

Assessing the Role of Entrepreneurial Competencies on Innovation Performance: A Partial Least Squares (PLS) Approach

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For decades, entrepreneurial competencies have been viewed as essential for entrepreneurs to perform successfully and transform businesses. However, research on entrepreneurial competencies and their impact on innovative performance is very much lacking. Furthermore, research on these two variables among SMEs is also scarce. Thus, the intention of this study is to review the literature on entrepreneurial competencies and innovative performance and to investigate the relationships of these two variables within the Malaysian SME context with empirical evidence. A step by step SmartPLS approach is utilized to validate the model and find substantial support for the study's hypotheses.

Keywords: Entrepreneurial Competencies, Innovative Performance, SME, SmartPLS

JEL Classification: L26, O31

I. Introduction

Of late, the Malaysian SME sector has soared in tandem with global business development. The government has acknowledged that SMEs are the backbone of the Malaysian economy and continues to provide various support and programs to enhance SME productivity (PEMANDU, 2010). To unlock the growth potential of SMEs, the government has developed an extensive array of innovation know-how programs among the SMEs. Nevertheless, the 2016 Global Innovation Index for innovativeness ranked Malaysia at thirty-fifth for innovativeness (Cornell University *et al.*, 2016). In 2011, Malaysia was ranked at thirty one, and in 2012 it was ranked at thirty-two (INSEAD, 2012). The decreasing trend in innovation in Malaysia is a concern because it indicates that Malaysia is losing its footing in innovativeness. This information is supported by Che-Ha and Mohd-Said (2012); there is a dearth of information on SME innovative activities in Malaysia. Therefore, the Malaysian SMEs need to embrace innovativeness to stay relevant in today's global economy because their survival depends highly on their innovativeness, creativity, and entrepreneurship.

One of the ways for SMEs to become innovative is to rely on the entrepreneur's ability and creativity to innovate. There is a suggestion that the Malaysian SMEs do not have the prerequisite entrepreneurial competencies (ECs) to engage in activities which lead to innovative performance (IP). While it is true that entrepreneurs with highly developed entrepreneurial competencies are more likely to introduce innovation to their businesses (Mitchelmore and Rowley, 2010), it is

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postulated that some of the competencies have more influence than others on innovativeness among entrepreneurs. Given the fact that ECs are important to SME innovativeness, this paper argues that it is essential to understand the EC relationship to innovative performance in business practices. Therefore, the purpose of this paper is to investigate the relationships between these two variables – entrepreneurial competencies and innovative performance among the Malaysian SMEs – with empirical evidence.

II. Literature Review

A. Entrepreneurial Competencies

Frey and Ruppert (2013) categorize competencies as belonging to either personal or organizational categories. Personal competencies are abilities acquired by individuals such as knowledge, skills, abilities, experience, and personality, whereas organizational competencies are the embedded processes and structures that continue within an organization even when individuals leave the organization. These two categories are not mutually exclusive because all the personal techniques in the organization process or the work culture can be embedded in the organization. According to Spencer and Spencer (1993), competency is driven by the need to achieve superior performance and acquire economic gain and business success. Baum *et al.* (2001) emphasize that competency can be classified as either *specific* competency or *general* competency. *Specific* competency is technical and industrial skill whereas, *general* competency is organizational and opportunity recognition skill. Moreover, many studies have attributed the success of small businesses to the competencies of the entrepreneurs (Mitchelmore and Rowley, 2013). There is no denying that entrepreneurial competencies are vital to an organization's establishment, expansion, and success; however, the discussion of competencies in the entrepreneurial literature is still in its infancy (Brinckmann, 2008). Studies from Henderson and Cockburn (1994), Man *et al.* (2002), and Chandler and Jensen (1992) that spur from research productivity, competitive advantage and business performance have been closely associated to specific competencies; nevertheless the competencies needed to initiate and sustain the entrepreneurial process are less clearly identified (Rasmussen *et al.*, 2014).

Entrepreneurial competencies (ECs) have been identified as a specific group of competencies that are necessary to be implemented for successful entrepreneurship (Mitchelmore and Rowley, 2010). Since this study focuses on SMEs, ECs are scrutinized in detail to distinguish between general competencies and entrepreneurial competencies. Entrepreneurial competencies have often been associated with the occurrence of small and new businesses (Colombo and Grilli, 2005; Nuthall, 2006). The research of Chaston *et al.* (1999) on small organizations looks into the different modes of behavior which relate to and impact organizational capability. They also reveal that there have been only a few literature attempts to investigate the constructs on small organizations using quantitative techniques. Interestingly, scholars who specialize in the field of entrepreneurship make a distinction between managerial competencies and entrepreneurial competencies (Lerner and Almor, 2002; Chandler and Hanks, 1994a and 1994b). Man *et al.* (2002) clarify that ECs involve both managerial and entrepreneurial competencies and view ECs as the total ability package of an entrepreneur to perform the job role successfully and to also transform the business. The main strength of Man *et al.*'s (2002) argument is that ECs are exercised by individuals who start and transform their businesses. Hunt and Meech (1991) also stress that in the entrepreneurial context, the focus is not on an organization but on the individual. In addition to entrepreneurial

and managerial competencies, an entrepreneur needs to master the technical functional role too (Camuffo *et al.*, 2012). These findings are supported by Bruyat and Julien (2001) and Stevenson and Jarillo (1990), who conclude that entrepreneurial competencies are distinct individual abilities to identify, develop, and exploit opportunities and resources. Additionally, Johnson and Winterton's (1999) positive contribution to the study of entrepreneurship is that the range of competencies needed to run a small organization is vastly different from that of a large organization, from both the qualitative and quantitative aspects. This argument is consistent with the Resource-Based-Theory which states that the value creation of an organization is closely related to the capability of its managers in attaining and developing resources (Barney, 1991; Grant, 2010).

The EC constructs used to build the framework for this study are from Man (2001) and Ahmad (2007). These entrepreneurial competency constructs are opportunity, strategy, relationship, concepts, and technical expertise. According to Man *et al.* (2002), an entrepreneur who masters these entrepreneurial competencies will have a positive impact on the firm's decision making, business strategy, and capabilities, which include innovative ability (new products, services, and processes), quality (maintaining high quality and image), cost-effectiveness (competitive price), and organicity (flexible organization structure and system to achieve production speed and responsiveness). A study by Ahmad *et al.* (2010) on Malaysian SMEs in the service sector confirmed that ECs are also strong predictors of business success. The result validates Gibb's (2005) argument that SMEs' competitive advantage is achieved and sustained by the ability of the entrepreneur and not the size of the organization. Entrepreneurship also refers to a process of opportunity recognition and pursuit that leads to growth that creates value and bears risk. Thus, it is strongly associated with innovation. The study by Ahmad *et al.* (2010) clearly explains that entrepreneurs are capable of minimizing the negative impact of the business environment if they always equip themselves with the necessary competencies.

B. Innovative Performance

Innovation is defined as the adoption of an idea or behavior that is new to an organization (Daft, 1978; Damanpour and Evan, 1984). The adoption of innovation is described as a process that includes generation, development, and implementation of new ideas or behaviors. Innovation is not only an adoption but also an adaptation of new information and practices, which leads to the ability to create new ideas and apply them to improvise new products, services, processes, and procedures (Bates and Khasawneh, 2005). The definition of innovation has evolved into different categories which include products, production methods and technologies, markets, services, and organizational structures, and an assumption is made that the source of information varies between different types of innovation (Freel and de Jong, 2009; Tödting *et al.*, 2009). Innovation can either be radical, which is revolutionary and original (Green *et al.*, 1995) or incremental, which is small improvements on an established process, product, or service. In sum, incremental innovations are improvements of existing products, services, processes, technical, or administrative conditions. Innovation, then, is multi-dimensional and is practiced by all types of organizations regardless of size because it is proven that organizations that are innovative have higher profits and market share (Prajogo and Ahmed, 2006). Many or most authors would agree that having distinguished entrepreneurial competencies is very important because such competencies will spur innovation.

Entrepreneurial competencies and innovations have always had a unique relationship. Schumpeter (1934) argued that technological and innovation change of a nation derived from the

entrepreneurs and innovation has been recognized as a competitive edge in business organizations. An individual who has developed his entrepreneurial competencies will eventually become involved in a special process of something new in the managerial, services, or product development process where he is willing to take on calculated risk (Ivanov and Bikbulatov, 2013). In this study, innovation involves the undertaking of actions to improve the products, processes, and procedures that help to increase the significance, usefulness, and performance of the products, processes, or procedures (Pinho, 2008), and innovative performance is defined as incremental product, service and process innovation because SMEs' innovation activities are more likely to be *ad hoc* or project driven (Hoffman *et al.*, 1998). Furthermore, SMEs are likely to focus on incremental innovation as posited by Oke *et al.* (2007).

III. Theoretical Framework

Based on the aforementioned literature review, the proposed hypotheses are listed below. Entrepreneurial competencies constructs are represented by strategic, conceptual, opportunity, relationship, and technical categories and are viewed as possible predictors of innovative performance (Man *et al.*, 2002). This study argues that innovation is characteristic of entrepreneurial competencies (Edwards-Schacter *et al.*, 2015) and can be learned as part of the personal development process. Furthermore, innovation relates to innovative behavior that triggers cognitive processes to produce novel business ideas (Bird, 2002). Given that entrepreneurial competency constructs are predictions of an entrepreneur's tendency towards innovation, it then can be anticipated that:

Hypothesis 1: *There will be a positive statistically significant relationship between conceptual competency and innovative performance.*

Hypothesis 2: *There will be a positive statistically significant relationship between opportunity competency and innovative performance.*

Hypothesis 3: *There will be a positive statistically significant relationship between relationship competency and innovative performance.*

Hypothesis 4: *There will be a positive statistically significant relationship between strategic competency and innovative performance.*

Hypothesis 5: *There will be a positive statistically significant relationship between technical competency and innovative performance.*

IV. Methodology

This study is quantitative in nature, and the scope focuses on SMEs that are registered with the SME Corporation Malaysia. Since this study focuses on SME entrepreneurs, the definitions of SMEs provided by the Small and Medium Industries Development Corporation (SMEDCorp Malaysia, 2014) will be used to identify appropriate businesses for inclusion in the study. A survey instrument was developed by adapting items from previous literature that are reliable and validated to evaluate the relationships between the entrepreneurial competency constructs and innovative performance.

Since many SME entrepreneurs in Malaysia are comfortable in answering in the Malay language, the survey instrument was also translated into the Malay language. The translation in this study applied the extended parallel translation procedure known as collaborative translation. By applying this technique, the equivalence in meaning and the intended sense of statement was captured (Limpanitgul and Robson, 2009). Again, the translated questionnaire was pre-tested by the respondents to ensure the questions were the same in the English and Malay versions of the questionnaire.

Data were collected by sending mail surveys where the questionnaires were distributed to 1,000 companies in all states of Malaysia. The respondents were the business owners *cum* entrepreneurs of SMEs. This study is a cross-sectional type of inquiry. Two screening questions were used to check the sample for any form of response bias (Podsakoff *et al.*, 2012). A total of 191 replies were received. Twenty-four questionnaires were not usable because they were partially completed and did not meet the screening questions criteria. Therefore, only a sample size of N=167 was used for this study, resulting in a response rate of 16.7 percent. This response rate is considered satisfactory because it is a common scenario in Malaysia to obtain a standard response rate of between 15 and 20 percent from SMEs (Othman *et al.*, 2001).

V. Sample Profile

This study surveys SME organizations in Malaysia either from the manufacturing or the services sectors. From the total of respondents, 65 were from the manufacturing sector and 102 were from the services and other sectors. This study complies with the new SME definition made by SME Corporation Malaysia. From the profile, 100 percent of the respondents are owners and also entrepreneurs for their respective organizations. All respondents have been operating their businesses for 3 years or more. The majority of the respondents have been operating between 4 and 10 years (31.14 percent), 25.15 percent have been operating for 21 years or more, 23.95 percent have been operating for 3 years, 12.57 percent have been operating between 16 and 20 years, and only 7.19 percent have been operating between 11 and 15 years. Micro size businesses form the majority of the respondents of the survey (43.71 percent), followed by small size businesses (37.13 percent) and medium size businesses (19.16 percent). This is in sync with the Malaysian 2011 census that confirms the majority of SMEs are micro establishments (77.0 percent) (Jabatan Perangkaan Malaysia, 2012). The majority of the respondents are private limited companies (61.08 percent) followed by sole proprietorships (22.75 percent), and only 16.08 percent are partnerships. More than half of the respondents are male (62.28 percent). The biggest group of respondents in this study falls between 40-49 (28.14 percent) years old, and the highest level of education attained by most of the respondents is the university degree level (52.69 percent). The majority of the respondents are Malays (79.04 percent).

VI. Findings and Discussion

The model was tested by applying the Structural Equation Modelling (SEM) procedure using SmartPLS which was developed by Ringle *et al.* (2010). The first step was to test for the convergent validity. Hair *et al.* (2010) suggested using the factor loadings, composite reliability, and average variance extracted to measure the convergence validity. Hair *et al.* (2014) state that an outer loading of 0.7 is acceptable because it is considered close enough to 0.708. Nevertheless, Hair *et al.* (2014) caution social sciences researchers to initially analyze the impact of deleting indicators between 0.40 and 0.70 on AVE and composite reliability. If deleting the outer loading does not increase the measure above the threshold, the reflective indicator should be retained. However, indicators with outer loading below 0.40 should always be eliminated from the scale (Hair *et al.*, 2012). The loadings after deleting some of the items exceeded the recommended value of 0.7 (Hair *et al.*, 2010) as depicted in Table I. The Composite Reliability as depicted in Table 1 ranged from 0.871 to 0.944 which exceeded the recommended value of 0.7 (Hair *et al.*, 2010). The average variance extracted, which reflects the overall amount of variance in the indicators accounted for by the latent construct, was in the range of 0.606 and 0.688, which also exceeded the recommended value of 0.5 (Hair *et al.*, 2010).

Table 1: Result of the Measurement Model

Constructs	Items	Loadings	AVE	CR	Deleted Due to Low Loading
Strategic Competency	ECS1	0.757	0.652	0.944	
	ECS2	0.749			
	ECS3	0.854			
	ECS4	0.773			
	ECS5	0.864			
	ECS6	0.770			
	ECS7	0.855			
	ECS8	0.854			
	ECS9	0.779			
Conceptual Competency	ECC10	0.750	0.628	0.871	ECC11
	ECC14	0.828			ECC12
	ECC15	0.807			ECC13
	ECC16	0.784			
Opportunity Competency	ECO17	0.853	0.681	0.895	
	ECO18	0.803			
	ECO19	0.850			
	ECO20	0.794			
Relationship Competency	ECR21	0.711	0.606	0.902	
	ECR22	0.811			
	ECR23	0.819			
	ECR24	0.735			
	ECR25	0.795			
	ECR26	0.794			

Table 1: Result of the Measurement Model: Continues

Constructs	Items	Loadings	AVE	CR	Deleted Due to Low Loading
Technical Competency	ECT27	0.810	0.688	0.898	
	ECT28	0.795			
	ECT29	0.835			
	ECT30	0.875			
Innovative Performance	IP1	0.808	0.638	0.898	IP4
	IP2	0.834			
	IP3	0.806			
	IP5	0.751			
	IP6	0.792			

Note: Loadings > 0.7, AVE>0.5, CR>0.7.

The next step was to measure the discriminant validity to check if the construct is exclusive from the other constructs by empirical standard (Hair *et al.*, 2014). For discriminant validity, the initial cross loadings of the items should correspond to their constructs and should be greater than the other constructs. Table 2 shows that there is sufficient discriminant validity for all constructs in this research. As shown in Table 2, all the square roots of the average variance extracted were higher than the correlations values in the row and the column, indicating adequate discriminant validity. In sum, the measurement model demonstrated adequate convergent validity and discriminant validity.

Table 2: Discriminant Validity of Construct

	Conceptual	Opportunity	Relationship	Strategic	Technical	IP
Conceptual	0.793					
Opportunity	0.781	0.825				
Relationship	0.717	0.661	0.779			
Strategic	0.650	0.665	0.669	0.808		
Technical	0.679	0.576	0.666	0.668	0.829	
IP	0.609	0.570	0.524	0.579	0.523	0.799

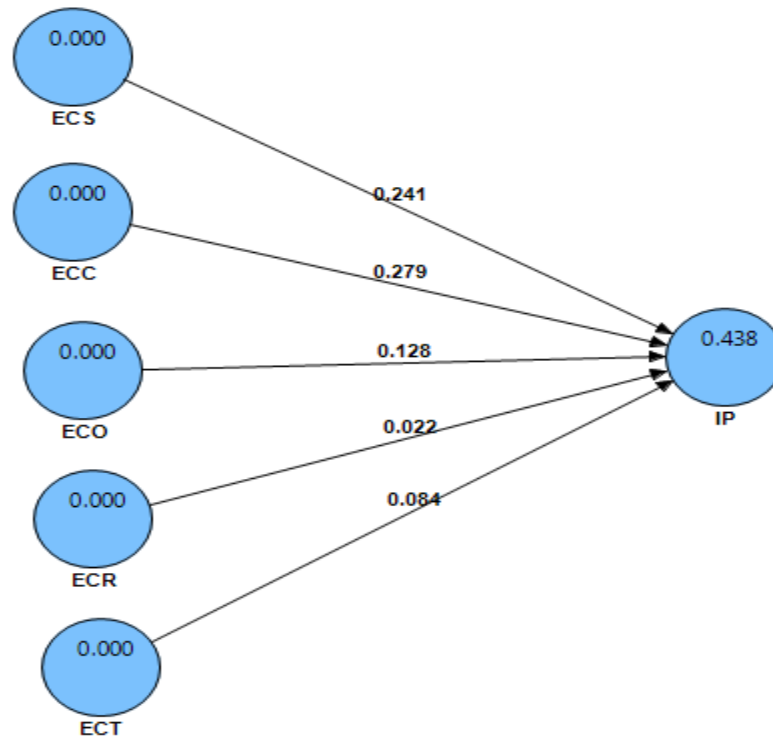
Note: Diagonals represent the square roots of the AVE while the off diagonal represents the correlations.

To test the hypotheses, an evaluation of the structural model was conducted. The analysis for the hypotheses was performed using the bootstrapping method. Table 3 shows that H1 and H4 are supported. Conceptual and strategic competencies are positively related to innovative performance. From Figure 1, the innovative performance R^2 value is 0.438, which suggests that 43.8 percent of the variance in the dependent variable is explained by EC.

Table 3: Hypothesis Testing

Hypotheses	Relationships	Std Beta	Std Error	t-value	Decisions
H1	Conceptual -> IP	0.279	0.136	2.056**	Supported
H2	Opportunity -> IP	0.128	0.120	1.068	Not Supported
H3	Relationship -> IP	0.022	0.094	0.228	Not Supported
H4	Strategic -> IP	0.241	0.092	2.617***	Supported
H5	Technical -> IP	0.084	0.085	0.993	Not Supported

Note: * $p < 0.10$ (1.28), ** $p < 0.05$ (1.645), *** $p < 0.01$ (2.33) one tail. Hypotheses are supported.

Figure 1: Structural Model

Conceptual competency is positively related to innovative performance with a beta value of 0.279, t -value of 2.056 and $p < 0.05$ significance level. Similarly, strategic competency is positively related to innovative performance with a beta value of 0.241, t -value of 2.617 and $p < 0.01$ significance level. Durkan *et al.* (1993), Mitton (1989), and Snell and Lau (1994) categorized business strategy, sustainability, and systematic and strategic planning as strategic competency. Baum (1994), Bird (1995), McClelland (1987), and Mitton (1989) define conceptual competency as coping with uncertainty risk, cognitive and analytical decision making, problem solving, learning, and innovative skills.

Conceptual and strategic thinking are very much associated as both require the ability to understand relationships and draw the elements together into a coherent framework. Both competencies require the ability to use key pieces of information to predict trends and to predict

the outcome of a complex situation. From the literature produced, Santandreu-Mascarell *et al.* (2013) conclude that innovation is the result of the development of an idea into the market which is processed by individuals highly competent in strategic and conceptual thinking. Thus, there is some evidence that strategic and conceptual competencies lead to innovation behavior.

Contrary to expectations, this study's result shows that the correlation of opportunity competency, relationship competency, and technical competency to innovative performance is not statistically significant. Hence, care needs to be exercised in making sense of the result. The likely explanation for this result is that budget and cash flow are constant constraints for many Malaysian SMEs, making it difficult for them to afford entertainment and business expenses to facilitate client engagement and business networking. Secondly, large organizations are given more attention and opportunities by the government and the business community compared to SMEs due to their financial stability and track record. Moreover, large organizations have established their reputations by their branding and marketing strategies. Due to these constraints, SMEs in Malaysia may be less likely to invest heavily in relationship building with the business community and government agencies. Furthermore, in a hierarchically ordered society, the CEOs of business entities are expected to be the contact points for all the higher level appointments, and this can create time constraints and limitations on relationship building among SMEs.

Another conceivable reason for the non-significant opportunity competency may be due to the basic concept of *malu* (shame) in the culture of the Malays in Malaysia (Abdullah, 1993). Malay respondents constituted 79.04 percent in this study. To the Malays, *malu* is an element of basic goodness and virtue in society, and in one study Malays were reported to score more highly on self-consciousness than other ethnic groups (Mastor *et al.*, 2000; McCrae and Terracciano, 2005). Malays are found to be *malu* to ask for favors and opportunities. Therefore, it is likely that opportunity competency is less developed among the Malay SMEs due to the reasons given. However, mindful of the above discussion, it is plausible to conclude that entrepreneurs with superior conceptual and strategic competencies are more likely to engage in competitive intelligence, which may help them in enhancing their innovative performance.

The insignificant relationship between technical and innovative performance results may also be linked to budget constraints experienced by Malaysian SMEs. The majority of the SME establishments in Malaysia are categorized as micro establishments. Furthermore, investing in technical competency requires time and capital. Perhaps many SMEs contend that in a globalized marketplace that is turbulent and dynamic and characterized by competitiveness and rapid technology innovation, replication of others' products and services is a more effective option because it reaps quick profit and benefits.

VII. Conclusion and Implication

The objective of this study is to examine EC constructs and innovative performance relationship in the Malaysian SME context. This study makes several contributions to the literature on strategic management. Firstly, this study extends the pool of literature by examining several EC constructs and innovative performance. Secondly, it is vital for government agencies to understand the SME entrepreneurial competencies in Malaysia because of its unique historical background, beliefs and practices, political systems, and cultures. The findings from this study clearly show that ECs are indeed important for Malaysian SMEs' economic success. The success of Malaysian SMEs is very much affected by the entrepreneurs' competencies in accelerating innovative performance. From this study, there is a consensus that some of the entrepreneurial

competencies influence innovativeness. Thus, entrepreneurs must have the right competencies to undertaking innovative projects. SMEs are advised to broaden their competencies to move their businesses forward, or they are at risk of being left behind in today's borderless global market. It is important for the SMEs to build these competencies by adopting new techniques and changing deep-rooted systems. Government agencies can initiate awareness campaigns to promote ECs that assist in innovative performance among the SMEs. Finally, universities can assist SMEs in developing their competencies by providing and building an across-the-board network system and incubation centers that provide access to resources. Moreover, by championing a meticulous and accurate competency database, it can become a reference point and a blueprint for providing support and training programs that are more relevant for today's millennial entrepreneurs. The database can be a tool in assessing the existing entrepreneurs' competencies and highlighting areas where change is needed to improve existing training programs and the level of support provided.

While the research design was tailored to address the hypotheses and focus on the significant variables, this study is not without limitations. Firstly, this study relied on cross-sectional data. It only considers the current state of SMEs and does not look further beyond the short and long term effect of entrepreneurial competencies on SME innovative performance. Future study in this area would benefit from using a longitudinal study methodology by which the degree of entrepreneurial competencies can be measured over time to entirely understand the study's framework.

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