

ENHANCING ORGANISATION EFFECTIVENESS THROUGH HUMAN, RELATIONAL AND STRUCTURAL CAPITAL: AN EMPIRICAL ANALYSIS

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Abstract

The research deepens the understanding of the role of intellectual capital in creating corporate wealth from the perspective of a developing nation like Malaysia. A different economic set up where there exists different technological advancements (Chen, Cheng and Hwang, 2005) and differences in views on the metaphors of knowledge between the West and Asia (Andriessen and Boom, 2007) suggests that, a different implication of intellectual capital may exist. Thus, the research contributes to the intellectual capital literature of the ASEAN countries where culture, politics, economics and social environment provide a different perspective and challenges. Resource-based theory views, intellectual capital as the resources of wealth creation, vital to firm financial performance and the key driver to achieve sustained competitive advantages (Riahi-Belkaoui, 2003; Tayles, 2004). The current research investigates the relationship of Malaysian listed companies' intellectual capital with organisation effectiveness. Based on the results through questionnaire survey of 155 Malaysian companies' managers, it was found that among the intellectual capital components, structural and relational capital significantly influence the organisation's effectiveness with structural capital as the strongest predictor. This reveals that structural capital, which comprises investment enhancement in technology, processes and systems, coupled with relational capital which includes customer-oriented and market driven activities, are imperative in determining high performance and competitive advantage.

Keywords: *intellectual capital, human capital, relational capital, structural capital and organisation effectiveness*

Introduction

The attention and importance of intellectual capital evolves with the advancement of the information or knowledge age (Guthrie, 2001). In the competitive knowledge-intensive and rapidly changing business environment, more firms are creating value based on knowledge and investing more in soft factors such as human resources, research and development, organisational development and relationships rather than in tangible physical assets (Juma and Payne, 2004; Bornemann and Leitner, 2002). As argued by Stewart (1997); and Stahle and Hong (2002), the older forms of capital such as properties, labour and financial capital are no longer effective to explain and forecast the success of enterprises or nations in the knowledge-based paradigm.

Lack of information and awareness on intellectual capital may lead to underestimation of future earnings (Roslender and Fincham, 2004). This would lead to crucial distortions in the operation, value and economy of companies as the management's direction and investment decisions will continue to be based on the information of traditional financial reporting. Managers face the risk of underestimating the value and contribution of intellectual capital and focus on improving the efficiency of physical assets only as these items are measured, considered and assessed by the managers (Bontis Dragonetti, Jacobsen and Ross, 1999). Consequently, it would create losses to the firms as intellectual capital has the ability to leverage profitability (Sullivan and Sullivan, 2000). Rastogi (2002) asserts that if knowledge is the basic or quintessential resource for value creation, then it is principle available to every enterprise. In order for companies to display sustained growth over time, the recognition of intangible asset wealth through knowledge embedded in the human, structural and relational should be emphasised.

Earlier researchers (Riahi-Belkaoui, 2003; Wang and Chang, 2005) proved that intellectual capital is essential for firms' survival and competitive success due to the significant link between intellectual capital and firm performance. The competitive success of companies is depending more on the strategic management of intellectual capital and less on the strategic allocation of physical and financial resources (Tseng and Goo, 2005). The fact that intellectual capital underpins firm future value (Roos, Roos, Edvinsson and Dragonetti, 1997; Riahi-Belkaoui, 2003), relevant to this, understanding on how intellectual capital of companies in Malaysia can translate into higher organisation performance is of utmost importance.

In capitalising opportunities which are acquired through technological advancements, countries having different capabilities may not cope homogeneously. Thus, countries that, do not possess the competency and capacity to be global players in acquiring knowledge and latest technologies will remain marginalised (Jarjis, 2006). Malaysia, similar to other developed countries, has set strategies to face challenges in the fast growth of knowledge driven economy. The shift to knowledge based economy is part of the wider plan to achieve the target of the nation's vision 2020 (Mustapha and Abdullah, 2004) which acts as a strategy to push Malaysia to achieve the developed nation status in economic performance and technological capabilities by the year 2020 (Fisher, Dawkins and Akin, 1994).

Fundamental differences exist in the concepts of knowledge and intellectual capital between the Western and Asian culture. The Western intellectual capital literature conceptualised knowledge as a capital that can be valued, capitalised and measured; or as a resource that can be created, stored, located or moved within the organisation. The Asian concept of knowledge is influenced by their culture and religion. The Asian philosophy treats knowledge as spirit and wisdom; and knowledge creation is a continuous, self-transcending process (Andriessen and Boom, 2007).

The relationships between intellectual capital and firm performance were found to be diversified across countries (Firer and Williams, 2003; Juma and Payne, 2004; Saenz, 2005; Wang and Chang, 2005), where culture, politics, economics and social environment provide different perspectives and challenges relative to the Western economy. Thus, the main objective of this research is to investigate the relationship between intellectual capital and organisation effectiveness among Malaysian firms.

The research aims to deepen the understanding of the role of intellectual capital and their interaction in creating corporate wealth from the perspective of a developing nation like Malaysia. By studying the relationships between intellectual capital and organisation effectiveness, the characteristics and value creating behaviours of the intangible resources, mainly intellectual capital, within the context of the organisation could be understood. The findings on the associations among intellectual capital components may help the managers in making investments decision and hence improve corporate strategic planning. It will assist in enhancing the long-term strategic focus and short-term operational capabilities. Thus, this permits organisations to plan strategies that mobilise the full potential of their intangibles in particular intellectual capital (Peppard and Rylander, 2001).

Literature Review and Hypotheses Development

Most definitions of intellectual capital comprise of three interrelated elements. Intellectual capital is the sum of customer capital (relational capital), structural capital (organisational capital), and human capital (Mayo, 2000; Dzinkowski, 2000; Al-Ali, 2003; Stewart, 2002) and is distinct from intangible assets. Intangible assets such as intellectual property, patent and goodwill are recognised in the traditional financial reporting statements whereas intellectual capital is the hidden resources in an organisation (Chu, Lin, Hsiung and Liu, 2005). Human capital is essential as it is the source of innovation and strategic renewal; it reflects the sheer intelligence of an organisation's human resources. An organisation's intellectual capital will reach its maximum potential if the organisation has a strong structural capital which includes infrastructure of human capital, a good working system and good corporate culture. Structural capital, which also includes innovation and improvement processes, is perceived as the critical link that enables intellectual capital to reach its fullest potential. The essential part of customers capital is the knowledge underpins in the relationships external to the organisation such as customers, suppliers, the government or related industry associations (Bontis, 1998) and any other parties that contribute to the value chain (Al-Ali, 2003).

Studies have proven that intellectual capital is a significant business asset not only in the information technology, high-technology and R&D industries (Wang and Chang, 2005; Tseng and Goo, 2005; Chu et al., 2005), but also include other services and non-service industries such as banking (Saenz, 2005), hotel industries (Engstrom, Westnes and Westnes, 2003; Rudez and Mihalic, 2005) and manufacturing including multinational firms (Riahi-Belkaoui, 2003). Despite the indifference between the West and Asia in conceptualising knowledge (Andriessen and Boom, 2007), most of the reviewed intellectual capital research have indicated a direct positive relationship (Wang and Chang, 2005; Riahi-Belkaoui, 2003; Chu et al., 2005; Tseng and Goo, 2005; Engstrom et al., 2003; Hermans and Kauranen, 2005) between intellectual capital and firms' performance though a few have revealed a reverse relationship (Firer and Williams, 2003; Juma and Payne, 2004).

A direct positive relationship indicates that firms with higher intellectual capital may perform better in terms of profitability and revenue growth. It implies that firms' capabilities to increase their values are influenced on how they manage the overall intellectual capital. More investments in human capital will produce proficient employees who thus assist in reaching the customers and strengthen relational capital. Simultaneously, the human and relational capital requires strong structural capital to expedite transactions and flow of knowledge and information.

The inexpensive intangibles such as information and knowledge embeds in the components of intellectual capital can and may substitute the costly physical and financial assets (Stewart, 1997). Firms should understand their resource structure and balance their knowledge based resources and physical assets, so that they are able to gain from the intellectual resources (Hamzah and Selamat, 2007).

Bontis (1998) highlights that a constant interaction among human, structural and customer capitals must exist in order for firms to control its knowledge base. Tacit knowledge, which in the minds of employees are not translated into organisational knowledge, will never positively affect business performance. Furthermore, if a company has talented human capital, the value creation is not guaranteed if production or marketing processes are not well organised or customers are not reached (Hermans and Kauranen, 2005). The two capitals (human and relational capital) require strong firms' procedures, databases and processes (structural capital) to translate to high firms' performance. In addition, the fact that structural capital is proprietary and not self-renewing in nature both human and relational capital assist to strengthen structural capital (Roos et al., 1997).

Nevertheless, the negative significant association between human capital efficiency and productivity and moderate positive association between structural capital efficiency and profitability found by Firer and Williams (2003) revealed a different scenario. The results imply that firms in South Africa, even though are extensively relying on intellectual capital (such as banking, electronic, information and service sectors), increase their productivity through the employment of tangible assets and consequently, put less effort in utilising the human capital. Overall, the empirical findings suggest that despite the efforts to strengthen the nation's intellectual capital, physical capital remains the most significant underlying resource of corporate performance in South Africa.

The resource-based theory views that firm resources, whether tangible or intangible, are the drivers behind competitiveness and organisation effectiveness (Riahi-Belkaoui, 2003). The theory perceives that the manipulation of human, physical and intangible resources as dynamic and will create value over time. Nevertheless, in long-term performance and in the knowledge economy, resource-based theory indicates that resources, especially intangibles, allow the growth of competencies (Bounfor, 2003). Intellectual capital researchers assert that the three intellectual capital components (human, relational and structural) will mutually “share, promote and grow” interactively and thus, value of the organisation enhances through the reciprocity of intellectual capital performance (Chu et al., 2005). An organisation which manages to continually increase its intellectual capital, strengthens its long-term growth (Chu et al., 2005). The fact that the creation and accumulation of intellectual capital should enhance organisation effectiveness, the current study hypothesised that there is a positive association between intellectual capital and organisation effectiveness.

Specifically it is hypothesised that

- H1: There is a positive association between human capital and organisation effectiveness.
- H2: There is a positive association between relational capital and organisation effectiveness.
- H3: There is a positive association between structural capital and organisation effectiveness.

The Conceptual Framework

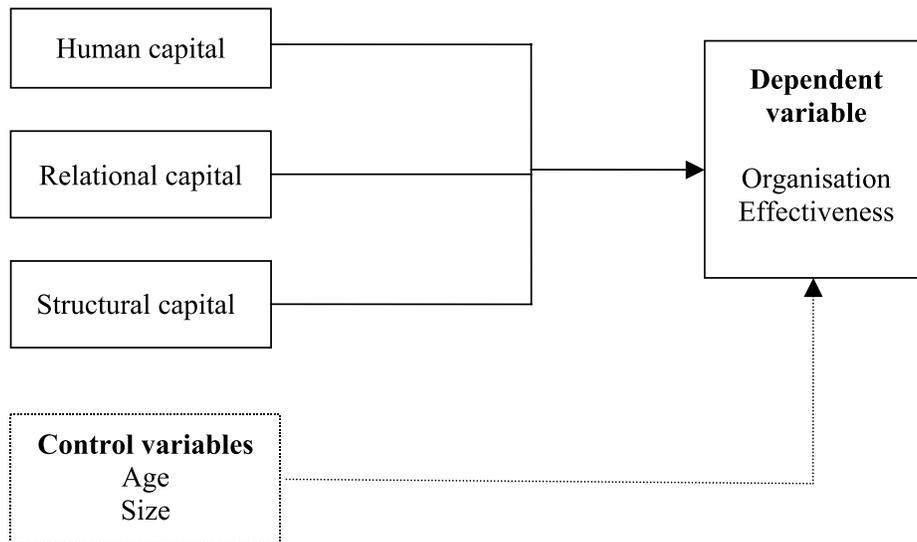


Figure 1.0 : The Conceptual Framework

The direct relationship proposes that the synergistic interaction of intellectual capital components contribute to create value in the organisation, thus, reinforced organisation effectiveness. Coates and McDermott (2002) assert that firm competitive advantage is accomplished through utilising to advantage the internal resources. The Resource-Based Theory implies that the integration of intellectual capital component can be a dynamic resource of the organisation to compete in the competitive business environment, and in addition, if the organisation possesses the competitive advantage criteria. The research model, as shown in Figure 1.0, indicates that the knowledge resources intellectual capital (independent variable) which comprised human capital, structural capital and relational capital have a direct link with organisation effectiveness (dependent variable).

Research Design

Sample

A total of 1,424 questionnaires were distributed to the managers of various levels and departments of companies listed on the main and second board of Bursa Malaysia and MESDAQ Trade. The questionnaires were sent to 654 companies which hold full and reliable information on the companies address, the managers' name and their designation. Two to five questionnaires were sent to each company in the samples. However, only 155 questionnaires were returned which resulted in a response rate of 16%.

The sectors selected as samples were from customers and industrial product, research and development, technology, trading and services. This selection was made due to the knowledge intensity quality present in the companies. Knowledge firms are firms that derive their profits from commercialisation of innovation and knowledge-intensive services, for example computer companies, high-technology firms, software companies and manufacturers of new or differentiated products. These value-adding companies differentiate themselves from the competitors through knowledge which are created by the human resource (Edvinsson and Sullivan, 1996). Trading and service companies were selected due to the nature of the business which requires continuous advancement and improvement in relational capital.

Independent Variables

Previous studies have applied diverse approaches for the intellectual capital measurement such as intellectual capital indexes (Wang and Chang, 2005; Chu et al., 2005; Tseng and Goo, 2005) and intellectual capital models, namely Value Added Intellectual Coefficient (VAICTM), Different Market to Book (DiffMtoB), Market Book Ratio (MBR) and Economic Value Added (EVA) (Firer and Williams, 2003; Juma and Payne, 2004; Chen et al., 2005; Goh, 2005; Kamaluddin and Sanusi, 2006). Similar to Youndt (1998), (Bontis, Keow and Richardson, 2000), Reed (2000), a questionnaire was designed for the current study.

The data on intellectual capital was measured using a seven-point likert scale ranging from strongly disagree (1) to strongly agree (7). Intellectual capital was measured based on

managers' perception on the intellectual capital level in the organisation. The intellectual capital themes and indicators were drawn from established intellectual capital research (Bontis, 1998; Youndt, 1998; Reed, 2000; Youndt, Subramaniam and Snell, 2004). Human capital is classified into three themes being employees' capabilities, employees' satisfaction and employees' sustainability. Relational capital themes are satisfaction and interaction. Structural capital consists of uniqueness, innovation and efficiency themes.

Dependant Variable

The data on organisation effectiveness was measured using a seven-point likert scale ranging from not at all well (1) to perfectly well (7). The organisation effectiveness measures required respondents to compare their firm's performance with the performance of the firm's competitor based on five dimensions i.e. profitability (measured by profit growth and market share), quality (measured by quality of products and services and new product development), sales growth, employee satisfaction and overall performance (Denison and Mishra, 1995; Bontis, 1998).

Control Variables

Youndt et al. (2004) asserts that the level to which a firm develops its intellectual capital may vary with its age. Similarly, firm size may influence the growth and degree of intellectual capital through increased access to resources and market power. Both age and size have been found to vary with firm's performance. Wang and Chang (2005) found a negative association of firm age with performance. On the other hand, intellectual capital had an unusual high correlation with size (Juma and Payne, 2004). Human capital is found to be the most important component of intellectual capital (Wang and Chang, 2005), thus it is necessary to control for the number of human resources. Therefore, the current study controls size through the number of full-time employees (Huang and Liu, 2005; Juma and Payne, 2004) and age through number of years in operation.

Results and Discussion

The Respondents' Profiles

The respondents comprised 59% males and 41% females. Majority of them are Chinese (52%), followed by Malays (43%) and Indians (5%). Most of them are from the middle management level (52%), the rest are from senior management group (35%) and top management group (13%) as shown in Table 1. As illustrated in Table 2, the managers are involved in human resources and administration (38%), finance and accounting (32%), sales and marketing (12%) and the rest are from research and development (7%), technology (3%), manufacturing and production (5%) and others (3%).

Seventy-nine percent (79%) of the top managers, 74% of the senior managers and 57% of the middle level managers have been with their firms for more than three years. Eleven percent (11%) of the top managers, 36% of the senior managers and 9% of the middle level managers have been with the firms for more than 10 years.

Table 1: Respondents' Management Level

Management level	No	%
Middle management level	81	52
Senior management level	54	35
Top management level	20	13
Total	155	100

Table 2: Respondents' Background

Job specification	No	%
Human resources & administration	59	38
Finance and accounting	49	32
Sales and marketing	19	12
Research & development	10	7
Technology	4	3
Manufacturing & Production	8	5
Others	6	3
Total	155	100

The Descriptive Statistical Analysis and the Reliability Tests

The descriptive statistical analysis and the reliability tests indicate that the data used for the study meet the levels of reliability required for significant analysis. In general, the overall cronbach alpha coefficients of intellectual capital and its dimensions (human capital, relational capital and structural capital), and organisation effectiveness are above 0.8 which confirms the internal consistency of the scales employed in the research instrument.

As illustrated in Table 3, between the three intellectual capital dimensions, relational capital had the highest mean of 5.11, followed by human capital with the mean of 4.97 and structural capital with the lowest mean of 4.71. The overall intellectual capital mean was 4.93. This indicates that the Malaysian managers perceive that relational capital is the most important element in their organisation among the intellectual capital construct, followed by human capital and structural capital. Overall, the intellectual capital in the Malaysian organisation is slightly above the average scale.

Table 3: The Descriptive Statistics of Human Capital, Relational Capital, Structural Capital and Overall Intellectual Capital

Variables	N	Min	Max	Mean	Std. Dev.
Human capital (HC)	151	3.13	6.60	4.9693	.72655
Relational capital (RC)	151	3.25	7.00	5.1093	.71792
Structural capital (SC)	147	2.82	6.55	4.7062	.77149
Intellectual capital	151	3.41	6.55	4.9301	.64174

Scale: strongly disagree (1) to strongly agree (7)

The Correlations Results

One of the assumptions underlying the use of regression analyses is to examine for the correlations among the independent variables. Correlation analysis describes the strength and direction (positive or negative) of the linear relationship between the two variables. The correlation coefficient (r) is examined for multicollinearity (Coakes, 2005). In the current research, Pearson product-moment correlation is applied as it designed for interval (continuous) variables (Pallant, 2001).

Table 4 summarises the associations between intellectual capital (human capital, relational capital and structural capital), organisation effectiveness, organisation year and number of employees. The relationships were investigated using Pearson product-moment correlation coefficient. The results indicated significant and positive relationships between the three intellectual capital dimensions with organisation effectiveness. The correlation coefficients were moderate between $r = .521$ to $.659$ and significant at the level $p < 0.01$. However, a very low correlation ($r < .1$) and not significant association was found between all the three dimensions of intellectual capital and organisation effectiveness with both the control variables organisation year and number of employees.

Table 4: Correlations of Dimensions of Intellectual Capital and Organisation Effectiveness

No	Items	1	2	3	4	5	6
1	Human Capital	1					
2	Relational Capital	.679**	1				
3	Structural capital	.596**	.645**	1			
4	Intellectual capital	.868**	.884**	.862**	1		
5	Organisation effectiveness	.521**	.620**	.659**	.689**	1	
6	Organisation Year	-.028	.033	-.138	-.049	.050	1
7	No of employees	.001	.019	-.009	.003	.059	.497**

** Correlation is significant at the 0.01 level (2-tailed).

Relationship between Intellectual Capital and Organisation Effectiveness

Table 5 summarises the multiple regression results of each dimension of intellectual capital (human, relational and structural capital) with organisation effectiveness. All the dimensions of intellectual capital individually contribute significantly and positively towards organisation effectiveness as shown in Models 2 to 4 of Table 5.

The results laid in Table 5 Model 1 indicate a significant positive relationship between organisation effectiveness and intellectual capital (Adj. $R^2 = .473$, $F(3,135) = 42.263$, $p < .001$). Standardised beta coefficient of 0.695 of intellectual capital indicates that intellectual capital makes a strong and unique contribution in explaining organisation effectiveness when organisation year and number of employees stand as control variables. The bivariate Pearson correlation coefficient (Table 4) showed a significant

correlation and high ($r = .689$) which further support the hypothesis that intellectual capital has a positive relationship with organisation effectiveness.

A detailed regression result of the three dimensions of intellectual capital with organisation effectiveness (Model 5 Table 5) reflects a positive and significant relationship between relational capital and structural capital with organisation effectiveness but an insignificant and positive association between human capital and organisation effectiveness. Structural capital contributed the most in explaining organisation effectiveness with standardised beta coefficient of 0.450 followed by relational capital (standardised beta coefficient of .274). Overall this model explained 49.3% of the variance in the dependent variable and is significant at $p < .01$.

In contrast to Model 5, Model 2 in Table 5 shows the individual relationship between human capital and organisation effectiveness was significant with Adj. $R^2 = .248$, $F(3,135) = 16.177$, $p < 0.01$. The control variables being organisation age and number of employees and human capital explained 24.8% of the variance in organisation effectiveness and human capital was a significant predictor. The correlation coefficient of these two variables as illustrated in Table 4 also showed a significant and high correlation of $r = .521$.

Similar to human capital, relational capital is also a significant predictor to organisation effectiveness. Model 3 of Table 5 is significant with Adj. $R^2 = .386$, $F(3,135) = 29.975$, $p < 0.01$. The bivariate Pearson correlation coefficient as illustrated in Table 3 also shows a significant and high correlation $r = .620$ between the variables which further confirms the regression findings. It can also be concluded that relational capital explained organisation effectiveness better than human capital as the standardised beta coefficient was higher ($\beta = .631$) as compared to human capital ($\beta = .512$) as shown in Model 3 and 2 in Table 5 respectively.

The correlation matrix ($r = .659$) in Table 4 indicates a positive significant relationship between structural capital and organisation effectiveness. Model 4 in Table 5 illustrates that structural capital and the control variables explain 44.1% of the variance in organisation effectiveness with $F(3,131) = 36.303$, $p < .01$, which was the highest among the three models (model 2 to 4). Structural capital individually was found to be significant and a positive predictor of organisation effectiveness.

The H1 which hypothesised that there is a positive association between human capital and organisation effectiveness is rejected due to the inconsistency in the statistical results provided in Model 2 and 5. However, given the significant statistical evidence and the positive direction of the relationship, the hypothesis that indicate there is a positive association between relational capital and organisation effectiveness (H2) and a positive association between structural capital and organisation effectiveness (H3) are supported.

Table 5: The Regression Models of Organisation Effectiveness with Intellectual Capital and its Dimension

Model	1			2			3			4			5		
	$OE = \beta_0 + \beta_1 Org\ age + \beta_2 Emp + \beta_3 IC$			$OE = \beta_0 + \beta_1 Org\ age + \beta_2 Emp + \beta_3 HC$			$OE = \beta_0 + \beta_1 Org\ age + \beta_2 Emp + \beta_3 RC$			$OE = \beta_0 + \beta_1 Org\ age + \beta_2 Emp + \beta_3 SC$			$OE = \beta_0 + \beta_1 Org\ age + \beta_2 Emp + \beta_3 HC + \beta_4 RC + \beta_5 SC$		
Variables	Coeff. (B)	Std. Error	Beta	Coeff. (B)	Std. Error	Beta									
Intercept	.156	.487		1.799**	.533		1.092*	.480		1.087*	.444		.294	.477	
Org age	.092	.084	.078	.067	.100	.057	.013	.090	.011	.172	.089	.146	.108	.087	.092
Emp	.007	.039	.013	.009	.047	.016	.020	.042	.037	-.008	.041	-.015	.006	.039	.011
IC	.935***	.083	.695												
HC				.611**	.088	.512						.679	.089	.101	.076
RC							.751**	.079	.631				.322*	.114	.274
SC										.752**	.072		.498**	.094	.450
R ²	.484			.264			.400			.454			.512		
Adj. R ²	.473			.248			.386			.441			.493		
F	42.263***			16.177**			29.975**			36.303**			27.108**		
df	(3,135)			(3,135)			(3,135)			(3,131)			(5,129)		

*** significant at the 0.001 level; ** significant at the 0.01 level; * significant at the 0.05 level

Where:

Org age = organisation age; Emp = number of employees; IC = intellectual capital; HC = human capital; RC = relational capital; SC = structural capital

Discussion of Results

The positive, significant and direct relationship between intellectual capital and organisation effectiveness found in this study is consistent with findings of earlier studies conducted across industries (Hamzah and Selamat, 2007; Bontis et al, 2000). The findings offer evidence that intellectual capital is a valuable business resource for industries of both knowledge intensive and non-knowledge intensive. The results imply that intellectual capital is a strong contributor to firms performance and competitiveness. Positive relationship signifies that firms which are high in human capital, structural capital and relational capital may perform better in terms of profitability and revenue growth.

Further analysis showed that both structural capital and relational capital were found to be significant predictors for organisation effectiveness. The findings are coherent with Wang and Chang (2005); Rudez and Mihalic (2005) and Engstrom et al. (2003). The above results conveyed that the managers of Malaysian companies agreed that the strength in relational capital and structural capital are imperative to determine high performance and, thus, to achieve competitive advantage. Consistent with Hamzah and Selamat (2007), the current study found that between the three intellectual capital dimension, structural capital contributes the most significantly to firms effectiveness.

Thus, it is an indication that management focuses on investment enhancement in technology, processes and systems (structural capital) which are essential in the knowledge economy. In addition, in the competitive business environment, the ability to sustain the customers is crucial. Thus, the current results exhibit that strong relationships with the customers, government, suppliers, affiliation and partners are vital to survive and maintain in the business.

Structural and customers capital grow when the firms and customers complement each other. Structural capital, which is manageable and controllable by the managers, accumulates knowledge and speeds flow of information to people in the firms and the customers. Efficient process system, however, is not balanced without strong interactions or relationships with the customers which are built throughout long-term exchanges of information and goods (Stewart, 1997; Roos et al., 1997). Bontis et al. (2000) assert that customer-focused companies and market driven will eventually generate competent firms systems and processes.

Nevertheless, human capital was found to be an insignificant predictor to firms effectiveness when combined together with relational capital and structural capital in one multiple regression model. The insignificant impact of human capital on organisation effectiveness does not imply that it is not important to influence performance. This, however, warrants for further research. Wang and Chang (2005) found that human capital has an insignificant direct impact on performance but nevertheless, has a significant indirect impact on performance through innovation and process capital. Edvinsson and Sullivan (1996) affirm that companies employ their human resources to create value, but perhaps not directly. This statement implies that the tacit knowledge embedded in the human resources may critically require supportive infrastructure in terms of organization

processes and documentation, databases, technology systems, company images, innovations and creativity to create a catalyst for people talented potential.

The regression models indicate that the control variables, being the organisation age and number of employees, has no significant influence on organisation effectiveness. The fact that the level which firms develop their intellectual capital may vary according to their age (Youndt et al., 2004) is not applicable in Malaysian industries in order to influence organisation effectiveness. The firm age has close effect to a firm growth rate. Firm growth rate may be associated to announcement of new product and development of new ventures (Hayton, 2002). The insignificant effect of firm age in the current study highlights that some firms may have been established much longer than the younger firms but are not forefront or insistent in terms of innovation, research and development.

In contrast to Huang and Liu (2005) and Juma and Payne (2004), number of employees, which is a proxy to firms size, has no significant impact on organisation effectiveness. As the organisation expands and the size of human resource increases, the access to certain knowledge becomes critical. Knowledge is widely shared, human resources become specialised and technologies are used to facilitate the dissemination of knowledge (Edvinsson and Sullivan, 1996). Thus, the current study result interprets that number of human resources, which is the most fundamental element in any firm and may have influence on the growth of intellectual capital, is not relevant to influence organisation effectiveness from the context of Malaysian listed companies. Increase in number of employees may not be a crucial factor on the growth of intellectual capital to influence organisation effectiveness as compared to growth in technologies.

Conclusion and Future Direction

The results of the current study support that intellectual capital is a significant business asset of Malaysian public listed companies as it plays a significant role in improving financial and market performance. Intellectual capital plays a vital role to influence performance, not only in the high-technology and R&D companies, but also to the manufacturing companies (the industrial and consumers product industries) and the services companies (the trading services and finance sectors). Based on the current research findings and evidences from present literature, universally, intellectual capital is imperative resources which determine the survival and competitive success of any firm. Thus, apart from managing and controlling the tangible resources (fixed capital or physical assets), firms should focus more on developing and strengthening the intangible resources which is more relevant and promising in the knowledge based economy.

Malaysia, which is in its transformation process to k-economy, requires investments in the knowledge infrastructure. In knowledge based economy, to be a developed nation and maintain the developed status, high quality human capital is a priority. To be more competitive, workforce must be more knowledgeable, adaptable and proficient. Thus, Government of Malaysia, realising the urgency, has identified the development of human capital by upgrading the mentality and intellectual capacity of its people as one of the main agenda under the Ninth Malaysia Plan (Badawi, 2001, 2006).

Past research has focused on the intellectual capital performance in the various sectors/ industry of the public listed companies. Future research may focus on the intellectual capital performance in the small medium industries (SME); public sector e.g. government agencies and the ministries; public or private universities and schools as limited research has been conducted in this area. The insignificant relationship between human capital and organisation effectiveness warrants future intellectual capital research to consider culture as a variable in their study. Culture may play an influential role in intellectual capital development or management. Furthermore, many countries in the world comprise multiracial and pluralist societies.

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