

# Intellectual Capital Efficiency Level of Malaysian Financial Sector: Panel Data analysis (2002-2006)

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## ABSTRACT

*Intellectual capital which encompasses human capital, structural capital and capital employed has been regarded as a prominent source of competitive advantage of various organizations, which influence the level of innovativeness and creativity that lead to the increase of business performance and a country's economic growth. Malaysia, as a progressive developing Asian country, must now focus on knowledge driven economy in order to be competitive and capable to face various challenges that exist in the global market. Malaysian financial sectors in particular, need to anticipate and rapidly respond to these demands and expectations in order to maintain their competitive edge in the industry. Therefore, the aim of this study is to examine the efficiency level and the trend of intellectual capital among Malaysian financial sectors and its impact on their company's value added. Using a model introduced by Pulic (1998) to measure value added intellectual Capital (VAIC<sup>tm</sup>) and panel data analysis to measure the trend of intellectual capital; it was found that out of 18 companies evaluated from year 2002-2006, banking sectors owning more on intellectual capital followed by insurance company and brokerage firm. Company's value added was very much related to the amount of capital employed as compared to other variables. The trend of intellectual capital shows positive relationship for almost all sectors. However the relationships was found insignificant.*

**Keyword:** *Intellectual Capital, Human Capital, Structural Capital and Capital employed*

## 1.0 INTRODUCTION

Intellectual capital has been regarded as a prominent source of competitive advantage of various organizations, which influence the level of innovativeness and creativity that lead to the increase of business performance and a country's economic growth. Thus, to be competitive in the global market, a progressive developing Asian country like Malaysia has to effectively transfer from just being an input-driven to a knowledge-driven economy that focuses more on utilizing human knowledge and skills, rather than on productions of labor-intensive goods (Goh, 2005). Whilst shifting into a knowledge-based economy, Malaysian organizations can achieve success in both the marketplace and with investors based upon intangibles or intellectual capital assets. In line with this, the enrichment of the mentality and intellectual capacity of a nation has become one of the areas targeted under the Ninth Malaysia Plan.

Given the tremendous power of intellectual capital assets to influence the valuation of an enterprise, it is critical that executives learn to employ these assets to improve profitability and increase shareholder value. With rapid changes taking place in the local financial landscape, financial institutions must be ready for the challenges and be well equipped with distinct capabilities to take advantage of the

opportunities that the new environment accorded. Among the challenges are intense competitive pressure, arising not only from changes in the financial environment, technological advancements and financial reforms but also the entry of new players and the increasing number of consumers who are discerned in terms of product quality as well as range, and are more financially sophisticated. Thus, financial institutions need to anticipate and rapidly respond to these demands and expectations in order to maintain their competitive level in the industry. Besides that, highly skilled individuals are strongly needed to facilitate the delivery of high value-added products and services as well as have the competencies to build consumer confidence and trust (Yakop, 2006).

Despite the importance of intellectual capital as a wealth driver to an organization and to a nation, there are many issues that are still debatable. One of the critical issues is regarding the development of measurement models that best explain the hidden values of financial institutions that reflects the values unexplained by traditional accounting method. Even though physical capital is vital for business operation, the emphasis on intellectual capital and skill sets is pivotal to support business performance. Therefore, the aim of this paper is to examine the efficiency level of intellectual capital among the companies under financial sectors in Malaysia and which component namely human capital, structural capital and capital employed contributes most to the value added intellectual capital.

## 2.0 LITERATURE REVIEW

### 2.1 Intellectual Capital

Intellectual capital is defined as intangible assets that comprise of technology, customer information, brand name, reputation and corporate culture that are invaluable to a firm's competitive power (Low & Kalafut, 2002). To further classify it, intellectual capital usually consists of (1) tacit knowledge and innovativeness of the employees; (2) infrastructure of human capital (i.e. good working system, innovation) and improvement processes of structural capital; and (3) external relationships of the firm (i.e. customers' capital). These are the key drivers of organization performance and creation of future wealth

(Bontis, Keow, & Richardson, 2000; Riahi-Belkaoui, 2003). Based on the definition given, intellectual capital can be divided into three important components: human capital, structural capital and capital employed.

#### 2.1.1 Human capital

Human capital can be defined as health, knowledge, motivation and skills, the attainment of which is regarded as an end in itself (irrespective of their income potential) because they yield fulfillment and satisfaction to the possessor. It is also referred to the employee competence in creating both tangible and intangible assets by contributing in the continuous generation of knowledge and ideas. Unlike structural capital, human capital is always owned by the individuals who have it, unless it is recorded in a tangible form or is incorporated in the organization's procedures and structures ([businessdictionary.com](http://businessdictionary.com)). In essence, continuous strengthening of intellectual resources and capabilities must be made to create a larger pool of talents and high caliber professionals in the banking and finance industry (Zeti, 2005). Financial sector in particular, needs a new generation of professional executives who are more customer-centric, technology-savvy, more highly qualified, flexible and agile with skill sets that are now more comprehensive than previously. In the context of globalization, high class human capital today has become a necessity and not merely opulence.

#### 2.1.2 Structural Capital

Structural capital encompasses the enabling structures that allow the organization to exploit the intellectual capital. The structures ranges from tangible items offered by an organization such as patents, trademarks and databases, to complete intangible success such as culture, transparency and trust among employees (Seetharaman, Low, & Saravanan, 2004). This capital is resulted from the products or systems that firm has created over time and will stay remains with the enterprise when people leave (Nik Muhammad & Aida, 2007). Thus, organizations that possess strong structural capital will have a supportive culture that permits their employees to try new things, to learn and to practice them (Bontis et al., 2000).

#### 2.1.3 Capital Employed

Capital employed on the other hand can be defined as total capital harnessed in a firm's fixed and current assets. Viewed from the funding side, it equals to stockholders' funds (equity capital) plus long-term liabilities (loan capital). However, if it is viewed from the asset side, it equals to fixed assets plus working capital (businessdictionary.com). Thus, capital employed represents the value of the assets that contribute to a company's ability to generate revenue (investorword.com) and it is also known as operating assets. This capital is normally financed by using two funding methods: shareholders' equity and net debts. It is the assets within a manager's direct span of control and typically includes accounts receivable, inventory and plant and equipment.

### 3.0 METHODOLOGY

This study focuses on the intellectual capital efficiency of companies under financial sector in Bursa Malaysia. The annual reports of the three financial sectors namely commercial bank, insurance company and security brokerage for the year 2002 to 2006 were chosen for this study. The model introduced by Pulic (1998) were used to measure Value Added Intellectual Capital (VAIC<sup>TM</sup>) and panel data analysis vis-a-vis multiple regression was used to identify the relationship between Value Added Intellectual Capital (VAIC) and its components such as Human Capital coefficient (HC), Capital Employed coefficient (CA) and Structural Capital coefficient (SC).

Value Added Intellectual Coefficient (VAIC<sup>TM</sup>) model introduced by Pulic (1998) enables the firm to measure its value creation efficiency (Pulic, 2001; 2002). VAIC<sup>TM</sup> method used financial statements of a firm to calculate the efficiency coefficient on three types of capital – that is human capital, structure capital and capital employed. Though VAIC<sup>TM</sup> uses accounting data, it does not focus on the cost of the firm. It is only focused on the efficiency of resources that create values to the firm (Bornemann 1999; Pulic 2000). A higher value for VAIC implies a greater efficiency in the use of firm capital, since VAIC is calculated as the sum of capital employed efficiency, human capital efficiency and structural capital efficiency. Pulic (2001) identified that firms' market value have been created by capital

employed (physical & financial) and intellectual capital.

VAIC of a firm can be calculated using the following five steps:

#### Step- 1

Calculation of value added (VA<sub>it</sub>) by all the resources of the firm during the 't' period of time.

Where,

OUTPUT<sub>it</sub> = Total income from all products and services sold during the period of t.

INPUT<sub>i</sub> = All expenses (except labor, taxation, interest, dividends, depreciation) incurred by firm for the period of t.

Therefore,

$$VAit = OUTPUTit - INPUTit \quad (1)$$

The Calculation of value added by a firm during a particular period is based on the theory of stakeholder view (Donaldson and Preston, 1995). The stakeholder theory suggests that everyone who affects and be affected by what a firm does has an interest (stake) in the firm. In this context "stakeholder" includes not only vendors, employees, customers, directors, government, but also members of community as a whole. Therefore, value added by a firm to stakeholders is a broad performance measurement of the firm than accounting profit, which calculates return attributable to shareholders of the firm. According to Riahi- Belkaoui (2003), value added by a firm during a particular period can be calculated by the following formula (2).

$$R = S - B - DP - W - I - D - T \quad (2)$$

Where: R is retained earnings for the period; S is net sales revenue; B is cost of goods sold plus all expenses (except labor, taxation, interest, dividends, depreciation); DP is depreciation expenses; W is employees' salaries and wages; I is interest expenses; D is dividend paid to shareholders; and T is taxes.

$$S - B = DP + W + I + D + T + R \quad (3)$$

The left hand side of the above formula shows that total value generated by the firm during a particular period and the right hand side indicates how the firm has distributed its generated value among stakeholders such as depreciation expenses – DP;

employees salaries and wages – W; debt holder interest – I; shareholder dividend – D; government taxes – T; and retained earning – R. Therefore, formula (3) can be rearranged to calculate value added by the firm, by the following formula (4).

$$VA = DP + W + I + D + T + R \quad (4)$$

$VA_{it}$  =  $DP_{it}$  (depreciation expenses) +  $W_{it}$  (salaries and wages) +  $I_{it}$  (total interest expenses) +  $D_{it}$  (dividends) +  $T_{it}$  (corporate tax) +  $R_{it}$  (profits retain for the year)

Following Pulic (2000a, b) and Firer and Williams (2003), the subsequent steps show the calculation of Value Added Intellectual Coefficient (VAIC) and its components such as coefficient of capital employed, coefficient of human capital and coefficient of structural capital.

#### Step- 2

The calculation of Value Added Capital employed Coefficient ( $VACA_{it}$ )

$$VACA_{it} = VA_{it} / CA_{it} \quad (5)$$

Where,

$CA_{it}$  = Capital Employed = Physical Assets + Financial Assets  
= Total Assets - Intangible Assets at end of 't' period.

$VACA_{it}$  = The value created by one unit of capital employed during the 't' period.

#### Step- 3

Calculation of Value Added Human Capital Coefficient ( $VAHC_{it}$ )

$$VAHC_{it} = VA_{it} / HC_{it} \quad (6)$$

Where,

$HC_{it}$  = Investment in human capital during the 't' period or total salary and wages including all incentives.

$VAHC_{it}$  = Value added by one unit of Human Capital invested during period of 't'.

#### Step- 4

Calculation of the Value Added Structural Capital Coefficient ( $STVA_{it}$ )

$$STVA_{it} = SC_{it} / VA_{it} \quad (7)$$

Where,

$SC_{it}$  = Structural capital ( $VA_{it} - HC_{it}$ )

$STVA_{it}$  = The proportion of total VA accounted by structural capital.

#### Step- 5

Calculation of Value Added Intellectual Coefficient ( $VAIC_{it}$ )

$$VAIC_{it} = VAHC_{it} + VACA_{it} + STVA_{it} \quad (8)$$

Where,

$VAIC_{it}$  = Indicate corporate value creation efficiency on firm resources

⇒ **Value added (VA):**

newly created value, calculated as follows:

$VA$  = Operating profit + Employee costs + Depreciation + Amortization, or

$VA$  = OUTPUT (Total income) – INPUT (All costs of purchasing goods and services from the market)

⇒ **Human Capital (HC):**

Overall employee expenses (salaries, education, training). In this analysis, it is considered as investment and not cost, thus not a substantial part of INPUT any more. Therefore:

**Human Capital Efficiency (HCE=VA/HC):**

⇒ **Structural Capital (SC):**

Result of human capital's past performance (organization, licenses, patents, image, standards, and relationship with customers). Therefore:

**Structural Capital Efficiency (SCE=SC/VA):**

⇒ **Capital Employed (CE):**

All material and financial assets.

**Capital Employed Efficiency (CEE=VA/CE):**

⇒ **Intellectual Capital Efficiency (ICE=HCE+SCE):**

Indicator which shows how efficiently IC has created value.

Indicator that shows how much VA is created on each monetary unit invested in CE.

⇒ **Value Added Intellectual Coefficient (VAICTM=ICE+CEE):**

Indicates the value creation efficiency of all resources (sum of the previous indicators). It expresses the intellectual ability of a company, regional or national economy.

#### 4.0 RESULTS AND FINDING

Based on the data collected from 18 financial company's annual reports listed in Bursa Malaysia for the year 2002 to 2006, Figure 1 to 4 shows the company's VAIC ranking. The results demonstrate that among the three financial sectors, commercial banks have shown the highest IC efficiency followed by insurance company and security brokerage firm (Figure 1). Affin Bank was dominated for the year 2002 to year 2004 and Public bank for 2005 and 2006 (Figure 2). For Insurance company, LPI mostly dominated the sectors (Figure 3) and for the security company, Kaf Seagroatt was dominated for all 5 years studied (Figure 4).

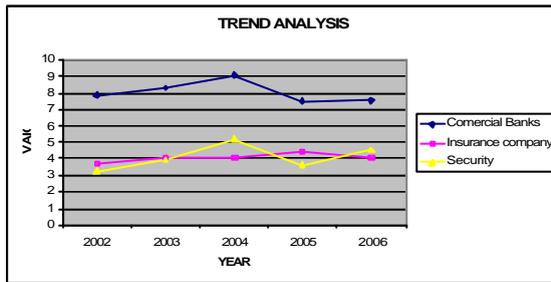


Figure 1: The trend of VAIC for the three financial sector for (2002-2006)

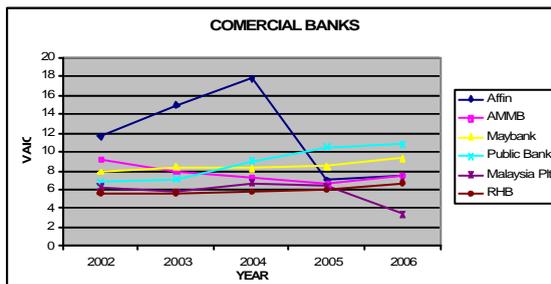


Figure 2: The trend of VAIC for commercial banks (2002-2006)

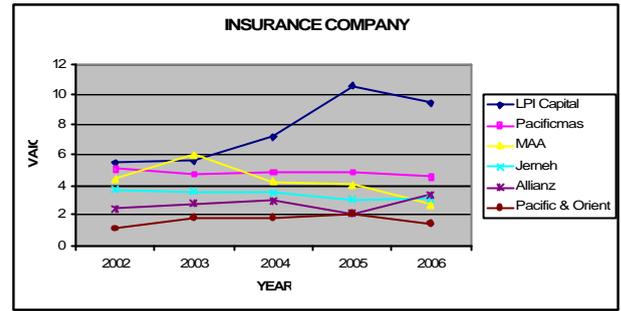


Figure 3: The trend of VAIC for insurance company (2002-2006)

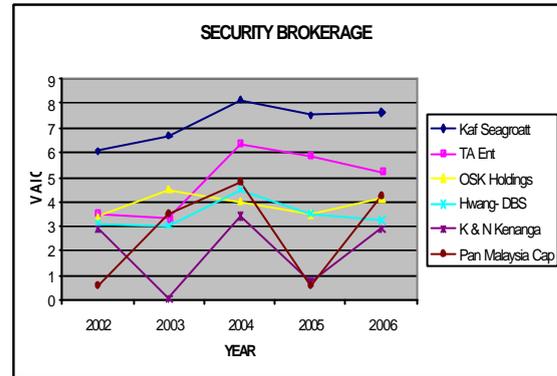


Figure 4: The trend of VAIC for security brokerage (2002-2006)

However, in terms of total corporate value added, the companies with high capital employed shows high total value added, for example Maybank, LPI capital and TA securities. Below are the trend analysis captured by the model. The graphical illustration was presented below.

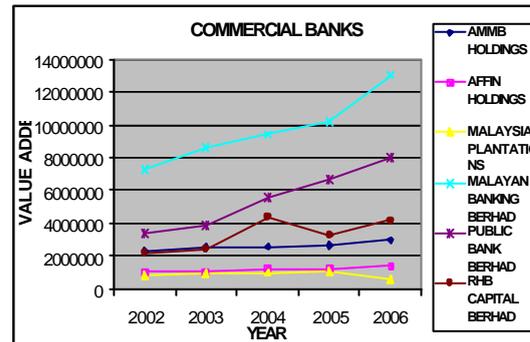


Figure 5: The trend of value added for commercial banks (2002-2006)

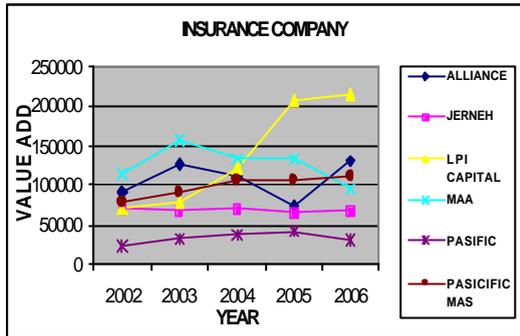


Figure 6: The trend of value added for insurance company (2002-2006)

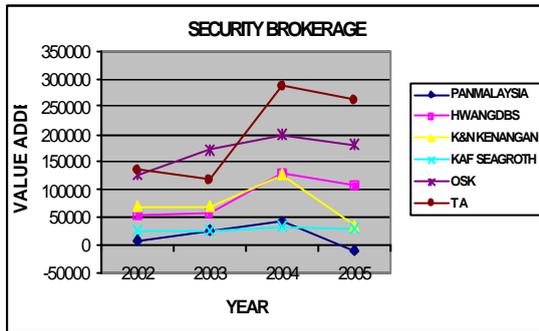


Figure 7: The trend of value added for security brokerage (2002-2006)

#### 4.2 Test of Relationships

Result of regression analysis reveals that relationships exist between Value Added Intellectual Capital (VAIC) and its components of human capital (HC), capital employed (CA) and structural capital (SC) as model 4 shows a perfect one of the R square. However, years given no significant impact on the performance of VAIC. Similarly, capital employed alone has shown no significant contribution to the VAIC level of efficiency. Out of the three components, structural capital has produced highest contribution to the efficiency level of VAIC as it showed 77 percent explanatory power and its contribution improved 76 percent of the VAIC performance.

Table 1: Model summary of multiple regression analysis

	Model 1 year	Model 2 VACA	Model 3 STVA	Model 4 VAHC
F value	0.352	0.171	34.04***	148***
R square	0.01	0.11	0.767	1.00
R square change	0.01	0.00	0.757	0.233
F change	0.352	0.00	100.7***	138***

INDEPENDENT VARIABLES	DEPENDENT VARIABLE VAIC			
	Model 1	Model 2	Model 3	Model 4
Year	-0.103	-0.103	0.36	0.00
VACA		-0.002	-2.45*	0.003***
STVA			0.914***	0.02***
VAHC				0.98***

\*\*\*significant at the 0.01 level, \*\* significant at the 0.05 level, \* significant at the 0.1 level

## 5. DISCUSSION AND CONCLUSION

The purpose of this empirical study is to investigate the efficiency level of intellectual capital among the Malaysian financial sector, its 5 year trend and the level of contribution of human capital, structural capital, and capital employed to value added intellectual capital. The study was conducted using the data from 18 companies annual reports listed from Bursa Malaysia. The method of analysis used was the one introduced by Pulic (1998, 2000, 2001) to measure intellectual capital efficiency and panel data analysis to see the relationship between VAIC and HC, SC and CA over the 5 years. Based on the measurement using VAIC™ method, banking institutions depict the highest result in efficiently utilizing their intellectual capital. However, in terms of total corporate value added Maybank, LPI capital and OSK Holdings having the highest value added. These companies produce lower IC efficiency in terms of human capital and structural capital but they maintain high capital employed. Thus, it can be concluded that in Malaysian financial sectors, firms' market value have been created more by capital employed (physical & financial) rather than intellectual capital. The findings of the study is consistent with the previous study of Goh (2005), where he also found that Maybank, which is the largest bank in terms of assets, net profit and shareholders' equity, had a lower intellectual coefficient. In the same study, he discovered that the performance of human capital is higher than those of structural and physical capital for both domestic and foreign banks in Malaysia.

Panel data analysis has confirmed that IC efficiency has no effect by years. The efficiency level of the IC indicates no trend over the years. In terms of relationship between VAIC and their components, the current study found that, overall intellectual capitals have positive and significant

relationships with only human capital and structural capital. However, capital employed alone has shown no significant relationships with VAIC. The reasons may be due to the fact that intellectual capital is influenced more by intangible than tangible assets of the organizations.

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