

The Effect of Intellectual Capital on Firm's Performance: Evidence from Servicing and Non-Servicing Sectors in Malaysia

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Abstract

The purpose of this study is to discover the effect of Intellectual Capital on the performance of companies and further compare the results between servicing and non-servicing sectors. The study investigates the cross sectional variation among value creation efficiency of Malaysia public listed companies for the period 2003-2008 (6 years). The samples were divided into 2 different groups which are servicing sectors and non-servicing sectors to investigate whether there is any different implication between both sectors. The results indicated that most of the listed companies in Malaysia rely heavily on human capital. In fact, more than 70 percent of the value created in the samples was attributed to human capital. The study also shows that human capital efficiency and capital employed efficiency have significant positive effect on market valuation and profitability while structural capital efficiency has negative effect.

Keywords: *Intellectual capital, Market valuation, Profitability, Servicing sectors, Non-servicing sectors.*

1. INTRODUCTION

The business world has seen a great evolution and liberalization from the old age. Malaysia in particular, from an agriculture-based country, has transformed to a country that depends more on manufacturing in the 1970s (Wikipedia, 2010). To strive for a developed nation status, emphasizing on manufacturing sector alone is definitely difficult to achieve the mission. A hybrid of servicing and non-servicing sectors plays a vital role in economic growth indeed. A healthy and strong servicing sector is a complement to the non-servicing sector. In the period of 1980-2005, on average, the servicing sector grew by 8.3 percent per year while manufacturing or non-servicing sector recorded 9.1 per cent per year. The growth in servicing sector as compared with non-servicing sector showed significant contributions to total output, total employment and export earnings to the country (Economics Division, 2005). The Third Industrial Master Plan (IMP3), 2006-2020, has targeted RM45.9 billion per year as investment to boost the growth in view of the important role of the servicing sector (MIDA, 2008).

One of the indications on the government initiatives to achieve Vision 2020 is the launching of Knowledge-based Economy Master Plan in 2002 to sustain a rapid rate of economic growth and improve the global competitiveness (Economic Planning Unit, 2001). There are numerous definitions of IC available in literature. However, the general definition by Chong (2008) is "non-monetary asset without physical substance but it possesses value or it can generate future benefits." The author drew a general view on IC after compiling a listing of 30 definitions and indications from literature covering period from 1991 until 2004. The definition of IC by Stewart in 1998 as cited by Chong (2008) is the collective brainpower that can be put to use to create wealth. The brainpower refers to knowledge, information, intellectual property and experience. Value Added Intellectual Coefficient (VAIC™), a prominent and proven method to measure IC (Chen et al, 2005; Chan, 2009a & 2009b; Ting & Lean, 2009) is used as the model to measure IC. This model is a practical measurement

system that reports the true value and performance of a company. Chan (2009a) outlines numbers of advantages of the method. Among others are objectivity, relevance, usefulness, comparability, simplicity, reliability and consistency with all major definitions as it does not undermined the importance of human capital (HC).

The purpose of this study is to discover the effect of IC on the performance of companies and further compare the results between servicing and non-servicing sectors. This would enable the firms to understand the three elements of IC, namely, HC, structural capital (SC) and customer capital (CC). Moreover, it could enable the companies to find out and strive for the main IC drivers within and outside their firms. Additionally, using VAICTM by Pulic (1998) to measure IC between two sectors would further enhance and promote the comparability attributes of the model. This paper is organized into five sections. The first section is the introduction of the research. It is followed by literature review in the second section which discusses the previous studies on IC. The third section summarizes the sampling, research methodology and research framework. The fourth section consists of analysis of data and the findings. Finally, the fifth section concludes the paper and gives recommendation for future research.

2. LITERATURE REVIEW

Few studies had been conducted in measuring the IC to the firm's performance. Firer and Williams (2003) investigated the association between the efficiency of value added (VA) from three major components to corporate performance. The results indicated that business sectors are heavily reliant on IC from a sample of 75 publicly trade firms in South Africa. Generally, they concluded that there was only a moderately positive association between firm's SC and profitability, HC and productivity. According to Saenz (2005), there is a clear positive relationship between HC indicators and market-to-book ratio (MBR), and almost non-existent one between HC indicators and banks' efficiency and financial return. Najibullah (2005) conducted the same study for 22 commercial banks of Bangladesh. The study concluded that investors valued a bank based on its physical assets by not considering its structural capital efficiency (SCE) and human capital efficiency (HCE). Chen et al (2005) carried out the similar study to investigate the relation between the value creation efficiency and firms' market valuation (MB) and financial performance in Taiwan. They supported the hypothesis that firms' IC had a positive impact on market value and financial performance. Shiu (2006) targeted 80 Taiwan listed technological firms for the year 2002-2003. The regression results demonstrated that CEE and HCE had a significant positive effect on profitability whereas SCE had a negative effect. The results for VAICTM documented that increases in value creation efficiency influenced profitability and MB but decreased productivity.

Tan et al (2007) also used Pulic's framework to investigate 150 publicly listed companies in Singapore for the years 2000 to 2002. The findings show that IC, company performance (ROE) and future company performance were positively related. The results also conclude that the contribution of IC to company performance differed by industry. Kamath (2008) also studied the relationship between IC components with the traditional measures of performance of the company namely profitability, productivity and MB. The study focused on 25 firms in the drug and pharmaceutical industry in India for the periods 1996 to 2006. The empirical findings fail to establish any significant positive relationship between firm's performance in terms of profitability, productivity and MB with any of the independent variables. Furthermore, the results also conclude that HC is the one which seen to have the major impact on the profitability and productivity of the firms over the period of study. Chan (2009a & 2009b) investigated if IC has any impact on the financial aspects of organizational performance and attempted to identify the IC components that may be the drivers for the leading financial indicators of Hong Kong listed companies from 2001 to 2005. The study

confirms again PC is highly regarded by local investors in the determination of the valuation of listed companies. However, it is concluded that Hong Kong companies tend to place less emphasis on HC in their effort to enhance productivity. Ting and Lean (2009) examined the IC performance and its relationship with financial performance of financial institutions in Malaysia for the periods 1999 to 2007. The study reveals that VAICTM and ROA are positively related among Malaysia's finance sector. The results also show that the three components of VAICTM are associated with profitability with the explanatory power of 71.6%.

In summary, all literature documented the studies on IC and firms' market value and financial performance. This study is extending the previous study of Ting and Lean (2009) by adding more dependent variables to measure the effect of IC on organizational performance namely MB, productivity (ATO) and ROE. The study adopted and extended Chan's (2009) framework by looking at the impact of IC in two different sectors namely servicing and non-servicing sectors.

3. DATA AND METHODOLOGY

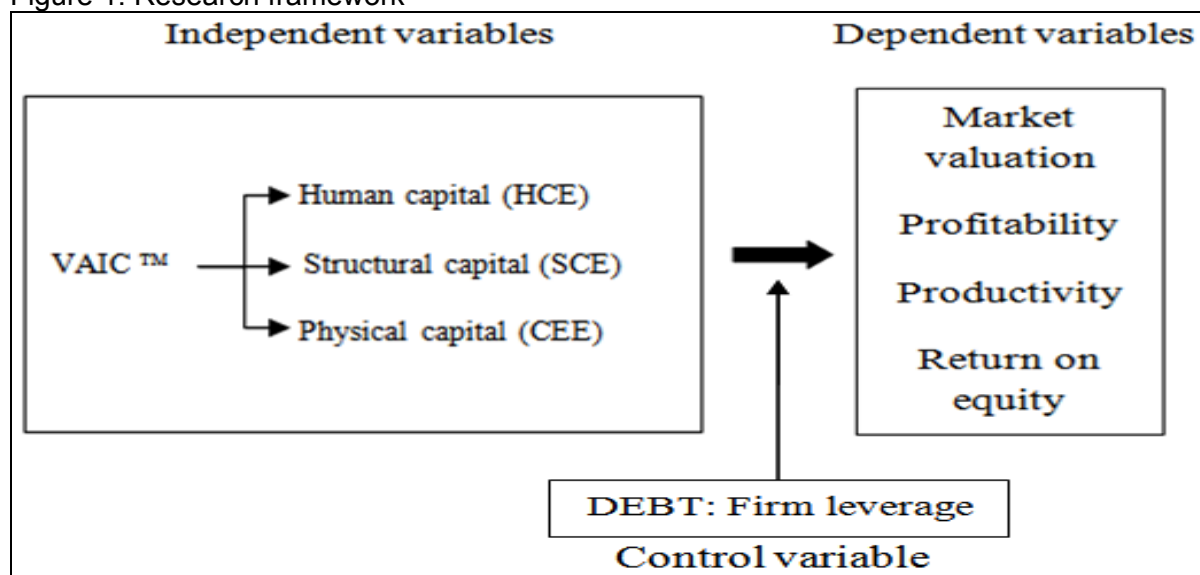
3.1 Source of data

The data used in this paper is collected from the annual reports of public-listed companies in the main market of Bursa Malaysia as of 20 January 2010. The total population is 859 companies consisting of 240 servicing companies (28%) and 619 non-servicing companies (72%). 74 samples from servicing sector (trading/services, finance and hotels) and 192 samples from non-servicing sector (consumer products, industrial products, construction, infrastructure, technology, properties, plantation and mining) are randomly selected using online random sequence generator available in RANDOM.ORG. The total sample size, 266 samples, is suggested by the online sample size calculator by Raosoft, Inc.

3.2 Research framework

As shown in Figure 1, the independent variables are VAICTM while dependent variables are MB, profitability (ROA), ATO and ROE. Firm leverage (DEBT) is the control variable.

Figure 1: Research framework



Source: Adapted from Shiu (2006) & Chan (2009a).

3.2.1 Independent variables

$$VAIC^{TM} = HCE + SCE + CEE$$

$$HCE = VA/HC$$

Where: $VA = OP + EC + D + A$

HC = Total salaries and wages, OP = Operating profits, EC = Total employee expenses viewed as investment, D + A = Depreciation and amortization

$$SCE = SC/VA$$

Where: $SC = VA - HC$

$$CEE = VA/CA$$

Where: CA = Book value of the net assets

3.2.2 Dependent variables

MB = market capitalization/ common stocks

ROA = operating income/ total assets

ATO = total revenue/ total assets

ROE = net income/ total shareholders' equity

3.2.3 Control variable

DEBT = total debt/book value of total assets

Following Chan (2009a & 2009b), the models of this study are as follow:

$$MB_i = B_i + B_1HCE + B_2SCE + B_3CEE + B_4DEBT + \varepsilon \quad (1)$$

$$ROA_i = B_i + B_1HCE + B_2SCE + B_3CEE + B_4DEBT + \varepsilon \quad (2)$$

$$ROE_i = B_i + B_1HCE + B_2SCE + B_3CEE + B_4DEBT + \varepsilon \quad (3)$$

$$ATO_i = B_i + B_1HCE + B_2SCE + B_3CEE + B_4DEBT + \varepsilon \quad (4)$$

3.3 Research hypothesis

H_1 : Companies with higher VAICTM have higher dependent variables.

H_2 : Independent variables are positively associated with dependent variables.

4. FINDINGS AND ANALYSIS

Table 1: Descriptive statistics for VAICTM and explanatory variables by sectors (2003-2008)

	Servicing		Non-servicing	
	Mean	S.D.	Mean	S.D.
HCE	3.5584	2.4579	3.2602	2.2494
CEE	0.6633	0.6261	0.3855	0.5221
SCE	0.6851	0.2560	0.6777	1.0516
VAIC TM	4.8461	2.8308	4.2863	2.6588
MB	1.3430	4.6104	0.9511	0.8850
ROA	3.0555	7.9311	2.2058	9.1327
ROE	4.3907	20.7207	2.8661	19.6358
ATO	0.6378	0.4410	0.6821	0.5112
DEBT	0.4316	0.1945	0.3945	0.1875
Sample size (n)	74		192	

The descriptive statistics of the independent, dependent and control variables of servicing sectors and non-servicing sectors are shown in Table 1. For HCE, the reported mean was 3.5584 for servicing sectors and 3.2602 for non-servicing sectors. It indicates that HCE for servicing sectors is slightly higher than non-servicing sectors. Servicing sectors also show a higher CEE and SCE (0.6633 and 0.6851) compared to those of non-servicing sectors (0.3855 and 0.6777). With regards to VAICTM (i.e. the sums of HCE, CEE and SCE), servicing sectors have higher efficiency ranking with VAICTM of 4.8461 compared to non-servicing sectors of 4.2863. In other words, servicing sectors are slightly more efficient than

non-servicing sectors. The mean for MB is about 1.343 and 0.9511 for servicing and non-servicing sectors respectively. It indicates that investors generally valued the servicing sectors in excess of the value of the book value of share price as reported in the financial statements of servicing sectors. ROA, ROE and ATO have means of 3.0555, 4.3907 and 0.6378 for servicing sectors and 2.2058, 2.8661 and 0.6821 for non-servicing sectors. However, the descriptive statistics also show that servicing sectors have higher gearing level of 0.4316 compared to non-servicing sectors with the debt ratio of 0.3945.

Table 2: Result from the analysis using VAIC™

Year	Sector	HCE	CEE	SCE	VAIC™
2003	Servicing	3.7521	0.6060	0.6414	4.9898
	Non-servicing	3.5940	0.3428	0.6103	4.5388
2004	Servicing	3.9529	0.5616	0.6791	5.1473
	Non-servicing	3.4784	0.3109	0.8262	4.6168
2005	Servicing	3.5338	0.7659	0.6870	4.8592
	Non-servicing	3.1932	0.3832	0.6556	4.1900
2006	Servicing	3.5299	0.6590	0.7017	4.8691
	Non-servicing	2.9735	0.3891	0.6644	4.0050
2007	Servicing	3.1571	0.6764	0.7006	4.3887
	Non-servicing	3.3329	0.4354	0.6398	4.3532
2008	Servicing	3.3934	0.7109	0.7006	4.7916
	Non-servicing	2.9740	0.4524	0.6695	3.9993
Average	Servicing	3.5584	0.6633	0.6851	4.8461
	Non-servicing	3.2602	0.3855	0.6777	4.2863

Result in Table 2 indicates that the value creation capability of the servicing and non-servicing sectors is largely attributed to HCE for the periods 2003 to 2008. In other words, HCE is the main contributor to VAIC™, followed by SCE and CEE. HC is important in servicing and non-servicing sectors. It helps a company's success and survival which are based on employee's excellent knowledge. In fact, more than 70 percent of the value created in the samples was attributed to HC. It indicates that most of the listed companies in Malaysia rely heavily on HC. The high value of HCE shows that the investment in HC yields a relatively higher return than investment in PC and SC.

Table 3: Correlations matrix for HCE, CEE, VAIC™, MB, ROA, ROE and ATO

	HCE	CEE	SCE	VAIC™	MB	ROA	ROE	ATO	DEBT
HCE	1	0.154**	0.091**	0.907**	0.117**	0.265**	0.207**	-0.075**	-0.037
CEE		1	0.026	0.378**	0.097**	-0.014	-0.030	0.283**	0.185**
SCE			1	0.428**	0.002	-0.147**	-0.081**	-0.072*	-0.042
VAIC™				1	0.127**	0.173**	0.138**	-0.010	0.000

**Correlation is significant at the 0.01 level.

*Correlation is significant at the 0.05 level.

Findings from Pearson pair wise correlations show that HCE is significantly positively correlated ($P < 0.01$) with CEE, SCE, VAIC™, ROA and ROE but significantly negatively correlated with ATO. The result implies HC is the factor either in servicing or non-servicing sectors which has a positive correlation with profitability of the company. However, it is insignificantly negative correlated with Debt Ratio. Results also indicate that CEE is significantly positively associated ($P < 0.01$) with VAIC™, MB, ATO and Debt ratio. Therefore, firms with high CEE would have better MB and productivity as compared to other companies with low CEE. On the other hand, SCE seems to have significant negative correlation with ROA and ROE with P value < 0.01 and ATO with P value < 0.05 . Therefore, a company with

low SCE will hamper its profitability in ROA, ROE and ATO. Moreover, the finding also presents a significant positive association between SCE with VAICTM ($P < 0.01$). Hence, from the above analysis, it can be deduced that the degree of associations among the independent variables are very weak, because the coefficients are very low. In other words, the correlation coefficients are not sufficiently large to cause collinearity problem in the regression.

Table 4: Standardized regression based on all samples

DVs	MB		ROA		ROE		ATO	
IVs	β	t	β	t	β	t	β	T
HCE	.109***	3.761	.262***	10.077	.206***	7.500	-.120***	-4.328
CEE	.078***	2.653	.052**	1.959	.010	.364	.336***	11.99
SCE	-.004	-.137	-.197***	-7.677	-.120***	-4.44	-.066**	-2.419
DEBT	.099***	3.391	-.36	-13.80	-.296	-10.8	.019	.684
	$R^2 = 0.033$		$R^2 = 0.227$		$R^2 = 0.141$		$R^2 = 0.123$	
	F-stat = 9.981		F-stat = 87.24		F-stat = 48.479		F-stat = 41.721	
	(P<0.01)		(P<0.01)		(P<0.01)		(P<0.01)	

Table 5: Standardized regression based on servicing sectors

DVs	MB		ROA		ROE		ATO	
IVs	β	t	β	t	β	t	β	T
HCE	.256***	4.114	.180***	3.229	.094	1.590	.016	.270
CEE	.032	.581	-.098**	-2.006	-.127**	-2.43	.398***	7.658
SCE	-.13**	-2.08	.156***	2.781	.129**	2.152	-.045	-.761
DEBT	.162***	2.987	-.402***	-8.301	-.309***	-5.96	.024	.472
	$R^2 = 0.073$		$R^2 = 0.256$		$R^2 = 0.153$		$R^2 = 0.160$	
	F-stat = 6.672		F-stat = 29.372		F-stat = 15.423		F-stat = 16.293	
	(P<0.01)		(P<0.01)		(P<0.01)		(P<0.01)	

Table 6: Standardized regression based on non-servicing sectors

DVs	MB		ROA		ROE		ATO	
IVs	β	t	β	t	β	t	β	T
HCE	.049	1.421	.232***	7.584	.197***	6.092	-.178***	-5.489
CEE	.166***	4.758	.148***	4.818	.119***	3.663	.375***	11.49
SCE	-.001	-.030	-.231***	-7.685	-.148***	-4.682	-.073**	-2.311
DEBT	.060*	1.755	-.358	-11.82	-.302***	-9.439	.019	.517
	$R^2 = 0.039$		$R^2 = 0.249$		$R^2 = 0.163$		$R^2 = 0.156$	
	F-stat = 8.562		F-stat = 69.633		F-stat = 40.897		F-stat = 39.025	
	(P<0.01)		(P<0.01)		(P<0.01)		(P<0.01)	

Note: The regression coefficients shown in the table are standardized regression coefficients (beta coefficients), and the value in the parentheses of the table is the t-statistic. ***, ** and * indicates that the estimated coefficient is significant different from zero at 1 percent, 5 percent and 10 percent respectively.

Table 4 shows the results of the regression analysis on HCE, CEE and SCE to dependent variables for all samples. Multicollinearity test of the three independent variables and control variable (HCE, CEE, SCE and DEBT) has been done. Using a cut-off value of VIF less than 5 (VIF for HCE =1.420, VIF for CEE =1.097, VIF for SCE=1.444 and VIF for DEBT=1.077 respectively) so no multicollinearity among the variables is found. The table presents the results of the linear multiple regression analysis of HCE, CEE, SCE and the control variables (DEBT) with MB, ROA, ROE and ATO. From the results, the three components and DEBT of the samples are found to have a significant effect on MB with the explanatory power of 3.3

percent. However, the explained variance is small in statistical significance when compared to the other regression models used in the study. In other words, the predictive strength of VAICTM for MB with the presence of the control factor, DEBT in regression models is low in overall explanatory power. However, all of the independent variables have significant positive impact on MB ($P < 0.01$). In terms of ROA, the regression model showed the strongest predictor with the explanatory power of 22.7 percent of the variance in ROA. However, out of the three IC components, SCE is the only variable that contributed a highly significant negative impact on ROA. For every addition SCE contributed to ROA, the decrease in the rating for ROA is RM0.197. HCE is found to be significantly positive in relation to ROE but significantly negative in the influence of ATO with $p\text{-value} < 0.01$ while SCE is significantly negative in relation to ROE and ATO with $p\text{-value} < 0.01$ and 0.05 respectively. For every addition SCE contributes to ROE, the decrease in the rating for ROE is RM0.12. However, there is a deduction of RM0.066 for ATO in every addition SCE. The result is consistent with Kamath (2008) who investigated 25 firms in drug and pharmaceutical industry in India stating that there was a negative correlation between companies' SC and its ROE and ATO.

Table 5 and 6 show the regression result of HCE, CEE, SCE and DEBT with MB, ROA, ROE and ATO comparing between servicing and non-servicing sectors. In servicing sector, R^2 for MB, ROA, ROE and ATO are reported as 7.3 percent, 25.6 percent, 15.3 percent and 16 percent respectively. While in non-servicing sector, R^2 for MB, ROA, ROE and ATO are reported as 3.9 percent, 24.9 percent, 16.3 percent and 15.6 percent respectively. HCE is found to have significant positive relationship with MB and ROA in servicing sector and ROA and ROE in non-servicing sector at the confidence level 99%. However, for CEE, the regression results show a significantly opposite relationship with ROA and ROE between servicing and non-servicing sectors. In other words, for every addition of CEE contributing to ROA and ROE, the decrease in the rating for ROA and ROE is RM0.232 and RM0.197 respectively for non-servicing sectors. However, an increment in CEE will reduce the servicing sector's ROA and ROE by RM0.098 and RM0.127 respectively. This result shows that capital employed plays an important role in increasing the financial performance of non-servicing sector but not in servicing sector. The regression result also suggests that SCE has a significant negative impact on MB, profitability and productivity in non-servicing industries in Malaysia. The control variable of Debt contributes very little to explaining the movement in the dependent variables except in case of ROE for non-servicing sector. However, findings show that there is a significant association between the leverage of the servicing sectors and its MB, profitability and ROE.

5. CONCLUSION

The purpose of this paper is to investigate the intellectual performance between servicing and non-servicing sectors in Malaysia. The empirical findings from this research clearly reveal that HC is important in servicing and non-servicing companies. Therefore, a company's success and survival are mainly based on employee's excellent knowledge. In fact, more than 70 percent of the value created in the samples was attributed to HC. It indicates that most of the listed companies in Malaysia rely heavily on HC. The descriptive statistics documented HCE for servicing sector is slightly higher than non-servicing sector. Furthermore, the results also indicate that investors generally valued the servicing sector in excess of the value of the book value of share price as reported in the financial statements for servicing sectors. The study shows that HCE and CEE have significant positive effect on MB and profitability while SCE has negative effect. The result is consistent as reported by Ting and Lean (2009). In other words, it shows the same directional signs for HCE (+), CEE (+), SCE (-) associated with profitability when we refer to all samples' regression result. With that, it can be concluded that VAICTM indicates efficiency in creating corporate value or the extent of corporate intellectual ability. In other words, the VAICTM results show that increases

in value creation efficiency influence profitability. However, this study is contradictory to the research done by Chen et al. (2005) which find that SC is significant positive with ROE. As a conclusion, IC is crucial in value creation for all company because it helps a company to generate income and improve their financial performance. IC is also considered critical for the competitive advantage, an increase in productivity and in market value. Even though there are other important factors contribute to the firm's performance, the researcher believes that the IC can be one of the predictors towards firm's performance. Moreover, investors need non financial disclosure besides financial measures to assist them in their decision making. This is the first study to investigate IC performance on the servicing and non-servicing sectors in Malaysia, this paper should be a good start or source of reference for future study on Malaysia's public listed sector. However, the study fails to determine the IC performance for all sectors due to the limited data. Besides that, we would like to suggest in future research; the researcher might consider examining the determinants of value creation efficiency in public listed companies

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