**THE IMPACT OF INTELLECTUAL**

**CAPITAL ON FIRM PERFORMANCE IN MALAYSIA**

Ahmad Ibn Ibrahimy and Karthyainee Raman

Faculty of Economics and Business, Universiti Malaysia Sarawak (UNIMAS)

**ABSTRACT**

The purpose of this study is to investigate the relationship between intellectual capital and performance of the companies listed in Bursa Malaysia. Using data drawn from 35 companies listed in Bursa Malaysia for the period of 2008 to 2017, regression model is constructed to examine the relationship between the components of intellectual capital, which are Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE), and the performance of the companies measured using the variable Return on Assets (ROA). Data collected are analyzed using statistical software EViews and the outcome has been interpreted according to the statistical rule. As a result, the overall outcome can be concluded that Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE) indicate positive relationship for influencing the performance of the companies listed in Bursa Malaysia. Additionally, Human Capital Efficiency (HCE) shows a negatively weak relationship with firm performance.

***Keywords***: Capital Employed Efficiency, Firm Performance, Human Capital Efficiency, Intellectual Capital, Malaysia, Structural Capital Efficiency.

**INTRODUCTION**

The world, nation, company or business’s growth is not profoundly determined by merely on physical assets such as buildings, lands, machineries and inventories but as well on Intellectual Capital (IC). Intellectual capital is the form of immaterial possessions; or likewise is the gathering of information concerning the company which can be used to create new customers, investors, presenting of their new goods, spreading their branches in which generally brings their company to a step higher in the competitive world of main element to materialize intellectual capital (Stewart, 1997). The foundations of non-physical (added) values for a firm or corporation are known to be structural capital, capital employed, and human capital. Moreover, intellectual capital also could be recognized as people intense to do brain work and fewer people involve in physical work. Even though this intellectual capital does not certainly been presented on the business’s balance sheet, nevertheless, the weightage for this feature is relatively significant. Intellectual capital is one of the essential means for profit pursuing and non-profit organizations.

In any emerging nation, government must able to regulate the investments when capitalizing in both physical and intellectual capital. Information on intellectual capital is required for the shareholder to know intensely about the firm and empower them for enhanced evaluation of firm’s future affluence creation capacities (Bontis et al. 2000). Malaysia has a chance to attain greater revenue nation rank besides reaching with the leading economies, with a mixture of funds and policies that mark the profitability. Value Added Intellectual Coefficient (VAIC) technique is presented by Pulic (1998) as the indicator for intellectual capital. This VAIC technique uses company’s financial statements to measure the efficacy coefficient of these three forms of capital; which are Capital Employed Efficiency (CEE), Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE). Greater value of VAIC allows the investor to place higher values on firms. In addition, the author also recognized that company’s market value is comprising of capital employed efficiency and intellectual capital. Cinca et al. (2003) reflected that the value of the company usually relative due to the intangible intellectual capital that it possesses. The authors (Tan et al., 2008) seemingly ponder the efficacy of using IC that directly affects company’s performance in which stakeholders’ actual benefit embedded.

The VAIC model of efficiency measurement has been confronted by latest studies in the IC literature with the basic assumptions used by Pulic (2000) in creating the VAIC approach negative operating profit. They argue that the VAIC model does not produce valuable analysis in companies which have their input higher than their output, and as an outcome, their productivity is small. Ståhle et al. (2011) shows that VAIC is an unacceptable measure of IC arguing that the VAIC approach using an unsettled conception of IC capitalisation via its components of structural and human capital. The above‐stated critics have introduced an argument as to whether the VAIC method is appropriate for measuring IC or not. Nevertheless, at this point in time, there is no perfect method existing for computing IC. These critics also suggest that forthcoming researchers should consider the introduction of other control factors and efficiency determinants, which could help in creating more accurate results. Regardless of the inherent limitations of VAIC as a method of measuring IC discussed above, its simplicity, reliability and comparability make it an ultimate measure for the context of the present study as this study makes an original contribution to the existing IC literature by analysing IC performance of various sub‐sectors.

Malaysia aims to be one of the excellent economy in the world by 2020, as it was mentioned in Wawasan 2020. As most of the individuals are trying to increase the physical assets in order to have an excellent growth in the economy, intellectual capital does play a major part in driving the economy. In Malaysia, very few companies proclaimed intellectual capital (intangible assets). Besides, the World Bank 2017 predicted that the Malaysian economy will encounter the current financial downturn and decline in crude oil and commodities prices. It also stated that unreliability in world financial markets would influence the investors and business sentiment. In the recent MH370 and MH17 ‘learning forum’, the intention of this forum were to aid the flow of intellectual capital, individual emotions and corporate knowledge at which it would bring out the ideas and solve the problems for the upcoming flight security and assurance. Not only that, Malaysia needs contributions in the knowledge infrastructure as it in the age of revolution to k-economy. In conjunction with that, labor pool should be flexible, well informed, and skillful in the competitive business world. Hence, Malaysian government found that under the Eleventh Malaysia Plan, the advancement of human capital, developing intellectual capacity and the mentality of Malaysian citizen should be the main plan to be improvise; as in New Economic Model 2010.

Increase in the efficiency growth, consistent usage of both human and physical capital would be vital for Malaysia to be labelled as a high-income status (The World Bank, 2016). Greater excellence of human capital is important in order to be a developed country and maintain that status in future based on knowledge based economy. This paper, therefore, focusing on examining the relationship concerning intellectual capital and the performance of companies listed in Bursa Malaysia. This article emphasizes the importance of intellectual capital and aims to find out how does this factor helps on the performances of firm’s financial as well as stakeholder’s values. It has important practical implications to the companies’ financial executives and managers as well as intellectual capital are very much related to all parts of an organization. This study provides an important opportunity to spread the understanding of the required tactics and strategies to reinforce company’s intellectual capital management, to allow it to compete and prosper in the present and upcoming competitive knowledge economy. Besides, the findings on the associations of the intellectual capital profiles with firms’ performance may help the managers in making investments decision and hence improve the corporate strategic planning. This study offers some important insights into short term operational capabilities and the long term strategic focus. Moreover, the result suggests some investigation or guidelines to the directors in considering the categories of investments that help corporations to progress the entire stock of intellectual capital and its outcome on the performance. Generally, nations and firms will benefit from better managing and understanding of their intangible assets. In a nutshell, this study provides many opportunities for all parties and mainly to corporate world and financial department and besides that, it also involves those who are interest in business and this research could be considered relevant to the finance field.

**LITERATURE REVIEW**

There are few studies based on Malaysian Listed Companies explored the issue of Intellectual Capital (IC) affecting firm performance. Kamal et al. (2012) investigated the relationship between intellectual capital and firm performance of Malaysian commercial banks with the time period 2004 to 2008. Using regression analysis, they found that intellectual capital components, for instance human capital and capital employed, can generate appropriate influence of bank performance. The results emphasized the essential of intellectual capital particularly for human capital and capital employed towards banking performance. Bchini (2015) evaluated the affiliation between the mechanisms of intellectual capital plus worth creation in Tunisian industrial firms. The author attempted to investigate with three independent variables (relational capital, organizational capital and human capital) and a single dependent variable (value creation). The research showed that intellectual capital is definitely and meaningfully related through worth formation. These three assumptions have been established, which implies that there is a noteworthy optimistic correlation among humanoid wealth and worth formation, structural wealth and worth formation, and interpersonal capital and worth formation in the Tunisian industrial enterprises. It can be seen from this study that the role of intellectual capital in worth formation is self-determining of the monetary condition of the nation and the commerce. It is relative to the equal besides countryside of company’s stock in the non-material sector. Alipour (2012) analyzed the role of Intellectual Capital (IC) and its associations with monetary performance throughout the period 2005-2007. The author used 39 insurance companies as sample and using regression (partial least squares) equation found that Value Added Intellectual Capital and its components have a significant positive relationship with firm’s profitability. There is an important optimistic association among Human Capital Efficiency (VAHU), Structural Capital Efficiency (STVA), Employed Capital Efficiency (VACA) and effectiveness (ROA). Moreover, Value Added of Employed Capital (VACA) positively affects the ROA value.

Bakhshani, S. (2015) examined the intellectual capital of food and beverage industry in Iran between the period of 2004-2009. Emphasis has been laid to show the relationship between monetary performance of the firms in food and beverage industry registered in Tehran Stock Exchange. With a sample of 127 companies, this study used Mann-Whitney Statistical test which results that human capital and communication enhance the company’s performance. Hence, human capital and communication capital play significant roles to cut costs and to generate value for shareholders in which it can improve their performance and profitability. Basuki & Kusumawardhani (2012) used a sample from the pharmaceutical industry registered in the Indonesia Stock Exchange during the years 2003-2009. They tested the impact of value added physical and intellectual capital efficiency on firm’s financial performance by means of linear regression investigation. The outcome reflected how the productivity of the Indonesian pharmaceutical industry could not be separated from investment in capital employed. The first factor, capital employed efficiency (CEE) is comparable to profitability, which specifies a significantly positive impact on productivity.

Ozkan et al. (2017) analyzed the relationship between intellectual capital and the financial performances based on the 10 years of sample data of banks at Turkey. The findings conclude that intellectual capital is primarily affected by human capital efficiency (HCE) while structural capital efficiency (SCE) and capital employed efficiency (CEE) is less effective in creating value in the banking sector. Singh & Narwal (2015) have found that HCE is positively related to financial performance and negatively linked with the stock market performance of various sectors (manufacturing, service and technology) of India. They also found that structural capital performance (SCE) is least important in these sectors, while physical capital performance has a significant effect in this context. Another research which conducted by Vladimir et al. (2017) on the impact of intellectual capital on corporate performance among Arab companies and determine the he validity of the Vallue Addeed Inbtellectual Coefficient (VAIC) as a measure of IC’s contribution to performance. Through this research, it has been concluded that earnings and profitability were significantly affected by structural and capital employed while market performance was mainly influenced by human capital. Sardo & Serrasqueiro (2017) in their research in analyzing the relationship between firms’ intellectual capital (IC), financial performance and market value as well as the relationship between ownership concentration and IC performance using a large sample of firms from14 countries in Western Europe. This study also uses VAIC model to measure ICThe result shows that the impact of IC components on firms' market value may not be immediate. Capital employed efficiency positively impacts on firms’ financial performance in the short run while structural capital positively affects the firm’s financial performance in the long run.

**DATA AND METHODOLOGY**

The study incorporated panel data fixed effect approaches to determine the impact of intellectual capital on firm performance of Listed Companies under Bursa Malaysia. To determine whether fixed or random effect to use, Hausman test was performed. The level of firm performance is examined using several variables as determinants such as human capital, structural capital and capital employed while considering firm size and leverage as control variables. These control variables have been included in this study due to their affectivity on the profitability of firms (Doğan, 2013) but the findings are not being reported here. This study uses sample firms composed of six main sectors in Malaysia; consumer product and services, telecommunication and media, industrial product and services, plantations, energy and construction; and performs panel data analyses covering 10 years from 2008 to 2017. These six sectors have also been clubbed into one whole sample to represent the whole economy and aims to explain both the effects of intellectual components using VAIC model on the firm’s performances. Therefore, the following model is used to study and evaluate the association between explanatory and explained variables and to determine the efficacy of the variable in influencing financial performance of the businesses registered in Bursa Malaysia.

The empirical relationships for firm as *i* in the year as *t* are given bellow:

ROAit = α + β1HCEit + β2SCEit + β3CEEit + β4SIZEit + β5LEVit + ɛit

Where,

ROA = Return on Assets

HCE = Human Capital Efficiency

SCE = Structural Capital Efficiency

CEE = Capital Employed Efficiency

SIZE = Size of the firm

LEV = Financial Leverage

ɛ = Error term

Following Chen Goh (2005), VAIC and its three components, HCE, SCE and CEE represent the independent variables. As explained earlier, VAIC measures the IC of firms and provides information about the value creation efficiency of tangible and intangible assets within a firm (Tan et al., 2008). In order to calculate VAIC, a firm’s ability to create value added (VA) to all stakeholders must first be calculated. In its simplest form VA is the difference between output and input. Output represents net sales revenues and input contains all the expenses incurred in earning the sales revenues except labour costs which are considered to be a value creating entity (Tan et al., 2008). This VA is also defined as the net value created by firms during the year (Chen Goh., 2005), and can be expressed as follows:

VAi = OUT – IN

Where:

VA: Value Added

OUT: Revenue and comprise all goods and services sold in the market

IN: All expenditures for operating a company (except for employee costs which are not considered

For the study, VAIC™ method developed by Ante Pulic (1998, 2000) has been used to measures the efficiency of IC.

VAIC = HCE + SCE + CEE

VAIC and its three components are being calculated by:

HCE = VA/HC

SCE = SC/VA

CEE = VA/CE

Where,

HC = total wages and salary

SC = VA-HC

CE = capital employed

Pulic (2000) argues that there is a proportionate inverse relationship between HC and SC, in the value creation process attributable to the entire IC base. Therefore, the measure of SCE is slightly different from other ratios.

The VAIC model presented above have been suggested by many researchers examining the relationship between intellectual capital and firm performance (Kamaluddin & Rahman, 2013; Ming-Chin et al., 2005; Sumedrea, 2013 and Chen Goh, 2005). This VAIC gives a new insight to measure and monitor the value creation efficiency of a company using the basic accounting figures. It is expected that if a company is successfully managing its IC, it is going to exhibit good productivity, profitability state of affairs, which is ultimately going to reflect on its stock market performance. There are 35 companies chosen for this study since only these companies have complete data needed. Some companies have limited data whereby some of the required data were not visible. The study used secondary data gathered from two different data sources, company’s annual reports and the Thomson Reuters Eikon Data Stream. Data was also gathered from Data Stream to guarantee consistency and validity of the data which were manually cross checked via the company’s annual reports. E-View 8 software has been used to determine the impact of intellectual capital on firm performance.

**FINDINGS AND DISCUSSION**

In broad, this study is conducted to determine the affiliation between intellectual capital and firm performance of the Listed Companies in Bursa Malaysia. The correlation method is used to estimate how strongly the variables are related or associated with each other to detect the multicollinearity problem among independent variables. The higher positive coefficient indicates the situation where the positive correlation between the variables is stronger and the higher negative coefficient indicates that the negative correlation between the variables is stronger. The benchmark for multicollinearity is 0.8, according to Gujarati (2003). Based on the correlation test, the return on asset and human capital efficiency has correlation coefficient of -0.11 which is significant. It means these variables have poor negative relationship. On the other hand, the return on asset and structural capital efficiency has correlation coefficient of 0.19 that is significant. It shows these two variables have weak positive relationship. As for the variables of return on asset and capital employed efficiency, the correlation coefficient of 0.07 indicates that they have poor positive relationship but it is not significant. The rest of the correlation coefficients indicates the relationship among other independent variables. The human capital efficiency and structural capital efficiency has moderately negative correlation of -0.65 which is significant. On the other hand, there is a poor positive significant correlation between human capital efficiency and capital employed efficiency (0.09). There is also a poor positive significant correlation among structural capital efficiency and capital employed efficiency (0.05) but it is not significant. Although the correlations are significant between independent variables, it is far below the Gujarati’s (2003) benchmark of 0.8. In addition, one of the characteristics of panel data is that it will avoid the problem of multicollinearity (Hsiao, 2007).

The usage of OLS pooled model in this study is to examine whether independent variables have any impact on dependent variable for the purpose of comparison with fixed effect model results. As far as this study is concern, this test is to verify whether human capital efficiency, structural capital efficiency and capital employed efficiency affect firm performance (ROA). This would consider being the basic approach used in estimating the panel data. The results for the OLS pooled model are shown in Table 1.

**Table 1: OLS Model results for selected companies listed in Bursa Malaysia**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Coefficient | Std. Error | t-Statistic | Probability |
| C | 10.83521 | 0.986335 | 10.98532 | 0.0000 |
| HCE | 0.000336 | 0.002540 | 0.132481 | 0.8947 |
| SCE | 11225.76\*\*\* | 4042.018 | 2.777266 | 0.0058 |
| CEE | 0.380194 | 0.324123 | 1.172996 | 0.2416 |
| R-squared | 0.040538 | Adjusted R-squared | | 0.032219 |
| F-statistic | 4.872891 | Prob (F-statistic) | | 0.002478 |

\*\*\* Significant at 1%

All three independent variables show positive relationships with the dependent variable Return on Asset (ROA). Human Capital Efficiency (HCE) shows that 1unit increase of HCE will cause 0.000336 unit increase in ROA, Structural Capital Efficiency (SCE) shows that 1 unit increase of SCE will cause 11225.76 unit increase in ROA and Capital Employed Efficiency (CEE) shows that 1 unit increase of CEE will cause 0.380194 unit increase in ROA. According to the results above, it is proven that only SCE is statistically significant at 1% level with the probability of 0.0058. As for the other two independent variables, they showed no significance at all. The R-square for ROA is 4.05 percent which signifies that 4.05 percent of the total variations were explained by the changes of HCE, SCE and CEE. F-stastictic value for ROA is 4.8729 which is statistically significant at 1% level.

Dougherty (2006) indicated that the choice of the model to best fit the data has to be done in a proper way. One of the ways for deciding which estimator to use to go for Hausman’s Specification Test. As for the Hausman test, it is to test for Random Effects Model versus Fixed Effects Model. If p-value is lower than 0.01, H0 will be rejected which indicates that Fixed Effect Model is more appropriate. Since the p-value (0.0040) is less than 0.01, therefore H0 is rejected. Sufficient statistical evidence has suggested that the Fixed Effect Model is more appropriate than Random Effect Model. In conclusion, the test reveals that Random Effect Model is endogenous but for the Fixed Effect Model is exogenous. The Fixed Effect Model which examines the group differences in intercepts [Cov ( λi, ε ) ≠ 0], the results are shown in Table 2.

**Table 2: Fixed Effect Model results for selected companies listed in Bursa Malaysia**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Coefficient | Std. Error | t-Statistic | Probability |
| C | 13.78290 | 1.135366 | 12.13960 | 0.0000 |
| HCE | 0.003806 | 0.002420 | 1.572470 | 0.1169 |
| SCE | 11201.77\*\*\* | 3753.359 | 2.984466 | 0.0031 |
| CEE | 1.939141\*\*\* | 0.513945 | 3.773056 | 0.0002 |
| R-squared | 0.377809 | Adjusted R-squared | | 0.304023 |
| F-statistic | 5.120367 | Prob (F-statistic) | | 0.000000 |

\*\*\* Significant at 1%

There are positive relationships between Return on Asset (ROA) and all three independent variables; which are Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE). The results indicate that 1 unit increases of HCE will cause increase in Return on Asset by 0.003806 unit. It is also shown that 1 unit of increase of SCE and CEE will cause an increase of 11201.77 unit and 1.939141 unit of Return on Asset respectively. The R-square for ROA is 37.78 percent which signifies that 37.78 percent of total variations were explained by the changes of HCE, SCE and CEE. Overall, there are significant positive relationships at 1% level between two independent variables, Structural Capital Efficiency (SCE) and Capital Employed Efficiency (CEE), and the performance of the companies measured through the proxy of Return on Assets (ROA). There is no statistically significant relationship between Human Capital Efficiency (HCE) and the performance of the companies listed in Bursa Malaysia.

**CONCLUSION**

The main objective of this study is to determine the relationship between the Intellectual Capital (IC) and the performance of the firms (ROA) listed in Bursa Malaysia. The specific objective are as follows: (i) to examine the relationship between Human Capital Efficiency (HCE) and firm performance, (ii) to test the relationship between Structural Capital Efficiency (SCE) and firm performance (iii) to investigate the relationship between Capital Employed Efficiency (CEE) and firm performance under Bursa Malaysia. It is found that the Human Capital Efficiency (HCE) is not statistically significant with dependent variable, Return on Asset (ROA). The finding can be compared to the research by Kamal et al. (2012) who found that there is a positive lower relationship between HCE and ROA but in this study it is not statistically significant. SCE and CEE show a positive relationship with the dependent variable, ROA. The findings are consistent with the studies conducted by Alipour, A. (2012) which stated that the correlations between all attributes of intellectual capital and business performance measured by Return on Assets (ROA) were positive. Besides, the results concluded that SCE and CEE has a significant positive relationship with firm performance. VAIC indicates efficiency in creating corporate value or the extent of corporate intellectual ability (Wei Kiong & Hooi Lean, 2009). In other words, the VAIC results show that increase in value creation efficiency positively influences the profitability of a firm. Therefore, it is necessary to maximize the utilization of resources, specifically IC for financial institutions in order to maximize the company’s profit.

This study is very essential for managers and directors who need to determine the conceivable changes that the firms need to build up their intellectual capital. Firstly, the research results allow the directors to utilize the VAIC approach to deal with better use and manage their IC and compare them with the best rivals in their industry. Accordingly, IC can be viewed as the generation of income and the firm’s long-term productivity. In addition, the research results can also serve as a useful contribution for managers to apply knowledge management in their firm to maximize stakeholder interests. This study lacks of centralization as the nature of profitability varies from industry to industry. In general, the VAIC method ignores the company's risk level, which is one of the most important factors in determining the value of the company and the IC. Finally, this study was conducted in Malaysia; therefore, the results may not apply to foreign countries. This is because the nature of the business environment varies according to the country in which the company operates. However, these results apply to Malaysia and countries with a similar Malaysian business environment.

Upcoming research can also compare other indicators that measure the efficiency of intellectual capital with VAIC models and measure the most valuable products, such as customer capital and relationship capital. Although the company's performances based on Intellectual Capital is evaluated using the VAIC model, upcoming studies of each variable can be executed individually. As an example, companies can emphasis on finding the structural capital has a noteworthy impact on the company's performances. This is the least important in this study. It can rise the understanding of the importance of structural capital as a tool for measuring a company's performances. As this study does not comprise measures based on the market to determine its performance, it should give more attention to the role of intellectual capital in performance appraisal, grounded on market research, such as using economic value added and rational market to books ratio. In future research, more in-depth investigations must be conducted to understand the profitability of companies in specific industries. This will, to a large extent, benefit this particular industry. This applies practically to all companies worldwide.

**REFERENCES**

Alipour, M. (2012). The Effect of Intellectual Capital on Firm Performance: An Investigation of Iran Insurance Companies. *Measuring Business Excellence*, 16(1), 53-66.

Bakhshani, S. (2015). The Relationship between the Financial Performance and Intellectual Capital in the Food and Beverage Enterprises. *International Journal of Business and Management Review*, 3(9), 80-89.

Basuki & Kusumawardhani, T. (2012). Intellectual Capital, Financial Profitability and Productivity: An Exploratory Study of the Indonesian Pharmaceutical Industry. *Asian Journal of Business and Accounting*, 5(2), 41-68.

Bchini, B. (2015). Intellectual Capital and Value Creation in the Tunisian Manufacturing Companies. *Procedia Economics and Finance*, 23, 783-791.

Bontis, N., Chua Chong Keow, W. & Richardson, S. (2000). Intellectual Capital and Business Performance in Malaysian Industries. *Journal of Intellectual Capital*, 1(1), 85-100.

Chen Goh, P. (2005). Intellectual Capital Performance of Commercial Banks in Malaysia. *Journal of intellectual capital,* 6(3), 385-396.

Cinca, C. S., Molinero, C. M. & Queiroz, A. B. (2003). The Measurement of Intangible Assets in Public Sector Using Scaling Techniques. *Journal of Intellectual Capital*, 4(2), 249-275.

Doğan, M. (2013). Does Firm Size Affect the Firm Profitability? Evidence from Turkey. *Research Journal of Finance and Accounting*, 4(4), 53-59.

Dougherty, C. (2006). *Introduction to Econometric*: Oxford University Press.

Hsiao, C. (2007). Panel Data Analysis - Advantages and Challenges. *TEST*, 16(1), 1-22.

Gujarati, D. N. (2003). *Basic Econometrics* (Forth Ed.). New York: McGraw Hill.

Kamal, M. H. M., Mat, R. C., Rahim, N. A., Husin, N. & Ismail, I. (2012). Intellectual Capital and Firm Performance of Commercial Banks in Malaysia. *Asian Economic and Financial Review*, 2(4), 577-590.

Kamaluddin, A. & Rahman, R. A. (2013). Intellectual Capital Profiles: Empirical Evidence of Malaysian Companies. *International Review of Business Research Papers*, 9(6), 83-101.

Ming‐Chin Chen, Shu‐Ju Cheng, Yuhchang Hwang, (2005). An Empirical Investigation of the Relationship between Intellectual Capital and Firms’ Market Value and Financial Performance. *Journal of Intellectual Capital*, 6(2), 159-176.

Ozkan, N., Cakan, S. & Kayacan, M. (2017). Intellectual Capital and Financial performance: A study of the Turkish Banking Sector. *Borsa Istanbul Review*, 17(3), 190-198.

Pulic, A. (1998). “Measuring the Performance of Intellectual Potential in Knowledge Economy.” Available at: [www.measuring-ip.at/Opapers/Pulic/Vaictxt.vaictxt.html](http://www.measuring-ip.at/Opapers/Pulic/Vaictxt.vaictxt.html).

Pulic, A. (2000). VAIC – An Accounting Tool of IC Management. *International Journal of Technology Management*, 20 (5/6/7/8), 702-714.

Sardo, F. & Serrasqueiro, Z. (2017). A European Empirical Study of the Relationship between Firms’ Intellectual Capital, Financial Performance and Market Value. *Journal of Intellectual Capital*, 18(4), 771-788.

Singh, R. D. & Narwal, K. P. (2015). Intellectual Capital and Its Consequences on Company Performance: A Study of Indian Sectors. *International Journal of Learning and Intellectual Capital,* 12(3), 300-322.

Ståhle, P., Ståhle, S. and Aho, S. (2011). Value Added Intellectual Coefficient (VAIC): A Critical Analysis. *Journal of Intellectual Capital*, 12(4), 531‐551.

Stewart, T.A. (1997). Intellectual Capital: The New Wealth of Organizations, Doubleday/Currency, New York, NY.

Sumedrea, S. (2013). Intellectual Capital and Firm Performance: A Dynamic Relationship in Crisis Time. *Procedia Economics and Finance*, 6, 137-144.

Tan, H. P., Plowman, D. & Hancock, P. (2008). The Evolving Research on Intellectual Capital. *Journal of Intellectual Capital*, 9(4), 585-608.

The World Bank (2016). Raising Productivity Growth Essential for Malaysia’s Progress towards High-Income Economy Status, World Bank Says. Retrieved from <http://www.worldbank.org/en/news/press-release/2016/12/19/raising-productivity-growth-essential-for-malaysias-progress> (accessed on 9 August, 2018).

Vladimir Dzenopoljac, Chadi Yaacoub, Nasser Elkanj, Nick Bontis, (2017). Impact of Intellectual Capital on Corporate Performance: Evidence From the Arab Region. *Journal of Intellectual Capital*, 18(4), 884-903

Wei Kiong Ting, I. & Hooi Lean, H. (2009). Intellectual Capital Performance of Financial Institutions in Malaysia. *Journal of Intellectual capital,* 10(4), 588-599.

Corresponding Author: Ahmad Ibn Ibrahimy can be conducted at *iahmad@unimas.my*