



## Intellectual Capital and Corporate Financial Performance: A Comparative Examination of Some Selected Malaysian and Foreign Companies

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### ABSTRACT

*Intellectual Capital (IC) is recognized as a key strategic asset for organizational performance in the competitive organizations. In this study, the performance of those companies will be measured and compared using both the intellectual capital and corporate financial performance between intellectual capital (IC) and some financial ratios of selected Malaysian and foreign companies and to find out whether there is any relationship between intellectual capital and some financial performance such as Return on assets, Return on Equity and Earning per share in the first place and which ratio has the more significance relationship to intellectual capital in the second place. Pulic's Value Added Intellectual Coefficient (VAIC) model is utilized as efficiency measure indicator, Human Capital Efficiency (HCE), Capital Employed Efficiency (CEE) and VAIC<sup>TM</sup>. The regressions model explores the relationships between intellectual capital and its contribution to the financial performance of firms in both current and future years. The results reveal that intellectual capital has got a considerable influence on some financial ratios of the selected Malaysia and foreign companies.*

**Keywords:** Intellectual capital, performance measure, VAIC.

### 1. INTRODUCTION

In the last three decades, Malaysia has transformed itself from a country that depended on agricultural commodities and mining to an industrializing economy. At that time, evaluations of company performance were typically relying on the traditional way of assessment with looking solely at financial performance. The discovery of intellectual capital has opened a new perspective in valuing the firms. Whenever there is a requirement to assess the company's performance, analysts, investors, researchers and students will obviously look for the company's annual reports. By dissecting its financial results for a particular year, company's performance in terms of efficiency, productivity, liquidity, gearing, and equity value can be discovered. But, those results do not seem to reveal the intrinsic value behind those performances. If humans are considered as the most important asset to the company, how do they being measured, especially in associating with the

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performance of the company? Thus, the term Human Capital was coined as one aspect of the intangibles.

In Malaysia, the term Human Capital is gaining momentum. But, various literatures have been long emphasizing on the importance of other aspects of intangibles such as market assets, structural asset and intellectual property rights in measuring the company's performance. It is therefore a subject that is gaining interest from various journals, news, management forums, and other renowned periodicals such as Business Week, Time Magazine, Forbes and The Edge. Therefore, it is one of the most challenging and elusive riddles in modern business – how do intangibles create value for the firm? The intellectual capital community had given some answers.

In this study the application of understanding on intellectual capital by measuring the performance of a few local companies against the foreign companies within the same industry. The performance of those companies will be measured and compared by using both intellectual capital and corporate financial performance.

## **2. LITERATURE RIVIEW**

Intellectual capital (IC) is a not a new concept. The term has appeared in the literature as early as 1836 with the publication of a book by Nassau William Senior entitled "An Outline of the Science of Political Economy". As claimed by Marr (2005), economists were among the earliest to use this term in academic writing. They highlighted the importance of IC as a production factor, and the uniqueness of IC in comparison to the traditional economic assets such as land, capital, and labor. While there appears to be a connection among authors that IC refers to the intangibles, there has been no agreement among them on how to define it. However, in simple term, IC refers to knowledge that can be converted into value.

According to Shaikh (2004), researchers first became interested in defining intellectual capital in the 1960s. But the demand for the information at that time was not strong enough to drive continued research and development. However, in the last decade the change in the global economy, from being manufacturing and industry-based to being knowledge-based, created renewed interest in intellectual capital and increased demand for measuring and reporting its effect on business and profitability.

John Kenneth Galbraith (1968)] a famous American economist was perhaps the one who laid the foundation towards understanding the concept of intellectual capital. He stressed that intellectual capital means intellectual action more than just knowledge or pure intellect. Moreover, intellectual capital can be seen both as a form of value creation and as an asset in its traditional sense (Roos et al, 1998).

Interest in research on issues related the IC has started in the early 1980s. Since then, IC has been defined and interpreted variously by different authors. Moreover, issues pertaining to the IC have been empirically examined from various perspectives by different researchers. Itami (1987) who pioneered the publication of empirical works on IC defined the term as intangible assets which include particular technology, customer information, brand name, reputation and corporate culture that are invaluable to a firm's competitive power. Stewart (1997) defined IC as knowledge, information, intellectual property and experience that can be put to use to create wealth. Brooking (1996) on the other hand, provided a more comprehensive definition of intellectual capital. According to author, IC is a term given to the combined intangible assets which enables the company to perceive and function an enterprise. An enterprise is then vested as the sum of its tangible and intangible assets as follows:

**Enterprise = Tangible Assets + Intellectual Capital**

More telling, Edvinsson (1997) equates intellectual capital with the sum of human capital, structural capital and customer capital:

**Intellectual Capital = Human Capital + Structural Capital + Customer Capital**

From a resource-based perspective, firms gain competitive advantage and superior performance through the acquisition, holding and subsequent use of strategic assets (Wernerfelt, 1984). A firm is expected to be able to strike an optimal balance between the employments of its tangible resources that is physical and financial resources; and intangible resources like people, technology and relationship (Salleh and Selamat, 2006).

There are several indicators employed by various researchers in their attempt to measure intellectual capital. For example, Edvinsson and Malone (1997) used the 'Navigator' model that focuses on financial, customer, process, renewal and development, and human capital to measure intellectual capital. According to this model, the hidden factors of human and structural capital when added together comprise intellectual capital. Bontis (1998) conducted an exploratory study that developed measures and models of intellectual capital through survey and research. He used 53 items to measure intellectual capital, in which 20 items measure human capital, 16 items measure structural capital and 17 items measure customer capital.

The researchers actually have not been much difference in defining, interpreting and modeling intellectual capital. Even though they are labeled differently, many intellectual capital models have similar constructs and measures. For example, human capital (Edvinsson and Malone, 1997) is termed as human-centered assets by Brooking (1996) and competence of personnel by Sveiby (1997).

Other definitions in the literatures include Moore (1996:36) who defines IC as customer capital, innovation capital and organizational capital.

The Canadian Imperial Bank of Commerce uses indices such as new ideas generated and implemented, new products introduced and the proportion of income from new revenue streams (Steward, 1994:74). This framework has the following categories of IC:

1. Market assets (consisting of service or product brands, backlog, customer loyalty, etc).
2. Intellectual property assets (education, work-related knowledge, vocational qualifications, etc.) and
3. Infrastructure assets (management philosophy, corporate culture, networking systems, etc)

Very little evidence is reported in the literature on the nature and extent of disclosure of IC in annual reports, particularly for the US companies. However, small-scale studies of companies' annual reports in other countries are reported in the literature. For example, Guthrie and Petty (2000) report on the frequency of the appearance of some IC components in annual reports of the 20 largest Australian companies. Then, Brennan (2001) presents evidence from annual reports of 21 Irish companies; Olsson (2001) reports on the 18 largest Swedish companies and Bozzolan et al. (2003) reports content analysis of the annual reports of a sample of Italian companies. Finally, Goh and Lim (2004) provide evidence of disclosure of IC in annual reports of 20 Malaysian companies. Collectively, these studies indicate that disclosure of IC in the annual reports of the companies investigated is quite limited.

Over the past decade, many resource-based view scholars have argued that intangible assets are the pre-eminent drivers of competitive advantage (Conner and Prahalad, 1996; Grant, 1996; Quinn, 1992). One reason for this is that rival organizations find it more difficult to replicate intangible assets as opposed to physical or tangible assets (Barney, 1991; Dierickx and Cool, 1989; Zander and Kogut, 1995). Some of the most important intangible assets organizations possess revolve around their different knowledge bases.

Other literature stream also point toward this inference. For example, human capital theorists (e.g. Becker, 1964; Schultz, 1961) simply reason that an increase in worker skills, knowledge and abilities most likely translates into increase organizational performance. When people possess high levels of knowledge and skills they generate new ideas and techniques that can embody in production equipment and processes; they initiate changes in production and service delivery methods; and they improve the links between employees, managers and customers (Berg, 1996).

Subsequently, intellectual capital is a financial element in determining the success of a business organization. In showing the importance of IC to a business organization, Grant (1991) has suggested three points. First, the IC of a firm should be one of the central considerations in formulating strategy, secondly the IC is one of the primary drivers upon which a firm can establish its identity and frame its strategy. Third, intellectual capital is as one of the primary sources of the firm's profitability. Therefore, firms need to strategically identify and develop their IC in order to gain a competitive advantage and to increase their performance (Petergraf, 1993; Prahalad and Hamel, 1990; Teece et al., 1997). Further, the key to a resource-based approach to strategy formulation is to understand the relationships between IC, competitive advantage, and profitability (Grant, 1991).

It is also noteworthy that the IC of a firm plays an important role in its strategic development, diversification and expansion. Its stressed by Lev (2001) network economies and synergies associated with research & development (R&D) and other intangibles are fundamental issues in corporate acquisitions, diversification and alliances.

The takeover prices paid for targets in many of these deals, especially those in knowledge intensive industries, often include very large payments for goodwill and IC. Thus many of the deals seem to have been driven by the need for the acquiring firms to access IC. Given the importance of IC to the success of a business, the pressure on companies to measure and disclose the value of their IC is growing. Studies in both the US and the UK have shown that analysts value information about intangibles (Mavrinac and Siesfeld, 1997; Coleman and Eccles, 1997). A number of empirical studies have also demonstrated that companies that are able to make meaningful disclosures about their long-term prospect achieve more satisfactory market valuations (Narayanan et al, 2000; Gu and Lev, 2001).

Although it seems unlikely that all IC will soon be reported in financial academics, accounting bodies are still defining and arguing over IC metrics and no generally accepted accounting principles have been agreed upon thus far. In recent years, the idea of emphasizing IC in organizations, for instance by referring to certain companies as either knowledge companies or knowledge-intensive companies, has gained popularity among both practitioners and scholars (Alvesson, 1989; Davenport and Prusak, 1998; Edvinson and Malone, 1997; Grant, 1999; Nonaka, 1994; Sveiby and Riesling, 1986). Pek (2005) has measured the intellectual capital performances of commercial banks in Malaysia for the period 2001 to 2003 using the efficiency coefficient called Value Added Intellectual Coefficient (VAIC). His findings showed that the value creation capability from all banks is largely attributed to Human Structural Efficiency (HSE).The study also has detected that investment in human capital yields a relatively higher return than investment in physical and structural capital.

Tan et.al (2005) also applied the VAIC method to study the intellectual capital performance of 150 companies listed on the Singapore Exchange for the financial year between year 2000 and 2002. The result of the study supports the notion that companies that actively nurture and increase their IC are likely to experience superior performance.

Firer and William (2003) have conducted a study that investigates the association between the efficiency of value added by the major components of a firm's resources base (physical capital, human capital and structural capital) and three traditional measures of corporate performance: (1) profitability, (2) productivity, and (3) market valuation. Proxies for the efficiency of value added by a firm's major resources components are measured using the VAIC methodology. Findings of the study, based on correlation and linear multiple regression analysis indicates that association between the efficiency of value added by a firm's major resources components and the three traditional dimensions of corporate performance is limited and mixed.

However, there is a little empirical testing of theories in the area of strategy development, diversification and expansion. Theory development and anecdotal evidence seem to be predominant starting with concept put forward by Penrose (1959) and further developed by Teece (1980), Montgomery and Wernerfelt (1988), and Markides and Williamson (1994). Empirical evidence can be found in Gupta and Roos (2001) who use a case study approach to demonstrate how the measurement of intellectual capital can aid organization's mergers and acquisition strategy.

#### **4. PROBLEM STATEMENT**

Intellectual capital researchers have proposed numerous definitions and several indicators in their attempt to define and measure intellectual capital. But, one aspect that we could not satisfy ourselves is - the revelation of how much or what really constitutes an actual value of an organization. How can one say a particular company is better than the others? How good is good? Conventional way of assessing the company's performance and its value via dissecting its audited financial statements can arguably be sufficient. By taking the current company's share price and multiplying it with its balance of stock outstanding, old school of thoughts seemingly trying to advocate the market value of the company. Then, we have ratio analysis. To a certain extent, it offers more extensive valuation even though it is limited to the performance of assets, liquidity, borrowings and cash flow that are purely financial in nature. In the end, does it truly represent the whole value of the company?

Several researchers have found that the method of measurement of institutional or organizational value in the current business environment using traditional financial methods is increasingly inadequate and often irrelevant to measure or determine real value in today's economy. How influential then the value inherent in people's skill, expertise and learning capabilities, as well as the value of human capital and structural capital in determining the financial performance of a company?

Cases have revealed that the intellectual capital measurement has been an emerging issue in evaluating the real value of the firms. Having said this, how influential it is in explaining company performance, growth and stock return?

#### **4. OBJECTIVES OF THE STUDY**

This study aims to examine the levels of IC for local companies as compared to the foreign companies (in the same industries), to quantify the influence of IC in explaining company performance and to examine the relationship between rate of growth of a companies IC and its future growth.

#### **5. METHOD OF ANALYSIS**

In examining the data our interest in this study in general is to examine the influent of intellectual capital in determining the financial performance of same selected companies in the sample. In this study the concept of the Value Added Intellectual Capital (VAIC) will be employed. The data for this study is obtained from financial statements (i.e annual reports), company web sites and financial times are included in the sample. The study based on three local companies in Malaysia and three foreign companies .

##### **5.1 Value Added Intellectual Coefficient (VAIC)**

Value Added Intellectual Coefficient (VAIC) developed by Ante Pulic in 1997. VAIC method is designed to provide information about the value creation efficiency of tangible and intangible assets within a company. The process of determining the VAIC of a company would involve four steps as follows:

Step One: To determine the company ability to create Value Added (VA)

$$\text{VA} = \text{OUTPUT} - \text{INPUT}$$

where:

VA = Value added  
OUTPUT = Sales and other revenues  
INPUT = Cost of sales and other expenses

Step Two: To calculate the value of human capital. This can express by the labor expense (Lexp)

$$HC = Lexp$$

where HC is human capital.

Efficiency of human capital is calculated as follows:

$$HCE = VA/HC$$

where

HCE = Human capital efficiency coefficient

VA = Value added

HC = personal cost, considered as an investment

Step Three: To calculate the value of structural capital.

$$SC = VA - HC$$

where

SC = structural capital

VA = Value added

HC = Total salaries and wages

Structural capital efficiency can be calculated as follows:

$$SCE = SC / VA$$

where

SCE = Structural capital efficiency coefficient

SC = Structural capital

VA = Value added

Step Four: Determining Capital Employed Efficiency Coefficient (CEE).

The intellectual capital cannot create value on its own. Therefore, we need information on capital employed efficiency that can be calculated in the following manner:

$$CEE = VA/CE$$

where

CEE = Capital employed efficiency coefficient

VA = Value added

CE = book value of net assets

Step Five: To determine an overall value creation efficiency on all three indicators need to be added up. It can be calculated as follows;

$$VAIC = CEE + HCE + SCE$$

where

VAIC= value added intellectual coefficient

CEE = capital employed efficiency coefficient

HCE = Human capital employed efficiency coefficient

SCE = Structural capital employed efficiency coefficient

This indicates the corporate value creation efficiency or “Intellectual ability” of the company. The VAIC allows for real-time tracking of the four indicators, not only for the company as a whole but also on the level of individual processes and function.

## 5.2 Company Performance

Company financial performance in this study will be examined from two perspectives.

### 5.2.1 *Intellectual Capital Efficiency (ICE)*

As one of the key indicator used in this study, Intellectual capital efficiency (ICE) will indicate how much value added is created on one monetary unit invested in employees. Therefore, it provides information about value creation efficiency of the company. Intellectual capital efficiency (ICE) obtained by adding up the partial efficiencies of human and structural capital. It can be calculated as follows:

$$ICE = HCE + SCE$$

where,

ICE = intellectual capital efficiency coefficient

HSE = human capital efficiency coefficient

SCE = structural capital efficiency coefficient

This concept is useful in verifying the level of efficiency of a company from the perspective of IC.

### 5.2.2 Traditional Measurement

Following Tan et al (2007) traditional measurements are as follows:

Return on equity (ROE).

Measures how much profit a company can generate for each dollar of shareholders' equity. ROE is a profitability ratio relating profits to investment.

$$\text{ROE} = \text{Profit to shareholders} / \text{Total shareholders' s funds}$$

Earning per share (EPS)

Used to measure the evaluation of companies in the financial market.. It gives a measure of profitability that incorporates the result of operating, investing and financing decisions.

$$\text{EPS} = \text{Profit to shareholders} / \text{weighted average number of shares}$$

Annual stock return (ASR)

Measures the changes in stock price inclusive of dividends and adjusted for any stock splits. It is calculated as follows:

$$\text{ASR} = [\text{share price}(\text{year } x + 1) - \text{Share price}(\text{year } x) + \text{Dividends}] / \text{Share price}(\text{year } X)$$

### 5.3 Company Internal Growth

One aspect of company financial performance that might be interesting for shareholder is company internal growth which measure by internal growth rate (IGR).

Internal growth rate is the maximum growth rate a firm can achieve without external financing of any kind. Internal growth rate as discuss by Ross (2006) is measure by:

$$\text{Internal growth rate} = \frac{\text{ROA} \times b}{1 - \text{ROA} \times b}$$

where

ROA = return on asset

b = plowback or retention

## 5.4 Company Sustainable Growth Rate

Sustainable growth rate is the maximum growth rate a firm can achieve without external equity financing while it maintain a constant debt equity ratio as discussed by Ross (2006) is measure by:

$$= ROE \times b$$

Sustainable growth rate

$$\frac{ROE \times b}{1 - ROE \times b}$$

## 5.5 Correlation Analysis

Our interest in this aspect of the study is to examine the extent of relationship between variables as follows:

Contemporaneous correlation.

Investigating the presence (if any) and magnitude of relationship between the value added intellectual coefficient (VAIC) and the following values;

Return of equity (ROE)

Earning per share (EPS)

Correlation analysis is the study of the relationship between two variables, and the correlation coefficient,  $r$ , is calculated to measure the strength as well as the direction of this linear relationship. One statistic that can compute the correlation between two variables,  $x$  and  $y$ , is known as the Pearson Product-moment or simply Pearson Coefficient. It is defined as follows:

$$r_{xy} = \frac{\delta_{xy}}{\delta_x \delta_y} = \frac{Cov(x, y)}{\sqrt{[Var(x)Var(y)]}}$$

where  $\delta_x$  and  $\delta_y$  are the standard deviations for variable  $x$  and  $y$ , respectively.

The correlation coefficient can ranges from -1.0 to + 1.0. While the correlation coefficient of -1.0 indicates a perfect negative or inverse relationship, a correlation coefficient of + 1.0 indicates a perfect positive or direct relationship. When  $r = 0$ , there is no relationship between the two variables,  $x$  and  $y$ .

When the correlation coefficient is squared, it is known as coefficient of determination. The coefficient of determination which is denoted as  $r^2$  and may range from 0.0% to 100%. It tells us the percentage of variation in the dependent variable ( $y$ ) which is explained by the (independent) variable ( $x$ ).

## Lagged Correlation

By lagged growth in VAIC as the lagged. This response to see how the current will value of growth in VAIC will effect internal growth of the company.

## 6. RESULTS AND DISCUSSIONS.

Major findings of this study can be summarized as follows: Based on the results of company performance from the perspectives of intellectual capital and traditional analysis, evidence suggest that both methods have arrived at almost the same conclusion. That is the same categories of industries have performed well in term of intellectual capital and also found to perform well from the perspective of traditional analysis. In general the foreign company is found perform better than the local company. It is worth nothing here that in comparing the performance of local and foreign company, the study also examine and analyze the data based on three sub period as follows:

- a. The period before the Asian financial crisis (1991- 1996)
- b. During the Asian financial crisis (1997 – 1999)
- c. After the Asian Financial crisis (1998-1999)

Findings of this aspect of analysis are summarized in the following points:

Before the Asian financial crisis, the local companies was performed well Oil and Gas Industries and telecommunications. During the Asian financial crisis, local companies were badly affected compared with foreign company except for Oil and Gas industries. During the new millennium, foreign companies have emerged to be the best companies both from the perspectives of intellectual capital and traditional analysis.

The research on the intellectual capital is based is based on the reality of the business success today. Even the Asian financial crisis, local companies have performed well relatively. This indicates that as among the biggest company in Malaysia, it is vulnerable to the bed performances of the Asian regional economy. The implication of this study could be conjectured in the following lines. This study provide insight for local and foreign to benchmarking themselves based on the level of efficiency ranking, to establish priorities and develop strategic plan, which will in turn their future performance. The finding also could help stakeholder and investors to access the value creating potential of local and foreign companies, regulatory bodies, academician, businessman, financial professional and decision makers to formulate and implement policies for establishment of a resilient related industrial sector.

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