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INTELLECTUAL CAPITAL AND PERFORMANCE: A STUDY ON MALAYSIAN SMEs

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Abstract

The purpose of this paper is to examine the effects of intellectual capital dimensions, namely human capital, structural capital and relational capital, on firm performance of SMEs in Malaysia. A questionnaire survey was administered to 440 SME managers in the services and manufacturing sectors. The data were analysed using Partial Least Square-Structural Equation Modelling (PLS-SEM) through measurement model and structural model assessment. The results demonstrate that only two dimensions, human capital and relational capital, have significant positive effects on firm performance. Meanwhile, no significant relationship exists between structural capital and firm performance. This study presents a conceptually yet empirically supported framework to describe the significance of the effects of intellectual capital elements on firm performance in the services and manufacturing sectors of SMEs. The study provides the managers useful insights into the importance of equipping their businesses with human capital, structural capital, and relational capital to enhance the performance, especially in knowledge-based economy. The study also offers the government valuable insights into the needs to provide intellectual capital-related programmes for better future of SMEs.

1. Introduction

In Malaysia, SMEs play critical roles in fostering growth, employment, and income of the nation with various financial and non-financial assistance from the government. SMEs were recognised as major tools in generating domestic-led investments, stimulating economic expansion, and increasing the job market for the country after the Asian financial crisis in 1997 and 1998. The policies and strategies developed by the government for SME development were the National SME Development Blueprint 2007, SME Development Framework 2008, and SME Masterplan 2012-2020. Moreover, the SME development has become the main agenda in all series of the Malaysia Plan. Among the early agendas are focusing on the issue of insufficient funds and credit facilities in the First Malaysia Plan (1966-1970), enhancing Bumiputera entrepreneurship and balancing the business activities in the Second Malaysia Plan (1971-1975) as well as establishing SMEs as training and development ground in the Third Malaysia Plan (1976-1980) and Fourth Malaysia Plan (1981-1985) (Economy Planning Unit, 2013). To recognise the important role of SMEs in bringing Malaysia to achieve a high-income nation status in 2020, the SME Masterplan 2012-2020 was introduced which witnesses various financial and non-financial programmes comprising of access to finance, access to market, infrastructure, human capital, and technology adoption (SMECORP, 2016) to accelerate the growth of SMEs.

SMEs in Malaysia are defined according to the annual turnover or number of full-time employees. For the manufacturing sector, the number of full-time employees must not exceed 200 or the sales turnover is limited to RM50 million. For services and other sectors including agriculture, construction, mining and quarrying, the number of full-time employees must not exceed 75 and sales turnover must not exceed RM20 million. The 2011 Economic Census reports that 97.3% or 645,136 of the establishments in Malaysia are made up of SMEs and only 2.7% or 17,803 represent multinational and public listed firms. Micro SMEs accounted for 77%, followed by 20% and 3% firms in small and medium sizes. With regard to the number of SME establishments by sector, services sector represents 90% of the total SMEs, followed by manufacturing (6%), construction (3%), agriculture and mining and quarrying (1%). The services sector dominates the contribution in total value added and employment with more than 65% compared to the manufacturing sector.

The changes in global business environment and rapid technology development led to the transition from a traditional-based economy to a knowledge-based economy (Kamukama 2013). As a consequence from the economic transition, large firms and SMEs in today's modern economy rely on investments in knowledge assets or intellectual capital rather than physical assets such as machinery to achieve superior performance (Daou, Karuranga, & Su, 2014; Kamukama, 2013). Intellectual capital comprises of human capital, structural capital, and relational capital that highlight the knowledge embedded in firms' employees, structure and infrastructure, and the relationship with external stakeholders. Prior empirical studies found that the reliance on intellectual capital offers firms a number of positive outcomes such as competitive advantages, enhancing corporate values, and firm effectiveness (Kamaluddin & Abdul Rahman, 2009). The impact of knowledge economy that emphasises intellectual capital is stronger for SMEs than larger firms considering the higher contribution of SMEs in the nation's economic development yet operating within scarce resources, which might hamper them from continuously serving the role as the economic backbone (Daou, Karuranga, & Su, 2013)

1.1. Intellectual capital dimensions

Intellectual capital refers to knowledge assets that can be converted into values (Edvinsson, 1997). Bontis (1998) defined intellectual capital as the pursuit of effective use of knowledge as opposed to information, where information refers to raw materials that will be processed and turned into knowledge as its output that helps firms in enhancing the current and future performance. According to Brooking (1996), intellectual capital can be distinguished into four major groups of assets: market assets, infrastructure assets, intellectual property assets, and human-centred assets. Market assets refer to assets that can provide firm power in the marketplace such as brands, customer base, reputation, distribution channels, and so on. Infrastructure assets include management processes, philosophies, financial systems, and information and technology system, which assist firms in their business operations and communication with other parties. Intellectual property assets are patents, copyrights, design rights, and trademarks that are protected by law, and finally, human-centred assets comprise of skills, knowledge, and expertise of the employees which do not belong to the firms. In sum, intellectual capital is assets and capabilities that are not recognised and disclosed in balance sheet yet contribute to the value creation and firm performance.

Human capital, structural capital, and relational capital form intellectual capital (Bontis, 1998). Human capital is the competencies, knowledge, skills, education, and capabilities acquired by employees and the most important driver of competitive advantage (Edvinsson, 1997). Bontis (1998) argued that human capital is the sheer intelligence of the organisation member, which is important for innovation and strategy renewal. Structural capital is non-human storehouses of knowledge that are owned and controlled by firms and remain in the firms when employees leave the firm after working hours (Bontis, 1998). It comprises of internal structural capital such as routines, procedures, databases and information systems, culture, and know-how that have lasting value (Mayo, 2000). Meanwhile, relational capital refers to the knowledge embedded in market channels, customer and supplier relationships, the government, and industry association (Bontis, Dragonetti, Jacobsen, & Roos, 1999). It reflects the ability of the firms to interact positively with external stakeholders in order to achieve better performance.

1.2. Past studies on intellectual capital and performance

Prior studies found that intellectual capital elements have positive and significant effects on performance. Kamath (2007) studied the relationship between intellectual capital and value-based performance of 98 commercial banks comprising of foreign banks and domestic banks in India from 2000-2004. The results suggest that the top performers of foreign banks in India have high levels of structural capital, which highly depend on technologies and therefore less focus on human capital. Komnenic and Pokrajcic (2012) investigated 31 multinational firms on the association between human capital efficiency, structural capital efficiency, and profitability of investments in the firms' assets (ROA), profitability of shareholders' capital (ROE), and productivity (ATO) for the period 2006-2008 in Serbia. They reported that that human capital has the strongest influence on performance and indicates a positive association with all corporate performance measures. The findings confirmed that multinational firms in Serbia put higher emphasis on employee training and education to assist them in achieving superior performance.

With reference to the influence of intellectual capital on SMEs, Tovstiga and Tulugurova (2007) found positive and significant effects of human capital and structural capital on performance of Russian innovative SMEs. The results indicate that human capital that was measured by attitude, competence, and attitude; and structural capital dimensions such as relational, organisational, and renewal and development were more important in driving SMEs towards performance rather than external factors such as socio-political, technological, and economical. Ngah and Ibrahim (2009) interviewed 12 respondents consisting of owners, managers and executives, and found that intellectual capital affects product and service innovation and performance of SMEs. The study concluded that the small size of SMEs leads to the close connection among employees, between employees and external stakeholders, and adequate technological support, which encourages SMEs to embark on innovation activities that will fulfil the needs of customers and in turn enhance the performance.

Khalique and Pablos (2015) investigated the relationship between intellectual capital and performance by applying integrated intellectual capital model ranging from human capital, structural capital, customer capital, social capital, technological capital, and spiritual capital of 115 SMEs in the electrical and electronics sector randomly selected from the database of The Electrical and Electronics Association of Malaysia, Federation of Malaysian Manufacturers. The study revealed that human capital, structural capital, and technological capital significantly influence firm performance. Nevertheless, previous studies such as Kamukama (2013), Khaliq and Pablos (2015), and Sharabati et al (2010) examined the effects of intellectual capital on performance for a single industry only, thus the findings are less generalisable to SMEs as a whole. This study differs as it comprises data from two major sectors of SMEs, namely services and manufacturing.

2. Problem Statement

SMEs are synonymous with financial and non-financial constraints that lead to their business failure. Among the challenges highlighted in prior studies are lack of financial access, limited supply of human capital, lack of productivity, and unavailability of recent technology and information system (Abdul Rahman, Yaacob, & Mat Radzi, 2016; Muhammad, Char, Yasoa', & Hassan, 2010; Zainol & Zainol Ariffin, 2013). It is reported that about 42% of micro-sized manufacturing SMEs that were formed in 2000 ceased their businesses in 2005 (SMECORP, 2012). Scarcity in the number of skilled employees, internal and external structures, and lack of connection with external stakeholders require SMEs to put more effort into utilising and managing the resource constraints as a way to adapt to the changes in business environment as well as attaining superior financial and non-financial performance simultaneously. Hence, SMEs are urged to become more resilient in adapting themselves to the changes in business environment that rely heavily on intellectual capital for superior performance. Nevertheless, SME managers have low awareness of the importance of intellectual capital in bringing their firms superior performance (Hashim, Osman, & Alhabshi, 2015; Steenkamp & Kashyap, 2010). Moreover, it is crucial for SMEs to get involved and grab the benefits from the assistance offered by the government through various development programmes to survive in today's challenging economy. However, not all SMEs are able to reap the benefits of the government's development programmes. A number of studies have been conducted in examining the effects of intellectual capital on firm performance (Khalique & Pablos, 2015. 2015; Kamukama, 2013;

Komnenic & Pokrajcic, 2012). However, limited empirical evidence was found on how intellectual capital influences SME performance. SMEs carry unique characteristics in many aspects compared to larger firms, thus the outcomes of the investigation on larger firms are less generalisable to SMEs (Cohen & Kaimenakis, 2007). For example, a small number of employees enables SMEs to build close relationships among employees and with external stakeholders, which in turn encourages the knowledge transfer among them compared to their larger counterparts (Cohen & Kaimenakis, 2007; Desouza & Awazu, 2006).

3. Research Questions

The main research question of this study is: "Does intellectual capital positively affect the SME performance?".

4. Purpose of the Study

This study aims to examine the effects of human capital, structural capital, and relational capital on SME performance. SMEs in the services and manufacturing sectors were selected in this study due to their high contribution in the number of establishments, total output, economic value added, and employment. For example, SMEs in the services sector accounted for 98.2% of the total establishments (591,883), generated RM286.6 billion of total output, RM165.3 billion of value added earnings, and 1,973,083 employment opportunities in 2010 (Department of Statistics Malaysia, 2016). Meanwhile, the capability of the manufacturing sector to adapt to changes in the economic environment from traditional-based economy to knowledge-based economy due to globalisation and modern technologies leads to government recognition in the forms of various financial and non-financial incentives for the sector to continuously contribute towards economic development (Jusoh & Parnell, 2008). Following the discussion of the positive effects of intellectual capital on firm performance, thus the following hypotheses were formulated:

Hypothesis 1 (H1): Human capital is positively associated with firm performance

Hypothesis 2 (H2): Structural capital is positively associated with firm performance

Hypothesis 3 (H3): Relational capital is positively associated with firm performance

5. Research Methods

5.1. Sample and data

This study adopted a proportionate stratified sampling. The list of the samples was derived from the Malaysia SME Community Directory (2013). Data were collected by mailing a set of questionnaires to 440 SME managers in the services and manufacturing sectors in Klang Valley. The questionnaire consists of three sections. Section A requires respondents to provide information about the demographic profile of their business. Meanwhile, Sections B and C measure the managers' perceptions of intellectual capital in their firm and the performance respectively. A five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was adopted for all item scales to measure the responses of the respondents related to aspects of intellectual capital and firm performance. As a result, a total of 98 questionnaires were received and usable for data analysis.

5.2. Measuring variables

Intellectual capital was measured by its elements, namely human capital, structural capital, and relational capital. Human capital was measured by competencies, intellectual agility, and attitude dimensions that were adapted from Khalique and Pablos (2015) and Tovstiga and Tulugurova (2007). Meanwhile, structural capital dimensions were intellectual property, process and procedures, information system, and research and development (R&D). The dimensions for relational capital were customers, suppliers, the government, banks, and social and communities. The measurement for structural capital and relational capital was adapted from Khalique and Pablos (2015), Sharabati et al. (2010), and Tumwine, Kamukama, and Ntayi (2011). Finally, the measurement scale for performance was adapted from the study of Wang, Wang, and Liang (2014).

6. Findings

6.1. Demographic profiles

Out of 98 respondents, 57 (58.2%) SMEs were from the manufacturing sector while the remainders were from the services sector. For the number of employees, 39 (39.8%) SMEs have 6 to 30 employees, 36 (36.7%) with 31 to 75 employees, and 23 (23.5) SMEs have 76 to 200 employees. Meanwhile, turnover was described as follows: RM300,000 to RM3,000,000 (37.8%), RM3,000,000 to RM15,000,000 (28.6%), RM15,000,000 to RM20,000,000 (18.4%), and RM20,000,000 to RM50,000,000 (15.3%). The SMEs were categorised into small (61.2%) and medium (38%).

6.2. PLS-SEM analysis

The hypothesised relationships were analysed using PLS-SEM. the analysis and interpretation of the research model are distinguished into two consecutive assessment phases: the assessment of measurement model and the assessment of structural model.

In the measurement model, the assessment was done by obtaining the value of outer loadings, indicator reliability, internal consistency, convergent validity, and discriminant validity. The indicator's outer loading should be 0.708 or higher in order to obtain a value that equals to 0.50 through the squared loading $(0.708)^2$. The analysis results show that the outer loadings for indicators coded HC1, HC2, HC9, SC1, and SC2 were less than 0.708. However, the indicators were not removed because the composite reliability and the average variance extracted (AVE) already met the threshold value. The composite reliability (CR) value for all constructs was more than the satisfactory threshold value of 0.7 and the value of AVE was higher than 0.50. The value of AVE is proposed to reach 0.50 or higher in order for the indicators to achieve convergent validity (Fornell & Larcker, 1981). Meanwhile, the discriminant validity for the research model was measured by applying heterotrait-monotrait ratio (HTMT) (Henseler, Ringle, & Sarstedt, 2015). The HTMT values obtained for reflective constructs in the measurement model are less than 0.85 based on the HTMT.85. The results indicate that the discriminant validity has been established between constructs in the model.

After the measurement model has been completely assessed, the structural model was tested to examine the hypothesised relationships. The bootstrapping procedures with 1,000 subsamples were conducted to examine the significance of the path coefficients and R^2 (Chin & Dibbern, 2010). The results

indicate that the path coefficients (β) of human capital (0.155, $t = 1.803$, $p < 0.05$) and relational capital (0.526, $t = 5.028$, $p < 0.05$) have a statistically significant contribution to the model, hence support H1 and H3 in relation to the effects of human capital and relational capital on firm performance. The results also revealed relational capital as the strongest predictor construct influencing performance due to the highest value of path coefficients. Nevertheless, the hypothesised relationship of the effect of structural capital on performance (H3) was found to be insignificant (β = 0.186, $t = 1.446$), hence H3 is not supported. The value of R squared (R^2) of 0.573 indicates the variance in the firm performance constructs that was explained by the combination of human capital, structural capital, and relational capital constructs and considered as moderate (Cohen, 1992). Table 1 summarises the results of the structural model assessment.

6.3 Discussion of findings

The results indicate that human capital (H1) and relational capital (H3) have significant positive relationships with performance, while structural capital (H2) was found to be a non-significant driver of firm performance. The significant effect of human capital on firm performance is consistent with prior studies of Daou et al. (2013), Khalique and Pablos (2015), and Tovstiga and Tulugurova (2007). The results are also in agreement with Alipour (2012) and Morariu (2014), who found the significant role of human capital in assisting firms to achieve superior performance. Based on the results, SMEs are aware of the importance of hiring not only competent employees but also those with intellectual agility and good attitude to improve individual and business achievements, especially in the challenging economy. The small size of SMEs encourages close relationships between the owners and employees as well as among employees, which facilitate the knowledge sharing, motivation, and leadership (Cohen & Kaimenakis, 2007; Coyte, Ricceri, & Guthrie, 2012; Desouza & Awazu, 2006). The important roles of employees in boosting the firm performance and enhancing the economic development simultaneously become the main government agendas by designing various human capital programmes in various levels starting from school and university (SMECORP, 2016). Nevertheless, the results contradicted Abdullah and Sofian (2012) and Khalique et al. (2015) as they found the insignificant effect of human capital on performance.

The insignificant effect of structural capital on performance is in agreement with Kianto, Hurmelinna-laukkanen, and Ritala (2010), and Suraj and Bontis (2012). On the other hand, the findings are in contrast with the studies of Abdul Wahid and Mahmood (2013), Bontis, Chua, and Keow (2000), Kamukama (2013), and Sharabati et al. (2010), who reported the significant relationship between structural capital and performance. Based on the findings, SMEs were found not putting high emphasis on process and procedures, information system, R&D, and intellectual property as push factors in improving their firm performance. This might be reasoned by the financial constraints that hinder them to embark on innovation and manage their intellectual property even though they have good ideas and knowledge innovation activities (Huggins & Weir, 2012). Moreover, SMEs might not require knowledge to be transferred and shared through formal method using information and communications technology (ICT) tools and software but encourage the employees to gain knowledge in a natural way such as learning from the owners or superiors (Coyte et al., 2012).

Lastly, the results also show a significant effect of relational capital on firm performance. The results support the studies of Marzo and Scarpino (2016), Adnan, Kamaluddin and Kassim(2014), and Wang and

Chang (2005). Nevertheless, the results are in contrast to Abdul Wahid and Mahmood (2013), who revealed the insignificant relationship between relational capital and performance. The results signify that SMEs recognise the knowledge flow through close relationships with customers and other external parties, which provide them with advantages in gaining better achievement and help the businesses stand out from their larger counterparts. Despite the lack of resources in financial and non-financial aspects, SMEs manage to build and maintain the connection with customers, which in turn improve customer satisfaction and loyalty (Ngah & Ibrahim, 2009).

Table 01. Result of the structural model assessment

Hypotheses	Beta (β)	*p* Values	Result
H1	0.155	0.036	Supported
H2	0.186	0.074	Not Supported
H3	0.526	0.000	Supported

7. Conclusion

This study examines empirically the effects of intellectual capital elements, namely human capital, structural capital, and relational capital, on SME performance in the services and manufacturing sectors. Based on the findings, human capital and relational capital were revealed to have significant positive effect on performance, while the association between structural capital and performance was not significant. The study highlights the crucial role of intellectual capital in driving SME performance in line with the needs of the knowledge-based economy that emphasises investment in knowledge assets. Moreover, the findings indicate the awareness of managers in equipping their businesses with competent employees, internal structure, and good relationships with external parties despite constraints in financial and non-financial aspects. Hence, it is important for SMEs to focus on the investment in knowledge assets by encouraging the training and development programmes to enhance the skills of the employees, structures, and external affairs. To show the continuous commitment, the government should continuously provide assistance in relation to intellectual capital programmes in accelerating the SME growth towards achieving Vision 2020. The study is not without its limitations. Unfortunately, the samples in this study only cover SMEs in the services and manufacturing sectors, therefore the findings obtained could not be generalised. For future research, it is suggested to include other SME sectors such as construction, agriculture, and mining and quarrying. It would also be interesting to make comparison between SME manufacturing and services firms on how intellectual capital affects their firm performance. The difference in the nature of work in the services and manufacturing sectors requires different emphasis on intellectual capital elements, thus it might lead to different results.

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