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Intellectual Capital Performance and Firm Value: The Effect of MFRS 139

Intellectual Capital
Performance and
Firm Value

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Abstract

Research Aims - We examine the intellectual capital (IC) performance and its connection with firm value. We also investigate whether the adoption of an enhanced quality standard MFRS 139 that affect recognition and measurement of financial instrument's fair values, moderates the relationship between IC performance and firm value.

Design/Methodology/Approach - We used panel data analysis of listed financial institutions' data for 2005 – 2015 period.

Research Findings - A positive association between IC performance and firm value is found, proposing that IC is an important resource for firms. The results also show that MFRS 139 implementation strengthens the relationship between IC performance and firm value. This result proposes that the MFRS 139 adoption that reflects enhanced transparency could help investors in assessing firm value.

Theoretical Contribution/Originality - This study introduces the effect of information asymmetry on the relation between resources (IC performance) and outcome (firm value) as described in the resources-based view. Thus far, not much is understood on the relationship between IC performance and firm value when transparency is enhanced by a new standard i.e. MFRS 139 adoption.

Managerial Implications in the Southeast Asian Context - MFRS 139 adoption enhances managerial decision-making and control. The outcome suggests that mandatory adoption of MFRS 139 facilitates managers and investors to know the real value created by the firm and influence its share price.

Research Limitations and Implications - The conclusion is limited to financial sector in Malaysia that experienced changes in the financial instruments standards.

Keywords - Intellectual capital, MFRS 139, firm value, intangible assets, Malaysia

INTRODUCTION

Generally, most shareholders and management have concern about firm value. When a stock market is not fully efficient, assessment of firm value by investors may be far from accurate because not all information is available to investors i.e. resulting in mispricing of firm value by the market. Among important information that can affect firm value is intellectual capital information. The resource-based view argues that intellectual capital (IC)¹ as one strategic asset could create additional value for the firm (Barney, 1991; Riahi-Belkaoui, 2003). The efficiency or ability of human, structural, and relational capital components of IC to create value i.e. called intellectual capital performance (Abeysekera, 2006; Elbannan, 2016; Kaplan & Norton, 2004; Kim & Taylor, 2014). This study intends to examine the relation between IC performance and firm value.

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¹ Alipour (2012) defines intellectual capital as all kinds of knowledge resources/assets related to the firm, which are expected to create essential value for shareholders' wealth.

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In addition, we want to test the effect of two different regimes, (1) historical cost IC performance information regime, and (2) fair value IC performance information regime on investor's judgment about firm value. The MFRS 139² Financial Instrument: Recognition and Measurement that was introduced in 2010 in Malaysia provides an interesting context on the effect of the change in reporting regime on firm value. Easton and Zhang (2017) report that value mispricing could happen when there is a mix of historical and fair value information.

Indeed the investigation about IC performance and firm value relationship is important. IC is known as the hidden value or value creation which is the differences between a firm's market value and its book value. Hence, it can be expected that a high performing IC can drive the firm's market value and the value to the shareholders. Here we can see that the firm's market value i.e. its market capitalization is related directly to IC. Conversely, incapability to manage IC performance may lead to jeopardizing the ability of company to create value. In addition, Salamudin et al (2010) argue that approximately 40% of Malaysian firms' assets are reported as intangible resources/assets. The IC appears as a major factor of firm's intangible assets, and this, in turn, generates additional value to the firm, gaining sustainable competitive advantages (Kaplan & Norton, 2004; Abeysekera, 2006; Wang, 2013; Kim & Taylor, 2014; Elbannan, 2016). Moreover, enhancement in the measurement of IC performance by the introduction of a new accounting standard on financial instrument could possibly improve the ability of the market to see the contribution of IC assets.

This study makes several theoretical contributions. First, this study introduces the effect of information asymmetry on the relation between resources (IC performance) and outcome (firm value) as described in the resources-based view. Information asymmetry is assumed to be reduced under the fair value regime, thus facilitating valuation decision by investors. In prior literature, International Financial Reporting Standards (IFRSs) adoption have been reported to have significant impact on firm's market value (e.g, Paananen & Lin, 2009; Hamberg, Paananen & Novak, 2011; Bova & Pereira, 2012; Bodle, Cybinski & Monem, 2016). It also provides accounting information for internal and external stakeholders to better decision-making (Ball, 2006) particularly on investments that can improve intellectual capital. However, in this study rather than the new fair value regime directly affecting firm value, we predict that the regime improves IC performance to firm value relationship because fair value improves the measurement of IC performance. Secondly, we utilized firms in the financial sector that were often neglected in the IC literature but have direct connection with the issue of historical cost versus fair value in the financial instruments transactions so that the effect can be clearly seen.

The unique case of reporting environment in Malaysia permits us to give more attention to the effect of MFRS 139 implementation without being affected by other standards. This is because of the gradual advantage of IFRSs adoption in Malaysia.

²Malaysian Financial Reporting Standards (MFRS) is a standard that was adopted from the International Financial Reporting Standards.

Only MFRS 139 (equivalent to IFRS 139) was deferred its implementation to 2010. Hence, the empirical results about the moderating role of MFRS 139 adoption i.e. historical cost for the period before adoption versus fair value after the adoption, reporting regimes can be clearly displayed by differential strength of association between IC performance (and its components) and firm value between the periods. Additionally, the importance to reduce information asymmetry is underscored in a market with weak form efficiency like Malaysia (Pick Soon & Abdul-Rahim, 2016).

This paper continues with the second section presenting a brief review of past studies in order to develop the study's framework. The subsequent section discusses the methodology applied for the research, whereby the following section four points out the empirical findings. Finally, section five presents a conclusion.

THEORETICAL UNDERPINNING

Knowledge-based theory proposes that knowledge is generated inside and outside an organization and considered as a fundamental factor for creating superior values and competitive advantages (Barney, 1991; Bontis, 1998; Bogner & Bansal, 2007; Sydler, Haefliger & Pruksa, 2014; Wang, Wang & Liang, 2014). Intellectual capital is an intangible source of knowledge recognized widely as firm's strategic resources/assets. Such resources should possess some attributes i.e., non-substitutable, imitable, scarce and valuable to be considered as strategic assets (Barney, 1991). These attributes are in line with the characteristics, definition, and framework of intellectual capital.

There is no agreement among academic researchers about the definition, measurement, and framework of intellectual capital (Ordóñez de Pablos, 2004; Choong, 2008; Hamzah & Ismail, 2008; Kamukama, Ahiauzu & Ntayi, 2010) is due to its non-physical nature. For instance, Edvinsson and Sullivan (1996) suggest a definition of intellectual capital that includes organizational capital, customer capital, and human capital. Meantime, Brooking (1997) proposes a framework that covers human assets, intellectual property assets, infrastructure assets, and market assets. Different from the above, Sveiby (2010) proposes that intellectual capital comprises external structure, internal structure, and individual competencies, while Stewart's (2000) comprehensive intellectual capital framework comprises three capitals namely; structural, human and customer capitals. This framework is extensively used in intellectual capital literature (see for instance, Kehelwalatenna, 2016; Hus-sinki, Ritala, Vanhala & Kianto, 2017; Nawaz & Haniffa, 2017).

Human capital encapsulates workforces' education, satisfaction, capabilities, welfare, skills, knowledge, philosophy, beliefs, and experience (Edvinsson & Sullivan, 1996; Bontis, Keow & Richardson, 2000; Abeysekera & Guthrie, 2005). Firms benefit from human capital during their day to day operations by providing goods and services for clients. Structural capital includes computer programming and software resources related to tangible assets' existence in the firm. Firms gain benefits from structural capital through investing in their R&D that leads to producing new goods and services. Customer capital consists of firm's networking, all kind of knowledge

inside and outside the firm, and ties between customers and firm (Edvinsson & Sullivan, 1996; Bontis et al, 2000; Abeysekera & Guthrie, 2005). Firms take advantage from customer capital through working together (i.e., the firm and their customers) and joining operations or processes together to facilitate day to day transactions. Hence, intellectual capital performance is measured based on its framework/components that reflect its efficiency.

The link between intellectual capital performance and firm value can be examined from Resource-Based View (RBV) arguments. RBV argues that firm's strategic resources can create value and sustain competitive advantage of the firm (Barney, 1991; Riahi-Belkaoui, 2003). Thus, based on RBV arguments, we regard intellectual capital performance (and its three components) as reflecting the tangible and intangible valuable resources of firms that can be used to increase a firm's market value.

Our argument is consistent with Bowman and Ambrosini (2000) that resources can create new use value (of a product), but the newly created value does not necessary can be realised in terms of exchange value (when it is sold). Only when a person perceives utility of having the product, then the particular product can be sold. In our case the resources that created value are reflected by intellectual capital performance, and the exchange value is the firm share price. In other words, investors agree to buy shares if they can see the value of the firm created by its intellectual capital assets.

In short, past literature has found inconsistent relationship between intellectual capital performance (and its components i.e., structural capital, human capital, and customer capital) and firm value; positive relationship (e.g., Kim & Taylor, 2014; Kweh et al, 2013; Nimtrakoon, 2015; Ratnatunga, 2002; Shiu, 2006), whereas others established a negative or insignificant relationship (e.g., Cheuk et al, 2006; Kamath, 2008; Maditinos et al, 2011). Nevertheless, according to the literature and resource-based view as underlying theory, our first hypothesis (H_1) is stated as follows:

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

With respect to IC performance components i.e., human capital, structural capital and customer capital, Nimtrakoon (2015) examined their influence on firm value of five ASEAN nations. The results showed a positive influence of intellectual capital and its components on firm value and its performance. Human capital and capital employee are the most significant components whereas structure capital has less significant impact on firm's value and performance. Mondal and Ghosh (2012) found that human capital is the one that contributes the most to intellectual capital overall performance whereas capital employee and structure capital are found to be less significant on bank performance. Therefore, we expect the importance of different components of IC toward firm value can be perceived to be different by market participants. Hence, we investigate intellectual capital performance compo-

nents separately and are expected to be related positively to firm value. According to past literature and resource-based view as underlying theory, our sub-hypotheses (H_{1a} , H_{1b} , H_{1c}) are stated as follows:

H_{1a} : Human capital performance is positively associated with firm value.

H_{1b} : Structural capital performance is positively associated with firm value.

H_{1c} : Capital employed performance is positively associated with firm value.

Prior literature has found positive relationship between intellectual capital (as resources) and firm value (such as Ratnatunga 2002; Kim and Taylor 2014). In contrast, the result from Cheuk, Wong and Kok (2006) suggests that intellectual capital performance does not have relationship with firm value among Malaysian finance firms. In this paper, we investigate this issue again and argue that the strength of the link is subject to whether the market can see the resources as valuable. If the market is inefficient i.e. information asymmetry between firm and investors is high, the relationship between intellectual capital and firm value may be weak, vice versa. Therefore we can expect if there is an event that can improve information flow between firms and market participants, the relationship between intellectual capital performance and firm value may improve.

In relation to the specific event that can improve information flow, the International Accounting Standards Board (IASB) has launched three different accounting standards for financial instruments, which relates directly to financial institutions i.e.; “MFRS 132 Financial Instrument: Presentation”, “MFRS 139 Financial Instrument: Recognition and Measurement”, and “MFRS 7 Financial Instrument: Disclosures” (Rabaya, Hamzah & Saleh, 2018). In case of our study, Malaysia gives an exclusive case study due to the gradual implementation of MFRSs. MFRS 132 was implemented in 2001 whereas MFRS 139 was delayed to 2010. These nine years of delay were due to the complex requirements of recognition and measurement methods of financial instruments (Guay, Samuels & Taylor, 2016). Here, this study investigates the effect of MFRS 139 adoption which has enhanced the information environment and the link between firm’s strategic resources (intellectual capital performance) and firm’s market value as argued above.

Our argument stems from the premise that the new MFRSs provide accounting information for internal and external stakeholder groups which help them create better decision-making (Ball, 2006). Rabaya, Hamzah and Mohd Saleh (2018) provide a detailed description of the gradual adoption of standards related to financial instrument in Malaysia. In short, there was no specific standard prior to year 2001, implemented Malaysian Accounting Standard Board’s (MASB) Standard 24 on disclosure of financial instrument fair values from 2001 to 2005 and MFRS 132 (adapted from IFRS 132) from 2006-2009 which is basically an improved version of financial instrument disclosure and presentation. Finally, Malaysia implemented MFRS 139 on the recognition and measurement of financial instrument in January 2010. Our focus point here is on the effect of MFRS 139 on financial instrument fair

values and hence the values created by intellectual capital assets. The comparison is between pre-MFRS 139 i.e. only standard on disclosure exist versus post-MFRS 139 i.e. after recognition and measurement of financial instrument's fair values was implemented.

Such comparison is important because the perception and hence reaction of market participants cannot be determinable. For example, Hassan et al. (2012) reveal that the adoption of MASB 24/MFRS 132 was found irrelevant to change stakeholders' decision-making because the information disclosure quality has not really changed. The low quality of information may lead to adverse influence on firm's value. In this situation, disclosed information may result in stakeholders' misunderstanding in decision-making. In contrast, MFRS 139/IAS39 was effectively implemented in Malaysia in January 2010. It focuses on issues related to recognition and measurement of financial instruments. For example, recognition and measurement classifications on financial statements i.e., equity account, profit and loss account, statement of financial position and amortizing cost (Callao, Jarne & Laínez, 2007). It also provides compartmentalization of firm's accounts, changes in financial assets and financial liabilities, and modification in financial equity (Callao et al, 2007). Interestingly, MFRS 139 promotes effective measurement method namely, fair value accounting approach. This approach contributes to decreasing information asymmetry, diminish earnings management, enhance information environment, and eventually build better decision-making (Iatridis, 2012).

Therefore, based on resource-based view and reduction of information asymmetry, we expect that in the post-adoption of MFRS 139, guidelines on reported financial instruments information that may enhance managerial decision-making and control was improved. Such information is predicted to be more relevant to all accounting information users, thus improving the perception about firm values. Table 1 presents comparison between pre and post-MFRS 139.

We argue that with poor information environment (pre-adoption of MFRS 139), the values created by intellectual capital assets may not be fully captured and ap-

Reference	Pre MFRS 139 adoption	Post-MFRS 139 adoption
Hassan and Saleh (2010)	Accounting information reported based on a historical cost approach.	Accounting information reported based on fair value approach.
Hassan et al. (2012)	MASB 24/FRS 132 provide inadequate disclosure or not comprehensive disclosure quality with low quality of transparency.	Disclosure and transparency rose directly after the mandatory adoption of MFRS 139 and financial instruments standards offer high-quality reporting.
Accounting Standards		
CPA Australia Report, 2015	There was inadequate disclosure and less information formative due to information requirement of financial instruments.	-MFRS 139 provides recognition classifications on business contract to buy/ sell non-financial assets, financial liability and financial assets. -Financial assets characterized (1) 'available-for-sale financial assets' (2) 'financial assets at fair value through profit or loss', (3) 'held-to-maturity investments' (4) 'loans and receivables'. -MFRS 139 provides measurement classifications through using fair value measurement on changes in fair value accounting that reflects on profit or loss, financial liability and financial assets.

Table 1.
Regression model results

preciated by the market participants. In contrast, the post-adoption of MFRS 139 has a number of advantages. First, it facilitates sufficient, effective and useful information particularly on fair value measures for the market to use (Deloitte, 2009). This reduced information asymmetry resulted in better aligned resources-perceived value relationship. Second, in the post-adoption of MFRS 139, information users particularly managers and investors have sufficient quality and quantity of information that may lead them to performed better decision-making towards investment in intellectual capital assets that can enhance firm value. Third, MFRS 139 is anticipated can reduce information risks and rising up firm’s share prices (e.g., Akhtaruddin & Haron, 2010; Barth, Landsman & Lang, 2008; Bova & Pereira, 2012; Francis et al, 2008; Healy & Palepu, 2001).

Based on past literature and resource based view, our second hypothesis (H_2) and sub-hypotheses (H_{2a} , H_{2b} , H_{2c}) are stated as follows:

- H_2 : Adoption of MFRS 139 strengthen the relationship between the intellectual capital performance and firm value.
- H_{2a} : Adoption of MFRS 139 strengthen the relationship between the human capital performance and firm value.
- H_{2b} : Adoption of MFRS 139 strengthen the relationship between the structural capital performance and firm value.
- H_{2c} : Adoption of MFRS 139 strengthen the relationship between the capital employed performance and firm value.

This study developed its hypotheses by revisiting two theories; resource-based view and information asymmetry argument. Resource-based view helps to support an argument on the relationship between intellectual capital performance (and its components) and firm value. While information asymmetry helps to support an argument on moderating role of new standard adoption on the relationship between intellectual capital performance (and its components) and firm value. Figure 1 shows the framework for this study.

METHODOLOGY

The sample of this study was obtained from listed firms in the financial sectors with a sample of 30 firms in the main market of Malaysian exchange from 2005 to 2015. This period was selected because the adoption year of MFRS 139 was in

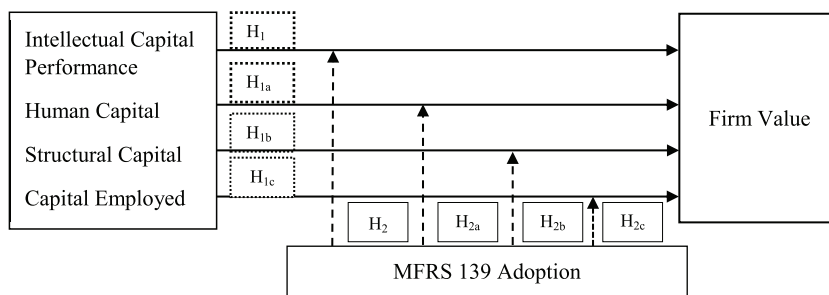


Figure 1.
The Framework

2010. Therefore, we collected 5 years of data before and after mandatory adoption. This particular sample was selected for many reasons. First, the intellectual capital performance relies on advanced standards of firm's strategic resources to be created. Particularly, financial sector contains huge financial instruments assets and liabilities. Thus, it is anticipated that financial institutions are largely influenced by the adoption of MFRS 139 compared to other sectors. Second, financial institutions have vital resources i.e., massive workforces and customers, vast volumes of strategic resources and sophisticated software (Ting & Lean, 2009). It also possesses extensive customer ties and additional initiatives i.e., particular information on the performance of intellectual capital. The data were obtained from secondary sources such as firm's annual reports and DataStream database. To test the hypotheses, the models are formulated as follows:

$$FV_{jt} = \beta + \alpha_1 VAIC_{jt} + \alpha_2 SIZE + \alpha_3 ROE_{jt} + \alpha_4 LEV_{jt} + \alpha_5 BDsize_{jt} + \alpha_6 BDdivr_{jt} + \alpha_7 BDind_{jt} + \alpha_8 BDnom_{jt} + \alpha_9 ACsize_{jt} + \alpha_{10} ACmeet_{jt} + \alpha_{11} ACexpert_{jt} + \theta_{jt} \quad (1)$$

$$FV_{jt} = \beta + \alpha_1 VAIC_{jt} + \alpha_2 MFRS\ 139_{jt} + \alpha_3 VAIC_{jt} \times MFRS\ 139_{jt} + \alpha_4 SIZE + \alpha_5 ROE_{jt} + \alpha_6 LEV_{jt} + \alpha_7 BDsize + \alpha_8 BDdivr_{jt} + \alpha_9 BDind_{jt} + \alpha_{10} BDnom_{jt} + \alpha_{11} ACsize_{jt} + \alpha_{12} ACmeet_{jt} + \alpha_{13} ACexpert_{jt} + \theta_{jt} \quad (2)$$

To test the sub-hypotheses, VAIC is replaced with HCP, SCP and CEP once at a time. Pulic (2000) introduces a quantified and tangible approach called "Value Added Intellectual Coefficient" (VAIC). VAIC focuses on a value-added approach created by intellectual capital and its components. We denote this as the intellectual capital performance i.e. its performance in generating values. It is worth noting that past studies have commonly utilized VAIC (e.g.; Alipour, 2012; Goh, 2005; Hus-sinki et al, 2017; Kamath, 2007; Kehelwalatenna, 2016; Nawaz & Haniffa, 2017; Ting & Lean, 2009) more than 2300 times (Volkov, 2012).

Thus, capturing the formulation of intellectual capital performance and its components is discussed step-by-step as follows. Value-added defines as firm's ability to drive more value for an organization's stakeholder groups (Clarke et al., 2011; Tan et al., 2008).

$$\text{Value-added (VA)} = \text{Operating Revenues (OR)} - \text{Operating Expenses (OE)} \quad (3)$$

VAIC model comprises three components of intellectual capital namely, efficiency of human capital, structural capital and capital employed.

$$\text{Humans Capital Performance (HCP)} = VA \div HC; HC = \text{Total salaries and wages} \quad (4)$$

$$\text{Structural Capital Performance (SCP)} = SC \div VA; SC = VA - HC \quad (5)$$

$$\text{Capital Employed Performance (CEP)} = VA \div CE; CE = \text{Total Assets} - \text{Intangible Assets} \quad (6)$$

$$\text{Intellectual capital efficiency (VAIC)} = HCP + SCP + CEP \quad (7)$$

Regarding to the other variables measurement, we used firm market capitalization (MCAP) to indicate the firm value. MCAP can be calculated by multiplying share prices with the number of shares at the end of financial period (Abdolmohammadi, 2005; Hussey, 1999; Ousama, Fatima & Abdul Rashid, 2012).

Regarding the interaction variable, MFRS 139 adoption was implemented on first of January 2010 that became mandatory adoption for listed firms in the Bursa Malaysia. This paper uses dummy variable method to measure the adoption of MFRS 139 where the value of 0 is given to the years pre-adoption (2005, 2006, 2007, 2008, and 2009), and the value of 1 is given to the years post-adoption (2011, 2012, 2013, 2014, and 2015) (Hamberg et al, 2011; Hassan & Saleh, 2010; Hassan et al, 2012; Yaacob & Che-Ahmad, 2012). Table 2 provides in detail measurements of all variables.

ANALYSIS

Table 3 Panel A presents descriptive statistics for all variables with 266 firm-observations. We used logarithm method to transform the firm value data. The average score of the logarithm of market capitalization (lnFV) is 14.210, along with a minimum score of 10.786 and the maximum value of 18.293. The result presents a vast variance of firm value among Malaysian listed financial institution holding companies. This result is in line with past studies (Taliyang, Mustafa & Man-

Variables	Measurements	Past Studies
Firm Value (FV)	Share price × number of outstanding shares	(Abdolmohammadi, 2005; Hussey, 1999; Ousama et al, 2012).
Intellectual capital performance (VAIC)	VAIC = HCP + SCP + CEP	(Hamzah et al, 2016; Hussinki et al, 2017; Kehelwalatenna, 2016; Mavridis & Kyrmizoglou, 2005; Nawaz & Haniffa, 2017; Ting & Lean, 2009; Williams, 2001)
MFRS 139	A dummy variable, 0 pro-adoption and 1 post-adoption of MFRS 139	(Hamberg et al, 2011; Hassan & Saleh, 2010; Hassan et al, 2012; Yaacob & Che-Ahmad, 2012).
Control Variables		
Firm's size (SIZE)	Total assets	(Haji & Ghazali, 2013; Ousama et al, 2012)
Firm's leverage (LEV)	Total liability/shareholders equity	(Clarke et al, 2011; Ousama et a., 2012)
Firm's profitability (ROE)	ROE	(Chen, Cheng & Hwang, 2005; Clarke et al, 2011; Haji & Ghazali, 2013; Ousama et al, 2012; Tan et al, 2007)
Board Size (BDsize)	Total number of directors on the board	(Appuhami & Bhuyan, 2015; Dalwai, Basiruddin & Abdul Rasid, 2015; Greco, 2011)
Board Diversity (BDdivr)	A dummy variable, 1 more than one ethnicity and 0 otherwise	(Ujunwa, 2012)
Board independence (BDind)	The ratio of independent directors on the board	(Appuhami & Bhuyan, 2015; Greco, 2011)
Board Nomination (BDnom)	A ratio of independent committee members in the nomination committee	(Salleh & Dunmore, 2009)
Audit committee size (ACsize)	Number of audit committee members	(Appuhami & Bhuyan, 2015; Greco, 2011)
Audit committee meetings (ACmeet)	Total number of meetings	(Greco, 2011)
Audit committee expertise (ACexpert)	The ration of an audit committee member who has professional certificates or Accounting and finances degree	(Ho & Taylor, 2013)

Table 2
Variables measurement

sor, 2014). Furthermore, the score of the logarithm intellectual capital performance (lnVAIC) is 0.0006 to 3.168, whereas the average score is 1.189. This finding is consistent with Chen et al, (2005) as well as Firer and Williams (2003) who found vast differences in scores of intellectual capital performance. The result indicates that HCP is considered the most dominant component among others that contribute up to 87% to the total overall intellectual capital (Alhassan & Asare, 2016; Murthy & Mouritsen, 2011; Rehman, Rehman, Rehman & Zahid, 2011). The findings sug-

Panel A: Overall descriptive Statistics				
Variables	Mean	Std. Deviation	Min	Max
Dependent Variable				
lnFV	14.210	1.846	10.786	18.293
Independent Variable				
lnVAIC	1.189	0.614	0.0006	3.168
lnHCP	1.036	0.580	-0.124	2.935
lnSCP	-0.634	0.558	-2.815	-0.045
lnCEP	-3.096	1.087	-7.0248	-0.302
Control Variables				
lnSIZE	15.784	2.184	10.258	20.378
lnROE	2.440	0.747	-0.733	3.907
lnLEV	1.078	1.922	-6.110	3.250
lnBDsize	2.041	0.267	1.386	2.564
BDdivr	0.873	0.333	0.0	1
BDind	0.506	0.129	0.222	1
BDnom	0.370	0.174	0.0	0.8
lnACsize	1.286	0.236	0.693	1.945
lnACmeet	1.727	0.469	0.0	3.044
ACexpert	0.421	0.230	0.0	1

Panel B: Descriptive statistics pre and post MFRS 139								
Variables	Pre-MFRS 139				Post-MFRS 139			
	Mean	Std. Dev	Min	Max	Mean	Std. Dev	Min	Max
Dependent variable								
lnFV	13.854	1.764	10.786	17.659	14.567	1.863	11.445	18.293
Independent variables								
lnVAIC	1.180	0.623	0.0006	3.168	1.197	0.608	0.0006	2.936
lnHCP	1.032	0.573	-0.0610	2.824	1.041	0.589	-0.1240	2.935
lnSCP	-0.623	0.511	-2.2960	-0.045	-0.647	0.604	-2.8150	-0.054
lnCEP	-3.089	1.124	-6.9950	-0.387	-3.104	1.052	-7.0248	-0.302
Control variables								
lnSIZE	15.686	2.158	11.963	19.950	15.882	2.212	10.258	20.378
lnROE	2.474	0.728	0.277	3.907	2.410	0.769	-0.733	3.907
lnLEV	0.993	2.035	-6.110	3.028	1.163	1.804	-5.541	3.250
lnBDsize	2.024	0.259	1.386	3.218	2.058	0.275	1.386	2.564
BDdivr	0.893	0.309	0.000	1	0.853	0.354	0.000	1
BDind	0.495	0.122	0.250	0.800	0.518	0.134	0.222	1
BDnom	0.368	0.172	0.000	0.800	0.373	0.177	0.000	0.8
lnACsize	1.286	0.241	0.693	1.945	1.286	0.232	1.096	1.945
lnACmeet	1.750	0.458	0.000	3.044	1.704	0.479	0.000	2.890
ACexpert	0.436	0.237	0.000	1	0.401	0.223	0.000	1

Note: lnFV: logarithm of firm's market capitalization, lnHCP: logarithm of human capital performance, lnSCP: logarithm of structural capital performance, lnCEP: logarithm of capital employed performance, lnVAIC: logarithm of value-added intellectual coefficient (lnVAIC = lnHCP + lnSCP + lnCEP), MFRS 139: Financial Instrument: Recognition and Measurements, lnSIZE: logarithm of firm size, lnROE: logarithm of firm's profitability, lnLEV: logarithm of firm's leverage, lnBDsize: logarithm of board director size, BDdivr: board of directors diversity, BDind: board of directors independence, BDnom: board of directors nomination, lnACsize: logarithm of audit committee size, lnACmeet: logarithm of audit committee meetings, and ACexpert: audit committee expertise.

Table 3.
Descriptive Statistics
(N = 266)

gest that more investments on human resources in financial institutions contribute to hidden value generated by their intellectual capital. Table 3 displays the descriptive analysis of the variables. Panel B segregates the descriptive statistics to pre and post-MFRS 139 periods. It appears that firm values, in general, are higher in post-MFRS 139 period.

This study used Pearson’s correlation to test the relationships among all variables. Table 4 shows that VAIC has a positive and significant correlation with FV. There are two components of VAIC that have positive and significant (lnHCP and lnSCP) correlation with FV except for lnCEP which reports a significant negative relationship. Table 4 shows that multicollinearity is not a major issue due to the correlations are not reaching the benchmark level at 0.80 (Gujarati and Porter 2009). We separated the components of intellectual capital in sub-model (model 1, model 1a, model 1b, and model 1c) in order to test which component (i.e., HCP, SCP, and RCP) has more contribution to the VAIC in total as well as the interaction factor (model 2, model 2a, model 2b, and model 2c) (Tabachnick & Fidell, 2013).

Table 5 and 6 present regression results for both regressions models, fixed effect model and random effect model respectively.³ Table 5 tests hypotheses 1, 1a, 1b, and 1c, showing the relationship among intellectual capital performance (VAIC) and its components (HCE, SCE, and CEE) towards firm value (FV). The fixed effect regression result shows that the VAIC has significantly positive relationship (p < 1%) with firm value (MCAP), fully supporting our first hypothesis. This result suggests that better performance of firm’s intellectual capital would generate more value for financial institutions. Hence, this result is consistent with Bontis et al, (2000), Riahi-Belkaoui (2003), and Joshi, Cahill and Sidhu (2010).

Regarding the intellectual capital components, Table 5 also presents linear regres-

³ We have tested the regression estimation using Breusch And Pagan Lagrangian Multiplier Test and all tests suggest random effect models are suitable. Meanwhile, Hausman Tests suggest fixed effect model to test the first hypothesis and its sub hypotheses, and random effect models to test the second hypothesis and its sub hypotheses.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. lnFV	1															
2. lnVAIC	0.2794	1														
3. MFRS139	0.1524	0.6981	1													
4. lnHCP	0.2076	0.3234	0.3504	1												
5. lnSCP	-0.3555	0.2503	0.0791	0.1129	1											
6. lnCEP	0.1833	0.0577	0.0319	0.0036	0.0174	1										
7. lnSIZE	-0.4154	-0.0672	-0.1201	-0.1290	0.1765	0.1017	1									
8. lnROE	-0.1714	0.0313	0.0466	-0.0101	0.0954	-0.0353	0.1558	1								
9. lnLEV	-0.5291	-0.0707	-0.0505	-0.1503	0.3233	0.0271	0.6997	0.2605	1							
10. lnBDsize	0.3588	0.1669	0.1259	0.1583	-0.0743	0.0568	-0.3105	-0.0945	-0.3029	1						
11. BDdivr	-0.0233	-0.0958	-0.0226	-0.0401	0.0367	-0.0472	0.0929	-0.0128	0.1663	-0.0352	1					
12. BDind	-0.0155	-0.0401	-0.0617	0.1249	-0.0087	0.0375	0.0899	0.0686	-0.0189	-0.0784	0.0630	1				
13. BDdnom	-0.1699	-0.0132	-0.0049	-0.0036	0.0203	0.0070	0.0931	0.1261	-0.0281	-0.0784	-0.1489	0.4808	1			
14. lnACmeet	-0.2087	-0.0580	-0.0874	-0.0713	0.0765	-0.0210	0.5350	0.1596	0.3512	-0.2600	-0.1093	0.1767	0.1350	1		
15. lnACsize	-0.0312	-0.0328	-0.0917	-0.0454	0.0522	0.0085	0.2235	0.0967	0.1651	-0.1194	-0.0240	0.1302	0.0398	0.3952	1	
16. ACexpert	0.0269	0.1458	0.1341	0.0783	0.0044	-0.0678	-0.1033	0.0336	-0.0853	0.0017	-0.0147	0.1895	0.1629	-0.0336	-0.0815	1

Table 4
Pearson Correlation

sion of fixed effect model of human capital (lnHCP) that shows a significant positive relationship at 1% on firm value, supporting H1a. The result indicates that firms need to invest more in firm's human resources i.e., workforces, education, satisfaction, and capabilities to create more hiding value to share prices. This finding is in line with past studies (eg., Andreeva & Garanina, 2016; Joshi et al, 2010; Kamath, 2007; Mavridis, 2004; Mondal & Ghosh, 2012). Result for structural capital (lnSCP) fully support H1b. However, the result reveals insignificant relationship between capital employed performance (lnCEP) and firm value. H1c is rejected. This result implies that whether capital employ performance increases or decreases, it does not influence the firm value in the financial sector. The result is consistent with Andreeva and Garanina (2016). Nonetheless, we conclude that the overall intellectual capital performance, HCE and SCE except CEE for our sample data have significant positive relationship with firm value. Previous studies with similar findings include for instance, Alipour (2012), Chang (2007), Joshi et al. (2010) and Sledzik (2012). In contrast, capital employed has no contribution to firm value. The insignificant finding could be due to capital employed in financial sector may not have the features of strategic resources i.e., imitable, scarce, valuable, and non-substitutable as found by Maditinos et al, (2011), and Soedaryono, Murtanto and Prihartini (2012).

Table 6 presents a random effect regression model of interaction effect. It examines the effect of MFRS 139 mandatory adoption on the relationship between intellec-

Variables	H ₁		H _{1a}		H _{1b}		H _{1c}	
	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
lnVAIC	0.343	0.000***	—	—	—	—	—	—
lnHCP	—	—	0.423	0.000***	—	—	—	—
lnSCP	—	—	—	—	0.255	0.013**	—	—
lnCEP	—	—	—	—	—	—	-0.063	0.351
lnSize	0.083	0.021**	0.081	0.022**	-0.080	0.023**	0.085	0.022**
lnROE	-0.030	0.547	-0.027	0.586	0.015	0.752	-0.002	0.959
lnLEV	0.925	0.000***	0.933	0.000***	0.907	0.000***	0.955	0.000***
lnBDsize	-0.093	0.538	-0.083	0.581	-0.073	0.622	-0.051	0.746
BDdivr	-0.114	0.427	-0.112	0.435	-0.072	0.602	-0.094	0.526
BDind	-0.098	0.773	-0.067	0.843	-0.145	0.663	-0.182	0.602
BDnom	-0.501	0.067*	-0.562	0.040**	-0.514	0.054*	-0.413	0.141
lnACsize	0.103	0.534	0.075	0.650	0.073	0.656	0.168	0.327
lnACmeet	-0.004	0.964	-0.004	0.964	-0.026	0.785	-0.024	0.815
ACexpert	-0.311	0.048**	-0.346	0.027**	-0.264	0.082*	-0.265	0.105
R- squared	0.2359		0.2422		0.2384		0.2656	
F-statistic	5.84		6.15		5.20		4.43	
Prob (F-statistic)	0.0000		0.0000		0.0000		0.0000	

Note: lnFV: logarithm of firm's market capitalization, lnHCP: logarithm of human capital performance, lnSCP: logarithm of structural capital performance, lnCEP: logarithm of capital employed performance, lnVAIC: logarithm of value-added intellectual coefficient (lnVAIC = lnHCP + lnSCP + lnCEP), MFRS 139: Financial Instrument: Recognition and Measurements, lnSIZE: logarithm of firm size, lnROE: logarithm of firm's profitability, lnLEV: logarithm of firm's leverage, lnBDsize: logarithm of board director size, BDdivr: board of directors diversity, BDind: board of directors independence, BDnom: board of directors nomination, lnACsize: logarithm of audit committee size, lnACmeet: logarithm of audit committee meetings, and ACexpert: audit committee expertise. ***, **, * correlation is significant at the level of 1%, 5%, and 10%.

Table 5
Fixed effect model of linear regression for hypotheses 1 to 1c

tual capital performance (VAIC) (and its components) and firm value (FV). The interaction effect of MFRS 139 for intellectual capital performance (lnVAIC×MFRS 139) shows a positive relationship between VAIC and MCAP at $p < 5\%$, fully supporting H2. The empirical result indicates that the mandatory adoption of MFRS 139 has strengthened the relationship between intellectual capital performance and firm value. The positive association is in line with information asymmetry argument whereby mandatory adoption of MFRS 139 increases accounting information disclosures leading to rich information environment and better managerial decision-making. This result suggests that mandatory adoption of MFRS 139 facilitates managers and investors to know the real value created by the firm and influence its share price.

Table 6 also provides evidence about the sub-model (for hypotheses 2a, 2b, and 2c). Mandatory adoption of MFRS 139 for human capital efficiency (lnHCP×MFRS 139) has been reported to have a positive significant association with FV at $p < 5\%$, supporting H2a. This result is consistent with overall VAIC result, whereby the adoption of MFRS 139 is observed to strengthen the relationship between human capital performance and firm value. Subsequently, the result recorded a significant positive relationship between interaction variable (lnSCP×MFRS 139) with FV at p

Variables	H ₂		H _{2a}		H _{2b}		H _{2c}	
	Coef.	p-value	Coef.	p-value	Coef.	p-value	Coef.	p-value
lnVAIC	0.237	0.008***	—	—	—	—	—	—
lnHCP	—	—	0.268	0.009***	—	—	—	—
lnSCP	—	—	—	—	0.020	0.828	—	—
lnCEP	—	—	—	—	—	—	0.056	0.359
MFRS 139	0.517	0.000***	0.569	0.000***	1.014	0.000***	0.650	0.001***
lnSize	0.014	0.625	0.013	0.662	0.014	0.626	0.013	0.659
lnROE	0.013	0.751	0.019	0.656	0.054	0.184	0.042	0.340
lnLEV	-0.243	0.017**	-0.230	0.025**	-0.269	0.005***	-0.275	0.009***
lnBDsize	-0.111	0.375	-0.097	0.439	-0.115	0.348	0.099	0.457
BDdivr	0.133	0.268	0.133	0.271	0.158	0.174	0.153	0.228
BDind	-0.617	0.030**	-0.593	0.038**	-0.620	0.026**	-0.717	0.016**
BDnom	-0.327	0.148	-0.354	0.122	-0.332	0.132	-0.232	0.329
lnACsize	0.011	0.893	0.151	0.278	0.138	0.315	0.215	0.139
lnACmeet	0.162	0.240	0.007	0.930	0.015	0.851	-0.034	0.691
ACexpert	-0.174	0.182	-0.194	0.140	-0.112	0.374	-0.159	0.251
lnVAIC×MFRS 139	0.210	0.028**	—	—	—	—	—	—
lnHCP×MFRS 139	—	—	0.182	0.077**	—	—	—	—
lnSCP×MFRS 139	—	—	—	—	0.408	0.000***	—	—
lnCEP×MFRS 139	—	—	—	—	—	—	-0.048	0.414
R- squared	0.3229		0.2779		0.3064		0.2800	
F-statistic	217.31		212.81		213.30		178.73	
Prob (F-statistic)	0.0000		0.0000		0.0000		0.0000	

Note: lnFV: logarithm of firm's market capitalization, lnHCP: logarithm of human capital performance, lnSCP: logarithm of structural capital performance, lnCEP: logarithm of capital employed performance, lnVAIC: logarithm of value-added intellectual coefficient (lnVAIC = lnHCP + lnSCP + lnCEP), MFRS 139: Financial Instrument: Recognition and Measurements, lnSIZE: logarithm of firm size, lnROE: logarithm of firm's profitability, lnLEV: logarithm of firm's leverage, lnBDsize: logarithm of board director size, BDdivr: board of directors diversity, BDind: board of directors independence, BDnom: board of directors nomination, lnACsize: logarithm of audit committee size, lnACmeet: logarithm of audit committee meetings, and ACexpert: audit committee expertise. ***, **, * correlation is significant at the level of 1%, 5%, and 10%.

Table 6
Random Effect Model
of Linear Regression for
hypotheses 2 to 2c

< 1%, which fully supports H2b. This result implies that the adoption of MFRS 139 strengthens the relationship between structure capital performance and firm value. However, different results emerged that the moderating role of MFRS 139 with capital employed performance ($\ln\text{CEE} \times \text{MFRS 139}$) shows an insignificant result. It is evident that this result does not support H2c. Hence, we argue that the post-adoption of MFRS 139 improves the performance of intellectual capital, human capital and structural capital, whereas the capital employee performance does not have an impact on firm value in the financial sector. We hypothesized that the MFRS 139 adoption moderates the relationship among the components of intellectual capital and its performance as well as firm capitalization in our sample. Overall, our results provide empirical support except for capital employed performance. According to information asymmetry argument, the adoption of MFRS 139 should contribute to increase information quality and quantity, reducing the cost of debt and information asymmetry and eventually increasing the corporate value and performance (Akhtaruddin & Haron, 2010; Barth et al, 2008; Bova & Pereira, 2012; Francis et al, 2008; Healy & Palepu, 2001).

CONCLUSION

This study investigates the relationship between IC performance as the main resource for creating additional value and the outcome i.e. firm value. Meanwhile, mandatory adoption of MFRS 139 provides transparent information for investors' assessment of firm value. Therefore, it also examines the role of mandatory adoption of MFRS 139 in strengthening the IC performance and firm value relationship.

In summary, we find a significant positive association between IC performance and firm value. This result suggests that as intellectual capital performance, particularly human and structural capitals performance, increases, the market positively reacts to the information, thus firm value will also increase. However, capital employed performance do not have influence firm value in the finance sector. Second, the relationship between IC performance and firm value was observed to be better after MFRS 139 implementation i.e. after the fair value IC performance information was used for measurement to replace historical IC performance information. Accordingly, the new accounting standard on financial instrument that is more transparent than before, facilitates the market to assess firm value. This stronger relationship is due to the increase of reliable and relevant measurement of financial assets and liabilities that resulted in more relevant income or value-added measure that acts as an indicator used for IC performance. This evidence also suggests that investors' valuation of firm value is more sensitive to changes in the fair value rather than historical cost information of IC performance. The result also implies that information asymmetry is important to be considered in the resource dependence view and its outcomes relationship. To this end we believe the study has made significant contribution to the literature. However, the conclusion is limited to financial sector in Malaysia that experienced changes in the financial instruments standards. We have tried to control for factors that could affect the firm values, but there could exist other external or economic wide factors that is time specific in the transition year which is beyond our control. Further investigation also needed to seek the reason

behind negative and insignificant impact of capital employed performance towards Intellectual Capital
firm value. Performance and Firm Value

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