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PERFORMANCE OF MALAYSIAN FINANCIAL FIRMS: AN INTELLECTUAL CAPITAL PERSPECTIVE USING MVAIC MODEL

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ABSTRACT

This study examined the influence of intellectual capital on Malaysian financial firms from two perspectives, performance of intellectual capital and impact of intellectual capital on financial performance. The data used were collected from the audited annual reports of 21 financial firms listed in the finance sector of Bursa Malaysia. The sample period was from 2011 to 2015 and the number of observations for this analysis was 105. Intellectual capital was measured using the modified value-added intellectual coefficient (MVAIC) model and financial performance was proxied by the return on asset (ROA). The findings suggested a strong association between MVAIC and ROA. CEE, HCE and SCE made significant and positive contributions towards financial performance. As for RCE, the findings revealed a positive but insignificant relationship with ROA. On the performance of intellectual capital, the HCE contributed approximately 82% to MVAIC followed by SCE 16%, RCE 1% and CEE 1%. Thus, the value creation capability of Malaysian financial firms is directly attributable to the HCE of the firms. The main limitations of the study were no control for firm-specific variables such as firm-size, and that the level of risk, firms' complexity and structural capital were not segregated into its components namely innovation capital and process capital to identify which was more dominant in creating value. Financial firms may use the results to address the factors affecting intellectual capital performance in order to maximize value creation capability. Education institutions need to collaborate with the finance industry to increase the relevance of their educational mission and to stimulate new directions in the education industry.

Contribution/ Originality: This study investigated intellectual capital in two dimensions namely intellectual capital performance and impact of intellectual capital on financial performance. The MVAIC model incorporates measurement of relational capital. The findings may allow financial firms to benchmark themselves based on the level of efficiency rankings, to establish priorities and develop strategic plans, thus inducing financial performance.

1. INTRODUCTION

Firms have resources that are both tangible and intangible in nature (Barney, 1991; Riahi-Belkaoui, 2002). These resources are used to create value and improve firms' financial performance. Firms' financial performance is also influenced by the country's economy. Malaysia's economy has recorded an average of 7 per cent growth over the last three decades (Goh, 2005) and it has undergone substantial changes over the years.

Malaysia's economic development can be divided into three phases with phase one from 1957 to 1969, phase two from 1970 to 1990 and phase 3 from 1991 onwards (Fadhlin *et al.*, 2004). Throughout the three phases, the government has set out various economic policies to ensure economic growth and development. These economic policies relied on the traditional production factors such as land, labor, capital and entrepreneur to sustain the economy. However, the extent of reliance on these production factors evolved over time. After independence in 1957, Malaysia's economy was supported by the agriculture sector and this sector was labor-intensive. As time passed, Malaysia's economy moved into the manufacturing sector and again was labor-intensive. Due to increasing labor costs, Malaysia was losing its competitiveness if it continued to depend on the production of labor-intensive goods from both agriculture and manufacturing sectors, and it would have affected future economic growth (Goh, 2005).

The changes in the global economy had witnessed a different approach towards firms' sources of value creation. In the old economy, a firm was considered as having a competitive advantage if it was able to produce a similar product at a lower cost. Thus, competitive advantage was defined as having lower cost, which mad the company enjoy a higher profit margin (Ting and Lean, 2009). However, the new global economy recognizes the importance of knowledge-based resources as the main factor in sustaining competitive advantage. The knowledge-based resources are also referred to as intellectual capital (Kristandl and Bontis, 2007) and intellectual capital is made up of the combination knowledge of human, structural and relational resources (Bontis, 1996; Edvinsson and Malone, 1997; Stewart, 1997). To keep up with the new global economy, Malaysia introduced the Knowledge Economy Master Plan in 2001 and its main purpose is to achieve a sustainable economic growth through investments on intellectual capital (Ting and Lean, 2009).

Due to the significance of intellectual capital on firms' financial performance and growth, many prior studies have been performed on intellectual capital. The objectives vary and some studies examined intellectual capital performance and some studies related intellectual capital to firms' financial performance. Despite the numerous studies, more studies on intellectual capital are needed. According to Marr *et al.* (2003) the study of intellectual capital will bring a lot of goodness and it will benefit many parties. The findings of the analysis may assist firms in terms of strategy formulation, strategy execution, diversification, expansion decisions, basis for compensation and to communicate measures to external stakeholders (Marr *et al.* (2003). The growth of a firm's intellectual capital has been interpreted as an early indicator for future profitability (Roos and Roos, 1997).

Quite a number of prior studies had used the value added intellectual coefficient (VAIC) model to measure intellectual capital performance (Goh, 2005; Kamath, 2007; Ting and Lean, 2009; Joshi *et al.*, 2010; Joshi *et al.*, 2013). This model, nevertheless, does not measure relational capital which is a pillar of intellectual capital. To better reflect intellectual capital performance, another model called MVAIC, was used in recent studies (Nimtrakoon, 2015; Ulum *et al.*, 2016). The measurement of intellectual capital using the MVAIC model is not widely investigated. Thus, replicating the study of Goh (2005); Ting and Lean (2009); Muhammad and Ismail (2009); Joshi et al. (2010); Joshi et al. (2013); Ulum et al. (2014); Nimtrakoon (2015); Ulum *et al.* (2016) this study was improvised by: first, adding relational capital into the measurement of intellectual capital via the MVAIC model; second, evaluating the intellectual capital performance of Malaysian financial firms; and third, empirically examining the association between intellectual capital and financial performance of Malaysian financial firms. Hence, this paper had three objectives: to evaluate intellectual capital performance, to measure the impact of intellectual capital on financial performance and to examine the separate effects of human capital efficiency, structural capital efficiency, relational capital efficiency and capital used efficiency on the financial performance of Malaysian financial firms.

The remaining parts of this paper is organized into the literature review which includes the definition of intellectual capital, the strengths and limitations of VAIC model and the use of MVAIC model, the review of previous studies and the development of the hypotheses. The next part includes the research methodology of the

study and the discussion of the empirical findings and the paper is concluded with some practical implications of the study and recommendations for future research.

2. LITERATURE REVIEW

2.1. Definition of Intellectual Capital

The concept of intellectual capital has evolved from different academic disciplines and has increasingly become an interdisciplinary field (Marr, 2007) which explains why there is no single definition or categorization of intellectual capital. Table 1 summarizes the construction and definition of intellectual capital put forward by many scholars.

Table-1. Construct and Definition of Intellectual Capital.

Scholars	Constructs	Definition
Bontis (1996)	Human Capital, Structural Capital, Relational Capital	Intellectual capital may provide a new resource-based for an organization to compete and win
Roos and Roos (1997)	Human Capital, Structural Capital	Intellectual capital is the "hidden" assets of an organization such as brand, trademarks, and patents and also includes all assets that are not shown in the financial statement. Intellectual capital is an organization's most important source of sustainable competitive advantages
Stewart (1997)	Human Capital, Structural Capital, Customer Capital	Intellectual capital is knowledge, information, intellectual property and experience; it is a collective brain power or useful knowledge
Edvinsson and Malone (1997)	Human Capital, Structural Capital, Customer Capital	Intellectual capital refers to the difference between an organization's market value and book value
Sveiby (1997)	Personnel Competence, Internal Structure, External Structure	Intellectual capital is knowledge that can be converted into value
Bontis (1998)	Human Capital, Structural Capital, Relational Capital	Intellectual capital is the effective use of knowledge as opposed to information
Andriesson (2004)	Human Resources, Organizational Resources, Relational Resources	Intellectual capital is all intangible resources that are available to an organization that give a relative advantage and which in combination are able to produce future benefit
Youndt *et al.* (2004)	Human Capital, Organizational Capital, Social Capital	Intellectual capital is the sum of all knowledge that an organization can leverage in the process of conducting business to gain competitive advantage

Source: Wang (2008).

The components of intellectual capital consist of human capital, structural capital and relational capital (Bontis, 1996); (Edvinsson and Malone, 1997); (Stewart, 1997); (Roos and Roos, 1997); (Bontis, 1998). Human capital is defined as the skills and knowledge of employees which can be developed through training and can be categorised into two groups: the employees and the firm (Joshi et al., 2013). The employees refer to the employees' personal attributes; technical competence, creativity, and the firm refers to the teamwork, corporate culture, and healthy working environment.

Structural capital encompasses all knowledge stored in the organizational infrastructures such as databases, organizational procedures, patents and trademarks, that supports employees' productivity (Roos and Roos, 1997). Structural capital is dependent upon human capital, since the latter is the primary factor for developing structural capital (Nazari and Herremans, 2007). Structural capital acts as a supportive infrastructure for human resources as an individual can have a high level of intellect, but if the organization has poor systems and procedures by which to track his or her actions, the overall intellectual capital will not reach its fullest potential (Bontis, 1998). Unlike

human capital, structural capital components can be owned and traded by an organization (Edvinsson and Malone, 1997) at least to the extent which they can be legally protected and become intellectual property rights. Edvinsson and Malone (1997) described structural capital as customer capital and organizational capital, with the latter being subdivided into process capital and innovation capital. Similarly, Roos and Roos (1997) defined structural capital (which they call organizational capital) as the sum of process capital and innovation capital; however they put relational capital on an equal footing with human capital and structural capital rather than as a subcategory.

Relational capital is the link that the firm has with its external environment for example the customers, suppliers, resource providers, banks and shareholders. Relational capital is the ability of a firm to create relational value with its external stakeholders in the form of customer and brand loyalty, customer satisfaction, market image and goodwill, power to negotiate, strategic alliances and coalitions. Joshi et al. (2013) stressed the importance of both creation and maintenance of relational capital. These scholars agreed on the notion that human capital, structural capital and relational capital were basic components of the intellectual capital construct.

2.2. Valuation Models

Scholars have linked intellectual capital to firms' competitive advantage. Thus, numerous valuation models have been introduced to measure intellectual capital. Table 2 summarizes the intellectual capital valuation models.

Table-2. Intellectual Capital and Valuation Models.

Valuation Methods	Inventor	Year
Balance Scorecard	Robert S.Kaplan and David P.Norton	1992
Intellectual Capital Audit	Annie Brooking	1996
Calculated Intangible Value	Thomas A.Stewart	1997
Holistic Value Approach	Goran Roos, J. Roos, Nicola C. Dragonetti and Leif Edvinsson	1997
Intellectual Capital-Index	Goran Roos	1997
Intangible Asset Monitor	Karl Erick Sveiby	1997
Market-to-Book Ratio	Thomas A. Stewart	1997
Skandia Navigator	Leif Edvinsson and Michael S. Malone	1997
Value Added Intellectual Coefficient	Ante Pulic	1997
Sullivan's Work	Patrick H. Sullivan	1998
Intangible Scoreboard	Baruch Lev	1999
Intellectual Capital Statement	Jan Mouritsen	2001
iValuing Factor	Ken Standfield	2001
Inclusive Value Methodology	Philip K. M. Pherson and Stephen Pike	2001
Citation-Weighted Patent	Bronwyn H. Hall, Adam B. Jaffe and Manual Trajtenberg	2001
Intellectual Capital Benchmarking System	Jose Maria Viedma	2001
Value Chain Scoreboard	Baruch Lev	2001
Extended VAIC (eVAIC)	Jamal A. Nazari and Irene M. Herramas	2007
Modified Value Added Intellectual Coefficient (MVAIC)	Ihyaul Ulum, Imam Ghozali and Agus Purwanto	2014

Source: Ulum et al. (2014).

Numerous models were suggested as a result of the lack of agreement by the scholars. Each valuation model has some advantages and disadvantages (Sydler *et al*., 2014). This study adopts a modified version of the valuation model proposed by Pulic (1998). Pulic (1998) proposed the VAIC model which was later modified by Ulum et al. (2014) by adding relational capital into the measurement of intellectual capital. The VAIC model was used in this study because of the wide acceptance of this model in the literature of intellectual capital. This was based on the findings of Volkov (2012) which stated that as of June 2012, the VAIC model of Pulic (1998) has been used in 46 studies and has been cited by 2373 studies (Hamidreza and Ruzita, 2013).

The VAIC model has several advantages. First, the model is straight forward and simple to use in determining the value of intellectual capital. Second, the acquisition of data required in the model is feasible because all the data are obtained from corporate financial reports (secondary data). Third, the data are obtained from audited financial statements, therefore the measurement is objective and verifiable (Goh, 2005). Fourth, the model makes cross-organizational or cross-national comparison possible, unlike other measurement models which require both financial and non-financial measures often including some subjective judgments. Fifth, the firms can use the model to evaluate their own intellectual capital and firms' performance (Firer and Mitchell, 2003; Chen *et al.*, 2005; Goh, 2005; Pew *et al.*, 2007; Laing *et al.*, 2010).

However, the VAIC model has some limitations (Joshi et al., 2013). The efficiency measurement of intellectual capital using the VAIC model has been challenged by several scholars. Chang (2007) suggested modifications to the VAIC model by adding research and development (R&D) expenditure and intellectual property (IP) for intellectual capital measurement. His study documented evidence that other elements such as R&D expenditure and IP are positively related with firms' market value and profitability, suggesting that additional information on intellectual capital is omitted from Pulic's VAIC model. Numerous scholars had defined intellectual capital as human capital, structural capital and relational capital however the model does not include relational capital in its measurement of intellectual capital (Ulum et al., 2014). Scholars had cited that relational capital had become the most important business success factor and the key factor in sustaining competitive advantage and creating firms' value (Andriesson, 2004). Chen et al. (2005) also argued that advertising expenditures (a proxy for relational capital) play an increasingly important role in business.

Factors such as increased global competition and increased people's standard of living are placing greater pressure for firms' to offer greater product differentiation and value added services. These can be achieved through improving firm's customer relation (relational capital) and address numerous needs of their customers (Goh, 2005). To measure relational capital, this paper adopted the MVAIC model by Ulum et al. (2014). The MVAIC model included relational capital in the measurement of intellectual capital in line with the construct and definition of intellectual capital adopted in this study.

2.3. Review of Prior Literature

Studies on firms' intellectual capital can be viewed from two different perspectives. Some scholars investigated the performance of human capital, structural capital and relational capital towards firms' growth that is the value creation capability of different components of intellectual capital (Goh, 2005; Kamath, 2007; Joshi et al., 2010) and some analyzed the relationship between intellectual capital and firms' financial performance (Ting and Lean, 2009; Nimtrakoon, 2015). The analysis of Bontis *et al.* (2000) investigated the performance of the three components of intellectual capital in the service and non-service industries in Malaysia. The result of the study indicated that structural capital has a great influence on business performance of both industries. The findings of Scafarto *et al.* (2016) on intellectual capital performance in the global agribusiness industry, revealed that relational capital has a positive impact on firms' performance. Other studies had also documented a positive contribution of relational capital towards firms' performance (Sharabati *et al.*, 2010; Mention and Bontis, 2013).

However, some studies argued that firms' relied more on their human capital to create value. According to Goh (2005) the value creation capability of commercial banks in Malaysia was contributed by human capital . A similar study conducted on Australian banks had documented the same result (Joshi et al., 2010). The findings of Kamath (2007) on the intellectual capital performance of Indian banking indicated some differences. The analysis suggested that foreign banks relied more on human capital while public banks relied more on physical capital for value creation. Thus, future study on intellectual capital performance is justified because prior studies have indicated mixed and inconclusive results. Goh (2005) emphasized the importance of benchmarking based on the level of efficiency ranking in order to establish priorities and develop strategic plans which can result in enhancing the

firms' future performance. The findings would assist stakeholders in assessing the creation capabilities of firms and policy makers to formulate and implement policies. Studies on intellectual capital performance in Malaysia are limited (Goh, 2005; Ting and Lean, 2009).

The findings on the relationship between intellectual capital and financial performance had also documented inconsistency. Some firms recorded positive relationship between intellectual capital and financial performance (Muhammad and Ismail, 2009; Khan *et al.*, 2015; Nimtrakoon, 2015) and others documented negative relationship between intellectual capital and financial performance (Kamath, 2008; Maditinos *et al.*, 2011; Mehralian *et al.*, 2012; Mosavi *et al.*, 2012; Joshi *et al.*, 2013; Bontis *et al.*, 2015). Therefore, this study further investigated the relationship between intellectual capital and financial performance.

2.4. Hypotheses Development

In a study conducted by Ting and Lean (2009) on the relationship between intellectual capital and financial performance of Malaysian financial institutions, the results indicated that intellectual capital has a positive impact on firms' financial performance. Similarly, Muhammad and Ismail (2009) had also documented that intellectual capital has positive and significant relationship with financial performance. The study of Khan et al. (2015) into the five major Islamic banks in Pakistan suggested a positive relationship between intellectual capital and financial performance. Nimtrakoon (2015) examined the relationship between intellectual capital and financial performance of technology firms on the five ASEAN stock markets (Indonesia, Malaysia, Philippines, Singapore, and Thailand) and the findings suggested a positive relationship between intellectual capital and financial performance. Drawing from these previous findings, the first hypothesis is posited as follows:

H1: Firms with greater intellectual capital tend to have higher financial performance.

The study of Bontis et al. (2000) of the service and non-service industries in Malaysia revealed that structural capital has a significant influence on the business performance of both industries. The findings of Scafarto et al. (2016) in the global agribusiness industry documented a positive contribution of relational capital towards firms' performance. Goh (2005) argued that the value creation capability of commercial banks in Malaysia was contributed largely by human capital efficiency. Similarly, the study of Joshi et al. (2010) for Australian banks documented the same findings. The study of Kamath (2007) on intellectual capital performance of Indian banking had indicated that public sector banks rely more on physical capital for value creation. According to the findings from previous studies, the second hypothesis is proposed as follows:

H2: Firms with greater HCE, SCE, RCE, and CEE tend to have higher financial performance.

To test the hypotheses formulated for this study, two regression models were presented as follows Model 1 and 2:

Model 1 $$ROA_{it} = \alpha_{it} + \beta_0 MVAIC_{it} + \varepsilon_{it} \quad (1)$$

Model 2 $$ROA_{it} = \alpha_{it} + \beta_0 HCE_{it} + \beta_1 SCE_{it} + \beta_2 RCE_{it} + \beta_3 CEE_{it} + \varepsilon_{it} \quad (2)$$

3. RESEARCH METHODOLOGY

The data were collected from the audited annual reports of 21 financial firms listed in the finance sector of Bursa Malaysia. There were 33 firms listed as at 31 December 2015 and initially three firms were dropped from the analysis due to the unavailability of data. Then nine more firms were dropped from the sample leaving the final sample size at 21. These nine firms were not used due to the non-availability of the marketing cost which is a proxy for relational capital. The number of observations for this analysis was 105 and the sample period was from 2011 to 2015.

Following prior studies of Ting and Lean (2009); Muhammad and Ismail (2009); Joshi et al. (2013); and Nimtrakoon (2015) this paper adopted ROA as the financial performance indicator. ROA is calculated as operating

profit divided by total assets. ROA is commonly used as a key performance indicator of firms' profitability, thus it has been robustly tested and widely used as a measure of financial performance in earlier research (Joshi et al., 2013).

Intellectual capital and its components namely human capital, structural capital, relational capital, capital used was measured using modified value-added intellectual coefficient (MVAIC) model. Mathematically, the MVAIC was presented as MVAIC= HCE+SCE+RCE+CEE. Several steps are taken in order to establish the value of MVAIC.

Step 1 was to establish the Value Added (VA). VA is derived from the equation: $VA = OP + EC + D + A$, where OP is operating profit, EC is employee costs, D is depreciation, and A is amortization. Step 2 was to establish efficiency scores namely HCE, SCE, RCE and CEE. To compute human capital efficiency (HCE) the equation was: HCE = VA/HC, where human capital (HC) represents the investment made by the firm on its employees. It includes salary, wages and all incentives paid to employees. This ratio gives the contribution made by every unit of money invested in human capital to the value added in the firm. In other words, HCE is an indicator of value added by human resources used by the business (Joshi et al., 2013).

To compute structural capital efficiency (SCE) the equation was: SCE = VA – HC/VA, where SCE indicates the proportion of total VA accounted by structural capital. SCE shows how much of the firm's value creation was generated by the structural capital (Joshi et al., 2013). To compute relational capital efficiency (RCE) the equation used was: RCE = RC/VA. RC is the marketing cost of firms. This ratio gives the contribution made by every unit of relational capital to the value added in the firm (Ulum et al., 2014). To compute capital used efficiency (CEE) the equation was: CEE = VA/CE, where capital used (CE) represents the total assets of the firm (Ulum et al., 2014). CEE was a measure of physical capital. This ratio gives the contribution made by every unit of physical capital to the value added in the firm.

4. EMPIRICAL RESULTS

This paper presented two levels of analyses: the first was the intellectual capital performance of Malaysian financial firms and the second was the relationship between intellectual capital and financial performance.

4.1. Intellectual Capital Performance

Table 3 illustrates the intellectual capital performance of Malaysian financial firms listed in Bursa Malaysia from 2011 to 2015.

The efficiency in utilizing intellectual capital was quantitatively measured using MVAIC model. The efficiency levels to be calculated were HCE, SCE, RCE and CEE. The sum of these efficiencies was termed as the MVAIC. As a performance measurement tool, the greater the value of MVAIC, the better the efficiency level of the firm (Joshi et al., 2013). If the value of firms' MVAIC rises over time, it indicates improvement in the efficiency levels, thus more value creation to the firm (Joshi et al., 2013).

The average value of intellectual capital performance of Malaysian financial firms from 2011 to 2015 was 3.8597 which was higher than that found by Ting and Lean (2009) for Malaysian financial institution during 1999 to 2007 which stood at 2.5493. The findings recorded an increase in the value creation capability of Malaysian financial sector in recent years. This improvement indicated that the financial institutions have managed their intellectual capital properly and efficiently (Ting and Lean, 2009). However, the average value of MVAIC (3.8597) was much lower than that revealed by Joshi et al. (2013) for the Australian financial sector during 2006 to 2008 which stood at 8.8224, suggesting a need for developing country such as Malaysia to benchmark their value creation efficiency of financial sector against a developed nation such as Australia.

Table-3. Intellectual Capital performance of Malaysian financial firms.

Malaysian Financial Firms	HCE	SCE	RCE	CEE	MVAIC	Ranking
Malaysia Buildings Society Bhd	9.7502	0.8965	0.0100	0.0380	10.6948	1
Public Bank Bhd	4.3606	0.7705	0.0181	0.0252	5.1744	2
Hwang Capital (M) Bhd	4.0141	0.6823	0.0597	0.0497	4.8058	3
Hong Leong Financial Group	3.5294	0.7103	0.0403	0.0199	4.2999	4
Bursa Malaysia Bhd	3.3440	0.7009	0.0243	0.2127	4.2818	5
Hong Leong Bank Bhd	3.3413	0.6992	0.0419	0.0186	4.1011	6
AMMB Holdings Bhd	3.2795	0.6940	0.0415	0.0305	4.0455	7
MNRB Holdings Bhd	3.0011	0.6611	0.0418	0.0541	3.7581	8
Allianz Malaysia Bhd	2.9215	0.6556	0.0359	0.0517	3.6646	9
Alliance Financial Group Bhd	2.8978	0.6548	0.0212	0.0256	3.5994	10
ECM Libra Financial Group	2.8532	0.5810	0.0268	0.0511	3.5122	11
Affin Holdings Bhd	2.8059	0.6349	0.0472	0.0213	3.5097	12
Manulife Holdings Bhd	2.7662	0.6076	0.0778	0.0262	3.4777	13
Malayan Banking Bhd	2.7451	0.6354	0.0447	0.0214	3.4466	14
RHB Bank Bhd	2.6951	0.6217	0.0621	0.0229	3.4018	15
BIMB Holdings Bhd	2.5004	0.5996	0.1205	0.0290	3.2495	16
Syarikat Takaful Malaysia Bhd	2.4680	0.5906	0.0379	0.0424	3.1390	17
CIMB Group Holdings Bhd	2.4717	0.5939	0.0334	0.0297	3.1287	18
Hong Leong Capital Bhd	2.0964	0.5215	0.0227	0.0408	2.6814	19
MAA Group Bhd	1.3176	0.1317	0.1102	0.0580	1.6175	20
Kenanga Investment Bank Bhd	1.2059	0.1626	0.0670	0.0288	1.4644	21
Average	**3.1602**	**0.6098**	**0.0469**	**0.0427**	**3.8597**	

HCE contributed approximately 81.87% to MVAIC followed by SCE 15.79%, RCE 1.21% and CEE 1.13%. The above ratios indicated that Malaysian financial firms have a high HCE in comparison to SCE, RCE and CEE. These findings were consistent with the findings of Goh (2005) for Malaysian banks and Joshi et al. (2010) for Australian banks. The result showed that the value creation capability of Malaysian financial firms was directly attributable to the HCE of the firms. The second contributor to MVAIC was SCE, but RCE and CEE had little impact on overall efficiency and the value creation capability.

The Malaysian Buildings Society Bhd had the highest efficiency ranking with a MVAIC of 10.6948. The efficiency in utilizing human capital was the main reason for the high performance of MVAIC as demonstrated by the Malaysian Buildings Society Bhd (HCE = 9.7502). Of the 21 firms, seven firms recorded an above average of MVAIC (3.8597). In relation to these seven financial firms, they were the most efficient firms in utilizing their intellectual capital to create value.

4.2. The Relationship between Intellectual Capital and Financial Performance

4.2.1. Descriptive Analysis

Table 4 illustrates the descriptive analysis of the variables in this study.

Table-4. Descriptive analysis.

Variables	Mean	Standard Deviation	Min	Max
HCE	3.1602	1.7699	0.9131	10.8174
SCE	0.6098	0.1881	-0.9510	0.9076
RCE	0.0469	0.0336	0.0083	0.1405
CEE	0.0427	0.0427	0.0060	0.2564
MVAIC	3.8597	1.8960	0.9959	11.7784
ROA	2.4839	2.7988	-0.7725	16.4058

The descriptive statistics included the mean value, standard deviation, minimum value and maximum value of all the variables in the study. The mean value of the MVAIC was 3.8597, depicting the value creation capability of

financial firms for every RM1 invested throughout 2011 to 2015. HCE was the most influential component of MVAIC in creating wealth with mean value of 3.1602, in relation to SCE, RCE and CEE with the mean values of 0.6098, 0.0469 and 0.0427 respectively. HCE largely determined intellectual capital efficiency in the finance industry. These findings were consistent with the findings of Goh (2005); Kamath (2007); Joshi et al. (2013); Ku Ismail and Abdul Karim (2011); Al-Musali and Ku (2014); Nawaz and Haniffa (2017).

HCE, SCE and RCE depicted value creation from intangible resources hence their emphasis was on intellectual capital, meanwhile CEE was the value generated from one unit of physical and financial capital; thus, it was the tangible resources. The combined mean value of the HCE, SCE and RCE was 3.8169, which was much higher than the mean value of CEE of 0.0427. The comparison suggested that firms create value more efficiently from intellectual capital rather than from physical capital. It was in line with prior literature that firms operating in the new economy tend to create value from intellectual capital rather than physical capital (Nimtrakoon, 2015).

As for ROA, the mean value was 2.4839, suggesting that the firms were able to generate profit during the period of analysis. The value of standard deviation measured the consistency of the data. It showed how far the data were alike or different from each other and as a rule of thumb, the lower the value of standard deviation, the higher was the consistency. The value of standard deviation for each of the four components of intellectual capital as reported above indicated a small deviation from mean value (e.g. mean of HCE 3.1602, std dev 1.7699) indicating a high consistency of the treatment in HCE, SCE, RCE, CEE across firms in the finance industry.

4.2.2. Correlation Analysis

Table 5 illustrates the Pearson correlation matrix for all variables in this study.

Table-5. Correlation Analysis.

Variables	HCE	SCE	CEE	RCE	MVAIC	ROA
HCE	1.0000					
SCE	0.7071***	1.0000				
CEE	0.0643	0.1205	1.0000			
RCE	-0.4254***	-0.5733***	-0.1942**	1.0000		
MVAIC	0.9975***	0.7518***	0.0910	-0.4406***	1.0000	
ROA	0.2487***	0.3568***	0.9664***	-0.3212***	0.2836***	1.0000

Note: ***,**,** correlation is significant at 0.01,0.05 and 0.1 level respectively.

The MVAIC was positive but weakly related to ROA (r=0.2836, p<0.0001). Three components of the MVAIC namely HCE, SCE and CEE, were positive and significantly associated with ROA. CEE had a strong relationship with ROA (r=0.9664,p<0.000.1) Moderate to weak associations were demonstrated by SCE (r=0.3568,p<0.0001) and HCE (r=0.2487, p<0.0001) with ROA. RCE demonstrated a negative association with ROA. Regarding the association of MVAIC and its components, a mixed result was recorded. HCE (r=0.9975) and SCE (r=0.7518) were found to be associated positively with MVAIC (p<0.0001). CEE showed an insignificant association; meanwhile RCE was negatively associated with MVAIC.

4.2.3. Hypotheses Testing

The results of the regression analyses were presented in Table 6 and its interpretation were as follows. The regression result for Model 1 exhibited the value of R^2 at 0.3899 percent, indicating that 39 percent variation in ROA was explained by the variation in MVAIC. The F-value was 48.73 and statistically significant at the 1 per cent level implying that the regression model was reliable for prediction. The result of Model 1 showed positive and significant associations between MVAIC and ROA. The estimated coefficient of 1.0192 inferring that when MVAIC

increased by RM1, the ROA would increase by RM1.0192. The findings supported H1, confirming that firms with greater MVAIC tended to have higher profitability.

The regression result for Model 2 exhibited the value of R^2 at 0.9728 percent, indicating that 97 percent variation in ROA was explained by the variation in the HCE, SCE, RCE and CEE. The F-value was 9178 and statistically significant at the 1 per cent level implying that the regression model was reliable for prediction. The result of Model 2 showed positive but insignificant associations between RCE and ROA. In contrast, HCE, SCE and CEE showed positive and significant relationships with ROA. The findings supported H2; confirming that firms with greater CEE, HCE, SCE but not RCE, tended to have higher ROA.

Table-6. Regression Results.

Dependant Variable : ROA		
Independent Variable	**Model 1**	**Model 2**
Intercept	-1.4507** (-2.64)	-2.3720*** (-18.42)
HCE	N/A	**0.0769***** (3.20)
SCE	N/A	**3.1800***** (12.99)
RCE	N/A	0.5316 (0.52)
CEE	N/A	**61.9501*** (85.60)
MVAIC	**1.0192***** (7.28)	
R^2	0.3899	0.9728
F-value	48.73	9178
Sig F-value	0.0001***	0.0001***
N	105	105

Notes: ***,**,* indicate statistical significance at the 1, 5 and 10 percent level respectively. The figures in the parentheses are the t-statistics. N is number of observation. N/A is not applicable.

The results reported several interesting findings. First, all the components of intellectual capital except for RCE, were significant and positively associated with ROA. However, the effect of CEE on ROA was significantly huge in comparison to HCE and SCE. It showed that CEE plays a major role in enhancing the financial performance of financial sector in Malaysia. The result was consistent with the findings of Ting and Lean (2009) for Malaysia financial sector; Ku Ismail and Abdul Karim (2011) for banks in Bahrain. The findings implied that tangible assets remained the most significant underlying resources of bank financial performance.

Second, the regression results indicated that the MVAIC was significantly and positively associated with ROA. The findings suggested that financial firms with greater intellectual capital tend to have higher financial performance. This result was consistent with the findings of Ting and Lean (2009); Ku Ismail and Abdul Karim (2011); Al-Musali and Ku (2014); Nimtrakoon (2015); Nawaz and Haniffa (2017). Third, the explanatory power indicated by R^2 in regression Model 2 (R^2 = 97) was relatively higher than the R^2 in regression Model 1 (R^2 = 39). These results suggested that the components of intellectual capital were better in explaining the variation in ROA as compared to the aggregate measure of MVAIC. This result was consistent with previous studies which found that the value of R^2 is higher for the components of VAIC (Chen *et al.*, 2005; Ku Ismail and Abdul Karim, 2011).

5. CONCLUSION AND RECOMMENDATION

This study examined the influence of intellectual capital of Malaysian financial firms from two perspectives: the performance of intellectual capital and the impact of intellectual capital on financial performance. Two hypotheses were tested to provide empirical evidence on the impact of intellectual capital on financial performance and to

examine the separate effects of human capital efficiency, structural capital efficiency, relational capital efficiency and capital used efficiency on the financial performance of Malaysian financial firms.

Hypothesis 1 that a higher value of MVAIC leads to higher ROA, was strongly supported. The findings indicated that intellectual capital measured by MVAIC had a strong association with the financial performance of Malaysian financial firms demonstrating that an increase in value creation efficiency affects firms' profitability.

CEE, HCE and SCE make positive contributions towards the financial performance of the firms. The findings supported Hypothesis 2, confirming that firms with greater CEE, HCE, SCE but not RCE, tended to have higher ROA. On the performance of intellectual capital, HCE contributed approximately 81.7% to MVAIC followed by SCE 16%, RCE 1.2% and CEE 1.1%. The above ratios indicated that Malaysian financial firms have high HCE in comparison to SCE, RCE and CEE. The result showed that the value creation capability of Malaysian financial firms was directly attributable to the HCE of the firms.

This study had some limitations that need to be acknowledged. First, this study did not control for firm-specific variables such as firm-size, the level of risk, and firms' complexity as suggested by the extant literature. Scholars argued that knowledge creation, diffusion and storage were inherently evolutionary in nature, thus the degree to which a firm developed its intellectual capital may be varied across the sample (Nawaz and Haniffa, 2017).

Second, there was a positive association between SCE and ROA, however this study did not classify structural capital into innovation capital and process capital to gain a better insight into structural capital efficiency or which of the two contributed more towards financial performance.

Some practical implications of the findings were identified in the context of the finance industry and the education industry. The findings revealed that the finance industry should increase the intellectual capital utilization in enhancing their financial performance. The findings also suggested that physical capital, human capital, structural capital may induce financial performance, thus proper allocation of investment in these resources was worth considering as the firms' value creation capability were detected by the efficiency level of their intellectual capital components.

As for the education industry, the findings of the study proved the existence of strong association between intellectual capital and firms' financial performance. Some components of intellectual capital such as human capital and structural capital lead to higher firms' profitability. Accordingly, the programs offered by education institutions must reflect and adhere to the needs of the industry. The education institutions may collaborate with the industry in order to increase the relevance of their educational mission and to stimulate new directions in the education industry. The institutions play a vital role as a means of both, for the efficient transfer of knowledge and providing training for skills required by the industry.

This study would like to make several recommendations for future research. First, future research may consider incorporating firm-specific variables such as firm-size, the level of risk, and firms' complexity as control variables as suggested by the extant literature. Second, this study did not classify structural capital into innovation capital and process capital. Perhaps, to gain a better insight into structural capital efficiency, it is recommended that the components of structural capital (innovation capital and process capital) be separated and included in future research.

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