (4), 771–788.
Sardo, F., Serrasqueiro, Z., Alves, H., 2018. On the relationship between intellectual capital and financial performance: a panel data analysis on SME hotel. Int. J. Hospit. Manag. 75, 67–74.
Scafarto, V., Ricci, F., Scafarto, F., 2016. Intellectual capital and firm performance in the global agribusiness industry. J. Intellect. Cap. 17 (3), 530–552.
Shore, L.M., Cleveland, J.N., Sanchez, D., 2018. Inclusive workplaces: a review and model. Hum. Resour. Manag. Rev. 28 (2), 176–189.
Silvia, L., Maftukhah, I., 2018. The effect of intellectual capital on the profitability of the banking companies listed on Indonesia stock exchange in 2013-2016. Manag. Analy. J. 7 (3), 393–399.
Singla, H.K., 2020. Does VAIC affect the profitability and value of real estate and infrastructure firms in India? A panel data investigation. J. Intellect. Cap. 21 (3), 309–331.
Subramaniam, M., Youndt, M.A., 2005. The influence of intellectual capital on the types of innovative capabilities. Acad. Manag. J. 48 (3), 450–463.
Sudiyatmoko, A., 2018. The effect of intellectual capital on non-performing financing and it's implication toward financial performance of sharia common banks. Sci. J. Ref.: Econ. Account. Manag. Busin. 1 (1), 241–250.
Sunariyanto, H.C., 2020. Pengukuran dan analisis kinerja intellectual capital Pt. X menggunakan metode value added intellectual coefficient (vaic). Doctoral Dissertation. Sepuluh November Institute of Technology.

Tan, H.P., Plowman, D., Hancock, P., 2007. Intellectual capital and financial returns of companies. J. Intellect. Cap. 8 (1), 76–95.
Ulfi, E., Saftiana, Y., Kalsum, U., 2019. The Effect of Intellectual Capital to the Market Value. Doctoral Dissertation. Sriwijaya University.
Ulum, I., Kharismawati, N., Syam, D., 2017. Modified Value Added Intellectual Coefficient (MVAIC) and traditional financial performance of Indonesian biggest companies. Int. J. Learn. Intellect. Cap. 14 (3), 207–219.
Urban, B., Joubert, G.C.D.S., 2017. Multidimensional and comparative study on intellectual capital and organisational performance. J. Bus. Econ. Manag. 18 (1), 84–99.
Vardarlıer, P., 2016. Strategic approach to human resources management during crisis. In: Procedia-Social and Behavioural Sciences, 12th International Strategic Management Conference, ISMC 2016, 28-30 October 2016, Antalya, Turkey, pp. 235–240.
Vo, D.H., 2018. Should bankers be concerned with Intellectual capital? A study of the Thai banking sector. J. Intellect. Cap. 19 (5), 897–914.
Wang, Y., Linsen, Y., Wenjie, P., 2017. Life insurance contribution, insurance development and economic growth in Chin. Int. J. Busin. Econ. Dev. (IJBED) 5 (2), 5–11.
Wu, W.Y., Chang, M.L., Chen, C.W., 2008. Promoting innovation through the accumulation of intellectual capital, social capital, and entrepreneurial orientation. R&d Manag. 38 (3), 265–277.
Xu, J., Liu, F., 2020. The impact of intellectual capital on firm performance: a modified and extended VAIC model. J. Comp. 12 (2), 161–167.
Xu, J., Wang, B., 2018. Intellectual capital, financial performance and companies' sustainable growth: evidence from the Korean manufacturing industry. Sustainability 10 (12), 46–51.
Yudawisastra, H.G., Manurung, D.T., Husnatarina, F., 2018. Relationship between value added capital employed, value added human capital, structural capital value added and financial performance. Invest. Manag. Financ. Innovat. 15 (2), 222–231.
Zakery, A., Saremi, M.S., 2020. Knowledge and intellectual capital in internationalizing SMEs, case study in technology-based health companies. J. Intellect. Cap. ahead-of-print No. ahead-of-print.
Zeghal, D., Maaloul, A., 2010. Analysing value added as an indicator of intellectual capital and its consequences on company performance. J. Intellect. Cap. 11 (1), 39–60.