Intellectual Capital and Investment Opportunity Set

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Abstract

The purpose of this article is to investigate empirically the effect of intellectual capital on investment opportunity set in Malaysia for the period of 2006-2011. This study examines the relationship via a panel data and fixed effect regression models. Pulic's Value Added Intellectual Coefficient (VAIC™) method is used as the measure to assess the performance of intellectual capital while factor analysis is used to construct the index of investment opportunity set (IOS). The findings showed that intellectual capital performance as the Value Added Intellectual Coefficient (VAIC), Intellectual Capital Efficiency (ICE), Human Capital Efficiency (HCE) Structural Capital Efficiency (SCE), Capital Employed Efficiency (CEE) have a significant positive effect on investment opportunity set. Since investing on intellectual capital can increase investment opportunities as a result of market value in any company, the outcomes of the current study are significant for managers aiming to increase the market value of their respective companies.

Keywords: Value Added Intellectual Coefficient (VAIC), Intellectual capital performance (ICP), Intellectual Capital Efficiency (ICE), Intellectual capital (IC), Investment Opportunity Set (IOS).

Introduction

Growth of investment will lead to economic growth and in developing a country, creating the investment opportunity set (IOS) is considered as a prerequisite for any investment (Borensztein et al. 1998). The construction and expansion of IOS are critical because they increase the market value of companies (Myers, 1977) which is the fundamental for the development of the country (World Bank, 2014). It is even critical for the case of Malaysia in its endeavor to become a developed country by the year 2020. The latest report World Bank (2014) on the financial indicators (gross domestic product, income level and market capitalization) shows that Malaysia is still lagging behind the desirable standards of the developed countries in this region (such as Japan, China and the Korea Republic). To quantum leap toward its developed nation target, Malaysia has embarked on a path of becoming a knowledge-based economy (k-economy) as its main transformation vehicle. This path is consistent with the resource based view (RBV) which posits that intellectual capital (IC) is an intangible asset that has a great potential for increasing competitive advantages (Barney, 1991) such as IOS which in turn, contributes to the development of the country. Therefore, identifying IOS and its determinants are currently among the most important issues in Malaysia.

There is no accepted common definition and classification of IC (Pablos, 2004). IC was defined as "the sum of all knowledge in a company applicable in the process of conducting business to create value for the firm" (Edvinsson and Malone, 1997,pp: 3). Bontis (2001) explains that IC is an organization's asset which is not recorded in a company's balance sheet but has generated or will generate value for the organization in the future. Edvinsson and Malone (1997) have categorized IC into two broad senses; human capital (HC) and structural capital (SC). They defined HC as "the

combined knowledge, skill, innovativeness, ability of the company's individual employees to meet the task at hand, company's values, culture, and philosophy." Meanwhile, SC is "the hardware, software, databases, organizational structure, patents, trademarks, and everything else characterizing the organizational capability as a back-up to the employees' productivity - in other words, it falls in the category of everything that will be left behind at the office when employees go home" (Edvinsson and Malone, 1997, pp: 3).

Most studies in the field of IC have only focused on the effect of IC or intellectual capital performance (ICP) on competitive advantages such as profitability and market to book equity ratio (Ali et al., 2012; Clarke et al., 2011; Wang, 2011; Kehelwalatenna et al., 2010). Meanwhile, the impact of performance of IC on IOS is still unattended. Therefore, this study attempts to find plausible answer(s) to this question: "Is there a relationship between performance of IC and IOS or whether or not the performance of IC leads to IOS?". The concept of IOS was first proposed by Myers (1977), believing that investment opportunities represent the market value of a firm which depends on the future optional expenditure. In the past, firm value may be divided into two components; the assets in place which are assessed separately on the basis of IOS, and investment opportunities encompassing the value of those options for making the future discretionary investments in positive NPV projects (Gaver and Gaver, 1995; Myers, 1997).

Literature Review

The literature in the field of financial variables shows that there are various factors which can effective lead to investment opportunities. According to the Resource-Based View (RBV), resources, strategies, capabilities and competence of the company can create competitive advantage (Barney, 1991). Competitive advantages of a company can be measured based on the superior long-term performance, higher profits relative to competitor, increased sales or market share, and investment opportunities. Resources that are needed to create a competitive advantage must possess four features including: valuable, rare, poorly imitable and lacking tactically similar substitution (Barney, 1991). Although IC is as an intangible asset, RBV proposes that it possesses all the four characteristics and therefore, is capable of creating competitive advantages by enhancing higher profitability and investment opportunities.

One of the most popular measures of intellectual capital performance is value added intellectual capital (VAIC^{TM}) that was introduced by Pulic (2000). One the advantage of VAIC^{TM} is because it allows the examination on IC as an index and through its individual components. Empirically, VAIC and its components have been shown to have a positive and significant effect on profitability. This is the result of survey on Iran insurance companies during the period from 2005 to 2007 (Alipour, 2012). He used VAIC™ for measuring IC and ROA for measuring profitability. Similar results were documented by Mehralian et al. (2012) in Iranian pharmaceutical sector during 2004 to 2009 period. In their study, performance is measured using ROA and productivity (ratio of total revenue to book value of the firm = ATO).

Venugopal and Madukkarai (2012) demonstrated that certain components of IC have greater effect on financial performance than VAIC. Their study involves software companies of the National Stock Exchange of India for the period 2000-2010. They find that CEE and SCE rather than HCE have a positive effect on financial performance (ROA and ROE). Similar results were documented by Razafindrambinina and Anggreni (2011). Still using VAIC™ to measure IC performance, they find that SCE and CEE have a positive effect on financial performance (ROA, asset turnover, revenue growth and operating cash flow ratio) while HCE does not.

Financial sector in Indonesia also gave the same result as in Iran and India. Zuliyati and Arya (2011) applied VAIC™ for IC and ROA, change in revenue and ATO for financial performance and

they found the relationship between IC and performance to be significantly positive. Similar results were reported by Ulum (2009) from 130 banking companies. He found that current and future financial performance was affected by IC (VAIC™). Similar result was found by Soedaryono et al. (2012) in 16 banking companies for a study period from 2005 to 2009. The same result was also reported for 2,161 firms listed on the Australian Stock Exchange from 2003 to 2008 (Clarke et al., 2011). They showed that IC and its elements have a positive effect on ROA. Similarly in Hong Kong (Chu et al., 2011) for the 2001-2009 period where SCE was found to have the most important effect on performance (ROA, ROE, M/B equity and ATO).

The literature has identified a number of studies on this topic in Malaysia. Ting and Lean (2009) has surveyed ICP using VAIC™ model from 1999 to 2007 in 20 financial institutions. Their results showed that VAIC (and all its three components) and ROA are positively related among Malaysia financial firms. Their results are consistent with the findings of Sofian et al. (2006) and Tan et al. (2007) in Malaysia. Mohd Khalique et al. (2013) showed that intellectual capital has significant influence on the performance of Islamic banks in Malaysia. They stated that intellectual capital is the most critical strategic asset for the success of the organizations. They argued that in a competitive business environment, intellectual capital is considered as the lifeblood of knowledge intensive organizations. The findings of this study also supported findings of previous studies such as Abdullah and Sofian (2012); Sharabati et al. (2013). In line with Mohd Khalique et al. (2013), Mehri et al. (2013) focused on companies in Trading and Services, Technology, Hotel and Consumer Products sectors listed on the Main Board of Bursa Malaysia from 2006 to 2010. The result indicated that HCE, SCE, CEE and VAIC are significantly positively related to market value, profitability and productivity. This research argued that in line with RBV, companies gain competitive edge and better performance through the acquisition, keeping and successive utilization of intangible resources which are important for competitive advantages and strong economic performance (Mehri et al., 2013).

Overall, the literature on IC shows that IC is a strategic asset that is capable of creating superior performance. In this regard, this study corroborates with the argument puts forward by Sudarsanam et al. (2006, pp:3) that "intangible assets contribute to the firms' competitive advantage and value creation as they give rise to growth opportunities". However, the exploitation of those growth opportunities requires investments. The focus of this study is intangible asset which is associated directly with human capital because as Becker (1994, pp:5) posits "individuals with higher levels of general human capital are more likely to identify more opportunities". To optimize human capital effectiveness, investment is needed in the form of education and work experience which enable the people to create more commercial ideas. In this study, the effectiveness of human capital is assessed based on its impact on a measure of competitive advantage, i.e., investment opportunity set (IOS). This study employs Pulic's (2000) VAIC™ model for measuring ICP. In essence, it hypothesizes a positive relationship between VAIC and IOS and this hypothesis is broken down into VAIC components for more detail examination:

Ha: There is a positive association between ICE and IOS.
Hb: There is a positive association between HCE and IOS.
Hc: There is a positive association between SCE and IOS.
Hd: There is a positive association between CEE and IOS.

Research Methodology

The sample of the study is companies listed on Bursa Malaysia during 2006 to 2011. Companies with negative earnings as well as those with missing data were excluded from the sample. The final sample of 188 companies during 6 years provided 1128 yearly-firm observations.

The panel data is superior as it can compute effects that cannot be easily discovered in cross-section and time series data (e.g. Gujarati, 2003). The data were extracted from DataStream as well as companies' annual reports. Based on the skewness, kurtosis, and Jarque-Bera statistics, some of the data were obviously not normality distributed. The problem persists even after attempting the Box Cos transformation. Non-normality distribution in financial data is a common case (Abdul Rahim, 2011; Cont, 2001). Normal distribution of residuals is essential in multiple regression. This study used the random or fixed the effect for both cross section and time by the Panel Least Squares method based on the results of Hausman test (Gujarati, 2003).

Since investment opportunity set (IOS) is not observable and since there has not been any consensus on an appropriate proxy variable, we use a composite of variables to represent IOS (Riahi-Belkaoui, 2000; Gul, 1999) .These variables are;

1. Market-to-book assets (MBA) - Smith and Warner (1979) believe that this ratio is negatively correlated with assets in place and positively to IOS because the market value of the firm is the value of assets in place and IOS where the less value of assets in place, the greater IOS is sought.

Market value of asset = total liability + market value of equity = TD + MV

Market value = MV = number of shares outstanding* share closing price

2. Market-to-book equity (MBE) - Collins and Kothari (1989) are of the opinion that the difference between the market and book value of equity is asymptotic of the value of investment opportunities.

3. Earnings before extraordinary items to price per share (E/P) - Chung et al. (1998) stated that greater earnings are generated by assets-in-place is expected to increase the EP ratio.

To construct the IOS index through factor analysis, we first determine whether or not the sample size is adequate for the factor analysis using the KMO test. The KMO is 0.60 which is greater than 0.5 for an acceptable factor analysis. The suitability of data for factor analysis is determined using the Bartlett's test of sphericity which result is significant (Lê et al., 2008). The composite index of investment opportunities was calculated using the component score coefficient. Table 1 shows that we have one common factor based on eigenvalue more than 1.0. The analysis also indicates that common factors include 68 percent of the variance of IOS. As expected, the common factor is positively and significantly correlated with MBA (0.928) and MBE (0.990) and negatively correlated with EP (-0.327). It shows that common factor captures the underlying construct of the three proxies.

The literature suggests several ways to measure intellectual capital, one of which is VAIC™ by Pulic (2000). VAIC^{TM} quickly gains popularity among researchers probably because of the following reasons: (1) This method is quantifiable, objective and quantitative without the prerequisite of any subjective grading; (2) It considers the stakeholder view and resource-based view via a value added approach in measuring IC; (3) It is simple and intelligible for management and business people; (4) It uses financial data to measure IC which consequently improves the reliability of the measurement and data availability; (5) It also considers human capital as the main key resource of IC in accordance with IC definitions in the literature; and (6) Its validity in different countries is increasing due to the excessive use.

VAIC is based on the following calculations:

VAIC = ICE + CEE

where;

ICE = intellectual capital efficiency = HCE + SCE,

CEE = capital employed efficiency = VA/CE,

HCE = efficiency of human capital = VA/HC,

SCE = structural capital efficiency = SC/VA,
HC = total salaries and wages for company,
VA = OP + EC + D + A,
OP = Operating Profit,
EC = Employee Cost,
D = Depreciation,
A = Amortization,
SC = structural capital = VA – HC, and
CE = book value of the net asset for a company

Table 1: Common factor analysis of the three measures of IOS (N= 1128)

Statistic		MBA	MBE	EP
Estimated commonality of the three IOS measures Eigenvalues		0.813	0.926	0.101
Proportion of Eigenvalues		2.038	0.830	0.131
Correlations between common factor and the three IOS measures		0.679	0.276	0.043
		0.928***	0.990***	-0.327***
Descriptive statistics	IOS	MBA	MBE	EP
Mean	-3.020	0.847	0.892	0.119
Median	-0.277	0.757	0.801	0.111
Maximum	4.748	2.945	2.912	0.552
Minimum	-1.449	0.119	0.243	0.002
Std. Dev.	0.972	0.437	0.381	0.063
Observations	1128	1128	1128	1128

*** $p<0.0001$. MBA= (Assets-Total Common Equity+ Shares Outstanding*Share Closing Price) /Assets. MBE= (Shares Outstanding * Share Closing Price) /Total Common Equity. EP=Primary EPS Before Extraordinary Items/ Share Closing Price.

Another significance of this method is it incorporates also the contribution of the physical capital (CEE) in calculating VAIC. Pulic (2000) argues that physical and financial capital is a prerequisite in creating value and performance. In this model capital employed (CE) was used instead of relational capital and relational capital which are intended as a component of structural capital.

Alnajjar and Riahi-belkaoui (2001) have presented a general model for IOS which included some of variables such as ROA, firm size, financial leverage, financial flexibility and financial risk. Accordingly, this study incorporates these variables in our model to recognize their potential impacts on the relationship between IC and IOS:

- LEV = financial leverage = debt to total assets ratio (Riahi-Belkaoui, 2000);
- ROA = profitability = earnings before interest and tax divided by total assets (Riahi-Belkaoui, 2000);
- SIZE = firm size = log of total assets (Riahi-Belkaoui, 2000);
- RISK = financial risk = natural log of the total debt divided by the book value of the total assets (Firer and Stainbank, 2003); and
- FLEX = financial flexibility = cash and cash equivalents divided by net assets (Drobetz, 2006; Ferreira and Vilela, 2004).

The general panel regression equation used in examining the relationship between ICP (VAIC) (and its main and sub-components) and IOS is presented as follows;

$$IOS_{i,t} = \alpha + \beta_1 ICP_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 ROA_{i,t} + \beta_4 LEV_{i,t} + \beta_5 RISK_{i,t} + \beta_6 FLEX_{i,t} + \varepsilon$$

where $ICP_{i,t}$ is the VAIC and each of its main and sub-components for the ith company at the end of year t, which will be incorporated in the regression model alternatively. α is the regression intercept, β is the estimated coefficient of the respective explanatory variable, ε is the regression error term while the remaining of the variables are as defined in earlier sections.

Results and Discussion

Table 2 illustrates the descriptive statistics for the all dependent and control variables. Panel A shows that HCE is dominant in contributing to ICE. With a mean of 2.308, about 81% (2.308/2.833) of efficiency created by IC was related to HCE. Additionally, since the mean value of CEE is also very low, this capital contributes minimally to VAIC (i.e., only around 11%). With 73 percent contribution to VAIC, HCE is the most important element in creating VAIC or ICP such that in the context of this study, companies with higher HCE are most likely to have higher VAIC. This finding is in line with that by Rehman et al. (2011). The yearly trend in Figure 1 shows that there is a slight decrease in the VAIC and all of its components in 2009, probably due to the adverse effect of the global economic recession in 2008. Nonetheless, it is also equally interesting to note that IOS is in its through in 2008. It is argued that the efficiency of the element of VAIC and IOS declining in 2011.

Table 2: Descriptive statistics

| Variable	VAIC	ICE	HCE	SCE	CEE	ROA	SIZE	FLEX	LEV	RISK
Mean	3.17	2.833	2.308	0.525	0.337	0.073	5.489	2.105	0.221	-1.113
Median	3.005	2.652	2.122	0.529	0.316	0.068	5.387	1.792	0.210	-0.907
Maximum	6.806	6.429	5.607	0.863	0.778	0.255	8.013	8.572	0.586	-0.232
Minimum	1.118	0.968	0.504	0.117	0.056	0.000	4.511	0.139	0.000	-4.66
Std. Dev.	0.941	0.956	0.826	0.144	0.137	0.042	0.527	1.142	0.129	0.723
Observations	1128	1128	1128	1128	1128	1128	1128	1128	1128	1128
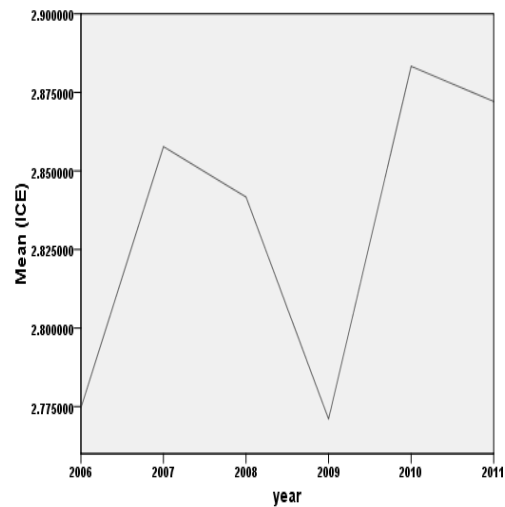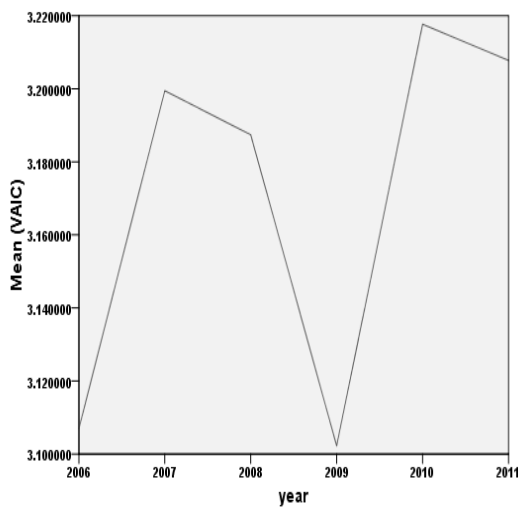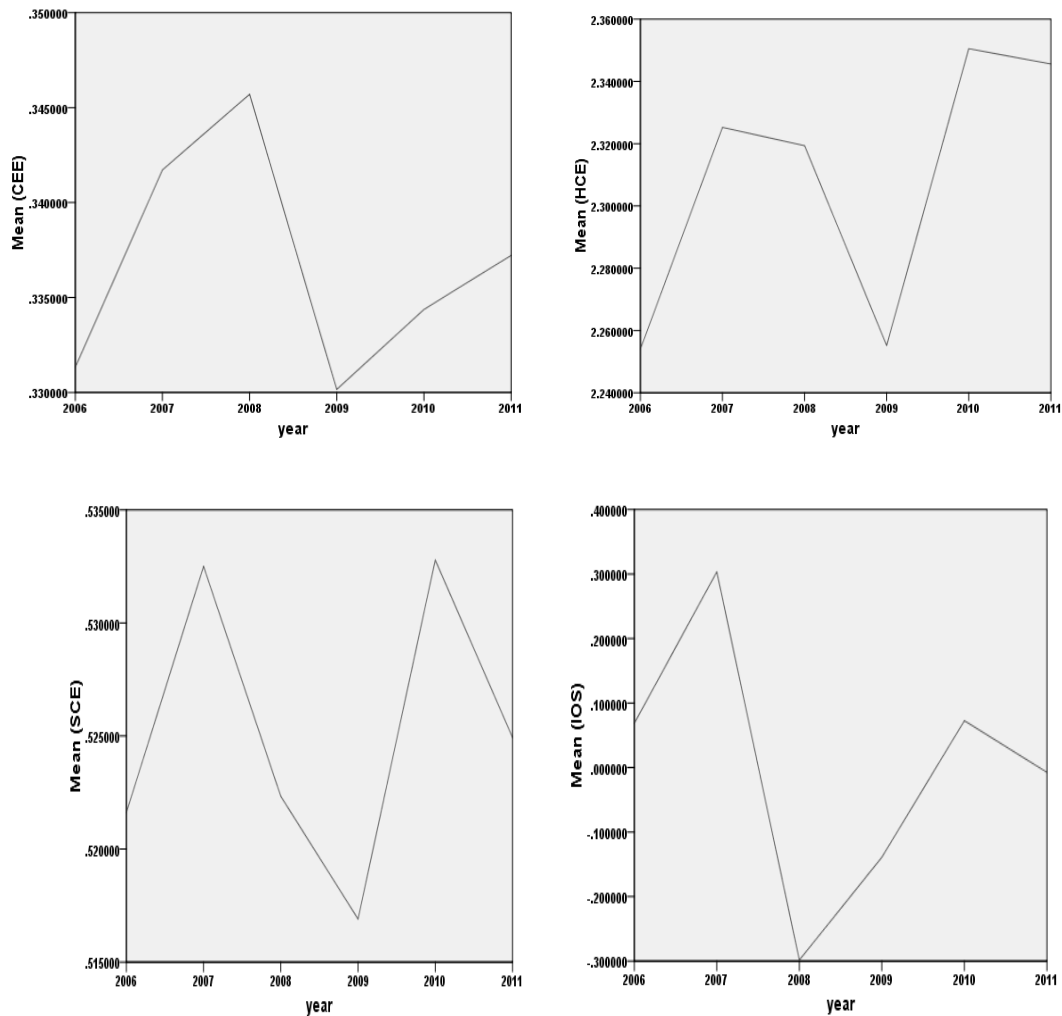
Figure 1. Changes of IC, its elements and IOS during 2006 to 2011 period

The correlation coefficients in Table 3 indicate that VAIC and each one of its elements have significant positive correlation with IOS. IOS is also significantly and positively correlated with firm size and ROA that is consistent with findings of Alnajjar and Riahi-Belkaoui (2001). The low correlations among independent and control variables(<0.90), and VIF statistics lower than 10 (<10) indicate no multicolinearity among independent and control variables.

In applying the balanced panel data, this study selects the suitable method of estimation between fixed effect and the pooled model using redundant fixed effect-likelihood ratio test (Greene 2005). The result rejects the use of pooled model in all models. The result of Husman test meanwhile indicates the use of fixed effect than the random effect model for the whole models. Accordingly, we run cross section and period fixed effect model to examine our hypotheses and the results are reported in Table 4.

The relationships between VAIC and each of its main and sub-components and IOS are positive and significant in all models. These results are consistent with the correlations in Table 3. The models produce adjusted R squares of about 0.33 which means that 33 percent change in the target variable (IOS) is due to predictor variables (independent and control variables). It is worth

mentioning that the strength of the effect of the CEE on IOS is larger than all components of VAIC. This is despite the fact that VAIC is mainly contributed by ICE and the fact that HCE is the dominant factor in ICE. This finding suggests that although ICE explains the larger portion of VAIC, it is CEE that relates more strongly to IOS. It reveals that financial and physical capital is the most important component of VAIC when it concerns the creation of IOS.

Table 3: Pearson's correlations

	IOS	ICE	HCE	SCE	CEE	ROA	SIZE	FLEX	LEV	RISK
VAIC	0.407**	1								
ICE	0.371**	0.989**	1							
HCE	0.368**	0.987**	0.997**	1						
SCE	0.354**	0.905**	0.916**	0.887**	1					
CEE	0.206**	-0.032**	-0.176**	-0.173**	-0.175**	1				
ROA	0.438**	0.395**	0.357**	0.349**	0.369**	0.221**	1			
Size	0.256**	0.394**	0.390**	0.387**	0.366**	-0.008	-0.047	1		
FLEX	-0.013	-0.036	-0.004	-0.002	-0.016	-0.215**	0.234**	-0.283**	1	
LEV	-0.039	-0.003	-0.021	-0.026	0.012	0.124**	-0.309**	0.237**	-0.492**	1
Risk	-0.057	0.027	0.028	0.024	0.052	-0.013	-0.095*	0.152*	-0.468**	0.641**

Notes: **Correlation is significant at the 0.000 level (two-tailed) and *Correlation is significant at the 0.001 level (two-tailed). No correlation is significant at the 0.05 level (two-tailed).

Table 4: Result of cross section and period fixed effect model using Panel least squares method

model	1	2	3	4	5	6	7
variable	coef/ (T stats)	coef/ (T stats)	coef/ (T stats)	coef/ (T stats)	coef/ (T stats)	coef/ (T stats)	coef/ (T stats)
VAIC and its components	VAIC=0 .108 $(3.03)^a$	ICE=0.080 $(2.23)^b$ CEE=0.791 $(3.19)^a$	ICE=0.098 $(2.47)^a$	HCE= 0.247 $(1.87)^c$ SCE=0.079 (1.95)c	HCE=0.108 $(2.54)^b$	SCE=0.548 $(3.06)^a$	CEE=0.888 $(3.54)^a$
ROA	5.711 $(6.55)^a$	5.258 $(6.41)^a$	5.912 $(6.67)^a$	5.869 $(6.61)^a$	5.958 $(6.86)^a$	6.076 $(6.75)^a$	5.844 $(7.21)^a$
SIZE	1.033 $(4.56)^a$	1.020 $(4.50)^a$	1.041 $(4.60)^a$	1.040 $(4.59)^a$	1.043 $(4.61)^a$	1.052 $(4.66)^a$	1.050 $(4.63)^a$
FLEX	0.055 (1.50)	0.068 $(1.86)^c$	0.053 (1.44)	0.054 (1.48)	0.053 (1.44)	0.058 (1.57)	0.073 $(1.96)^c$
LEVE	0.318 (0.90)	0.242 (0.68)	0.328 (0.92)	0.323 (0.90)	0.331 (0.93)	0.307 (0.87)	0.222 (0.63)
RISK	-0.075 (-0.9)	-0.078 (-0.92)	-0.075 (-0.90)	-0.076 (-0.91)	-0.075 (-0.89)	-0.079 (-0.94)	-0.080 (-0.34)
F statistic	$(27.33)^a$	$(26.09)^a$	$(26.95)^a$	$(24.99)^a$	$(26.86)^a$	$(26.61)^a$	$(27.56)^a$
R-sq	0.334	0.34	0.332	0.332	0.332	0.33	0.336
VIF	<2.08	<2.20	<2.07	<4.96	<2.07	<2.08	<2.18

Notes: Dependent variable is IOS. Superscripts a, b, and c indicate significance at the 1%, 5% and 10% levels, respectively. VIF = variance inflation factor..

In regard to the influence of control variables on IOS, profitability is by far the most important predictor followed by the firm size. The other three control variables, financial leverage,

risk and flexibility, practically play no particular role in determining IOS in all models. The positive relationship between IOS and size as well as IOS and ROA confirm the findings of an earlier research by Alnajjar and Riahi-Belkaoui (2001).

Before accepting the reliability of the regression results, diagnostic tests are conducted on the estimated regressions and the models fulfill all tests, including the issue of autocorrelation. Panel-corrected standard errors (PCSE) method was employed for capturing autocorrelation and heteroscedasticity in the residuals (White, 1980).Other fundamental assumptions regarding regression are also evaluated, such as normality of error distribution, and linearity of the relationship between dependent and independent variables.

Conclusions

IC is progressively one of the most important strategic assets intended towards creating permanent corporate competitive advantages. According to the resource-based theory, intangible strategic asset can create competitive advantages, including the investment opportunity set IOS. The study conceptualizes the relationships between ICP (and its main and sub-components) and IOS and the results consistently support those hypotheses. The VAIC used to measure performance of intellectual capital (ICP) in this study allows the examination on ICP to be broken down into its sub-components of human (HCE) and structural (SCE) capital. Based on the results of our analysis, both elements have a significant positive relationship with IOS but the strength of effect is in favour of the HCE. This finding shows that more investment on efficient people means higher human capital efficiency (HCE) which results in more IOS. The mean of 2.308 for HCE suggests that about 81 percent of efficiency created by IC was contributed by HCE. It can be inferred that the expertise and efficiencies of employees were eminent in generating the firm value.

Becker (1994) believes that firms can create more business ideas and opportunities via human capital. Human capital is key in identifying investment opportunities which are related to creativity and abilities to come up with higher quality solutions to a problem (Lang et al., 1995). Similarly, Jääskeläinen and Lönnqvist (2011) have argued that losing key employees could be detrimental to firms because it temporarily diminishes the firm's productivity. Whereas Ruchala (1997) state that investment in human capital is needed because it can improve production efficiency, product or service quality, and product differentiation, earning strategic competitive advantages.

The impact of human capital in creating IOS cannot be considered in isolation of the other capital employed in firms. SC also needs to be considered as a valuable strategic asset and infrastructural base for a company in the knowledge era. It includes assets such as information systems, routines, procedures and databases. It also prepares the instrumentation and design in the process of making value (Bozzolan et al., 2003). Weak structural capital causes reduction in staff motivation and capabilities. Therefore, employees could not produce value and competitive advantage for a company if the firm's SC is weak (Bontis 2001). Similarly, our statistical analysis showed that the relationship between CEE and IOS is also significant and as a matter of fact the strength is greatest compared to others. It means that CEE which includes financial and physical capital is empirically proven to create competitive advantage in the form of IOS. Overall, the results of this study affirm that companies treat investment in all types of capital equally important in order to optimize its ability to increase its investment opportunities and ultimately, its value.

Reference

Abdul Rahim, R. (2011). Impact Of Crisis On Stock Market Integration: Evidence From Asean-5 Plus 3+1 Coutries. Discussion Paper of the Faculty of Economics and Management-UKM. Available:http://www.ukm.my/fep/pub. Accessed on [2012-6-8].

Abdullah, D. F. & Sofian, S. (2012). The Relationship between intellectual capital and corporate performance. Procedia-Social and Behavioral Sciences, 40: 537–541.

Ali, S. H. A., Haron, R., Alamasi, A., & Ibrahim, M. K. (2012). "The Hidden Economic Value: Intellectual Capital Performance In Information Communication Technology Firms". paper presented at the 3rd International Conference On Business And Economic Research. 12 - 13 March2012,Bandung,Indonesia,
Available:http://internationalconference.com.my/proceeding/3rd. Accessed on [2013-8-11].

Alipour, M. (2012). The effect of intellectual capital on firm performance: an investigation of Iran insurance companies. Measuring Business Excellence, 16(1): 53–66.

Alnajjar, F. K., & Riahi-belkaoui, A. (2001). Empirical validation of a general model of growth opportunities. Managerial Finance, 27(3):72–90.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1): 99–120.

Becker, G. S. (1994). Human capital: *A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.

Bontis, N. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. International Journal of Management Reviews, 3(1): 41–60.

Bozzolan, S., Favotto, F.& Ricceri, F. (2003). Italian annual intellectual capital disclosure: an empirical analysis. Journal of Intellectual Capital, 4(4):543–558.

Borensztein, E., De Gregorio, J. & Lee, J. W.,(1998). How does foreign direct investment affect economic growth? Journal of International Economics, 45(1): 115–135.

Chung, K. H., Wright, P., & Charoenwong, C. (1998). Investment opportunities and market reaction to capital expenditure decisions. Journal of Banking and Finance, 22(1): 41–60.

Chu, S. K. W., Chan, K. H., & Wu, W. W. Y. (2011). Charting intellectual capital performance of the gateway to China. Journal of Intellectual Capital, 12(2): 249–276.

Clarke, M., Seng, D., & Whiting, R. H. (2011). Intellectual capital and firm performance in Australia. Journal of Intellectual Capital, 12(4):505–530.

Collins, D. W., and Kothari, S. P. (1989). An analysis of Intertemporal and cross-sectional determinants of earnings response coefficients. Journal of Accounting and Economics, 11(2): 143–181.

Cont, R. (2001). Empirical properties of asset returns: stylized facts and statistical issues. Quantitative Finance, 1(2):223–236.

Drobetz, W. (2006). Corporate Cash Holdings : Evidence from Switzerland. Available: http://papers.ssrn.com/sol3/papers.cfm .Accessed on [2012-6-23].

Edvinsson, L. & Malone, M. S. (1997). *Intellectual capital: Realizing your company's true value by finding its hidden brainpower*. New York, NY: HarperBusiness New York.

Ferreira, M. a., & Vilela, A. S. (2004). Why Do Firms Hold Cash? Evidence from EMU Countries. European Financial Management, 10(2): 295–319.

Firer, S.& Stainbank, L. (2003). Testing the relationship between intellectual capital and a company ' s performance : Evidence from South Africa.Meditari Accountancy Research,11(1):25-44.

Gaver, J. J., & Gaver, K. M. (1995). Compensation policy and the investment opportunity set. Financial Management:19–32.

Greene, W. (2005). Fixed and Random Effects in Stochastic Frontier Models. Journal of Productivity Analysis, 23(1): 7–32.

Gujarati, D. N. (2003). *Basic Econometrics*. Fourth edi. United States Military Academy, West Point.

Gul, F. a. (1999). Government share ownership, investment opportunity set and corporate policy choices in China. Pacific-Basin Finance Journal, 7(2): 157–172.

Jääskeläinen, A., & Lönnqvist, A. (2011). Public service productivity: how to capture outputs? International Journal of Public Sector Management, 24(4): 289–302.

Kehelwalatenna, S., Gunaratne, P. S. M., & Lanka, S. (2010). The Impact Of Intellectual Capital On The Firm Performance And Investor Response : An Empirical Study Of Selected Sectors In Colombo Stock. University of Kelaniya, Sri Lanka. Available: http://archive.cmb.ac.lk:8080/research/handle/70130/2228. Accessed on [2013-7-12].

Lang, L., Ofekb, E., & Stulz, R. M. (1995). Leverage , investmcmt , and firm growth. Journal of Finance Economics, 40: 3–29.

Lê, Q., Spencer, J., & Whelan, J. (2008). Development of a tool to evaluate health science students' experiences of an interprofessional education (IPE) programme. Annals of the Academy of Medicine, Singapore, 37(12): 1027–1033.

Mehralian, G., Rajabzadeh, A., Sadeh, M. R., & Rasekh, H. R. (2012). Intellectual capital and corporate performance in Iranian pharmaceutical industry. Journal of Intellectual Capital, 13(1): 138–158.

Mohd Kh Mehri, M., Umar, M. S., Saeidi, P., Hekmat, R. K. & Naslmosavi, S. (2013). Intellectual Capital and Firm Performance of High Intangible Intensive Industries: Malaysia Evidence. Asian Social Science, 9 (9): 146–155.

Mohd Khalique,S, Jamal Abdul Nassir, Abu Hassan & Noridah Samad, B. (2013). Impact of Intellectual Capital on the Organizational Performance of Islamic Banking Sector in Malaysia. Asian Journal of Finance & Accounting, 5(2): 75–83.

Myers, C. (1977). Determinants Of Corporate Borrowing. Journal of financial economics, 5: 147–175.

Pablos, P. O. De. (2004). European learning firms Measuring and reporting structural capital Lessons from European learning firms. Journal of Intellectual Capital, 5(4): 629–647.

Pulic, A. (2000). VAIC^{TM}–an accounting tool for IC management. International journal of technology management, 20(5): 702–714.

Razafindrambinina, D., & Anggreni, T. (2011). Intellectual Capital and Corporate Financial Performance of Selected Listed Companies in Indonesia. Malaysian JournIanl toelfl eEcctounaol mCiacp iSttaul daiensd, 48(1): 61–77.

Rehman, H. ur, Zahid, A., Rehman, C. A., & Rehman, W. ul. (2011). Intellectual Capital Performance And Its Impact On Corporate Performance : An Empirical Evidence From Modaraba Sector Of Pakistan . Australian Journal of Business and Management Research, 1(5):8–16.

Riahi-Belkaoui, A. (2000). *Accounting and the investment opportunity set*. Greenwood Publishing Group.

Ruchala, L. V. (1997). *Managing and Controlling. Management Accounting*-New York-, 79: 20–27.

Smith, W., & Warner, B. (1979). On financial contracting: An analysis of bond covenants. Journal of Financial Economics, 7:117–161.

Sharabati, A. A., Nour, A. I. & Shamari, N. S. (2013). The Impact of Intellectual Capital on Jordanian Telecommunication Companies' Business Performance. American Academic & Scholarly Research Journal, 5 (3): 32–46.

Soedaryono, B., Murtanto, & Prihartini, A. (2012). Effect intellectual capital (Value Added Intellectual Capital) to market value and financial performance of banking sector companies listed in Indonesia stock exchange : 89–106. Phuket -Available:Thailand. http://portal.kopertis3.or.id/bitstream/123456789/1046/1/Effect_Intellectual_Capital_Value. pdf.Accessed on[2014-9-17].

Sofian, S., Tayles, M., & Pike, R. (2006). The implications of intellectual capital on performance measurement and corporate performance.Available: http://scholar.google.com.my/scholar. Accessed on [2013-7-9].

Sudarsanam, S. Sorwar, G, & Marr, B. (2006). Real options and the impact of intellectual capital on corporate value. Journal of Intellectual Capital, 7(3):291–308.

Tan, H. P., Plowman, D., & Hancock, P. (2007). Intellectual capital and financial returns of companies. Journal of Intellectual Capital, 8(1): 76–95.

Ting, I. W. K., & Lean, H. H. (2009). Intellectual capital performance of financial institutions in Malaysia. Journal of Intellectual Capital, 10(4):588–599.

Ulum MD Ihyaul.(2009). Intellectual Capital Performance of Banking Sector in Indonesia, Journal Of Accounting And Finance, 10(2): 77-84.

Venugopal, D., & Madukkarai, S. N. T. G. (2012). Intellectual Capital and Value Creation Efficiency- An Empirical Investigation into the Intellectual Capital and Financial Performance of Indian Software Industry, 33(1): 119–132.

Wang, M. S. (2011). Intellectual Capital and Firm Performance. Annual Conference on Innovations in Business and Management: 1–26. London, UK. Available: http://www.cibmp.org/Papers/Paper566. Accessed on[2012-9-17].

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. Econometrica: Journal of the Econometric Society, 48(4): 817–838.

World bank. (2014).word bank,. Available: http://data.Worldbank.org/ indicator. Accessed on [2014-3-14).

Zuliyati & Arya, N. (2011). Intellectual Capital and Company ' s Financial Performance. Dynamics of Finance and Banking, 3(1): 113–125.