

The Nexus between Intellectual Capital and Firm's Financial Performance: ACE Market Vantage Point

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Abstract

This paper aims to examine the impact of Intellectual Capital (IC) on a firm's financial performance in the ACE Market of Bursa Malaysia. In the era of the knowledge economy, intellectual capital is considered the dominant factor in contributing to superior performance. Hence, there is an emerging emphasis on intangible assets, and wealth creation is allied with the development and maintenance of intangible resources. The empirical data was covering 81 firms from 2009-2018. This study used the Modified Value-Added Intellectual Capital Model (MVAIC) to measure intangibles by applying a two-step system generalized method of moments (GMM). The result revealed that the MVAIC is significantly related to ROA negatively. It means that MVAIC can predict the future of financial performance and its effect negatively. The results extend the understanding of the role of intellectual capital in creating corporate values and building sustainable advantages for companies in developing countries like Malaysia. Therefore, this research suggests that in the future, studies on intellectual capital and a firm's financial performance should apply dynamic panel and MVAIC model in a

broad scope not only specific to the knowledge-based industry. As the importance of intellectual capital is not only limited to knowledge-based industries.

Keywords: Intellectual Capital, Firm's Financial performance, knowledge-based Economy, Modified Value-Added Intellectual Capital (MVAIC), The ACE Market.

Introduction

In the current knowledge-based economy, intangible assets are considered the essential factor for the organization's succession. In the old economy, the effectiveness of the developing economy depended on the employments of traditional production factors like land, labor, capital, and entrepreneur in making a value-added to the well-being (Adesina, 2019; Hadad, 2017; Veselá & Klimová, 2014). Traditional bookkeeping strategies look backward into the past and measure physical assets only. However, new value creation techniques have contemplated intangible assets for a prosperous, competitive market (Dosso & Vezzani, 2019; Nazari, 2014).

Nevertheless, in Malaysia, accounting standards for disclosing intellectual capital are unavailable. In the absence of such a requirement, the disclosure of intellectual capital is entirely voluntary in nature. Thus, firms have complete discretion in their annual reports' disclosure (Yau, Chun, & Balaraman, 2009).

In the current economic environment, companies are facing considerable challenges to maintain their competitiveness. Along these lines of thinking, market dynamism pushes to meet the enormous demand for knowledge (Mahdi, Nassar, & Almsafir, 2019). Relating this to the theory of resource-based view, the theory explains that the ideal approach to make procedures to upgrade firm execution is to utilize the accessible assets to accomplish or increase maintainable competitive advantage. This theory is a fundamental determinant of an organization's competitive advantage and performance improvement. Furthermore, in an economy dominated by the creation and diffusion of knowledge, the role of intellectual capital is indelible. It is believed that monitoring and identifying intangible assets highly connected to the determination of failure or success of a firm (Jordão Ricardo Vinícius, Novas, & Gupta, 2019). Therefore, intellectual capital is considered a vital element of the overall performance development of an organization (Saddam, 2020). Also, intellectual capital management is a vital movement that impacts a firm's performance (Maji & Goswami, 2016). Several effective intellectual capital measurement methods have been established since the importance of intellectual capital has been comprehended (Edvinsson & Malone, 1997; Kaplan & Norton, 1996; Roos & Roos, 1997; Sveiby, 1997). This method includes a balanced scorecard, intellectual capital index, intellectual capital monitor, to the latest Value-Added Intellectual Capital (VAIC). However, Maji and Goswami (2017) and Xu and Wang (2018) suggested the use of modified VAIC (MVAIC) is better in evaluating the structural capital efficiency (SCE) and relational capital efficiency (RCE) to some extent than the previous VAIC Model. Therefore, this study adopted the latest and Modified VAIC model to reflect the results better using 81 companies listed in the ACE Market of Bursa Malaysia.

Despite the rising investment in the knowledge base economy firms, there is still limited coverage conducted on some areas of intangible assets. Numerous researches investigated the efficient use of IC in the Banking sector (Goh, 2005; Oppong & Pattanayak, 2019; Ousama & Fatima, 2015; Shih, Chang, & Lin, 2010), but there is still limited research focus on other sectors and markets. Therefore, this study focuses on the firms listed in the ACE Market as it has been disregarded. The goals of knowledge-based firms, including the ACE Market, can

only be achieved using all their resources (tangible and intangible). Hence, it is essential to observe whether the other sectors and markets use their IC effectively and contribute to the new economy's growth. Thus, this study focuses on 81 firms listed in the CAE market of Bursa Malaysia from 2009-2018.

The Importance of ACE Market in Malaysia

There are two markets in Bursa Malaysia; the first one is the Main Market which is the best and most normal road for firms to raise capital. The Main Market is occupied mainly by established firms with sound financial performance. At the same time, the ACE Market gives an elective sponsor-driven market, and it is a perfect stage for a firm with significant potential advancement and development. The ACE Market is an open door for developing firms to boost their business to higher ground and set up better financial standings in all business sectors. In this way, it shows that the ACE Market helps the firms to continue to grow, and in the long run, it eventually moves into the Main Market. Characteristics like noticeable growth, good leadership to develop the business, adequate frameworks, strategy, arrangements, controls, and assets to run the organization with the standards and guidelines should be practiced by the firms looking to list the ACE Market.

Since the ACE Market is the most important market that permits medium-and small-sized firms and entrepreneurs to infuse progressively capital into their firms and in this manner, this subsequent development and, consequently, reassuring more innovative products, development, and growth in the economy. This market provides better transparency in the market for investors (Ghasemi & Razak, 2017). Therefore, studying the influence of intellectual capital on the firm financial performance of firms listed in the ACE Market is essential to provide market participants better understanding. Moreover, a significant capital market can be contributed by the better financial performance of firms listed in the ACE Market. This is corresponding with the securities commission's expectation of increasing the capital market performance.

For a variety of reasons, the ACE Market is included in this Study. First, the number of companies listed on the ACE Market is constantly changing, and one of the main reasons for listing and delisting is the inconsistent financial situation (Isa, 2019). Next, companies listed on the ACE Market include manufacturing, trading and service industries, and construction industries with excellent growth potential (Jaafar et al., 2020). Consequently, most companies listed on the ACE Market are considered knowledge-intensive industries. Fundamentally, intellectual capital research is the perfect choice for knowledge-intensive industries (Adesina, 2019; Al-Musali & Ku Ismail, 2014; Goh, 2005; Joshi, Cahill, Sidhu, & Kansal, 2013; Kamath, 2007; Oppong & Pattanayak, 2019; Shih et al., 2010). Finally, the nature of the ACE Market requires intellectual capital to enhance the ACE Market performance in the business environment these days that are more complex and demanding. The companies listed in the ACE Market have not shown good long-term performance, and the market value is also lower than that of the Main Market (Shinozaki, 2014).

The Objective of the Study

The importance of intellectual capital is undisputable in the current economy. Therefore, the purpose of this Study is

- 1) To determine the impact of the Modified Value-Added Intellectual Capital (MVAIC) model on the firm financial performance of the ACE Market.

Ulum et al (2014) have tested the new model of MVAIC as a measure of the performance on the intellectual capital of the banking firm in Indonesia. The results showed that MVAIC gave a positive effect on market capitalization. In addition, MVAIC was also shown to affect the profitability of ROA. Similarly, a study by Nimtrakoon (2015) found a positive relationship between MVAIC and a firm's ROA. Similarly, a study conducted by S.Mohammad and Bujang (2019) found a positive and significant relationship between MVAIC and ROA for 21 firms listed in the financial sector of Bursa Malaysia.

Literature Review

The relationship between intellectual capital and financial performance is governed by resource-based theories, in which corporate resources are the main driving force for competitiveness and corporate performance. However, according to Barney (1991), not all company resources can become a source of competitive advantage. Barney (1991) believes that these resources can be divided into two categories, namely tangible and intangible resources. Tangible resources include physical technology used in a firm, a firm's plant and equipment, geographic location, and access to raw material. Meanwhile, intangible resources refer to human capital and organizational capital. Human capital resources include the training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm.

The intellectual capital cannot be easily imitable because every organization has its fundamental material (tangible) and non-material success factors such as culture, strategy, system, skills, leaders, and key employees. According to Barney (1991), resources should be VRIN to create value for the organization. Hence, relating the concept to the characteristics of intellectual capital as a valuable knowledge-based resource, According to Lin (2013), the characteristics of intellectual capital are similar to the VRIN framework of Barney (1991), who defined resources to attain competitive advantage for value creation

- a) "Intellectual Capital is valuable (V), rare (R), imperfectly imitable (I), and non-substitutable (N).
- b) Intellectual Capital is communicable to others.
- c) Components of intellectual Capital are both distinctive and comprehensive". With the characteristics mentioned above, intellectual capital can be transformed into the competitive advantage of the firm.

In this study, the focus will be on the role of intellectual capital as invisible resources of a firm in value creation from the Resource-Based View (RBV) perspective. The intention is to understand the characteristics of the intellectual resources and capabilities that drive a firm's competitive advantage. The following figure 1 shows how intangibles might be defined as a subset of strategic resources according to the RBV theory. According to Kristandl and Bontis (2007), the RBV and intangibles can be placed in a natural hierarchy since the latter connects to a firm's strategy. Both contribute to sustained corporate performance and competitive advantage.

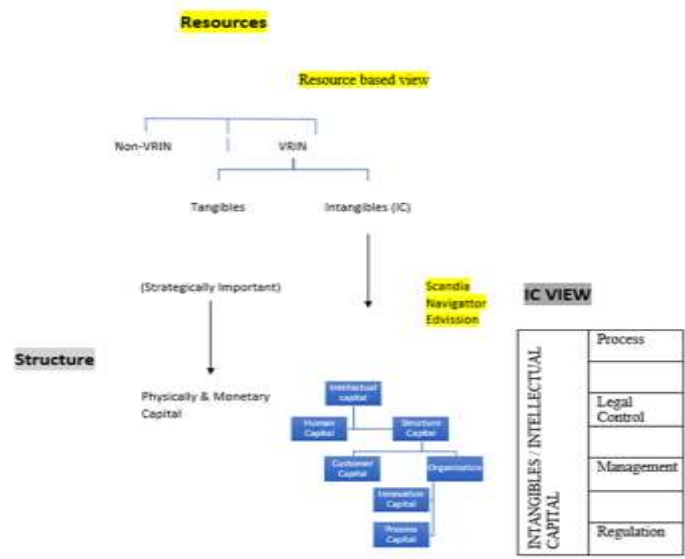


Figure 1: Firm's resources

Source: Kristandl & Bontis (2007) Constructing a definition for intangibles using the resource-based view of the firm. *Management Decision*, 45.

Nowadays, business organizations are struggling to survive. Because of the competitive business world and organization's value creation, it is mainly based on intangible resources (Gogan, 2014), for example, intellectual Capital (Edvinsson & Malone 1997; Stewart, 2010). According to Edvinsson and Malone (1997), the financial statements derived from actual accounting standards do not deliver the necessary information to the managers. Thus, it is difficult to predict or evaluate its future financial performance and its value-creating factors. Consequently, the usage of financial statements which "hide" the intangibles can result in wrong decision-making. In the present era of the information economy, today's world economy is fronting with two new factors of production, namely information, and knowledge. Hence, the implementation of a knowledge-based economy is required for better growth and competitiveness. Also, it is a good idea for the transformation from an industrial to a knowledge society. (Cavusoglu, 2016; Saunders & Brynjolfsson, 2016).

The significance of knowledge in creating value, driving productivity and promoting economic growth has long been recognized (Carayannis, Ferreira, Jalali, & Ferreira, 2018). Therefore, the central role of knowledge in today's economies has been an added focus on information technology, learning, and the accelerated pace of technical and scientific advance that results from that place. While in the past, knowledge was not considered the primary source and a driving force of economic growth and raising the standard of living. However, in the 20th century, society started to realize its importance, becoming an integral part of economic theories and models. As a result, the knowledge-based economy is grounded on a paradigm that focuses on intellectual capital as a prime mover (Serrat, 2017).

Data and Methodology

This Study used the MVAIC model developed by Ulum et al (2014), which originated from the VAIC model established by (Pulic, 2000); the prime aim is to measure the relationship between IC and financial performance of firms listed in the ACE Market. This Study also uses

MVAIC components to measure independent variables: Human Capital efficiency (HCE), Structural Capital Efficiency (SCE), Relational Capital Efficiency (RCE), and Capital Employed Efficiency (CEE) (Buallay, 2019; Buallay, Cummings, & Hamdan, 2019b; Tran Ngoc, Van Loan, & Vo Duc, 2020; Xu & Li, 2020). The dependent variable (financial performance) has been measured using Return on Asset (ROA); it reflects the efficiency of using available assets to create profits (Al-Musali & Ku Ismail, 2014). Finally, control variables such as SZE (total company assets) and LEV (total assets/total liabilities) have been included to enhance the internal validity of the research. The data for the Study is collected from the audited annual report, and the analysis time is from 2009-2018. The data is obtained from all sponsor-driven markets in Malaysia (ACE Market). This Study attempts to absorb all companies listed on the Bursa Malaysia ACE Market, each of which includes 131 companies. However, due to criterion meet up (Abor, 2005; Addae, Nyarko- Baasi, & Hughes, 2013), the final sample of this study consists of 81 companies, and the data are analyzed using two-step GMM.

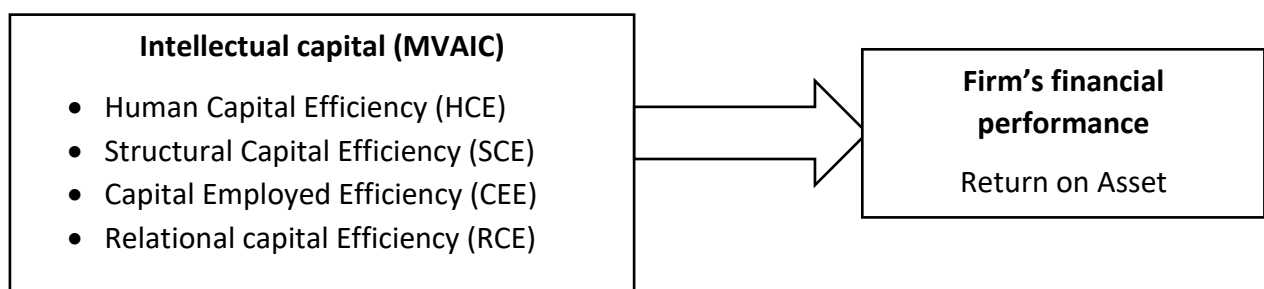


Figure 2: Theoretical Framework

Hypotheses Development

H1: MVAIC relates significantly to a firm's ROA

Ulum et al (2014) have tested the new model of MVAIC as a measure of the performance on the intellectual capital of the banking firm in Indonesia. The results showed that MVAIC gave a positive effect on market performance. In addition, MVAIC was also shown to affect the profitability of ROA. Similarly, a study by Nimtrakoon (2015) found a positive relationship between MVAIC and a firm's ROA. Likewise, a study conducted by Mohammad and Bujang (2019) found a positive and significant relationship between MVAIC and ROA for 21 firms listed in the financial sector of Bursa Malaysia.

Variables and Method of Computation

Table 1

Firm's Specific Factor, Accounting Indicators, Measurement

Variable	Accounting indicators	Measurement
Performance	Return on Asset (ROA)	$\frac{\text{Net Profit After Tax}}{\text{Total assets}}$
Intellectual Capital	Human Capital Efficiency (HCE)	$\frac{\text{Value Added (VA)}}{\text{Human Capital (HC)}}$
Intellectual Capital	Structural Capital Efficiency (SCE)	$\frac{\text{VA} - \text{HC}}{\text{VA}}$
Intellectual Capital	Capital Employed Efficiency (CEE)	$\frac{\text{VA}}{\text{Capital Employed}}$
Intellectual Capital	Relational Capital Efficiency (RCE)	$\frac{\text{Relational Capital}}{\text{VA}}$
Intellectual Capital	Modified Value-Added Intellectual Coefficient (VIC)	$\text{HCE} + \text{SCE} + \text{RCE} + \text{CEE}$

Model Specification

This study uses the dynamic panel data by applying the two-step system GMM. It is used to estimate the dynamic relationship between intellectual capital and a firm's performance in the ACE market. GMM model established by (Arellano & Bond, 1991), the well-developed GMM estimator can produce consistent results in the presence of heteroscedasticity and resolve autocorrelation by differencing (Baltagi, 2008). GMM can combine this dynamic nature of relationships to provide effective tools to deal with endogenous issues. Due to the endogenousness of the lagged dependent variable or explanatory variable, the FE or RE panel model may not be applicable (Ibrahim & Law, 2014). Consistent with the previous work of (Al-Hamadanya, Rasheeb, & Mohammedc, 2020; Nadeem, 2016, 2017; Soetanto & Liem Pei, 2019; Tran Ngoc et al., 2020; Wintoki, Linck, & Netter, 2012; Zhang, 2021), the latter also consider on the endogenous effect and consider GMM for regression. Therefore, to determine the effect of the MVAIC on a firm's performance, the following baseline regression is established Equation (1).

$$\text{ROA}_{it} = \alpha_{it} + \beta_0 + \beta_1 \text{MVAIC}_{it} + \beta_2 \text{LSZE}_{it} + \beta_3 \text{LEV}_{it} + \omega_{it} \quad (1)$$

- α = The constant term
 ROA = Firm's financial performance (ROA)
 MVAIC = Modified Value-Added Intellectual Capital
 SZE = Firm size
 LEV = Leverage
 ω_{it} = Error term.

Empirical Analysis

The descriptive statistics analysis is based on panel samples listed on the ACE Market of Bursa Malaysia from 2009-2018. The data collected applies to companies that have continued to use data for the ten years under review and have not modified their financial year. These findings are summarized in the following table: -

Table 2

Descriptive Statistic

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
ROA	-0.42257	0.00	5.457783	-102.711	10.614
MVAIC	-26728	15.00	522145	-13400000	2043221
MV	53764.18	0.27	430009.3	-0.99	6677355
SZE	6.76E+07	-0.22	1.10E+08	41805	1.32E+09
LEV	0.336117	1.14	8.92919	-216.25	112.375

The above table shows that from 2009-2018, the performance of listed companies on the ACE Market received more negative returns than positive returns. According to this study, in the average survey results of 81 companies listed on the ACE Market, only 32 companies received positive returns (81.51%), and the remaining 49 companies earned negative returns, equivalent to 60.50%. The negative return of ROA is because most companies listed on the ACE Market are involved in high-risk businesses, such as technology and emerging industries. In addition, the ACE Market has always been known for poor market performance compared to the Main Market (Shinozaki, 2014), and therefore reflects negative returns. Regarding modified value-added intellectual Capital (MVAIC), which includes all the components of intellectual capital such as HCE, SCE, RCE, and CEE, also presents negative returns of -26728 by using this method, the maximum value is 2043221 with a highest median value of 15. By comparing the median and mean in this Study, it can be concluded that the MVAIC data set is unevenly distributed because the mean and median values are far away from -26728 to the maximum median of 15. This specifies that data distribution is skewed to the left, as the mean value is less than the median.

Table 3

Estimated result

Variables	Notation	(ROA)
lagged DV	L.ROA	0.399*** (0.005)
Modified Valued Added Intellectual capital	MVAIC	0.000*** (0.000)
Size of the firms	ISZE	4.948*** (0.060)
leverage of the firms	LEV	-0.041*** (0.001)
Observations		729
Number of Firms		81
Number of Instruments		38
Arrelano-Bond test for AR(2) (p-value)		0.245
Hansen (p-value)		0.562

The results of the estimated regression using the two-step GMM method are shown in table 3. The result obtained shows that the two-step system GMM estimator is unbiased, consistent, and effective because the p-values for both AR(2) and Hansen are more than 0.05. This indicates that the model is correctly specified and the instruments are valid. This means that the study failed to reject the null hypothesis that there is no autocorrelation. In addition, the lag dependent variable is statistically significant, which indicates that the dynamic two-step system GMM is the best estimator. The number of instruments is also less than the number of groups.

The relationship between MVAIC and ROA is positive at a 1% significance level (0.000). This signpost, in the ACE Market, the MVAIC model and ROA have a favorable connection. This is because the MVAIC model can be a valuable tool for many parties in incorporating IC performance into decision-making (Buallay et al., 2019a). The findings confirm that MVAIC has a positive impact on ROA, implying that any investment in MVAIC will increase the return on assets of the ACE Market firms. This is reliable with the findings of (Weqar et al., 2020), who found MVAIC is substantially and positively associated with the profitability (ROA) of Indian banks, and this result also favor the findings of (Mondal & Santanu, 2012) and (Ramandeeep & Narwal, 2016) in the manufacturing industries, also (Sydler et al., 2014) in the publicly traded pharmaceutical and biotechnology firms. These researches verify empirically that intellectual capital acts as a tool for increasing profitability and productivity.

Relating to MVAIC and ROA in the ACE Market, this result is unmistakable; even though the ACE Market did not produce a significant return instead of the primary market, the ACE Market produced a positive return of 39.51% the total of 81 firms. In addition, despite the lower amount of return, the ACE Market can still contribute to the growth of intangibles (HCE, RCE, SCE, and CEE) by considering investment opportunities. As a result, a thorough understanding of the components of intellectual capital coefficients is critical for an organization's success. It may hold the key to achieving the desired levels of intellectual

Capital (Tiwari, 2020). Moreover, Laing, Dunn, and Hughes-Lucas (2010) specified that the MVAIC model that combines the three IC components of HCE, SCE, and RCE is a valid evaluation instrument and capable of imparting discrete values IC. In conclusion, consistent with signaling theory, if a firm has higher profitability and better performance, it may signal to judge IC efficiency, increasing its revenue. The research results also show that intellectual capital can be used as a potential tool for creating value (Xu & Li, 2020).

Finally, relating to the control variable, this Study obtained mixed results for SZE and LEV. This is reliable as the relationship between leverage, size, and firm performance can be positive (Yao et al., 2019), a negative relationship (Xu & Li, 2019; Xu & Wang, 2019), or an insignificant relationship (Buallay et al., 2020; Tran & Vo, 2018). Furthermore, it is because different firms have different sizes (total assets) and different amounts of leverage (total liabilities /total asset); thus, the result and contributions of this control variable to the ROA may provide different results (Ngoc & Duc, 2020).

Conclusion

This study determines the impact of the MVAIC model on a firm's financial performance. Including 81 firms listed in the ACE Market of Bursa Malaysia from 2009-2018. The result proven and supported the finding of the MVAIC model is the reliable measurement model in measuring intangibles (Maji & Goswani, 2017; Ulum et al., 2014). In this study, even though the relationship between MVAIC and ROA is significant, the coefficient value is close to zero, meaning the effect of MVAIC on ROA is very minimal. Relating this to the ACE Market condition, the market has not demonstrated a satisfactory performance for an extended period. Due to lower market capitalization and higher risk of being delisted (Ghasemi & Razak, 2017). Therefore, by looking at the returns of the ACE Market, the market is experiencing a lower return compared to the Main Market. This is matching to the finding, whereby, MVAIC model is proven its importance in measuring intangibles. However, the ACE Market's nature and characteristics made the coefficient value lower and have minimal effect.

Recommendations

In the future, the studies on intellectual capital should be using the MVAIC model rather than VAIC. Due to this fact, Stahle et al (2011) criticized the VAIC method and argued that it has nothing to do with intellectual capital but instead measures the organization's labour and capital coefficients. Furthermore, the VAIC model cannot measure relational Capital (Bayraktaroglu Ayse, Calisir, & Baskak, 2019; Joshi et al., 2013). Notwithstanding, relational capital is the pillar of intellectual capital, mediating the relationship between human Capital (Agostini & Nosella, 2017).

Secondly, since IC is still a new thing globally, research on IC should be concentrated in more areas (Mohtar et al., 2015). In addition, the importance of IC is not limited to knowledge-based industries. Therefore, the IC environment must also be implemented in all sectors and countries, including developing and emerging markets, as studies on developed countries have been widely covered.

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