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Intellectual Capital Efficiency and Firm Performance in Malaysia: The Effect of Government Ownership

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ABSTRACT

In the era of digital information, intellectual capital becomes more important to firms because the economic environment throughout the world continuously focused on the existence of knowledge capital in the firms to ensure firms' survival. However, the existence of firms' investment in intellectual capital is not clear because it is reported as an expense rather than asset. This situation makes the efficiency of intellectual capital investments vague which can jeopardize firms' performance and value. However this weakness could be overcome with a reliable governance in the firms. The objective of this study is to investigate the moderating effect of government ownership (a characteristic of corporate governance) in the association between the efficiency of intellectual capital and firm performance. Government ownership has always been seen by investors as controversial especially when the government seems to always taking advantage of firms' wealth. This study utilised a sample of 1,048 firm-years data from financial statements of firms listed on the main market of Bursa Malaysia for years 2012 through 2014. Findings shows a positive association between intellectual capital efficiency and firm performance. However the existence of government ownership weakens the association. Findings support the grabbing hand theory which argues that government ownership is seen as negative by stakeholders due to only taking advantage and not enhancing the existence of intellectual capital in firms. Findings show that investors still need to be alert if they want to invest in firms owned by the government in Malaysia. Nevertheless, the findings could also assist the government as owners to listed firms to improve their reputation in order to be seen as the entity that would help elevate firms' performance which could eventually assist to heighten the capital market and economy of Malaysia.

Keywords: Intellectual capital efficiency, government ownership, grabbing hand theory, Malaysia

INTRODUCTION

Intellectual capital should be an asset to firms but is not seen in the financial reports due to it being reported only as an expense (Harisson & Sullivan 2000; Roos & Roos 1997). In the era where economy is based on knowledge and digital, intellectual capital information is a critical source that should result in value and competitive advantage to the firms (Alfraih 2017). This source on competitive advantage is expected and should be able to give additional value to stakeholders which eventually will create wealth to the firms (Bontis, William & Richard 2000; Chahal & Bakshi 2015; Marr & Schiuma 2001) providing benefits to all stakeholders apart from the firms themselves (Lentjušenkova & Lapina 2016). Capital market participants have also agreed that investments in intellectual capital should be able to enhance the level of innovation and profitability of firms (Sullivan & Sullivan 2000). However due to the reporting of the intellectual capital being hidden could jeopardize stakeholders ability to refer to its information for their better decision making. By using a measurement of intellectual capital as if being reported as an asset, prior studies provide evidence of a positive association between intellectual capital information and firm performance (Clarke, Seng & Whiting 2011; Kamukama, Ahiauzu & Ntayi 2010, 2011; Vishnu & Gupta 2014). However due to investments in intellectual capital not reported in a clear manner causing lack of information on the efficiency of intellectual capital and could jeopardize firms' value and performance (Zavertiaeva 2016). In order to ensure that the intellectual capital efficiency can be more highlighted to increase firms' performance, it is expected that the existence of a reliable governance is essential (Nkundabanyanga 2016) because the management of intellectual capital information needs a decision making process involving innovation, perception and flexibility on the part of the decision makers (Mahfoudh & Ku Nor Izah 2014).

One of the characteristics of good governance in firms is the existence of a reliable ownership structure (SCM 2017). Typical among firms in Asian countries is the existence of concentrated ownership structure and many being controlled by government ownership (Romlah & Zaleha 2016). Prior research found government ownership structure had strong influence in the efficiency potential for firms' intellectual capital (Rossi, Citro & Bisogno 2016; Sullivan 1999) through monitoring and supervision of firms' activities and ensuring firms' performance is continuously flourishing (Feng, Sun & Tong 2004; Megginson & Netter 2001; Nazli Anum 2010; Razak, Ahmad & Huson 2008).

The main objective of a government owned firms' business activities should be to maximize society's

wellbeing and contributing towards the country's economic development apart from achieving the required profits (Lau & Tong 2008; Megginson & Netter 2001; Nazrul-Hisyam, Rubi & Huson 2011; Norman, Mara-Ridhuan & Mohamat-Sabri 2009; Yaseen, Rashidah & Abdulsamad 2016). However there is a negative perception among stakeholders towards government owned firms in Malaysia due to the serious loss previously occured in several multinational government linked companies (GLC) such as the Malaysia Airlines System and Proton (Lau & Tong 2008). The negative perception arise due to among others, reports that highlight how the government is taking advantage of the firms' wealth and many times could not save those firms from debt problems in order to compete healthily with other firms. Apart from that, the existence of business and political networking in Malaysia is seen as jeopardizing government owned firms' performance because most of the political figures appointed as board members did not have the right experience and expertise to effectively monitor firms' activities (Azmi 2011; Romlah & Zaleha 2016; Yaseen et al. 2016). This situation indirectly could raise difficulties to manage the governance in the firms to form, develop, and benefits intellectual capital related to firms' human, structural and relational capital (Mahfoudh & Ku-Nor-Izah 2014).

Nonetheless, with the development of multiple efforts on the part of the government lately to enhance the country's economy especially on the issue of intellectual capital, it is interesting to investigate whether the stakeholders is still uncomfortable with the existence of government ownership in Malaysia with regards to the efficiency of intellectual capital. This is especially important since the latest corporate governance regulation mandate a serious enhancement through the Companies Act 2016 and the Malaysian Code on Corporate Goverannce (MCCG) 2017 as well as the previous 11th Malaysia Plan (spanning years 2016 to 2020) portraying continuous effort from the government to strengthen the country's economy on the aspect of intellectual capital. For example, MCCG 2017 requires firms to disclose in detail each management remuneration for stakeholders to be able to assess the value of firms' performance (SCM 2017) based on firms' intellectual capital spending (Pulic 2008). Prior to these latest regulations but related directly to our study sample were the MCCG 2012 and the 10th Malaysia Plan (spanning years 2010 to 2015). In the lack of evidence on the moderating effect of government ownership, therefore the objective of this study is to investigate whether government ownership has a role in the association between the efficiency of intellectual capital and firm performance.

The idea of intellectual capital (IC) efficiency comes from Pulic (2004) and further discussed in more detail in Pulic (2008). Pulic (2008) argues that in this digital era, firm performance should be look upon based on the IC of the firm and not simply on the end results, that is, the profits alone. As such IC should be the focus to reflect potential firm value and firm performance. In addition, the measurement of IC should be based on its efficiency whereby the efficiency is best measured based on the processes in the operations of the firms. The better is the IC efficiency, the better should be expected of firm value and firm performance by the stakeholders. Furthermore, IC efficiency is important towards firm valuation by stakeholders because it would also reflect potential for firm continuous survival. Poor IC efficiency would therefore reflect poor potential for firm survival.

This study looks at the issue of intellectual capital and government ownership in Malaysia because Malaysia's effort to achieve the category of a developed country in year 2020 has only two years to come and yet its GDP per capita is still at the low medium level, that is, still far from the level of other developed countries (IMF 2017). In her effort to achieve a developed nation, Malaysia must be serious in managing its intellectual capital because economy in the digital era is the digital knowledge economy specially comes from the source of intellectual capital. At the same time, the controversial trustworthiness of government ownership among firms in Malaysia is still strongly debated at the world forum due to the 1MDB case which started in 2015 and still unresolved until now, involving several key figures of the current government political party (Farrel, Tan & Geiger 2017). The 1MDB company was formed in 2009 by the current Prime Minister of Malaysia (BBC 2016).

This paper proceeds with section two discussing prior literature and the development of the study's hypotheses. The third section will explain the methodology utilized in this study. Section four will report and discuss the study's findings. Finally section five will provide the conclusion of the whole paper.

Literature Review and Hypotheses Development

Intellectual Capital Efficiency and Firm Performance

Knowledge-based theory suggest that knowledge is the main contributor or the main source towards value creation in a firm through the accumulation and usage of all knowledge sources within the firm (Amrizah & Rashidah 2009; Bontis 1998; Bogner & Bansal 2007; Cohen & Levinthal 1990; Spender & Grant 1996; Sydler, Heafliger & Pruska 2014; Zhining, Nianxin & Huigang 2014). Prior studies provide evidence that a firm source of knowledge is the largest contributor to the enhancement of firm performance (Amrizah & Rashidah 2009; Bogner & Bansal 2007; Zhining et al. 2014).

It is expected that firms will combine its internal and external knowledge and subsequently create new knowledge (Cohen & Levinthal 1990) whereby with those knowledge the firm will be able to compete in their relevant industries (Bontis 1998; Cohen & Levinthal 1990; Spender & Grant 1996; Sydler et al. 2014). As such the firm performance is then link to the sources owned by the firms (Fu-Chiang, John & Qian 2014). Firms' intangible sources such as the intellectual capital focused on the

usage of knowledge in the process of creating firm value (Lentjušenkova & Lapina 2016) which should be able to solve many problems (Cohen & Levinthal 1990) and eventually able to maintain firms' competitive advantage in the long run (Lentjušenkova & Lapina 2016).

Many prior studies suggested that there are three main components of intellectual capital, that is, human capital, structural capital and relational capital which are expected to have positive association with firm performance (Cohen & Levinthal 1990; Spender & Grant 1996; Sydler et al. 2014). Human capital refers to the existence of human knowledge within the firms which include knowledge from the board of directors members, the management team as well as all the other employees. A firm is expected to obtain benefits from the human capital resources through human knowledge and expertise in the day to day operating process which eventually will contribute towards the success and enhancement of the firm performance. Structural capital refers to the existence of intangible items such as the computer softwares which comes from the existence of tangible assets in the firms. Firms obtain benefits from these structural capital resources through research and development (R&D) whereby knowledge and other structural capital will be used to produce new products which eventually will give positive effect towards firms' performance. Relational capital refers to the existence of all aspects of firms' networking with all other entities that communicate and work together with the firms. Firms can obtain benefits from the source of relational capital through joint process, working together with others and helping each other to facilitate and speed up the day to day operation of the firms which eventually will influence firms' performance.

In the current digital era, competition between firms is becoming more complex and must be look at from the global perspectives. Firms is expected to be more pressured and have to be always ready to increase their business performance because the performance function as the long term measurement for future endeavor to continuously survive in the economic market (Kuo-An, Yu-Wen, Hao-Chun & Pin-Yu 2013). Prior studies found that investments in the intellectual capital allows firms to increase their efficiency in the knowledge system as well as escalating the firms' performance (Clarke et al. 2011; Kuo-An et al. 2013). Existence of intellectual capital in a firm is important because it is considered as a firm source for wealth (Kuo-An et al. 2013) which in time can increase firms profitability (Sydler et al. 2014).

Prior studies found positive association between intellectual capital information and firm performance (Goebel 2015; Kamukama et al. 2011; Ming-Chin, Shu-Ju & Yuhchang 2005; Kuo-An et al. 2013; Phusavat, Comepa, Stiko-Lutek & Ooi 2011; Nazrul Hisyam et al. 2011; Noradiva, Azlina & Parastou 2016). A positive association is also found between intellectual capital components such as the human capital, structural capital and relational capital with firm performance (Andreeva & Garanina 2016; Clarke et al. 2011; Zhining et al. 2014; Noradiva et al. 2016) within the manufacturing industry (Phusavat et al. 2011) and the micro financing industry (Kamukama et al. 2010). Firms' intellectual capital information also has positive effect towards firm market value and firm financial performance, as well as having potential to become an indicator towards firm future financial performance (Ming-Chin et al. 2005). Prior studies also found evidence of a positive association between intellectual capital and firm performance in the pharmaceutical industry (Vishnu & Gupta 2014); for the sample in all industries on the Taiwan Stock Exchange (Ming-Chin et al. 2005); as well as for the sample in all industries on the Australian Stock Exchange (Clarke et al. 2011). The association were also positive before and after the financial crisis for firms in Taiwan (Kuo-An et al. 2013). The findings provide evidence that firms which utilized intellectual capital effectively could increase firms' profitability through time (Sydler et al. 2014). Based on prior studies findings and the knowledge based theory, our first hypothesis (H1) is therefore stated as follows:

H_1: Intellectual capital efficiency is positively associated with firm performance.

MODERATING EFFECT OF GOVERNMENT OWNERSHIP

However, since the information on intellectual capital investments could not be reported as an asset in the statement of financial position, but only exposed as an expense in the income statement, could result in a poor decision making on the part of the stakeholders to value the efficiency of intellectual capital towards performance and firm value (Zavertiaeva 2016). Therefore it is suggested that firms must have a good and reliable governance to assist in ensuring that investments in intellectual capital be seen as more efficient by the stakeholders for the purpose of decision making regarding firm performance. From the aspect of intellectual capital, corporate governance should be responsible to form, develop and obtain benefits from intellectual capital to make it more efficient (Mahfoudh & Ku-Nor-Izah 2014). One element of corporate governance that can be linked directly to the efficiency of intellectual capital is the ownership structure of the firms because ownership that can control firms' operation can influence the stakeholders' perception regarding the intellectual capital. Our study focused on the existence of government ownership in firms that is expected can influence the relationship between intellectual capital efficiency and firm performance. When the government has a stake in firms in the form of controlling shareholdings, they will have the right to put several influential representatives on the firms' board of directors (Romlah & Zaleha 2016). Members on the BOD that represent controlling or government shareholdings usually have the power to decide on critical decision making of the firms (Masciandaro & Quintyn 2008). The critical decision making that involves IC efficiency would eventually affect firm performance.

In general, there is two opposite views on the influence of government ownership that can become a moderator in the association between intellectual capital efficiency and firm performance. Under the stakeholder theory, there is two stakeholder views regarding firms being owned or controlled by the government. The first view is the helping hand view and the second is the grabbing hand view (Masciandaro & Quintyn 2008; Romlah & Zaleha 2016). If the stakeholder sees government ownership in the role of assisting the firm, it is expected that the association between intellectual capital efficiency and firm performance will be strengthen, supporting the helping hand view. On the other hand, if stakeholder sees government ownership in the role of taking advantage negatively on the firms' wealth, the association between intellectual capital efficiency and firm performance will be weaken, supporting the grabbing hand view.

There are prior studies that found a positive and significant association between government ownership and firms' market performance (Lau & Tong 2008; Nazrul Hisyam et al. 2011; Padmanabha 2016), supporting the helping hand view. The argument is that government intervention can assist in solving firms' problems earlier than usual, such as easier to obtain financial assistance from inside and outside of the country, assisting firms to obtain large scale government projects and other assistance that can push towards enhancing firm performance faster. Prior studies also found a positive and significant association between government ownership and intellectual capital efficiency (Chiung-Ju, Tzu-Tsang & Wen-Cheng 2011; Firer & Williams 2005; Foong, Loo & Rajeswary 2009) which also support the argument on the helping hand view.

Nevertheless prior studies also found evidence that support the grabbing hand view. Shleifer and Vishny (1997) found inefficiency in the management of firms under the government ownership. One possibility could be that firms' management on behalf of the government were represented by individuals not serious in undertaking their responsibilities because they do not have the relevant experience or expertise to do the job (Romlah & Zaleha 2016). There is prior studies who also found that firms with government ownership showed poorer performance compared to other ownership structure (Nazrul Hisyam et al. 2011; Sabur, Omar & Wares 2012; Zeitun & Tian 2007) supporting the grabbing hand view perspective. Prior studies that found increase in government ownership result in lower firm performance (Mohammad 2013; Zeitun & Tian 2007; Romlah & Zaleha 2016) also shows possibility of stakeholders not convince on the supporting role of government as firms' owners. The grabbing hand view generally suggests that government representatives on firms' board of directors might actually take advantage of the firms' wealth for their own personal benefit and not for the goodness of the people in the country (Masciandaro & Quintyn 2008). In the case of IC efficiency, it is expected that decision making of the representatives with regards to IC investments would only benefit certain factions of the government leadership and not the whole country. Nonetheless Norman et al. (2009) found insignificant influence of government ownership towards intellectual capital efficiency.

Prior studies that linked the role of ownership structure as a moderating variable in the association between intellectual capital and firm performance include studies by Kordlouie, Dehkaiani and Ebrahimi (2014) and Noradiva et al. (2016) that investigate the role of institutional ownership and management ownership respectively in the association between intellectual capital and firm performance. Kordlouie et al. (2014) discussed on findings from prior literature that investigate situation among Taiwanese, Greece and Iranian firms. They conclude that institutional ownership has a positive role in the association between intellectual capital and firm performance. Noradiva et al. (2016) investigate on the role of management ownership among firms listed on the ACE (Access, Certainty, and Efficiency) market, previously known as the MESDAQ (Malaysian Exchange of Securities Dealing and Automated Quotation Market) market, in Bursa Malaysia during the years 2009 until 2012. They found no significant role of management ownership in the association between intellectual capital and firm performance. Earlier, Norman et al. (2009) investigate the role of government ownership, foreign ownership and family ownership towards the performance of intellectual capital among firms listed on MESDAQ market, in Bursa Malaysia. Their sample was firm-years data throughout 2005 until 2007. Specifically they found insignificant association between government ownership and intellectual capital performance.

Findings from prior studies suggested that there is no one specific view among stakeholders with regards to the role of government ownership as a moderating variable in the association between intellectual capital efficiency and firm performance. If the stakeholders sees government ownership in the helping hand perspective, they would presume that the government ownership will strengthen the association between IC efficiency and firm performance. However, if the stakeholders sees government ownership in the grabbing hand view perspective, they would presume that the government ownership would weaken the association between IC efficiency and firm performance. As such, based on prior literature and the theory, we proposed our second hypothesis (H2) without a specific direction as follows:

H_2: Government ownership moderates the association between intellectual capital efficiency and firm performance.

Furthermore, there is also a gap in the literature with regards to findings on the role of government ownership in the association between intellectual capital efficiency and firm performance. Hence we decided to fill up this gap in our current study.

METHODOLOGY

The sample of our study is originally 1,200 firm-years data of financial information throughout 2012 until 2014 collected from firms listed on the main market of Bursa Malaysia in various industries. After excluding firms without complete information (14), firms with negative equity values (9), firms with negative R&D values (11), firms with extreme values (118), the final sample is 1,048 firm-years data. Sample data is between years 2012 until 2014 mainly due to the time period of our study. Nevertheless the time period happens to cover the existence of the 1MDB company which was formed by the Malaysian Prime Minister in 2009 and had created a controversial financial issue at the world level until today. Sample data in this study include all industries available in Bursa Malaysia including Trading & Services; Consumer Product; Property/Construction; Industrial Product; IPC; Plantation; Finance; Hotel; Technology; and REITs. The main objective of our study is to examine the moderating role of government ownership in the association between intellectual capital efficiency and firm performance. As such, based on the main objective of this study, our empirical model has independent variable of interest being Intellectual Capital Efficiency (ICE), dependent variable being firm performance (PERFORM), government ownership (GOVOWN) being the moderating variable of interest, and we include several relevant control variables.

INDEPENDENT VARIABLE – INTELLECTUAL CAPITAL EFFICIENCY (ICE)

Due to the absence of a formal standard on the reporting of intellectual capital, prior researchers examine on the possibility of the existence of intellectual capital efficiency through information on the expense accrued by firms for the purpose of managing intellectual capital. Roos and Roos (1997) defined intellectual capital as a hidden asset whereby its information was not reported as an asset in the finanacial statement of firms. Several quantitative and qualitative methods have also been utilized by prior studies to measure intellectual capital (Bontis 1998; Brennan & Connell 2000; Sullivan 1999; Sullivan & Sullivan 2000). One quantitative method that has been established and continuously utilized in prior studies to measure the efficiency of intellectual capital is the Value Added Intellectual Capital (VAIC) developed by Pulic (2004). The VAIC measurement suggested that as the VAIC amount increases, the more efficient is the firm in utilizing its intellectual capital asset (CIMA 2004).

The original formula of VAIC introduced by Pulic (2004) was:

$$VAIC = HCE + SCE + CEE$$

Where by HCE refers to Human Capital Efficiency, SCE refers to Structural Capital Efficiency, and CEE refers to Capital Employed Efficiency. Vishnu and Gupta (2014) added another item to the main component of VAIC formula, that is, the Relational Capital Efficiency (RCE). RCE is an important component of intellectual capital which refers to the knowledge that exist in the relationship between employees or firms' management with external parties having interests or stakeholding in the firms (Clarke et al. 2011; Phusavat et al. 2011; Sydler et al. 2014; Zhining et al. 2014). RCE is measured using advertising or marketing expenses which usually being undertaken to enhance firms' product and brand value (Ming-Chin et al. 2005). This expense is chosen as a proxy for relational capital (RC) with the assumption that firms bear the cost to develop and maintain relationship with external parties relevant and related to the wellbeing of the firms (Vishnu & Gupta 2014).

This study utilized the measurement of the more recent VAIC as follows:

$$VAIC = HCE + SCE + CEE + RCE$$

Based on prior studies, there is two suggestions with regards to the measurement of the structural capital efficiency (SCE). SCE measurement originally proposed by Pulic (2004) was:

$$SCE\ 1 = SC / VA$$

Where:

- Structural Capital (SC) = Value Added (VA) minus Human Capital (HC).
- Value Added (VA) = Operating profit + Employee Costs + Depreciation + Amortization.
- Human Capital (HC) = Employee or Staff Costs.

SCE 1 measurement has been utilized in many prior studies (Clarke et al. 2011; Ming-Chin et al. 2005; Noradiva et al. 2016; Pulic 2004). However Ming-Chin et al. (2005) believe that the SCE 1 measurement proposed by Pulic (2004) was not complete because it does not utilized the information on R&D (research and development) costs. R&D costs is usually seen as a driver to the firms' advancement in technology and growth (Ming-Chin et al. 2005). As such, Vishnu and Gupta (2014) introduced a new formula to measure SCE. The structural capital is measured based on R&D costs incurred by the firms. SCE 2 is measured as follows:

$$SCE\ 2 = VA / \text{R\&D costs}$$

This study measure SCE based on both SCE 1 and SCE 2 but in separate analysis. Therefore this study measure the independent variable, Intellectual Capital Efficiency (ICE) generally as follows:

$$ICE = HCE + SCE + CEE + RCE$$

Where:

- HCE = VA / HC. Whereby VA = Operating profit + employee costs + depreciation + amortization. HC = employee costs.

- CEE = VA / CE. Whereby CE = net book value of asset. VA is measured as above.
- SCE 1 = SC / VA. Whereby SC = VA minus HC. VA and HC are measured as above.
- SCE 2 = VA / R&D costs. Whereby VA is measured as above.
- RCE = VA / RC. Whereby RC = Advertising expense. VA is measured as above.

DEPENDENT VARIABLE – FIRM PERFORMANCE (PERFORM)

This study measures firm performance based on the market value of the firms commonly utilized in prior studies. The first measurement is the market value of equity over the book value of equity (MBE) (Kuo-An et al. 2013; Ming-Chin et al. 2005; Noradiva et al. 2016). The second measurement is Tobin's Q (TQ) ratio (Goebel 2015; Kuo-An et al. 2013; Nazrul Hisyam et al. 2011). Therefore firm performance (PERFORM) is based on the following two measurements:

1. MBE = (*market value of share per unit x outstanding number of shares) / book value of equity
2. TQ = [(*market value of share per unit x outstanding number of shares) + total liabilities] / total asset

*Market value of share (i.e. share price) per unit is taken at two dates, that is, (1) at the financial year end and (2) at six months after the financial year end. This is to ensure that all relevant information has been included in the share price of the firms when the decision making was made by the investors (Abdullah, Abdul-Shukor, Ahmad & Mohamed 2015). In terms of regulation, Bursa Malaysia requires listed firms to submit their annual reports within six months after the financial year end (Bursa Malaysia 2017).

MODERATING VARIABLE – GOVERNMENT OWNERSHIP (GOVOWN)

Government is assumed able to make decision for a firm if it owns a holding of 20% and above in the firm (Feng et al. 2004; Razak et al. 2008; Nazrul Hisyam et al. 2011). GOVOWN is measured based on the percentage of ownership owns by government institution, government agencies, government investment linked companies (GILC) and government linked companies (GLC) in the list of among top 30 shareholdings in the firm available in the annual reports of firms (Gul 1999; Lau & Tong 2008; Norman et al. 2009). The list for GLCs is available on the website of Khazanah Nasional Berhad, which is the firm that act as a branch of the government investment company (Lau & Tong 2008; Norman et al. 2009). Apart from the shareholdings measurement, a dummy variable is also utilized. Based on the the shareholdings percentage, a dummy variable is coded as 1 for firms having government ownership 20% and above (Feng et al. 2004; Razak et al. 2008; Nazrul Hisyam et al. 2011) and zero otherwise. The 20% cut-off shareholdings is under the assumption that the government is able to have a controlling shareholdings and other shareholdings will more likely become non-controlling shareholders.

CONTROL VARIABLES

In order to reduce the effect of other variables that might disturb the relationship between variables of interests in this study, we include five control variables in our analysis as follows:

i. Institutional Ownership (INSTOWN) – Institutional investors usually have many resources that can easily influence and monitor the action of the firms' management. As such, institutional ownership structure need to be control because many prior studies found that it can influence firm performance (Kordlouie et al. 2014; Romlah & Zaleha 2016). Institutional ownership is measured based on the percentage of shareholdings held by institutional owners as found in the list of top 30 shareholdings in firms' annual reports, whereby the focused taken is to be at least individually at 5% shareholdings in order to consider as having influenced towards firm performance.
ii. Leverage (LEV) – When firms have a high level of debt compared to its assets, it is expected that firms' management will tend to focus more on the requirements of the debtholders and less on the demand of the shareholders (Clarke et al. 2011; Ming-Chin et al. 2005). Prior studies usually found leverage have a negative association with firm performance (Clarke et al. 2011; Ming-Chin et al. 2005; Romlah & Zaleha 2016). This is because stakeholders will see a high leverage to be a reflection of firms being in a high risk situation. Leverage (LEV) is measured based on total debt over total assets.
iii. Research and Development (R&D) – Prior studies found a positive association between Research and Development (R&D) and firm performance (Clarke et al. 2011; Ming-Chin et al. 2005). Firms which focused on R&D has a tendency to depend more on intellectual capital to increase firm performance. Therefore R&D expenditures need to be controlled.
iv. Firm Size (SIZE) – Different firm sizes can result in different level of intellectual capital efficiencies as well as firm performance. Firm size is measured based on either firm total sales vis-a-vis revenues (Chiung-Ju et al. 2011) or total assets (Mahfoudh & Ku Nor Izah 2014; Noradiva et al. 2016; Romlah & Zaleha 2016). It is expected that firm size will have a positive association with firm performance (Romlah & Zaleha 2016).
v. Industry (IND) – Prior studies found intellectual capital efficiency is not the same in different industry (Clarke et al. 2011; Ming-Chin et al. 2005). In this study, industry is control by categorizing firms into industries

as listed on the main market of Bursa Malaysia which include Industrial Products, Trading & Services, Consumer Products, Property/Construction, and Others (REITs, IPC, Finance, Plantation, Hotels, and Technology).

REGRESSION MODEL

Based on the above discussions, therefore the empirical model in this study is as follows:

$$PERFORM_{it} = \beta_0 + \beta_1 ICE_{it} + \beta_2 GOVOWN_{it} + \beta_3 ICE*GOVOWN_{it} + \beta_4 LEV_{it} + \beta_5 R\&D_{it} + \beta_6 SIZE_{it} + \beta_7 INSTOWN_{it} + \beta_8 IND_{it} + \varepsilon_{it}$$

Where:
PERFORM = Firm performance based on MBE or TQ. ICE = Intellectual capital efficiency based on HCE + SCE + CEE + RCE. GOVOWN = Percentage shareholdings of Government ownership. LEV = Leverage based on Total debt over Total assets. R&D = R&D costs. SIZE = Firm size based on Total sales or Total assets. INSTOWN = Percentage shareholdings of Institutional ownership. IND = 1 for each industry, zero otherwise (where industry category is based on the Bursa Malaysia category). ε = error term for the model.

FINDINGS AND DISCUSSIONS

DESCRIPTIVE STATISTICS

Table 1 shows that RCE (relational capital) is the main contributor to ICE, with mean value 8.086 or 67.24% (8.086/12.0256) of the total mean of ICE, when the SCE is measured based on Pulic (2004) formula. However, when SCE (structural capital) is measured based on Vishnu and Gupta (2014) formula, SCE becomes the main contributor to ICE, with mean value of 76.03% (36.386/47.852) from the total mean of ICE.

Mean value for MBE1 (when using share price at financial year end) is 1.055, MBE2 (using share price at six months after) is 1.093. Mean value for TQ1 (using share price at financial year end) is 1.026, TQ2 (using share price at six months after) is 1.049. The range for GOVOWN (government ownership) falls between 0% and 76.42%. The government is assumed able to make decision for the companies if they own at least 20% (Feng et al. 2004; Razak et al. 2008; Nazrul Hisyam et al. 2011). The range for INSTOWN (institutional ownership) falls between 0% and 93.31%. The institutions is assumed able to control the firms if they own at least 5% in the firms. Mean value for LEV is 0.371 showing that about 37.1% of firms assets are being funded through loans.

With regards to normality of data, Table 1 shows that the skewness and kurtosis of all variables fall within an acceptable range of ±3.00 (Hair et al. 2010). For variables having skewness and kurtosis not within the range, it is still acceptable because the data size which is large can overcome the issue of normality (Pallant 2002). Dummy variables of GOVOWN and IND is not reported in Table 1 because the dummy variables only involve either the value of 1 or zero.

Table 2 shows the results of correlations among variables based on Pearson correlation. Intellectual capital efficiency ICE1 (where SCE was based on Pulic (2004) measurement) shows a positive and significant correlation with all measurements of firm performance MBE1, MBE2, TQ1, and TQ2. On the other hand ICE2 (where

TABLE 1. Descriptive statistics of variables (N = 1,048)

Variables	Minimum	Maximum	Mean	Standard deviation	Skewness	Kurtosis
HCE	-3.104	9.243	3.104	2.291	1.250	1.121
SCE1	-0.702	1.767	0.559	0.327	-0.629	3.588
SCE2	-29.939	100.256	36.386	22.372	0.752	1.476
CEE	-0.386	1.094	0.276	0.198	1.290	2.748
RCE	-5.552	31.404	8.086	8.640	1.565	1.425
ICE1	-7.408	41.370	12.026	9.280	1.313	1.097
ICE2	-38.671	140.326	47.852	27.115	0.496	1.087
MBE1	0.105	3.620	1.055	0.766	1.553	2.104
MBE2	0.058	3.761	1.093	0.817	1.545	1.968
TQ1	0.218	2.677	1.026	0.474	1.468	2.069
TQ2	0.160	2.785	1.049	0.506	1.478	2.022
GOVOWN	0.000	76.420	3.709	11.343	4.175	18.339
R&D	4.482	8.743	6.318	0.715	0.535	0.474
LEV	0.003	0.940	0.371	0.197	0.393	-0.337
SIZE	6.004	10.272	8.412	0.682	0.242	0.108
INSTOWN	0.000	93.310	28.897	24.405	0.297	-1.232

Note: HCE = Human capital efficiency. SCE1 = Structural capital efficiency (Pulic, 2004). SCE2 = Structural capital efficiency (Vishnu & Gupta, 2014). CEE = Capital employed efficiency. RCE = Relational capital efficiency. ICE1 = Intellectual capital efficiency with SCE1. ICE2 = Intellectual capital efficiency with SCE2. MBE1 = Market to Book value of Equity (share price at financial year end). MBE2 = Market to Book value of Equity (share price at 6 months after financial year end). TQ1 = Tobins'Q (share price at financial year end). TQ2 = Tobins'Q (share price at 6 months after financial year end). GOVOWN = Percentage of shareholdings by government. R&D = Log of R&D expenses. LEV = Total debts over Total assets. SIZE = Log of Sales. INSTOWN = Percentage of shareholdings by Institutions.

TABLE 2. Pearson Correlations among Variables (N = 1,048)

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	ICE1	1														
2	ICE2	0.634***	1													
3	MBE1	0.121***	-0.026	1												
4	MBE2	0.122***	-0.021	0.946***	1											
5	TQ1	0.098***	-0.044	0.964***	0.911***	1										
6	TQ2	0.101***	-0.034	0.915***	0.964***	0.947***	1									
7	GOVOWN	0.013	0.030	0.018	0.007	-0.003	-0.011	1								
8	R&D	0.177***	-0.088***	0.305***	0.291***	0.294***	0.279***	0.185***	1							
9	LEV	0.113***	0.013	0.063**	0.066**	0.046	0.042	0.102***	0.284***	1						
10	SIZE	0.161***	0.101***	0.199***	0.182***	0.185***	0.169***	0.177***	0.849***	0.383***	1					
11	INSTOWN	0.006	0.036	0.040	0.037	0.043	0.040	0.285***	0.069**	-0.054*	0.057*	1				
12	IND1	-0.004	-0.085***	0.117***	0.096***	0.108***	0.088***	0.018	0.153***	0.047	0.108***	-0.070**	1			
13	IND2	-0.138***	-0.042	-0.004	-0.007	0.008	0.006	-0.094***	-0.035	-0.103***	0.027	0.028	-0.228***	1		
14	IND3	0.039	-0.027	-0.052*	-0.023	-0.063**	-0.037	0.033	-0.029	0.159***	-0.029	-0.016	-0.240***	-0.200***	1	
15	IND4	0.116***	0.022	0.121***	0.109***	0.105***	0.090***	0.181***	0.102***	0.018	-0.032	0.045	-0.231***	-0.192***	-0.203***	1
16	IND5	-0.013	0.115***	-0.159***	-0.150***	-0.138***	-0.127***	-0.116***	-0.169***	-0.108***	-0.069**	0.017	-0.333***	-0.277***	-0.293***	-0.281***

Significant at < 0.01***, < 0.05**, < 0.10*. Note: Measurements of all variables are as describe in other tables.

SCE was based on Vishnu and Gupta (2014) measurement) shows a negative correlation with all measurements of firm performance MBE1, MBE2, TQ1 and TQ2, but the correlations were not significant.

With regards to multicollinearity issue, Table 2 shows that variables which are highly correlated, at above 0.90 are variables which are not examined within the same model when they are analysed. As such, multicollinearity issue has been controlled (Tabachnick & Fidell 2013). Furthermore, the VIF and Tolerance of independent variables in all multiple regressions (refer to Tables 3 and 4 specifically) are totally within the acceptable level of VIF below 10 and Tolerance above 0.10 (Hair et al. 2010) suggesting there is no issue of multicollinearity among independent variables. In Table 2, IND1 refers to Trading & Services; IND2 refers to Consumer Product; IND3 refers to Property/Construction; IND4 refers to Others (IPC, Plantation, Finance, Hotel, Technology, REITs); and IND5 refers to Industrial Product.

MULTIPLE REGRESSIONS

Table 3 presents findings of multiple regressions where the ICE1 (intellectual capital efficiency) measurement is based on SCE1 (structural capital efficiency) following

TABLE 3. Multiple Regression of Moderating Variable Government Ownership – ICE1 (N=1,048)

Variables	MBE1				MBE2			
	Coefficient	t-statistic	Tolerance	VIF	Coefficient	t-statistic	Tolerance	VIF
Panel A:								
Intercept	-0.406	-1.333	0.913	1.096	-0.282	-0.863	0.913	1.096
ICE1	0.006**	2.554	0.471	2.124	0.007***	2.638	0.471	2.124
GOVOWN	-0.001	-0.500	0.496	2.017	-0.002	-0.636	0.496	2.017
ICE1*GOVOWN	-0.012	-1.403	0.791	1.264	-0.013	-1.410	0.791	1.264
LEV	0.034	0.269	0.246	4.070	0.074	0.544	0.246	4.070
R&D	0.446***	7.135	0.232	4.305	0.492***	7.331	0.232	4.305
SIZE	-0.190***	-2.812	0.896	1.116	-0.236***	-3.267	0.896	1.116
INSTOWN	0.001	1.208	0.680	1.470	0.001	1.185	0.680	1.470
IND1	0.240***	3.663	0.751	1.331	0.212***	3.017	0.751	1.331
IND2	0.165**	2.365	0.712	1.405	0.161**	2.150	0.712	1.405
IND3	0.050	0.724	0.662	1.511	0.089	1.194	0.662	1.511
IND4	0.263***	3.567			0.243***	3.071		
R^2	0.132				0.122			
Adj. R^2	0.123				0.112			
F value	14.357				13.057			
p-value	0.000***				0.000***			
Variables	TQ1				TQ2			
	Coefficient	t-statistic	Tolerance	VIF	Coefficient	t-statistic	Tolerance	VIF
Panel B:								
Intercept	0.183	0.969			0.259	1.274		
ICE1	0.003**	1.992	0.913	1.096	0.004**	2.150	0.913	1.096
GOVOWN	-0.001	-0.553	0.471	2.124	-0.001	-0.715	0.471	2.124
ICE1*GOVOWN	-0.011*	-1.904	0.496	2.017	-0.010*	-1.745	0.496	2.017
LEV	0.009	0.116	0.791	1.264	0.009	0.107	0.791	1.264
R&D	0.288***	7.411	0.246	4.070	0.315***	7.544	0.246	4.070
SIZE	-0.131***	-3.112	0.232	4.305	-0.157***	-3.483	0.232	4.305
INSTOWN	0.001	1.388	0.896	1.116	0.001	1.305	0.896	1.116
IND1	0.127***	3.109	0.680	1.470	0.107**	2.453	0.680	1.470
IND2	0.097**	2.238	0.751	1.331	0.094**	2.016	0.751	1.331
IND3	0.007	0.152	0.712	1.405	0.027	0.576	0.712	1.405
IND4	0.136***	2.958	0.662	1.511	0.116**	2.358	0.662	1.511
R^2	0.125				0.113			
Adj. R^2	0.116				0.104			
F value	13.455				12.051			
p-value	0.000***				0.000***			

Significant at < 0.01***, < 0.05**, < 0.10*

Note: HCE = Human capital efficiency. SCE1 = Structural capital efficiency (Pulic, 2004). SCE2 = Structural capital efficiency (Vishnu & Gupta, 2014). CEE = Capital employed efficiency. RCE = Relational capital efficiency. ICE1 = Intellectual capital efficiency with SCE1. ICE2 = Intellectual capital efficiency with SCE2. MBE1 = Market to Book value of Equity (share price at financial year end). MBE2 = Market to Book value of Equity (share price at 6 months after financial year end). TQ1 = Tobins'Q (share price at financial year end). TQ2 = Tobins'Q (share price at 6 months after financial year end). GOVOWN = Percentage of shareholdings by government. R&D = Log of R&D expenses. LEV = Total debts over Total assets. SIZE = Log of Sales. INSTOWN = Percentage of shareholdings by Institutions. IND1 = Trading & Services. IND2 = Consumer Products. IND3 = Property/Construction. IND4 = Others.

the suggestion by Pulic (2004). Table 3 shows that ICE1 consistently have a positive and significant association at least at 5% level with all PERFORM (firm performance) variables, that is, MBE1, MBE2, TQ1, and TQ2, fully supporting our first hypothesis, H1. Table 4 presents findings of multiple regressions where the ICE2 (intellectual capital efficiency) measurement is based on SCE2 (structural capital efficiency) following the suggestion by Vishnu and Gupta (2014). Table 4 shows that ICE2 also consistently have a positive association with all PERFORM (firm performance) variables, that is, MBE1, MBE2, TQ1, and TQ2, however not all significant. Intellectual capital efficiency ICE2 is only significant at 10% level with MBE1, $\beta = 0.002$. ICE2 is significant at 5% level with MBE2 at $\beta = 0.002$. ICE2 is not significant with either TQ1 or TQ2. Table 4 findings therefore partially support our H1.

Nevertheless, we conclude that overall, intellectual capital efficiency ICE for our sample data do have a consistent positive and significant association with firm performance, supporting our H1. Our findings ~~is~~ are therefore consistent with prior literature findings on the association between intellectual capital information and firm performance (Goebel 2015; Kamukama et al. 2011; Ming-Chin et al. 2005; Kuo-An et al. 2013; Phusavat et al. 2011; Nazrul Hisyam et al. 2011; Noradiva et al. 2016). Furthermore our findings suggest that investors consider firms' intellectual capital information in their decision making through time since the association is significant at financial year end as well as at six months after.

With regards to government ownership as the moderating variable and to find evidence for H2, which is the main objective of our study, Table 3 Panel A shows that moderating variable of government ownership for ICE1 (ICE1*GOVOWN) has a negative association with firm performance, $\beta = -0.012$ for MBE1 and $\beta = -0.013$ for MBE2, but both insignificant. This findings do not support H2. However, Table 3 Panel B shows that moderating variable of government ownership for ICE1 (ICE1*GOVOWN) has a negative association with firm performance, $\beta = -0.011$ for TQ1 and $\beta = -0.010$ for TQ2, and both are significant at 10% level. This finding therefore do mildly support our H2.

Nonetheless, when ICE is measured based on ICE2, Table 4 Panel A shows that moderating variable of government ownership for ICE2 (ICE2*GOVOWN) has a negative association with firm performance, $\beta = -0.006$ for MBE1 and $\beta = -0.006$ for MBE2, both significant at 5% level. This findings support H2. At the same time Table 4 Panel B shows that moderating variable of government ownership for ICE2 (ICE2*GOVOWN) has a negative association with firm performance, $\beta = -0.003$ for TQ1, significant at 5% level, and $\beta = -0.003$ for TQ2, significant at 10% level. This finding therefore also support our H2 since we do not proposed any direction for our hypothesis. As such, our findings show tendency that investors in Malaysia do perceive government ownership to be unhealthy with regards to being the owners of firms whereby government existence in firms is seen as taking advantage of firms' situation concerning intellectual capital efficiency (ICE). The government is assumed not actually assisting to increase ICE but rather weakening the association between ICE and firm performance, supporting the theory of grabbing hand view rather than the helping hand view.

Our findings on the effect of government ownership as the moderating variable in the association between IC efficiency and firm performance is consistent with findings from prior studies on the issue of the role of government ownership in firms (such as studies by Sabur et al. 2012; Mohammad 2013; Zeitun & Tian 2007; Romlah & Zaleha 2016; Yaseen et al. 2016; Masciandaro & Quintyn 2008).Our findings suggest that for the sample of our study, investors do not appreciate the existence of government representatives in firms, specifically on the representatives' decision making regarding IC investments because the decision making was probably not for the benefit of the country but more for the benefit of certain groups in the government leadership. Nevertheless, in this aspect, the Malaysian government has since react positively towards the issue of firms' governance when the MCCG 2017 require listed firms to disclose top management remuneration to the public which could avoid potential misappropriation of firms' wealth among top management or members on the board of directors.

Conclusion

The main aim of this study is to investigate the role of government ownership in the association between intellectual capital efficiency and firm performance among firms listed on Bursa Malaysia. Even though the Malaysian government have taken many initiatives at the country level to instigate the citizens to take serious action with regards to intellectual capital issues, however it seems those actions do not really give a positive impression to the capital market participants, especially the investors. Based on our sample of 1,048 firm-years data of firms listed on Bursa Malaysia, being the stock exchange of Malaysia, we found that the existence of government ownership in the listed firms are perceived as a negative situation to the investors. Government ownership seems to be perceived by the investors to be taking advantage of firms' intellectual capital investments which result in a reduction to firm performance. In the absence of government ownership, the intellectual capital investments were associated positively with firm performance, as expected based on the knowledge based view theory. We therefore extend prior literature by providing further empirical evidence on the moderating role of government ownership in a country whereby there is still a controversial issue of investors' trust towards government ownership among listed firms.

The findings seems to support the argument of the grabbing hand theory with regards to the role of

TABLE 4. Multiple Regression of Moderating Variable Government Ownership – ICE2 (N=1,048)

Variables	MBE1				MBE2			
	Coefficient	t-statistic	Tolerance	VIF	Coefficient	t-statistic	Tolerance	VIF
Panel A:							0.824	
Intercept	-0.401	-1.320			-0.269	-0.825	0.373	
ICE2	0.002*	1.875	0.824	1.213	0.002**	2.130	0.393	1.213
GOVOWN	0.001	0.315	0.373	2.680	0.000	0.028	0.790	2.680
ICE2*GOVOWN	-0.006**	-2.248	0.393	2.547	-0.006**	-2.038	0.217	2.547
LEV	0.062	0.489	0.790	1.267	0.105	0.776	0.205	1.267
R&D	0.488***	7.349	0.217	4.598	0.544***	7.634	0.895	4.598
SIZE	-0.224***	-3.117	0.205	4.887	-0.281***	-3.641	0.678	4.887
INSTOWN	0.001	1.114	0.895	1.118	0.001	1.100	0.748	1.118
IND1	0.242***	3.701	0.678	1.474	0.216***	3.071	0.712	1.474
IND2	0.168**	2.397	0.748	1.337	0.164**	2.183	0.663	1.337
IND3	0.059	0.856	0.712	1.405	0.099	1.338		1.405
IND4	0.274***	3.720	0.663	1.507	0.253***	3.198		1.507
R^2	0.132				0.121			
Adj. R^2	0.123				0.112			
F value	14.326				12.991			
p-value	0.000***				0.000***			
Significant at < 0.01***, < 0.05**, < 0.10*								
Variables	TQ1				TQ2			
	Coefficient	t-statistic	Tolerance	VIF	Coefficient	t-statistic	Tolerance	VIF
Panel B:	0.193	1.021						
Intercept	0.001	1.248	0.824	1.213	0.274	1.347		
ICE2	-0.000	-0.145	0.373	2.680	0.001	1.624	0.824	1.213
GOVOWN	-0.003**	-2.057	0.393	2.547	-0.001	-0.436	0.373	2.680
ICE2*GOVOWN	0.018	0.231	0.790	1.267	-0.003*	-1.747	0.393	2.547
LEV	0.304***	7.358	0.217	4.598	0.021	0.252	0.790	1.267
R&D	-0.144***	-3.219	0.205	4.887	0.339***	7.638	0.217	4.598
SIZE	0.001	1.359	0.895	1.118	-0.178***	-3.706	0.205	4.887
INSTOWN	0.127***	3.119	0.678	1.474	0.001	1.275	0.895	1.118
IND1	0.098**	2.245	0.748	1.337	0.109**	2.485	0.678	1.474
IND2	0.011	0.259	0.712	1.405	0.095**	2.023	0.748	1.337
IND3	0.140***	3.051	0.663	1.507	0.032	0.699	0.712	1.405
IND4	0.124				0.119**	2.429	0.663	1.507
R^2	0.114				0.112			
Adj. R^2	13.296				0.102			
F value	0.000***				11.863			
p-value					0.000***			
Significant at < 0.01***, < 0.05**, < 0.10*								

Note: HCE = Human capital efficiency. SCE1 = Structural capital efficiency (Pulic, 2004). SCE2 = Structural capital efficiency (Vishnu & Gupta, 2014). CEE = Capital employed efficiency. RCE = Relational capital efficiency. ICE1 = Intellectual capital efficiency with SCE1. ICE2 = Intellectual capital efficiency with SCE2. MBE1 = Market to Book value of Equity (share price at financial year end). MBE2 = Market to Book value of Equity (share price at 6 months after financial year end). TQ1 = Tobins'Q (share price at financial year end). TQ2 = Tobins'Q (share price at 6 months after financial year end). GOVOWN = Percentage of shareholdings by government. R&D = Log of R&D expenses. LEV = Total debts over Total assets. SIZE = Log of Sales. INSTOWN = Percentage of shareholdings by Institutions. IND1 = Trading & Services. IND2 = Consumer Products. IND3 = Property/Construction. IND4 = Others.

government ownership in firms. The grabbing hand theory suggest that the existence of government ownership in firms is not really providing assistance to firms but more in the role of taking advantage of firms' wealth for the benefit of a few figures within the government. The findings should be of concern to the Malaysian government since this negative perception is still around within the capital market environment notwithstanding of the many efforts from the government to implement the rules and regulations on intellectual capital situation in Malaysia. This finding should also be of concern to the authority relevant to the capital market in Malaysia including the Bursa Malaysia and especially the Securities Commission of Malaysia with regards to the existence of the government ownership among listed firms in Malaysia.

Notwithstanding the findings, however, we would like to caution the generalizability of our findings in that it is limited to our sample of study only, which is only for the period of three years, 2012 until 2014, and also not on the whole population of the listed firms on the stock

exchange. In addition we believe future studies could investigate in more detail on the role of government ownership by examining a specific time frame of the investors reaction on the same issue but on specific item of intellectual capital investments, for example during the purchase of an expensive computer system software or during the announcement of a large R&D investments. Nevertheless, our findings do need to be alert by certain relevant parties such as the Minority Shareholder Watchdog Group (MSWG) in Malaysia with regards to the wellbeing of non-controlling shareholders where the government is among the controlling shareholders.

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