SOCIAL INTELLIGENCE, ENTREPRENEURIAL DECISION-MAKING STRATEGY AND SUSTAINABILITY PERFORMANCE OF TECHNOLOGY-BASED SMES IN MALAYSIA

by

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Dayang Hasliza Muhd Yusuf

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LIST OF ABBREVIATIONS

AVE	Average variance extracted
BSF	Business Start-Up Fund
CRDF	Commercialisation of Research & Development Fund
EDM	Entrepreneurial decision-making strategy
ET	Entrepreneurial talent
HTMT	Heterotrait-Monotrait
JAT	Jacks-of-all trades
KBV	Knowledge-based view
MDeC	Malaysian Digital Economy Corporation
MTDC	Malaysian Technological Development Corporation
PLS	Partial Least Square
PLS-SEM	Partial Least Square Structural Equation Modeling
RBV	Resource-based view
SEM	Structural equation modelling
SI	Social intelligence
SME	Small-to-medium enterprises
SP	Sustainability performance
TBS	Technology-based SMEs
TMT	Top-management team
TPM	Technology Park Malaysia
UET	Upper-echelon theory
VAF	Variance accounted for
VIF	Varian inflation factor

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Kecerdasan Sosial, Strategi Pembuatan Keputusan dan Prestasi Mapan di Kalangan EKS Berasaskan Teknologi di Malaysia

ABSTRAK

Sektor EKS berasakan teknologi dilihat antara penyelesaian untuk memacu ekonomi Malaysia. Walau bagaimanapun, di sebalik harapan dan pelaburan yang dibelanjakan untuk mempromosi sektor EKS berasaskan teknologi, bilangan kajian yang dijalankan bagi mendalami fenomena prestasi EKS di Malaysia tidak begitu menggalakkan. Prestasi keusahawanan, diukur menggunakan prestasi perniagaan mapan yang lebih menyeluruh meliputi objektif penciptaan nilai-nilai ekonomi, sosial, dan persekitaran. Kajian ini telah memilih untuk menyelidik pengaruh bakat keusahawanan usahawan terhadap prestasi perniagaan mapan EKS berasaskan teknologi. Teori *Upper-echelon* (UET) digunakan bagi mendasari penyelidikan ini. UET, pada asalnya tertumpu kepada penjelasan prestasi syarikat korporat diperluaskan penggunaannya untuk menjelaskan fenomena pengaruh usahawan individu memandangkan pembuatan keputusan dilakukan sepenuhnya oleh usahawan. Pungutan data dalam kajian ini dibuat secara edaran soal selidik dalam dua peringkat iaitu peringkat uji rintis dan peringkat pungutan data sebenar. Sampel responden dipilih dari direktori EKS berasaskan teknologi yang dibangunkan berdasarkan senarai syarikat EKS di Malaysia. 91 set soalselidik (kadar respon 30.3%) yang telah dipulangkan dan dianalisa. Deskriptif analisi menggunakan perisian IBM-SPSS, manakala penilaian model kajian dibuat menggunakan SmartPLS3.0. Analisa PLS-SEM melibatkan dua peringkat 1) penilaian model pengukuran, bagi ujian kebolehpercayaan dan kesahan konstruk dan pengukuran, dan 2) penilaian model struktur, bagi menilai hubung-kait antara konstruk kajian. Keputusan menunjukkan konstruk UET bagi ciri-ciri individu utama juga relevan bagi ciri-ciri individu usahawan, strategi pembuatan keputusan, dan prestasi mapan. Kajian ini juga mendapati bakat usahawan yang diwakili oleh pengetahuan dan kecekapan yang dibina melalui pengalaman terdahulu memberi pengaruh yang besar terhadap prestasi mapan EKS berasaskan teknologi. Keputusan kajian ini juga mendapati kecerdasan sosial mampu menyederhanakan pengaruh bakat usahawan ke atas prestasi mapan, di mana semakin tinggi tahap kecerdasan sosial usahawan, semakin berkurangan pengaruh bakat ushawan terhadap prestasi mapan, dan sebaliknya. Kajian ini juga menyediakan bukti bahawa pembuatan keputusan keusahawanan dipengaruhi oleh bakat usahawan, dan menjadi pencelah dalam hubungan antara bakat usahawan dan prestasi mapan syarikat. Walau bagaimanapun, disebabkan kajian ini berbentuk eksploratori dan skop kajian yang terhad kepada EKS berasaskan teknologi di Malaysia, keputusan empirikal mungkin tidak terpakai secara umum kepada semua EKS yang bukan berasaskan teknologi, dan EKS yang terletak di luar Malaysia. Kajian ini menyumbang kepada pengetahuan, empirikal, metodologi, dan amalan dalam pembinaan bakat keusahawanan dan prestasi mapan. Kajian in memberi sumbangan, antaranya kepada teori pembangunan keusahawanan dengan menghubungkan kepentingan pengaruh kebolehan kognitif usahawan terhadap prestasi mapan EKS berasaskan teknologi. Kajian ini turut memberi sumbangan empirikal kepada pengoperasian prestasi mapan sebagai pengukur prestasi yang lebih luas dan menyeluruh bagi EKS berasaskan teknologi.

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Social Intelligence, Entrepreneurial Decision-Making Strategy and Sustainability Performance of Technology-Based SMEs in Malaysia

ABSTRACT

The SMEs sector is among the solutions to boost the Malaysian economy. The SMEs are encouraged to adopt technology and innovation to boost performance. However, despite the aspirations and massive investment in promoting the technology-based SMEs (TBS), insufficient research has been conducted on TBS performance in Malaysia. There is also the call for use of sustainability performance, which is more comprehensive, encompassing the economic, social, and environmental value-creation objectives. Notwithstanding the contribution of other performance drivers, this study chose to examine the influence of individual entrepreneurial talent on the sustainability performance of TBS. The Upper-echelon theory (UET) is used to underpin the investigation of entrepreneurial talent, social intelligence, and entrepreneurial decision-making strategy influence on sustainability performance. The UET – originally explains top-management team influence on firm decision-making and performance in corporations, is extended to explain the phenomenon of individual entrepreneur influence as in TBS, as decision-making lies largely on the owner-entrepreneur. Data collection method in this study was the survey questionnaire. Data collection was carried out in two steps i.e. pilot testing and actual data collection. Sample respondents were drawn from the directory of TBS, developed based of lists of technology-based SMEs in Malaysia. 91 usable questionnaires (30.3% response rate), were obtained and analysed. Descriptive statistics was done using the IBM SPSS, while model assessment using PLS-SEM that covers 1) measurement model assessment, for reliability and validity evaluation of the study constructs and measures, and 2) structural model assessment, for evaluation of the effects between the constructs. The results revealed that the UET constructs of key individual characteristics are also relevant for individual entrepreneurs' characteristics, entrepreneurial decision-making strategy, and sustainability performance in TBS. The study also found that entrepreneurial talent represented by knowledge and skills developed during prior experience is a strong influence on sustainability performance of TBS. The study findings also revealed that social intelligence is able to moderate the effect of entrepreneurial talent on sustainability performance, whereby the higher the level of social intelligence of entrepreneurs, the lesser is the influence of entrepreneurial talent on SME performance, and vice versa. The study also provides a strong evidence that entrepreneurial decision-making is influenced by entrepreneurial talent and fully mediates the entrepreneurial talent influence on TBS sustainability performance. Due to the exploratory nature and scope of the study, which is limited to TBS in Malaysia, the empirical results may be non-generalizable to other SMEs which are not technology-based and to SMEs that are in other countries. The current study contributes to knowledge, empirical, methodological, and practice in entrepreneurial talent development and sustainability performance. The study contributes, among others, to the theory of technopreneurship development by connecting the significant influence of entrepreneur's cognitive abilities to sustainability performance of TBS. The study also contributes empirically on the operationalisation of the sustainability performance as a wider and more comprehensive measure for TBS performance.

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CHAPTER 1

INTRODUCTION

1.1 Overview

The survival of technology-based SMEs (TBS)[1] is one of the major concerns of policy makers and academics all over the world. This is due to the poor performance of start-up SMEs, as studies have reported that the failure rates among SMEs in UK are as high as 80% (Storey & Cressy, 1996), as high as 75% in US (Ashraf, Hassan, Ghafoor, & Aslam, 2015; Shane, 2012a, 2012b) within the first five years of establishment, while in South Africa almost 46.6% were closed down within two years (Ligthelm, 2010). Meanwhile, in a case study investigating causes of failure and cessation among Korean TBS, as high as 60% TBS in the study failed within three years from inception (Kang, 2012), while 42% of new businesses born in business incubators in the Basque Country failed within their first five years of operations (Pena, 2004). Meanwhile, previous studies have reported that the management and measurement of TBS performance is trickier than that of a large corporation. This is due to the nature of much smaller TBS, which are unstructured and highly uncertain due to rapid technological advancement. Thus, there is a growing body of literature that argues for sustainability as a measure of entrepreneurial

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[1] As technology-based SMEs (TBS) are part of SMEs, in this thesis, reference made to SMEs may also refer to TBS due to scarcity of data and information specifically on TBS. Whenever possible, specific reference will be made to TBS.

performance as it covers the triple bottom line of economic, social, and environmental value creations objectives.

On the other hand, recent evidence also suggests that characteristics of individual entrepreneurs contributes significantly in driving entrepreneurial performance of TBS (Kang, 2012). The individual entrepreneurs' characteristics and abilities to carry out entrepreneurial activities were termed as entrepreneurial talent (Federici, Ferrante, & Vistocco, 2007; Ferrante, 2005; Ostergaard, 2014; Shrivastava, 2010). Thus, the first objective of the study is to evaluate the direct effect of entrepreneurial talent on sustainability performance.

Meanwhile there are suggestions that higher social intelligence among entrepreneurs leads to improved entrepreneurial performance. However, there is no empirical evidence to support this. At the same time, much inconsistency still exists about the influence of entrepreneurial talent accumulated through prior work experience, on firm performance. Thus, the study also aims to explore the potential effect of social intelligence on the entrepreneurial talent influence on sustainability performance.

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Aside from the distinctive performance measurement nature of TBS, earlier studies have also reported that the challenges faced in managing a TBS are distinct from that facing corporations and that the profile and decision-making heuristics between entrepreneurs and corporate managers are dissimilar. Moreover, several researchers have suggested that the decisions in the day-to-day operation of TBS are more challenging, and that decision makers in TBS cannot rely on standard operating procedures, which are

prevalent in their larger and more established counterparts. Entrepreneurial decision-making is a growing concern when discussing TBS performance. Gibcus, Vermeulen, & De Jong (2009) suggested that the success or failure of TBS is highly dependent on the decision-making strategy of entrepreneurs. The influence of entrepreneurs' characteristics on the decisions made by firms, and its subsequent influence on firm performance is also explained by the upper-echelon theory (UET) (David, Paul, Ongeti, Nicholas, & Evans, 2012; Hambrick & Mason, 1984; Hambrick, 2007; Nielsen, 2010). Thus, this study also aims to examine the indirect effect of entrepreneurial decision-making strategy on the entrepreneurial talent influence on sustainability performance.

In addition, technology has been argued to be important in boosting SME performance, and subsequently the economy of a nation (Vasauskaite & Streimikiene, 2016; Vasauskaite, 2014). Thus, in Malaysia, the SME sector is encouraged to adopt technology and innovation to boost their performance. As early as 1996 via the Seventh Malaysian Plan (SMP), technology adoption was given the focus to bring Malaysia to a higher economic level. Furthermore, with the introduction of Vision 2020 in 1990, Malaysia aims to transform its economy from the traditional capital and labour intensive to a knowledge-based economy (KBE) to achieve higher economic growth based on innovation and technology advancement by the year 2020. While among the initiatives adopted in the National Transformation Program (NTP) is the increased adoption of the information and communication technology (ICT) among SMEs, and financial technology (fintech) by the financial services sector in providing better financial access and support to SMEs and TBS.

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However, despite the high representation of SME in the Malaysian economy (97.3% of business establishments in Malaysia are SMEs), the performance was far below expectations. Thus, to rectify the situation, various initiatives encouraging the adoption of innovation and technology among SMEs to move the SMEs up the value chain. The initiatives include setting up of agencies to TBS, setting up facilities for product testing and certification, channelling financial aids through various government funding schemes amounting to RM48.1 billion, running over RM9,127.2million worth of SME development programs benefiting 2.5 million SMEs with the goal of raising the productivity of SMEs (ERIA, 2014; National SME Development Council, Malaysia [NSDC], 2014). However, it was reported that despite the high aspirations and massive investment in promoting the TBS sector, insufficient research has been conducted on TBS performance in Malaysia (ERIA, 2014). Thus, the context chosen for this study is the TBS in Malaysia.

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1.2 The Importance of TBS

The importance of TBS to an economy have been widely discussed in literature (Organisation for Economic Co-Operation and Development [OECD], 2005; Wright, Liu, Buck, & Filatotchev, 2008). TBS have been argued to be important drivers of innovation and growth (Wright et al., 2008), and play a major role in industrialized economies through strong contribution to economic growth and social development (D'Angelo, 2012; OECD, 2005). Adoption of technology among TBS has help overcome among limitations and challenges of surviving the initial phase of life span, due to the small sizes and the uncertainties of the innovation process (capital and knowledge gap). With the aid

of technology and innovation, TBS can compensate for the scarcity of internal resources and competences, and therefore able to address wider range of market opportunities (Parida, Westerberg, & Frishammar, 2012). A TBS is usually marked with a high growth potential and high leverage of knowledge and intellectual property (Memon, Rozan, Ismail, Uddin, & Daud, 2015).

Studies conducted in European countries which were predominantly innovation-driven and technology-intensive, had reported the strength of contribution of TBS to the economy (Harms, Luck, Kraus, & Walsh, 2014; Matlay, Ruzzier, Hisrich, & Antoncic, 2006; Vasauskaite & Streimikiene, 2016). For instance, technology had been identified as a pull factor to motivate grey entrepreneurs into starting up businesses (Harms et al., 2014) in a study among more senior entrepreneurs in the Rhine valley, Europe. While TBS were considered as high-growth or high potential new ventures in a study among high-growth firms in Finland (Autio & Rannikko, 2016). Technology is among the forces driving globalisation of SMEs in Slovenia, where TBS becomes more aware of opportunities via improved connection, communication and information processing (Matlay et al., 2006). While in a separate study examining intensity of energy consumption among manufacturers, technological advancement was found to lead to efficient use of energy. Development of innovative management and technology solutions led to increased industrial competitiveness and promotion of economic growth. Implementation of advanced manufacturing technologies enabled the creation of high technology and knowledge-intensive jobs, and rejuvenated the economy while keeping it highly competitive in global markets (Vasauskaite & Streimikiene, 2016).

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In Malaysia, strong diffusion of technology and innovation had been argued to help Malaysia transitions from a middle income to a high-income nation. As at 31 December 2012, commercialisation of R&D Fund (CRDF) 9MP resulted in contribution of RM691 million in total output; generated more than RM60 million income to local residents; created employment for 8,437 persons; and generated RM239 million in total value-added (or GDP) in the economy (Malaysian Technological Development Corporation [MTDC], 2013a).

1.3 Research Problem

Review on the vast literature concerning TBS performance drivers leads to a few research problems.

Firstly, despite the abundance of interest of both researchers and policy makers, the subject of TBS performance suffers from the greatest challenges of defining and operationalising entrepreneurial performance (Ács, Autio, & Szerb, 2014; Ács et al., 2014; Amit, MacCrimmon, Zietsma, & Oesch, 2000; Cohen, Smith, & Mitchell, 2008; Lumpkin & Dess, 2001; Fukugawa, 2013; Mayer-Haug, Read, Brinckmann, Dew, & Grichnik, 2013; Richard, Devinney, Yip, & Johnson, 2009; Venkatraman & Ramanujam, 1986; Zott & Amit, 2007). To date, there has been little agreement on what should be the appropriate measurement of entrepreneurial performance. The extensive studies that have been conducted on the performance management and measurement have largely focused on performance measures for larger corporations, rather than entrepreneurial performance (Bacidore, Boquist, Milbourn, & Thakor, 1997; Bititci, Garengo, Dörfler, & Nudurupati,

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2012; Garengo, Biazzo, & Bititci, 2005; Garengo & Biazzo, 2012; Kaplan & Norton, 1992; Kaplan, 2010; Liu, Li, Zhu, Cai, & Wang, 2014; Al-Matari, Al-Swidi, & Fadzil, 2014; Richard et al., 2009; Taylor & Taylor, 2014; Venkatraman & Ramanujam, 1986). However, the nature of TBS is distinct from large corporations or multinationals, due to their smaller sizes, less structured operations, rapid technology development, and higher uncertainties surrounding the SME environment (Garengo & Biazzo, 2012; Hudson, Smart, & Bourne, 2001). Thus, the issue of whether generic measures, such as sophisticated valuation techniques, ratios and indexes, are suitable and to be used in performance of TBS, have been debated (Garengo & Biazzo, 2012; Hudson et al., 2001; Taylor & Taylor, 2014). The management and measurement of entrepreneurial performance then, is argued to be more complex due to their nature, and has grown in importance in light of the high failure rates failure rate of TBS (Shane, 2012a; Storey & Cressy, 1996). Thus, there exist a measurement gap concerning of entrepreneurial performance which merits a deeper investigation from the perspective of TBS in Malaysia (Garengo & Biazzo, 2012; Muñoz & Dimov, 2015).

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Aside from the above, prior studies involving TBS performance have tend to use innovation as measure of performance. While other studies are found to employ the more traditional measures of financial or market performance. For instance, a meta-analysis review of 61 studies conducted on from a period of 1985 to 2007, found that 54% of the studies used sales as performance measure, 14.8% studies used profitability, and 10% studies used bankruptcy-related measures for performance of small businesses (Brinckmann, Grichnik, & Kapsa, 2010; Mayer-Haug et al., 2013). This has been challenged, and entrepreneurial performance is argued to actually be multidimensional

and thus, should not be restricted to only economic nor financial objectives (Carsrud & Brännback, 2011). In fact, previous studies examining entrepreneurs' motivation revealed that financial objectives are not the most important factor (Akola, 2008). Meanwhile, authors have suggested that the scope of TBS performance measures be widened from such traditional measures, and extended to encompass social, economic, and environmental value creation objectives (Akola, 2008; Cohen et al., 2008). Sustainability performance then is proposed to be the TBS performance measure that incorporates all the three economic, social, and environmental (or ecological) value creation objectives (Cohen et al., 2008; Jolink & Niesten, 2015; Muñoz & Dimov, 2015). Sustainability is argued to lead to long-term value creations while having a positive social and economic impact on the communities where a firm operates (Rapacioli & Obsorn, 2011).

However, Cohen et al. (2008) only dealt with the conceptual framework for the sustainability performance measures with three broad underlying dimensions of economic, social and environment, albeit without the operationalisation of the three underlying dimensions. While most studies in entrepreneurship performance have been mostly restricted to part and not all of the measures, therefore giving limited attention to performance sustainability measurement that simultaneously integrate social, environmental and economic perspectives (Jolink & Niesten, 2015; Maletic, Maletic, & Gomiscek, 2012). Hence, there is a critical need for a new study to address the measurement gap of operationalising sustainability performance from the perspectives of achievement in terms of economic, social, and environmental value creation objectives in the context of TBS.

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