

EFFECT OF INTERNAL BARRIERS ON INNOVATION PERFORMANCE IN EMBRYONIC SMEs IN MALAYSIA

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ABSTRACT

Manufacturing small and medium enterprises (SMEs) need to propel their creativity and innovativeness to enhance their innovation performance in the competitive and fast-changing environment. The current environment has transformed the internal working pattern, structure, and communication system to survive the rough business ecosphere. Consequently, SMEs encountered innumerable barriers to achieve the innovation performance and the SMEs should recognise the internal barriers so that they are able to accelerate their innovation performance. Therefore, this study aims at examining the internal barriers namely constraint in financial resources, constraint in technology, and constraint in human resources that hamper the innovation performance among the Malaysian manufacturing SMEs. This study embarked on two phases of data collection. First phase includes a series of semi-structured interviews with 15 participants from 5 SMEs via snowballing technique to gather their insights on internal barriers that impede innovation performance. For second phase, the survey method was adopted, and 217 SMEs responded to the survey. All the responses were analysed using SmartPLS technique. The interview findings demonstrate that all the internal constraints are indeed important for SMEs to grasp and serve as the obstacles for innovation performance. Nevertheless, from the quantitative analysis, only financial constraints serve as the significant barrier

that impede innovation performance. To summarise, this research produces insights on decisive proof regarding internal barriers that inhibit the manufacturing SMEs to achieve innovation performance.

Keywords: internal barriers, financial constraints, technology, human resources, innovation performance, SMEs

INTRODUCTION

Small and medium enterprises (SMEs) can be considered as prominent entities in the private sectors, which play an important role in developing the Malaysian economy. Mohamad et al. (2021) have argued that SMEs serve as the backbone of a national economy. According to the statistics, 99.2% of total business establishments in Malaysia are the SMEs, totaling up to 548,267 enterprises. Most of these SMEs (87%) are located in the service sector, followed by the manufacturing sector (7%), and agriculture sector (6%). Moreover, in terms of economic indicators, SMEs contribute 32% of gross domestic product (GDP), 59% of employment, and 19% of exports (SME Masterplan, 2012–2020). This outcome has shown that SMEs are essential to the economic development of the nation. Malaysian government has acknowledged the importance of SMEs, where the efforts are more focused on the development of SMEs. SMEs in Malaysia are encouraged to be in line with the SME Development Framework to be prepared in the digital era in which the economy is driven by technology and innovation. Innovation is essential to growth since the accumulation of knowledge alone is inadequate in explaining the progress and this is where innovation comes, serving as a conduit in synthesising this knowledge into new products and services (Braunerhjelm, 2010; Ramdan et al., 2022). In addition, there is a sign on the progress of SMEs as highly innovative SMEs and improve faster if compared to non-innovative SMEs (Ramdan, et al., 2022; Bilton & Cummings, 2010). Therefore, SMEs need to enhance their innovative capabilities in order to maintain the competitive edge and further improve the company performance. However, the performance of Malaysian SMEs did not live up to the expectation despite being provided with various incentives and support by the Malaysian government as their contribution is only 38.8% to the overall GDP, 17.3% to total exports, and 66.2% to total employment (Dzuljastri et al., 2021). Although most of the business establishment in Malaysia is the SMEs, their contribution towards national GDP remains small as compared to the nation's counterpart. For instance, SMEs in Singapore contribute half of their national GDP at 50% (TRPC, 2020). Due to these circumstances, an important question must be raised: "Why Malaysian SMEs are still lagging despite being provided with various incentives through support mechanism, programmes, and strategies

in order to boost their performance?” As Malaysia strives to become a developed nation, the performance of SMEs needs to be further improved. Achieving such a feat is not easy and SMEs will face major challenges ahead. Awang Tuah et al. (2021) have argued that the competitiveness of SMEs particularly in export will be affected due to the emergence of new technologies in ICT, increase in factor costs, and global challenges. Therefore, to maintain their competitive edge, SMEs must build an organisational culture that encourages innovation (Agbor, 2008; Halim et al., 2021). The market environment will constantly change due to globalisation. SMEs should be on the move and for SMEs that successfully implement the innovative culture, they must continuously search for effective ways in improving the innovation performance. Madrid-Guijarro et al. (2009) and Halim et al. (2021) have argued that failure in seizing innovation as core business strategy could render small firms to be less competitive due to obsolete products and processes. Adopting innovation as core business strategy will give amazing perks to firms, but it also comes with various challenges. For instance, firms are hiring employees to undertake business operation, and as the SMEs embrace innovation as their core business strategy, everyone in the SMEs must take part in the process. In this sense, the ability of employees to innovate and to be creative will become major factors in explaining innovation performance. On the contrary, lack of ability to innovate among employees should hamper innovation performance of a firm. Hanifah et al. (2021b) have also argued that internal human capital in terms of skilled personal is one of the factors which could inhibit the innovation activities.

Unlike larger companies, SMEs will face difficulties in some areas, for instance they could not afford to provide first class training and skills to their employees, conquering new market, and harder to invest in new technology (Yahya et al., 2011). Vossen (1998) and AlQershi (2021) have argued that R&D in smaller firms is more efficient due to the flexibility in organisational structure; however, the innovative output from a large firm with well-developed marketing channel will have greater value. In order to further understand the impact of barriers on innovation, Madrid-Guijarro (2009) has conducted a study among SMEs in Spain and categorised the barriers into internal and external. Nevertheless, for SMEs to maintain their competitive edge in the developed nation, they need to emphasise the barriers within their control in order to build the internal strengths for robust organisational culture that encourages innovation. Internal factors are considered crucial to be in the spotlight since these factors are embedded within the SMEs, and due to the nature of SMEs which are pocket-sized and frail. As such, it is pertinent for them to understand better their internal barriers to move forward and embrace the concept of innovation performance. The study argues that SMEs may perceive that internal barrier namely lack financial resources, poor human resources, weak financial position, high cost and risk in technologies are complicated to overcome,

and therefore limiting firm's innovation activities. The above discussion has justified that serious attention should be given to dwell on the influence of internal barriers toward innovation performance. In addition, Omar et al. (2017) argued that the internal barriers have an impact on the performance among manufacturing SMEs in Malaysia. The study selected several business owners from manufacturing SMEs and conducted an interview to find the most challenging factors to enhance performance. The interview found an interesting discovery where constraints in financing resources, technology, and human resources were the major barriers to performance. Even though scholars have discovered the dominant barriers to innovation performance, the study on this area of research is still lacking in imperial evidence.

This study applies the concept of the resources-based view (RBV) as the supporting theory, to develop a cohesive theoretical research framework that synthesis internal barriers (constraint in finance, constraint in technology, and constraint in human resources), and innovation performance. The relationship between these resources is crucial among SMEs to gain better understanding about the impact of internal barriers toward innovation performance. In this respect, this study aims to provide the empirical results on the influence of internal barriers on innovation performance among Malaysian manufacturing SMEs. Positively, by gaining more knowledge in this area, SMEs could devise appropriate strategies to improve the innovation performance among them.

LITERATURE REVIEW

Innovation Performance

According to Zizlavsky (2016) innovation performance can be described as the ability to transform innovation inputs into outputs. It involves the action to improve the products, process, procedures that increase the significance, usefulness and performance of the products, process, and procedures (Pinho, 2008; Hanifah et al., 2021b). As innovation is the key in achieving competitive edge, SMEs must boost their innovation performance to win the market and for their business survival. In the context of Malaysia, the performances of SMEs are lower than its counterpart despite many incentives has been poured to improve the growth of SMEs. In explaining this situation, we might overlook something crucial which is the outcome of the innovation process. Rosenbusch et al. (2011) have found that instead of spending more resources towards innovation process inputs, SMEs should focus on the outcomes from the process of innovation to reap larger increase in firm's performance. Therefore, a successful breakthrough in innovation

is the key factor that leads to growth and performance of SMEs. However, as firms engage more in innovation, the obstacles also increase (Galia & Legros, 2004). Hanifah et al. (2021b) and Vasudevan et al. (2021) have also argued that innovation poses additional threats or obstacles from both internal and external factors. For that reason, gaining a better knowledge on the potential obstacles or barriers to the innovation performance might provide SMEs with better information on how to tackle the barriers and to further improve their performance. Hence, this study will focus on the investigation of internal barriers to innovation performance.

Internal Barriers

Pursuing innovation as a firm's core business strategy is not an easy task for an organisation, especially among SMEs. Unlike large organisation, SMEs are expected to face more challenges in the effort to pursue innovation due to constrain in resources in terms of human capital, financial, technology, equipment, and know-how (Omar et al., 2017).

Constraints in financial resources

Naturally, innovative firms especially SMEs are inclined to struggle from financial difficulties since their informational opaqueness, their little tangible assets to pledge as collateral, and the riskiness of their strategies, most potentially innovative firms are credit-rationed and face relevant obstacles in financing their investments (Brancati, 2015; Dzuljastri et al., 2021). In the wake of the 2008 financial crisis, there has been a bigger focus on access to finance for SMEs. Some indication suggested that innovative firms have difficulty accessing finance (Lee et al., 2015). Brancati (2015) has clarified that financing of innovative projects is a critical topic in the literature of finance and growth. The global financial crisis has caused financial institutions to be more vigilant and the credit procedures have become so difficult and complex. Implication from the global financial crisis, SMEs experiences a difficult situation to access financial support. SMEs faces difficulty in understanding the complicated procedures since the banks always set very high requirements for SMEs to obtain financing facilities. SMEs are more likely to experience financial constraints compared to larger firms. Beck and Demirguc-Kunt (2006) and Pu et al. (2021) also have argued that the impact of financing conditions on firm development is very crucial. As such, Yuen and Ng (2021), Abdullah et al. (2009), Kee-Luen et al. (2013), and Azmi et al. (2014) have echoed that SME failures arise when they have lack of working capital, and concurrently they did perform any form of strategic planning and innovation activities.

Constraint in technology

Constraint in technology refers to the limitations of the company to gain new technology for R&D system to keep up with the dynamic changes in the environment. Technological obsolescence is a key problem worrying the SMEs sector in developing countries (Subrahmanya et al., 2014) because technology has imperative effects on business activities. A business that has excellent technological capacity may acquire new opportunities that will outperform its competitors, and this way will ensure the stability and survival of the business operation. However, owners of many SMEs do not feel urgency to adopt the modern technology as it is expensive (Nawai & Shariff, 2011; Yuen & Ng, 2021). Additionally, to manage the technology, SMEs need to recruit skilful employees with extra expenditures on the wages (Hairuddin et al., 2012). However, Mazidah et al. (2014) argued that majority of Malaysian SMEs do not pay significant attention on the crucial role of innovation and technology towards their business performance. Merely a small number of SMEs have undertaken the challenges to implant technology in their business activities. Apparently, Hairuddin et al. (2012) stated that technology has a powerful influence toward innovation, in which carelessness to implement the technology may cause difficulty for SMEs to expect progressive innovation growth within the organisation. As such, SMEs are unable to enter the global market if they cannot leverage the competitive advantage from the technology. In this respect, employees will also be affected in terms of their career development due to stagnant business activities of the SMEs (Awang et al., 2010). Therefore, it is difficult for SMEs to support innovation culture within the organisation (Khan & Khalique, 2014).

Constraints in human resources

Technological advancements have contributed to major changes to the nature of present operating systems. Due to this situation, it has wedged the changes in work, employees and the expertise involved. Small entrepreneurs make advancements in their operations, but they do not recognise the critical role of effective human resource for their success. Nevertheless, the SMEs face the challenge of changing their employees to obey a new descriptive job, and to find a suitable skilled workforce certainly during periods of technological changes. SMEs must undergo some changes to develop along with the technology's changes, and capable of competing with global companies. Besides that, inefficient human resources can be one of the barriers toward innovation activities within SMEs (AlQershi et al., 2022; Baldwin & Lin, 2002). Resistance to change, some of which results from inadequate training or poor employees' skills, is an important organisational challenge. Tung et al. (2022) have pointed out that small business managers often

lack education and training that have been linked with a successful innovation strategy. It is important to note that dissimilar from other resources in organisations, human resources are to be potentially non-outdated, and their skills are moveable across diverse products, technologies, and markets.

Hypotheses Development

Three hypotheses were developed to test the relationship between constraint in financial resources, constraint in technology, and constraint in human resources on innovation performance which are derived from the conceptual framework stipulated in Figure 1.

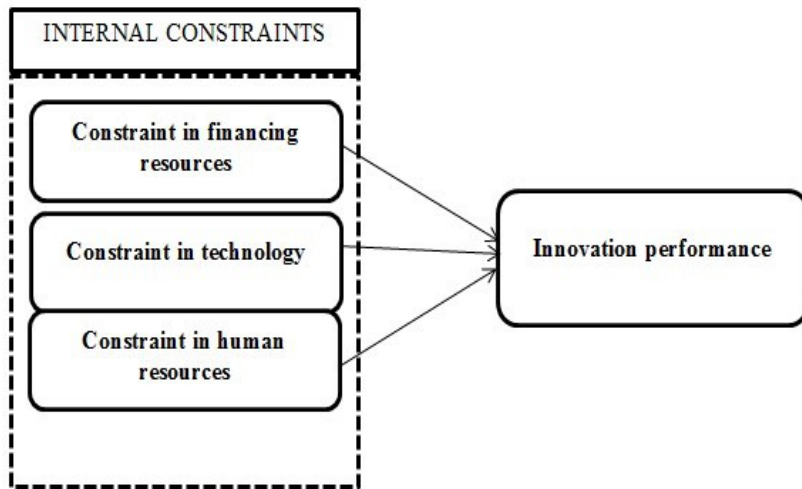


Figure 1. A framework for the relationship between internal constraints and innovation performance

The relationship between constraint in financial resources and innovation performance

Financial constraints refer to the lack of internal and external financial resources to be allocated to SMEs' innovation activities. According to RBV, financial resources are the most significant resources for growth and performance of SMEs. These resources include the ability of the SMEs to generate internal funds, and the capacity to borrow from external sources as well as other financing mechanisms that include cash balances, supplier credit, advance receipts, venture capital, leasing, factoring, and others (Hossain, 2020). SMEs are generally financed both from internal and external sources to foster innovativeness and development, it is critical to ensure the profitability and innovation performance of SMEs (Pu et al.,

2021). Some studies highlight that the availability of finance is the prime factor for the success and growth of SMEs (Hossain, 2020). The main barrier of growth for SMEs is the lack of finances and concluded that financing constraints have negative influence on the innovation performance.

According to Dzuljastri et al. (2021), the contemporary models of economic growth believe that economic development can be achieved through investment and the exploitation of knowledge. Unlike large firms, SMEs cannot afford to invest more in innovation due to the limitation of resources. Halim et al. (2021) have also argued that SME has more tendencies to face financial constraints and their inclination towards innovation is susceptible to the financial shape of a particular company. SMEs rely largely on their internal funds to finance R&D and this is not sufficient. As a result, they abandon some of their projects or may not be able to conduct R&D at all (Kamalrulzaman et al., 2021). In addition, Madrid-Guijarro et al. (2009) have argued that barriers particularly associated with lack of financial resources may be perceived as overwhelming, and thus limiting the firms' innovation activities. If this happens, SMEs will not be able to gain the outcome from the process of innovation, and therefore SMEs' overall performance gets affected. Lee et al. (2015) have conducted a study by examining 10,000 UK SME employers and found that innovative SMEs have a higher probability to apply for financial assistance compared to other firms, but they also have higher difficulties to access finance. This situation will have a huge impact toward innovation performance as SMEs will have more difficulties reaping the innovative output from the R&D. In addition, scholars have agreed that difficulties in financing R&D will have a huge impact on innovation performance among SMEs (Bovzi'c & Rajh, 2016; Tung et al., 2022). Based on the above discussion, the following hypothesis is postulated.

H1: The higher the constraint in financial resources, the lower the innovation performance among manufacturing SMEs in Malaysia.

The relationship between constraint in technology and innovation performance

While the literature recognises financial constraints as an important barrier to both the innovation and internationalisation of SMEs, some empirical studies show that constraint in technology resources is another barrier that impede innovation. Lack of technology may hamper creativity and the propensity to innovate (Indrawati et al., 2020). Technological innovations require the use of complementary assets to produce and deliver new products and services (Teece et al., 1997), suggesting that various types of innovation are needed if the real benefits of innovation activity

are to be obtained which subsequently will improve innovation performance. Technology is progressing faster than ever, and firms have to cope with the changes through technology development. However, due to the constraints in resources, attempting to develop the technology internally poses great challenges toward SMEs (Subrahmanya et al., 2014). In addition, SMEs will face larger obstacles in entering the global market as they fail to maintain competitive advantages due to the constraints in technologies (Zainol et al., 2018). Nowadays, new technology emerges as they evolve and lack of information on recent technologies might have a certain impact on the outcome of innovative projects. Iqbal and Hameed (2020) have conducted a study in order to find the important barriers to innovation project among French manufacturing firms. The study has found that innovation projects can be affected by lack of information on technologies. Another study by Choi and Lim (2017) examined the relationship between technology acquisition and innovation performance among manufacturing SMEs in Korea. The study has found that technology acquisition has a positive influence on SMEs' innovation performance. From another perspective, the constraints in technologies that interfere with the process of acquiring new technology and know-how could hamper the innovation performance among SMEs. Therefore, the following hypothesis is postulated.

H2: The higher the constraint in technology, the lower the innovation performance of manufacturing SMEs in Malaysia.

The relationship between constraint in human resources and innovation performance

Major challenges that prevent SMEs from achieving innovation include insufficient in human resources, non-inventive employees, and the lack of understanding of ideas. In this respect, the obstacles to innovation are primarily related to human resources, namely inadequate skills, low formal competencies and qualifications, and limited motivation to become involved in the innovation process. Some other studies also suggest that the barrier to innovation is largely because of the low quality of human resources in companies (Gazem et al., 2017). Human resources serve as one of the critical components for the success of organisation. According to Porter (1980) and Barney (1991), human resources theories have acknowledged the importance of employee toward organisation. Okpara (2011) has conducted a study in order to identify the factors that limiting the growth of SMEs in Nigeria by examining 211 small business owners. The findings have found that lack of management experience among SMEs is a major contributor toward business failure. In addition, the study acknowledged that lack of management skill is a major constraint toward business growth. SMEs in various countries have

addressed a shortage of skilled labour as one of the major constraints toward growth (Hessels & Parker, 2013). Apart from that, shortage in skilled labour has also posed some influence on innovation performance according to several studies. For instance, Lim and Shyamala (2007) conducted a study by examining the obstacles faced by manufacturing firms in Malaysia based on the data from the Third National Survey of Innovation in year 2003. Out of nine obstacles, the study has found that innovators perceive that the obstacle related to skilled labour is important compared to non-innovators. Another study by Dzuljastri et al. (2021) examined the barriers to firms' innovation among SMEs in Iran, where half of the respondents in the study perceived one of the importance barriers to innovation is the shortage in skilled personnel. To achieve a firm's objectives, employees in a particular firm need to be competent and able to perform. This requirement would be greater for innovative firms that operate in a highly competitive market. The employees need to be knowledgeable and possess a capacity to be creative as creativity is essential toward innovation. Halim et al. (2021) mentioned that the holder of knowledge, which is human, serves as a tool for innovation. Urbancova (2013) has also argued that the output of innovation particularly innovative ideas is utilised by organisation to achieve competitive advantages; however, the creation of these ideas relies upon personal creativity, knowledge, skills, and abilities. Hypothetically, the limitation of human capital in terms of creativity, knowledge, skills, and ability will hamper innovation performance. Therefore, the following hypothesis is postulated.

H3: The higher the constraint in human resources, the lower the innovation performance of manufacturing SMEs in Malaysia performance.

METHODOLOGY

To examine the relationship between the internal barriers and innovation performance among Malaysian manufacturing SMEs, this study used mixed method research approach with more focus on quantitative approach. This approach offers better understanding of the issue, rather than providing final evidence. This is important since the framework is lacking in term of empirical evidence. Therefore, this study will follow the mixed methods of exploratory sequential design as suggested by Onwuegbuzie et al. (2010), where the collection of data starts with qualitative then followed by quantitative approach. In this respect, the topic of interest was explored on how individuals describe a topic by starting with interviews, analysing the information, and using the information to develop a survey instrument. This instrument is then used to collect data from the population to see if the qualitative findings can be generalised to the population. The main

purpose of this method is to identify the situation faced by SMEs in real-world setting by conducting an interview among SMEs owner, and further strengthening the findings with empirical evidence obtained from the quantitative data. Therefore, the research has been conducted in two stages. The first stage involves gathering the data according to real-world setting. This can be achieved by interviewing the SMEs owner and directly gathering their view and opinion on the potential barriers towards innovation based on their experience. To extract the data related to respondents' experience, one of suitable approach is through qualitative method (Morse & Richards, 2002). The interview session was conducted individually, and the respondent was prompted to comment on various aspects regarding their business activities including their management style. On the second phase, data has been collected in quantitative mode through a survey. The quantitative data is collected through a set of questionnaires that distributed among Malaysian manufacturing SMEs. The target respondent for this study is extracted from the list of manufacturing SMEs registered in the Federation of Malaysian Manufactures (FMM) directory 2019, and according to the following criteria:

1. The business must be a manufacturing company in Malaysia.
2. The business must have less than 200 full-time employees.
3. The business sales turnover does not exceed RM50 million.

Data from the survey has been analysed using the PLS-SEM to examine the interaction between internal barriers and innovation performance. This study follows the common routine in PLS-SEM by establishing the validity and reliability of measurement model. In this stage, the convergence validity and the discriminant validity of the model were performed. As both measures have been confirmed, the evaluation proceeded to the assessment of structural model where the testing of hypotheses took place. Therefore, the study provides empirical evidence that assists to understand the impact of internal barriers on innovation performance among manufacturing SMEs in Malaysia.

Research Instruments

This study uses a structured questionnaire to investigate the impact of internal barriers on performance. Measurement for internal barriers namely constraint in financial resources, constraint in technology, and constraint in human resources are listed below. In analysing the constraint in financial resources, the study adapts the measurements by Madrid-Guijarro et al. (2009) and Hadjimanolis (1997). There are five items used for this study and was measured based on a 5-point Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree."

For constraint in technology, the measurement was developed by Hadjimanolis (1999) and Prajogo and Ahmed (2006), this part consists of constraint in technology items to capture the barriers to innovation activities. Eight items were measured on a 5-point Likert scale ranging from “1 = strongly disagree” to “5 = strongly agree.”

For constraint in human resource, this study adapts the measurements from Madrid-Guijarro et al. (2009). It consists of internal barriers that impact innovation activities. There are five questions on constraint in human resources and was measured based on a 5-point Likert scale ranging from “1 = strongly disagree” to “5 = strongly agree” for each item.

Six questions were used to measure the innovation performance, and the measurement was developed by Johannessen et al. (1997) and Denan et al. (2009). A 5-point Likert scale ranging from “1 = strongly disagree” to “5 = strongly agree” was used to measure each item.

The detail of the measurement is attached in the Appendix section.

RESULTS

The Results from Interview

To examine the relationship between the internal barriers and innovation performance, interview was conducted to obtain insights and the investigation on the influence of innovation on firm’s performance has been conducted by several scholars in Malaysia. However, the conclusion on impact of barriers particularly the constraints in technology on the innovation performance among SMEs in Malaysia is relatively untold. Therefore, this study has been carried out to investigate the influence of internal barriers on innovation performance. The interview session has shed some light on the issue and challenges that may hamper the innovation performance among Malaysian manufacturing SMEs. Snowballing technique was used to derive of five SMEs that willing to participate in the research. Fifteen participants from these five SMEs agreed to participate in the interview session. Based on the interview, the respondents have agreed that constraints in financial, technology, and human resources are the most challenging factors. Apart from that, the feedback from respondents signifies that these constraints also have some impact on the firm’s operating activities. Out of five SMEs, four of them have pointed out that difficulties in accessing financial resources will affect the firm’s innovation activities and their competitive advances. In addition, the lack of

financial resources not only has a bad influence on innovation activities but also toward the internal process of the firm.

On the other hand, out of five SMEs, three of them have agreed that the constraints in human resources will have some impact on innovation performance. All of them agreed that human resources in terms of skilled workers are essential toward firms. They also implied that lack of skilled workers and management skills have an adverse effect on the completion of a project. However, they did not specify the types of projects in terms of innovative or non-innovative. Based on the information collected in the interview session, the study found some evidence on the impact of constraints in human resources on SMEs. Though, empirical evidence is needed to verify the influence of constraints in human resources on innovation performance. In terms of technological constraints, out of five respondents, only two of them agreed that this barrier has a profound impact on the innovation performance. They also revealed that acquiring new technology is relatively expensive and perceived that there is no urgency to do so. Despite huge efforts by the government of Malaysia to improve the wellbeing of SMEs, based on this interview, it seems that the perception among SMEs owner and managers on the importance of technology to the firm's survival is practically low.

Table 1 reveals that the Malaysian manufacturing SMEs agreed to have the three major constraints, which are constraint of finance, constraint of technology, and constraint of human resources. Andalib et al. (2020a) mentioned that whenever either of these constraints occur SMEs' innovation performance are affected immensely. Andalib et al. (2019a) and Andalib and Halim (2020) also pointed out various challenges of the manufacturing SMEs, and Abdul-Halim et al. (2020) mentioned that besides having internal constraints, there are also external constraints in the SMEs. Andalib and Darun (2018) addressed the human resources of the manufacturing industry and the manufacturing SMEs and mentioned that the innovation performance gets hugely affected when employees' rights are not fulfilled or addressed in proper manner. As per Andalib et al. (2019b), the factors of the manufacturing companies in the entire world differ depending on various local and zonal characteristics. Since, in this paper Malaysian manufacturing SMEs are discussed about, these fall under the Eastern zone of the world and have a certain set of rules and characteristics. Therefore, constraints and challenges faced in this part of the world might be different in the other part of the world.

Table 1
Cases versus constraints

Cases	Type of SME	Constraints		
		Finance	Technology	Human resources
SME1	Manufacturing	Agreed	Agreed	Agreed
SME2	Manufacturing	Agreed	Agreed	Agreed
SME3	Manufacturing	Agreed	Disagreed	Agreed
SME4	Manufacturing	Agreed	Confused	Disagreed
SME5	Manufacturing	Disagreed	Confused	Confused

Table 2 significantly revealed the implicit portfolio of the participants and their concerns about the internal barriers (IB) that need to be emphasised and fixed. Selecting the participants' snowballing technique has been used where top-down references are applied and these participants' have enough knowledge with experience about the SMEs' functions and operations where they regularly faced internal barriers while doing any sort of innovation performance (Andalib & Halim, 2019).

Interview data has been transcribed and coding has been done to find out the agreed and disagreed version of the interviewees, and thematic analysis was performed. The interviewees have also highlighted the innovation performance and impact of internal barriers on it in their discussions. Table 3 exhibits that if constraints are identified, determinants can be found as well to re-engineer a more sustainable model for the SMEs as per Andalib et al. (2020a).

Table 3 shows the significance of innovation performance (IP) and IB in the SMEs, where participants directly discussed the issues. The constraints or IB observed in the qualitative study have been the dimensions of the quantitative study as well, where discrete hypothesis has been developed to identify and do evaluation in a more in-depth manner. Researchers tried to justify that these IBs are indeed significant for this study.

Table 2
Participants of the SMEs

Cases	Participants'	Positions	Type of SME	Emphasise on IB fixation
SME1	P1	Finance Manager	Manufacturing	FC
SME1	P2	HR Manager	Manufacturing	HRC
SME1	P3	Production Executive	Manufacturing	TC
SME2	P4	IT Executive	Manufacturing	TC
SME2	P5	Finance Officer	Manufacturing	FC
SME3	P6	Finance Head & Partner-Entrepreneur	Manufacturing	FC
SME3	P7	IT Support-Stakeholder	Manufacturing	TC
SME3	P8	Creative Manager	Manufacturing	HRC
SME4	P9	HR Operation	Manufacturing	HRC
SME4	P10	Talent Manager	Manufacturing	HRC
SME4	P11	Finance Officer	Manufacturing	FC
SME5	P12	Production Support	Manufacturing	TC
SME5	P13	Entrepreneur-Owner	Manufacturing	FC
SME5	P14	IT Head	Manufacturing	TC
SME5	P15	Finance Manager	Manufacturing	FC

Note: IB = internal barrier; FC = financial constraint; HRC = human resource constraint; TC = technology constraint

Table 3
Cases versus interview data on IP and IB

Cases	Innovation Performance	Internal Barriers
SME1	Strongly existent	Strongly existent
SME2	Strongly existent	Strongly existent
SME3	Weakly existent	Strongly existent
SME4	Weakly existent	Strongly existent
SME5	Weakly existent	Weakly existent

The Profile of the SMEs

Among the 217 respondents, the year of establishment was in the range of 1968 to 2017. In terms of major products produced by the manufacturing SMEs, 37.8% were food and beverages, followed by textiles and wearing apparel, and body care products of 24.9%, respectively. The least major product was rubber and plastic (0.9%) and chemical products (0.5%). About 133 (61.3%) manufacturing SMEs focused on the local market since most of them were still in the initial stages of business. About 71 (32.7%) SMEs focused on mixed markets, and only 13 (6%) of them prioritised their business in the foreign market. In terms of demographic background, most of the respondents were the business owner (49.8%), followed by partnership of 20.7% and others which refer to someone in management level who answered the questionnaire on behalf of their owner (29.5%). Most of the SMEs entrepreneurs were in business for 10 years and less (74.7%). And 17.5% of them had business experience from 11 to 20 years, followed by 21 to 30 years (5.1%). Only 2.8% of them were in business for 31 years and above. For numbers of employees in the SMEs, about 77% of the SMEs employed 50 and less employees, followed by 10% of them possessed 51 to 100 employees. Only 9.7% employed 101 to 150 employees and the least was SMEs that recruited 151 to 200 employees with 2.8%. Table 4 exhibits the profile.

Table 4
Profile of SMEs

Demographic variables	Categories	Frequency	Percentages
Year of establishment	1970 and below	4	1.8
	1971–1980	2	0.9
	1981–1990	2	0.9
	1991–2000	19	8.8
	2001–2010	60	27.6
	2011 and above	130	59.9
Major product	Textiles and wearing apparel product	54	24.9
	Food and beverage product	82	37.8
	Wood and furniture product	5	2.3
	Rubber and plastic product	2	0.9
	Leather and related product	3	1.4
	Chemical product	1	0.5
	Pharmaceutical and medicine product	8	3.7
	Body care product	54	24.9
Other products	8	3.7	

(Continued on next page)

Table 4 (Continued)

Demographic variables	Categories	Frequency	Percentages
Business market	Foreign	13	6
	Local	133	61.3
	Mix	71	32.7
Position level	Business owner	108	49.8
	Partnership	45	20.7
	Others	64	29.5
Years in business	1–10	162	74.7
	11–20	38	17.5
	21–30	11	5.1
	31 and above	6	2.8
Number of employees	1–50	168	77.4
	51–100	22	10.1
	101–150	21	9.7
	151–200	6	2.8

The Evaluation of Measurement Model

This study used PLS-SEM to test the validity and reliability of the measurement model. The evaluation of measurement model for reflective constructs involves the assessment of internal consistency, individual indicator reliability, and convergent validity and discriminant validity. The summary of measurement model was presented in Table 5. Table 5 consists of values on indicator loading, average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha. The values of CR and Cronbach's alpha were the two measures used in examining the internal consistency. Findings in Table 5 were in concordance with the recommendation by Hair et al. (2014) where all values of CR and Cronbach's alpha were greater than 0.7, therefore proving the existence of internal consistency. Afterward, the convergent validity was established by examining the value of indicator loading and AVE. According to Hair et al. (2014), the minimum required values for indicator loadings should be greater than 0.708, and for AVE, the values must be greater than 0.5. In Table 5, all indicator loadings in the model were greater than 0.7. In addition, the values of AVE for all dimensions in the model were greater than the minimum required value of 0.5. These findings indicated that all the items in the model do have evidence on convergent validity. Since the convergent has been established, the next step is to determine whether the items were truly measuring the variance in their own construct.

Table 5
Summary of measurement model

Dimensions	Items	Indicator loading	AVE	CR	Cronbach's alpha
Constraint in financial	CF1	0.851	0.768	0.943	0.926
	CF2	0.898			
	CF3	0.915			
	CF4	0.852			
	CF5	0.864			
Constraint in human resources	CH1	0.840	0.819	0.958	0.945
	CH2	0.924			
	CH3	0.940			
	CH4	0.912			
	CH5	0.907			
Constraint in technology	CT1	0.810	0.747	0.959	0.958
	CT2	0.867			
	CT3	0.859			
	CT4	0.870			
	CT5	0.906			
	CT7	0.876			
	CT8	0.795			
	CT6	0.925			
Innovation performance	IP1	0.863	0.733	0.943	0.927
	IP2	0.873			
	IP3	0.874			
	IP4	0.856			
	IP5	0.878			
	IP6	0.791			

Discriminant Analysis via HTMT

Heterotrait-monotrait (HTMT) ratio of correlations is the last method to assess the discriminant validity. There are two ways of using HTMT approach, first by using the HTMT value greater than 0.85 by (Kline, 2011) or 0.90 (Gold et al., 2001) and second by using statistical test purpose to assess the HTMT inference (Henseler et al., 2014). For the statistical test method when the confidence interval of HTMT values for the structural paths contains the value of 1, it is considered

as lack of discriminant validity, but if the value of 1 fall outside the interval range, it suggests that the two constructs are empirically distinct. In other words, discriminant validity is established when the 90% bootstrap confidence interval of HTMT does not include the value of 1 (Ramayah et al., 2016). Table 6 shows the result for HTMT statistical method, the value of confidence interval neither lowers and upper do not include result of 1. Thus, the discriminant validity is achieved based on HTMT inference.

Table 6
HTMT discriminant analysis

	Original Sample (O)	Sample Mean (M)	Bias	5.00%	95.00%
CF → IP	0.283	0.285	0.002	0.145	0.420
CH → IP	0.284	0.287	0.003	0.156	0.409
CT → IP	0.099	0.129	0.030	0.057	0.172

Structural Model Assessment References

After establishing the reliability and validity of measurement model, the next step is to assess the structural model. This involves evaluation of the relationships and predictive capabilities of the constructs. However, to proceed, it is crucial to run collinearity assessment to trace the presence of collinearity among sets of constructs. According to Hair et al. (2014), collinearity issue exists when variance inflation factor (VIF) value is greater than 5.0. Result on collinearity assessment was presented in Table 7 where all constructs scored below 0.2, hence there was no collinearity issue among indicator constructs.

Table 7
Collinearity assessment

Model		Collinearity statistics	
		Tolerance	VIF
1	Constraint in financial	0.561	1.783
	Constraint in technology	0.545	1.834
	Constraint in human resources	0.799	1.251

Note: Dependent variable = IP

The structural model assessment shall proceed toward hypotheses testing. The result on the significance testing is presented in Table 8. Out of three paths, one path was significant with *t*-value of 1.936.

Table 8
Significance testing results of the structural model path coefficients

Relationships	Path coefficient	Standard deviation	Standard error	t-value	P-value	Significance levels
CF → IP (H1)	0.186	0.096	0.096	1.936	0.053	*
CH → IP (H2)	0.115	0.087	0.087	1.323	0.187	Not significant
CT → IP (H3)	-0.069	0.139	0.139	0.497	0.619	Not significant

Note: Significance levels at * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The model’s predictive capabilities for this study were examined through coefficient determination (R^2 value) and predictive relevance (Q^2 value). According to Hair et al. (2014), in general, the R^2 values of 0.75, 0.50, or 0.25 for endogenous construct can be interpreted as substantial, moderate, and weak. On the other hand, the Q^2 values larger than 0 indicate that the predictor constructs have predictive relevance for a particular endogenous construct. As presented in Table 9, the R^2 value for the model was at 0.047, meaning that 4.7% of the variance in the innovation performance can be explained by predictor constructs (constrain in financial, constrain in human resources, and constrain in technology). According to the path model in this study, the predictive relevance Q^2 of innovation performance has a value of 0.015, which implies that the model does have predictive relevance. As such, the hypotheses results indicated that only constraint in financial has a significance relationship ($p < 0.05$, t -value 1.936) on innovation performance. Constraints in human resources and technology have non-significance relationship with innovation performance. Thus, the result showed that H1 was supported while H2 and H3 were not supported.

Table 9
Model’s predictive capabilities

Dimension	R^2 value	Q^2 value
Innovation performance	0.047	0.015

According to the results, the model does have the required convergence validity as the value of AVE for all constructs is greater than 0.5. In addition, the model possessed the internal consistency where the value of CR and Cronbach’s alpha for all constructs is greater than 0.7. According to the results, all constructs in the model can explain their unique variance and therefore confirm the presence of discriminant validity. On the evaluation of structural model, out of three hypothesised paths, one path shows a significant relationship whereas the other two paths are not significant. The study has confirmed that the financial constraints

do have a significant relationship to the innovation performance. This finding is in concordance with the claims of the respondents in the interview. On the other hand, the constraints in technology and human resources do not have a significant impact on the innovation performance among participants in this study. In terms of explanatory power, the framework has a small R^2 value. However, in terms of predictive relevance, the model has a positive Q^2 value, which implies that the predictor variables do have a predictive power. The small predictive power from the model may be due to the scope of study where this study is derived from a much larger study and limited number of predictor variables in the constructs.

DISCUSSION

This study has been conducted to investigate the relationship between internal barriers and innovation performance. This study has utilised the mixed methods approach, where the data was gathered through qualitative and quantitative approach. In qualitative approach, the data was gathered through interview, and the quantitative data was gathered by a survey. Through this approach, researchers have identified the major barriers faced by SMEs, and further investigate the potential barriers claimed by respondents' over empirical result. The feedback from the interview session has confirmed that constraints in financial, technology, and human resources are the major challenges toward SMEs. Most of the participants in the interview agreed that financial constraint is the main barrier toward innovation performance, followed by the constraints in human resources and technology. One of the pressing concerns is where SMEs perceive that acquiring technologies is not important and there is no urgency to do so. The root cause that might explain this kind of attitude among SMEs is due to the cost of acquiring new technologies. From the interview, three important barriers toward innovation performance have been drawn and the investigation proceeds toward empirical report.

There are several factors that may explain the non-significant relationship between constraints in human resources and constraints in technology on innovation performance. For human resources constraints, these refer to problems related to employee's expertise, resistance to change, lack of qualified personnel, difficult to keep qualified employees, and other related to human resources management (Madrid-Guijaro et al., 2009). As such, weakness in human resource commitment can be a signal to poor innovation performance since human resource practices are the critical elements to move the SMEs' activities toward efficient and effective operation of the organisations. Thus, the absence of support within the firm in terms of human resources seriously inhibits innovation activities. Nevertheless, in this study constraints in human resources may not be an important factor to

promote innovation performance since human resources among SMEs is not powerful enough to provide huge potential for enabling innovation. The nature of SMEs which are small, fragile, and unstable makes them do not possess stable and strong composition of human resource practices. As such, SMEs rely more on other factors to which are more critical in promoting innovation performance.

Similarly, constraint in technology was also not stipulated as a significance factor due to the current dynamic and turbulent environment have forced SMEs to compete globally and to change their traditional methods of conducting businesses and try to adapt with new technology. Technology has literally changed every aspect of business operations and occurred so fast. In line with this issue, the dramatic change of technology has posed a great challenge to SMEs because many of them appear to be unfamiliar with new technologies. The most common obstacle regarding technology is that it is too expensive and costly. Besides, SMEs often hesitate to roll out new technologies because they lack the expertise and staff to properly manage them. Although the majority of the SMEs realised the benefit to embrace technological, but they often lack financial access that causes difficulty getting expert co-workers. SMEs should keep in mind that technology growth is a good thing for almost any business but if it too much growth in technology aspect or more specifically, technology growth too fast, it can be a serious threat to business's financial issues.

CONCLUSION

This study aims to investigate the key internal barriers which SMEs experience toward their innovation performance. Further, this study has utilised the mixed method approach to attain the accuracy of the findings. According to the qualitative findings, financial limitations are the key impediment to achieve the innovation performance followed by the lack of technology and human resources. The key issue that may explain this sort of mindset among SMEs is the cost of acquiring new technologies. The interview revealed three important barriers to the innovation process, namely financial, human resources, and technology. However, empirical findings of this study show that financial constraint has significant association with innovation performance. On the contrary, constraints in human resources and constraints in technology have insignificant association with innovative performance.

Implications

This study contributed to a new body of knowledge in the fields of strategic management and entrepreneurship. The conceptual framework was derived from the RBV and was established from the results of qualitative assessment in which the internal barriers that impede innovation are mainly from constraint in financial, technology, and human resources. Furthermore, this study is also underpinned by the view of effectuation theory. This theory provides different judgments to allow entrepreneurs to engage in resource bundling effectively. According to Chandler et al. (2011), effectuation emphasises combining resources at hand to create new strategic goals. Besides that, effectuation theory contributes to new venture growth through creative human actions (Read & Sarasvathy, 2005). Thus, effectuation principle allows new entrepreneurs to leverage possibilities and create opportunities with resources in hand such as financial, human resources and technology, and at the same time, they could shape the existing market or even create new market for their profitable growth.

In a nutshell, Malaysia is a country that is dominated by a large proportion of SMEs as compared to other forms of business establishments. Due to the huge contribution to the economy, the competitiveness of Malaysian SMEs must be sustained over time. In view of this, innovation is the best approach, and can be considered as a competitive weapon to boost a firm's core value capability. Operating in a very complex and competitive business environment, the ability to compete has become a coveted quality among organisations regardless of their size whether it is small, medium, or large (Teresa, 2016). This situation is even critical for SMEs to embrace the concept of innovation. As such, SMEs need to recognise the internal innovation barriers to acquire innovation and be able to achieve their competitive capabilities. It has been argued that internal barriers, for instance lack of financial resources can affect innovation performance negatively (Madrid-Guijarro et al., 2009). Meanwhile, D'Este et al. (2014) has posited that access to finance is also an imperative issue for SMEs to engage in innovation activities, and without sound financial aid, the tendency for SMEs to experience failure of innovative projects is very high (Segarra et al., 2013). Due to the financial limited issues, SMEs struggle with shortage of equipment and technology that probably affect the innovation process, and at the same time can be risky and disruptive. These constraints have prohibited SMEs from coping with changes since it involves an enormous amount to change. Due to this problem, it has wedged the changes of nature of work, employees, and the expertise involved. Additionally, human resources were not significant and probably, SMEs often lack education

and training that have been linked with a successful innovation strategy required skilled personnel to maneuver SMEs to achieve business growth especially in innovation process.

Apparently, the constructs are furnished to deal with its loopholes and finalise with meaningful themes; innovation performance constructs are gone through this same process as well (Andalib et al., 2019a; Andalib et al., 2020a), This study has provided the empirical evidence on the influence of internal barriers toward innovation performance among Malaysian manufacturing SMEs as well as have enlightened these themes with qualitative probe. The study tried to bring out the core internal barriers that puts great impact on the manufacturing SMEs of Malaysia in an intense way that hampers the innovation performance of the organisation. This was necessary to comprehend so that the SMEs can work on these factors more to reduce the harmful effect and increase the positive impact for the organisation. Since SMEs have huge impact on the national GDP, their hindrances to innovation performance are indeed an important sector to work on. This study also hopes to shed some light into the problems concerning innovation performance issues among manufacturing SMEs in Malaysia. This study provides support that entrepreneurs can create their strong internal sources to suit the competitive business environment and help to improve their innovation performance. So, it is important for manufacturing SMEs to understand what type of barriers that they need to put extra attention to encourage them to enhance the innovation performance. It also provides impetus for SMEs to look beyond their short-term goals and assist SMEs and envisage the internal constraints as a useful factor that inhibit their innovation activities in achieving their competitive advantages. In line with this scenario, policymakers should accelerate more support and assistance for SMEs in overcoming the internal constraints to elevate the innovation performance. In fact, more programs should be introduced to aid SMEs in exploring innovation adoption. This result provides insights to the policymakers to choose suitable media to announce about their various assistance programs for SMEs in Malaysia. To conclude, this modest study is expected to contribute a more detailed understanding to the literature and shed some light on this little-known gap in research.

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APPENDIX

Constraint in Financial Resources

1. My company experiences high cost of financing the innovation
2. My company deals with difficulty in accessing financial resources
3. My company experiences inadequate financial means
4. My company deals with pay-off period of innovation too long
5. My company experiences innovation costs hard to control

Constraint in Technology

1. My company experiences inadequate R&D in technology
2. My company deals with inadequate design, testing, and other technical facilities
3. My company deals with lack of a clear technology strategy
4. My company has lack of technology experience necessary for development of specific innovation
5. My company has limited access to stay on the leading edge of technology
6. My company has lack potential of new technology
7. My company has not acquired technology in advance of needs
8. My company has not constantly thinking of new technology

Constraint in Human Resources

1. My company experiences manager resistance to change
2. My company experiences employee's resistance to change
3. My company deal with lacks qualified personnel
4. My company deals with lacks internal employee training
5. My company is having problems in keeping qualified employee

Innovation Performance

1. New product (i.e., new packaging, new design, etc.)
2. New services (i.e., rapid delivery, product customisation, etc.)
3. New methods of production (i.e., implementation of new process/technology, etc.)
4. Opening new markets (i.e., open to retailers instead of to end users)
5. New sources of supply (i.e., new modes of logistics to achieve raw material)
6. New ways of organising (i.e., empowerment, production control, etc.)