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INTELLECTUAL CAPITAL EFFICIENCY OF LISTED SMES IN MALAYSIA

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ABSTRACT

This study examines the value-added of intellectual capital of Malaysian listed SMEs. The data is based on the annual reports of 26 SMEs listed in the LEAP market of Bursa Malaysia from 2017 to 2019, which provides 78 observations for the analysis. The efficiency in terms of value-added is measured using modified value-added intellectual coefficient (MVAIC) model. The model is made up of human capital efficiency (HCE), structural capital efficiency (SCE), relational capital efficiency (RCE) and capital employed efficiency (CEE), the sum of these four is called MVAIC. Since the model is based on the assumption that both, physical capital and intellectual capital are a function of production, HCE, SCE and RCE represent value-added of intellectual capital, meanwhile CEE represents value-added of physical capital. The findings of the analysis reveal that the average value-added of HCE, SCE, RCE and CEE are 2.1911, 0.5103, 0.0975 and 0.2501 respectively and MVAIC is 3.0490. The proportion between intellectual capital and physical capital is 2.7989 to 0.2501, suggesting the value-added from intellectual capital is higher in comparison to physical capital. SMEs may use the input to increase recognition of intellectual capital and address the factors affecting intellectual capital performance in order to maximize value creation capability. The study does not consider other component of intellectual capital such as innovation capital, which becomes a limitation of the study. Future study should consider the impact of intellectual capital on SMEs performance.

1. Introduction

In Malaysia, small and medium-sized enterprises (SMEs) play a crucial role in its economy. According to Economic Census 2016 (SME Corp Malaysia, 2020), SMEs represent 98.5% business establishments in Malaysia and are divided into five sub-sectors namely services which account for 89.2% of the total establishments, manufacturing stands at 5.3%, construction 4.3%, agriculture 1.1% and mining 0.1%. In terms of contribution to the economy, SMEs contributed 38.3 per cent to total GDP, 17.3 per cent to total exports and 66.2 per cent to employment growth during 2018 (SME Corp Malaysia, 2019). In the context of knowledge-based economy, intellectual capital has become an important factor that can determine the success or failure of SMEs (Xu and Li, 2019). According to Ngah and Ibrahim (2009), SMEs do not usually measure and recognize intellectual capital as driver of growth and as a source of competitive advantage. In addition, SMEs have different characteristics from large firms, therefore, empirical analysis become necessary to address this issue (Xu et al., 2019).

In this study, Modified Value Added Intellectual Coefficient (MVAIC) model comprises human capital efficiency (HCE), structural capital efficiency (SCE), relational capital efficiency (RCE) and capital employed efficiency (CEE) is used to measure intellectual capital efficiency. Previous studies indicate that the intellectual capital efficiency of SMEs varies across industries and countries. For instance, Xu et al. (2019) examine the influence of intellectual capital and its four components in high-tech and non-high-tech SMEs operating in China's manufacturing sector. Their findings reveal that capital employed efficiency, human capital efficiency, structural capital efficiency are found to be the most influential value drivers while relational capital efficiency possesses less importance. In another similar study, Sardo, Serrasqueiro and Alves (2018) using a sample of 934 Portuguese SMEs' hotel analyse the effect of intellectual capital and its components on financial performance during 2007 to 2015, their findings indicate that human capital, structural capital and relational capital provide a positive impact on firm performance of SMEs. In the case of Malaysia's SMEs, analysis on intellectual capital efficiency has received little attention. Measuring and understanding intellectual capital efficiency has not been properly provided. Therefore, this study aims to fill the gap by assisting SMEs in constructing effective intellectual capital management system that can enhance performance.

This study contributes to the body of knowledge on intellectual capital in two ways. First, the research extends prior studies by assessing and comparing intellectual capital efficiency of listed SMEs in Malaysia. The data for the analysis is drawn from Leading Entrepreneur Accelerator Platform Market (LEAP), the third market launched in July 2017 by Bursa Malaysia for SMEs, thus providing a new research setting for intellectual capital study. Second, intellectual capital efficiency which refer to the value-added of intellectual capital components comprising human capital, structural capital and relational capital, use MVAIC model, therefore providing a more comprehensive measure of intellectual capital efficiency. The findings of the study may provide insights for SMEs to effectively and efficiently manage intellectual capital and provide important implications for investors when using intellectual capital efficiency to assess firms' ability to create value.

The paper is organized as follows. Section 2 presents the definition of intellectual capital and its components. Section 3 describes the data and methodology of the study. Section 4 presents the result and discussion, while section 5 is conclusion.

2. Literature Review

Various definitions of intellectual capital have been discussed and elaborated by scholars. Bontis (1998) described the construct of intellectual capital as human capital, structural capital and relational capital. He argues that intellectual capital may provide a resource for firms to compete and win against their competitors. Stewart (1997) define intellectual capital as human capital, structural capital and customer capital which collectively becomes the brain power of the firms and it represents useful knowledge, information, experience, intellectual property. Edvinsson and Malone (1997) explain that human capital, structural capital and customer capital are the main elements that make up intellectual capital and it is the difference between firms' market value and book value. In view of this, most scholars agreed that intellectual capital comprises human capital, structural capital and relational capital (formerly known as customer capital). Human capital is a core pillar of intellectual capital and it is the firms' employees' talent, skill, creativity, experience, innovation capability which subsequently become a source of competitive advantage. Structural capital is the infrastructure that support the operation of the firm. It includes the processes, systems, technology, database, corporate culture, organizational procedures, patents, trademarks. Relational capital represents the value of relationship with stakeholders. It is the knowledge embedded in the identification, development and maintenance of external relationship. Examples of the value are brand loyalty, market image, commercial power and reputation (Bontis, 1998; Stewart, 1997; Edvinsson et al., 1997).

Efficient and effective management of intellectual capital are crucial as it has been recognised as a source of competitive advantage. Therefore, investment in intellectual capital requires measurement to reflect the value of return. Numerous measurement models have been proposed by scholars for instance *Balance Scorecard* (Kaplan and Norton, 1992), *Calculated Intangible Value* (Stewart, 1997), *Intellectual Capital-Index* (Roos and Roos, 1997), *Value Added Intellectual Coefficient* (Pulic, 1998) and so on. To measure value-added for each component of intellectual capital, this study adopts the modified version of Value Added Intellectual Coefficient model by Pulic (1998) called MVAIC model. This model has been used in recent studies to measure intellectual capital efficiency (e.g. Nimtrakoon, 2015; Ulum, Rizqiyah and Jati, 2016; Xu et al., 2019).

3. Data and Methodology

3.1 Data

Data for the value-added analysis is drawn from LEAP market of Bursa Malaysia. LEAP market is a market established for SMEs to enable SMEs to gain access to capital market. As of 31 August 2020, there are 34 SMEs listed in the LEAP market. However, due to unavailability of data only 26 SMEs were analysed for their intellectual capital efficiency. Since LEAP market is a new market, launched in July 2017, the data for the analysis covers a three-year period from 2017 to 2019.

3.2 MVAIC Model

Value Added Intellectual Coefficient (VAIC) model has been used time and again in the literature of intellectual capital, therefore, it has been robustly tested (Joshi, Cahill, Sidhu and Kansal, 2013). In addition, this model offers several advantages such as data for the analysis is obtained from annual report, as a result it enhances comparability between firms and more objective than perceptual measures. However, there are some limitations for instance the model

does not include the measurement of relational capital. Therefore, this study adopts Modified Value Added Intellectual Coefficient (MVAIC) model. VAIC and MVAIC models are based on the assumption that both, physical capital and intellectual capital are a function of production. Consequently, the models will measure value-added of both physical capital as well as intellectual capital. MVAIC model is mathematically computed as **$MVAIC = ICE + CEE$** . ICE is intellectual capital efficiency representing intellectual capital, while CEE is capital employed efficiency an indicator of physical assets' value-added. ICE is the sum of human capital efficiency (HCE), structural capital efficiency (SCE) and relational capital efficiency (RCE). The following table explains the calculation process of the value-added for each component of MVAIC model.

Table 1: Computation of MVAIC model.

Model Components	Definition	Formula	Explanation of Terms
Value Added (VA)	The value created by the firm as operating profit before interest and tax (EBIT), adding back non-cash expenses like depreciation, amortisation and employee costs.	$VA = P + E + D + A$	P = Operating Profit E = Employee costs D = Depreciation A = Amortisation
Human Capital (HC)	The expenses related to employee compensation and development.	$HC = \text{Total wages and salary cost}$	$HC = E$
HCE	The contribution made by every unit of money invested in HC to the VA.	$HCE = VA / HC$	HCE = Human Capital Efficiency VA = Value Added HC = Human capital
Structural Capital (SC)	The supportive infrastructure that enables HC to function.	$SC = VA - HC$	VA = Value Added SC = Structural Capital
SCE	The contribution made by every unit of money invested in SC to the VA.	$SCE = SC / VA$	SCE = Structural Capital Efficiency VA = Value Added SC = Structural capital
Relational Capital (RC)	The expenses related to selling and distribution cost or marketing expenses.	$RC = \text{Total selling and distribution cost}$	
RCE	The contribution made by every unit of money invested in RC to the VA.	$RCE = RC / VA$	SCE = Relational Capital Efficiency VA = Value Added RC = Relational capital
Capital Employed	Representing capital expenditure of the company.	$CE = TA - IA$	TA = Total assets IA = Intangible assets
CEE	The contribution made by every unit of money invested in physical capital to the VA.	$CEE = VA / CE$	CEE = Capital Employed Efficiency VA = Value Added

			CE = Capital Employed
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Source: Adapted from Chowdhury, Rana and Azim (2019)

4. Results and Discussion

The efficiency levels are indicated by HCE, SCE, RCE and CEE, the sum of these four generate MVAIC. As a performance indicator, the higher the MVAIC, the better is the efficiency level of the firm (Goh, 2005; Joshi et al., 2013). Table 2 shows the mean value of MVAIC and its components of listed SMEs from 2017 to 2019. The mean value of MVAIC is 3.0490, implying that listed SMEs create RM3.0490 for every RM1 utilized and the table indicates that eleven firms reveal efficiency level above average. In other words, these eleven firms are the most efficient SMEs in utilising their intellectual capital to create value during 2017 to 2019. Among the four components of MVAIC, HCE accounts for the highest proportion of MVAIC. The HCE is the most influential component with the greatest average value of 2.1911, implying for every RM1 invested in employees, the value-added generated is RM2.1911, compared to SCE, RCE and CEE with average value of 0.5103, 0.0975 and 0.2501, respectively.

The proportion of intellectual capital efficiency which is the sum of HCE, SCE and RCE is 2.7989 and CEE is 0.2501. The value creation capability of Malaysian SMEs is largely contributed by intellectual capital efficiency which stood at RM2.7989, while physical capital contributed RM0.2501. The findings suggest that intellectual capital is a source of SMEs' competitive advantage and main driver of business growth. These findings are consistent with prior studies that reveal intellectual capital efficiency is the most effective driver of value creation compared to physical capital (Nimtrakoon, 2015; Xu et al., 2019). Table 2 shows the value-added of HCE, SCE, RCE, CEE and overall intellectual capital efficiency using MVAIC model.

5. Conclusion

Intellectual capital which is intangible in nature has become the main driver of value creation in the knowledge-based economy. The purpose of the study is to measure the value-added of intellectual capital and its components in the context of Malaysian SMEs. The analysis reveals that the intellectual capital efficiency (ICE at 2.7989) is higher compared to physical capital (CEE at 0.2501). The measurement, based on MVAIC model, suggest that the value creation capability of SMEs is largely contributed by their intellectual capital and its components. The HCE is the most influential component contributing 2.1911, followed by SCE at 0.5103 and the least influential is RCE at 0.0975. The findings may have several practical implications, for instance SMEs may consider providing continuous training, designing attractive remuneration policies, challenging job design to improve skill and competence of their employees. Meanwhile, to further strengthen the structural capital, SMEs may consider installing information system and increase the use of technology in their operations. Through the proper use of technology, knowledge is efficiently acquired, created, shared, documented and applied (Xu et al., 2019). In addition, SMEs are not efficient in utilizing their relational capital as indicated by RCE which stood at 0.0975. Managers should engage in collaborative activities to build relations with external parties. Through these efforts, SMEs will acquire new knowledge and connect with their customers to improve and maintain customers' loyalty.

This study has some limitations, for example the model employed does not consider other aspect of intellectual capital such as innovation capital that may affect the efficiency level. Also, the impact of intellectual capital on firm performance is not examine. In view of this, future research may consider employing other measurement models such as A-VAIC and perform regression analysis on the impact of intellectual capital on firm performance. Therefore, further research on the subject appears warranted.

Table 2: Intellectual Capital Efficiency of Malaysian Listed SMEs

SMEs	HCE	SCE	RCE	CEE	MVAIC	Ranking
Uniwall APS Holdings Bhd	5.9637	0.8155	0.0000	0.3719	7.1511	1
Polymer Link Holdings Berhad	3.9471	0.8306	0.0130	0.1892	4.7030	2
Supergenics Berhad	3.7154	0.5364	0.0000	0.2759	4.5276	3
Supreme Consolidated Resources Bhd	3.3744	0.6791	0.0000	0.1089	4.1624	4
Cloudaron Group Berhad	3.0545	0.5620	0.0004	0.3702	3.9871	5
MCOM Holdings Berhad	2.6700	0.5651	0.2045	0.4428	3.8824	6
Fibromat (M) Berhad	2.5953	0.3883	0.4086	0.1414	3.5338	7
Enest Group Berhad	2.8304	0.5071	0.0042	0.1642	3.5058	8
CRG Incorporated Berhad	1.6116	0.3789	1.1018	0.2884	3.3807	9
Metro Healthcare Berhad	2.4547	0.5464	0.0000	0.2869	3.2880	10
JM Education Group Berhad	2.1100	0.5067	0.1427	0.4272	3.1866	11
Nova Pharma Solutions Berhad	2.0495	0.4992	0.0110	0.3770	2.9367	12
SEERS Berhad	0.3871	2.5140	0.0000	0.0322	2.9333	13
Mykris International Berhad	2.1207	0.4571	0.1110	0.2377	2.9264	14
Manforce Group Berhad	1.9391	0.4079	0.0000	0.2579	2.6049	15
ACE Innovate Asia Berhad	2.0048	0.4231	0.0000	0.1705	2.5984	16
SL Innovation Capital Berhad	1.4156	0.2860	0.0410	0.6831	2.4256	17
IDB Technologies Berhad	1.4897	0.3287	0.1743	0.4138	2.4065	18
TOPVISION Eye Specialist Berhad	1.7054	0.4060	0.0000	0.1674	2.2788	19
Amlex Holdings Berhad	1.5468	0.3769	0.0387	0.1750	2.1374	20
CE Technology Berhad	1.5944	0.3870	0.0214	0.1468	2.1495	21
TT Vision Holdings Berhad	1.7418	-0.0028	0.1159	0.1710	2.0259	22
Baba Eco Group Berhad	1.3566	0.3323	0.1246	0.2120	2.0255	23
GPP Resources Berhad	1.3362	0.3294	0.0000	0.0967	1.7622	24

Polydamic Group Berhad	1.0094	0.2228	0.0218	0.2390	1.4929	25
Matrix Parking Solution Holdings Bhd	0.9443	0.1833	0.0000	0.2482	1.3758	26
Mean	2.1911	0.5103	0.0975	0.2501	3.0490	

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