International Academic Institute for Science and Technology

International Academic Journal of Business Management
Vol. 4, No. 2, 2017, pp. 69-82.

ISSN 2454-2768

International Academic Journal of Business Management

www.iaiest.com

The Influence of Government Support on Innovation Performance among Manufacturing SMEs in Malaysia

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Abstract

Government support plays an important role in fostering innovation performance and the growth of small and medium enterprises (SMEs).Being considered as the backbone of Malaysian economy, the development of this sector is important as Malaysia will transform into a high income nation. Realizing the importance of SMEs toward the economic growth, Malaysian government provided various incentives and support programs worth in billions of ringgit for improving the performance of SMEs in Malaysia. Therefore, it is importance to examine the effectiveness of those support programs toward SMEs since it is waste of resource if no outcome emerges from those investment and efforts. However, most of the literature from previous study in Malaysia has mentioned on the linkage between government support and SMEs performance but very few has focuses on innovation performance. In the attempts to fill this gap, this research aims to investigate the influence of government support and entrepreneurial bricolage on innovation performance. The concept of bricolage offers a new approach to understand innovation in resource scarce environment as most of SMEs faced major challenges from such environment. In addition, this study also aims to investigate the extent of interaction from the government support on the relationship between entrepreneurial bricolage and innovation performance. The study has adopted a quantitative research approach where 217 sets of data has been collected from Federation of Malaysian Manufactures (FMM) Directory for year 2016. The response rate of the survey is at 43.4%. The reliability and validity of measurement model has been established through PLS-SEM and both predictors variable (government support and entrepreneurial bricolage) have a positive significant effect on innovation performance. However, the interaction of government support on the relationship between entrepreneurial bricolage and innovation performance is not significant. Nevertheless, this study has provided the empirical evidence and also contribute to the body of existing literature of academic research. Hopefully that this paper can contribute to the existing literature and fills the gap of research.

Keywords: Government Support, Innovation Performance, Manufacturing, Malaysia

1. Introduction

Relationship between innovation and firm's performance have been a popular topic among scholars. According to a study by Rosenbusch, Brinckmann, & Bausch (2011) innovation has a positive effect on the performance of SMEs. The finding has been produced through meta-analyses technique by analysing 42 empirical studies on 21,270 firms. In order to foster growth and maintaining the competitive edge, embracing innovation is crucial. Another previous study by Atalay, Anafarta, & Sarvan (2013) has investigate the relationship between innovation and firm performance among 113 firms in automotive supplier industry in Turkey. By classifying innovation into four types, the finding points out that both products and process innovation have a positive influence on firm's performance. Both studies in the discussion have shown the importance of innovation in order to reach growth in business.

Small and medium enterprises (SMEs) have receive much attention from researchers and policy-makers in recent decade. SMEs are considered as the backbone of national economy, driving the economic activities and also providing jobs for people. In term of performance, SMEs contribute up to 36.6% toward national GDP in 2016 (Department of Statistics Malaysia, 2017). Realizing the importance of SMEs toward national growth, Malaysian government has introduced various incentives and support programs to foster the performance among SMEs in Malaysia. For instance, under 2018 Budget, Malaysian government has allocate RM20 billion for the development small and medium enterprises (SME), strong evidence of government's commitment toward improving the performance of SMEs in Malaysia (SME Corporation Malaysia, 2017). However, the aspect of firm's performance cannot be realized if SMEs fail to innovate as innovation plays an important role in firm's growth. In this notion, in order to improve the firm's potential, SMEs have to increase their innovation performance.

The use of government support to foster firm's innovation performance is notable as being a popular practice by several countries (Wei & Liu, 2015). The discussion on the impact of government support toward firm's innovation has been debated since last few decades. For instance, a previous study traced back to 1960s suggested that in order to ensure optimal allocation toward invention, government have to take part in financing the research and development (R&D) (Arrow, 1962). A much recent studies have also investigate the effectiveness of various government intervention on firm's innovation performance (Bérubé & Mohnen, 2009; Herrera & Nieto, 2008; Wei & Liu, 2015; Xu, Huang, & Xu, 2014). However, these studies focused on certain country where each country may have different characteristics in term of demography, policies and incentives. In the context of Malaysia, studies between government support and innovation performance particularly among SMEs are limited.

In the context of Malaysia, the government support toward SMEs is taking its effect as the contribution of SMEs toward national GDP increases each year. Although there is an increase in term of contribution toward national GDP, the economic landscape of SMEs in Malaysia is considered modest but not very impressive as the total output of SMEs in Malaysia are less than 50% despite being provided with various incentives from the government (Department of Statistics Malaysia, 2017). In addition, According to Global Innovation Index report 2017, Malaysian innovation index scored at 42.72 per cent which is below than other south eastern country such as Singapore with a score of 58.69 per cent. Even though a lot of effort has been devoted in order to improve the growth of SMEs, the outcomes shows that the development of SMEs are increasing but in much slower pace. In order to become a high income nation by year 2020, Malaysia only have a little amount of time to spare. Therefore, this study aims to investigate the influence of government support toward innovation performance among manufacturing

SMEs in Malaysia. In addition, this study also aims to investigate the interaction of government support on the relationship between entrepreneurial bricolage and innovation performance.

2. Literature Review

Nowadays, the key toward business survival for any businesses depends on their ability to cope with changes in the environment as the market constantly shifts by rapid advancement of technology. For instant, the launch of iPhone by Apple in 2007 has significantly transformed the mobile phone industry (Capatina & Draghescu, 2015). One of the innovative breakthrough was the merging of mobile telephony, internet services and personal computing into a single device, Apple has opened up a new industry (Kenney & Pon, 2011), the smartphone industry. A year later, in 2008 Google introduced the first open-source Android operating system for mobile phone (Mian, Teixeira, & Koskivaara, 2011). Unlike Apple's IOS that runs in closed system, Android serves as an open platform and by giving handset manufacturers free licensing on their operating systems, manufacturers are now able to produce phone at lower cost which causing more players enters the market (Kenney & Pon, 2011). In highly competitive high-tech sector, as companies develops new products or services, they are vulnerable to the innovative move by competitors and despite having unsafe position, some companies made it through by formulating strategies that eventually paved their way to become a platform leader (Gawer & Cusumano, 2002). According to Gawer & Cusumano (2002), not all industry can create platform leaders but for those who successfully ascended to that level, they are able to employ a certain degree of influence over the direction of innovation which taking place in the industry, consequently extending their presence over the network of firms and customers. The smartphone industry is one of many example where innovation is importance in maintaining competitive edge and firm's survival.

Previous study by Roberts & Amit (2003) has argued that a particular innovation may influence firm performance when the firm able to develop a major new product or process which resist imitation by competitors. In this sense, the company is able to maintain their competitive edge while stays longer in the business. However, studies regarding relationship between innovation and firm performance has been previously conducted by various scholars (Calantone, Cavusgil, & Zhao, 2002; Ngah & Ibrahim, 2009; Rosli & Sidek, 2013; Sivageahnam, Al-Mamun, Nasir, & Ibrahim, 2015). However, studies on factors that could influence innovation performance among SMEs particularly in Malaysia are rather few in numbers. Therefore this study aims to investigate possible factors that could explain the innovation performance among manufacturing SMEs in Malaysia. Due to the limitation of research, this study only draws two possible factors that could explain the innovation performance. These factors are the entrepreneurial bricolage and government support. The following framework is proposed in figure 1.

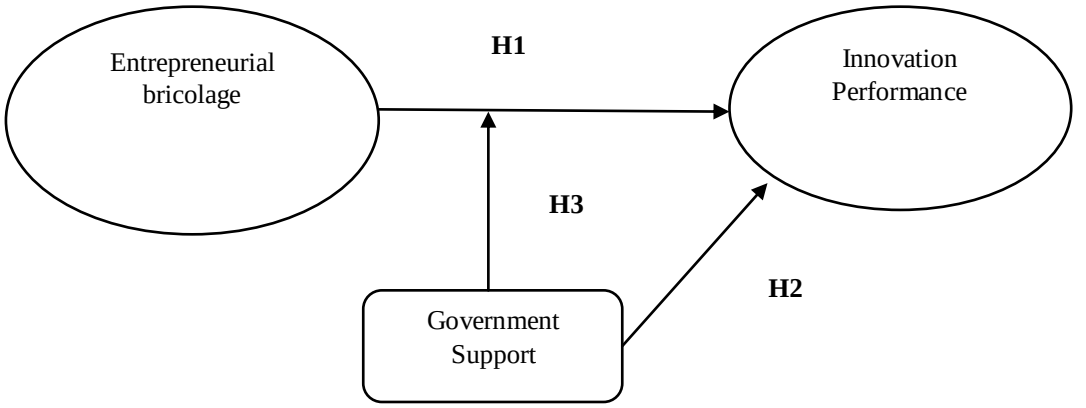


Figure 1: The proposed framework

Entrepreneurial bricolage is another approach in understanding innovation where it is denote as the capacity of entrepreneur to recombine and transform new products, services, or systems by using available resources at hand (Davidsson, Baker, & Senyard, 2017). Instead of acquiring new resources, entrepreneurs with bricolage behaviour are able to utilize and recombine any existing resources into valuable output (Baker, Miner, & Eesley, 2003). In the environment where resources are limited, bricolage offers a new way in explaining innovation. Previous study by Baker & Nelson (2005) has appraised 29 resource-constrained firms and most observable results pointed out that bricolage produced a one-time solution instead of real innovation but in some occasion, valuable products or service innovation were verily attained from bricolage. A more recent study by Chen & Fan (2015) has investigate 203 start-ups venture in Taiwan which aims to investigate the influence of entrepreneurial bricolage on the speed of innovation. The outcome from that study shown an interesting result where entrepreneurial bricolage does positively influence the speed of innovation among start-ups venture.

In this sense, bricolage behaviour among entrepreneurs serves as the engine of value creation even though the firms operates in environment where resources are limited. In the context of SMEs, much literatures has associated resource scarcity in terms of financial, information, know-how and human resources (Freel, 2000; Hessels, 2008; Hewitt-Dundas, 2006; Hollenstein, 2005; Knight, 2000; Madrid-Guijarro, Garcia, & Van Auken, 2009; Woschke, Haase, & Kratzer, 2017). Therefore the notion of bricolage deems to be appropriate to be adopted in explaining innovation performance since the majority of SMEs are experiencing constraint in resources. Hence, the following hypothesis is proposed.

H1: Entrepreneurial bricolage will positively influence innovation performance among manufacturing SMEs.

Government plays an important role in fostering the growth of SMEs. There is considerable evidence where government support policies for private R&D activities lead to positive outcome on business. Previous study by Mamuneas & Nadiri (1996) appraised on the contributions of R&D tax incentives and publicly financed R&D investment policies in promoting privately funded R&D investment and also growth of output among US manufacturing industries. The results suggest that the appropriate tool for

improving efficiency and stimulating output growth is through publicly-financed R&D investment, while R&D tax policies considered as a useful tool in stimulating R&D investment among private sector. Another study by Hewitt-Dundas & Roper (2010) has examined the effect of public innovation support on innovation outputs among manufacturing plants in Ireland and Northern Ireland. The overall results from this study has showed that the public support by the government on R&D have a positive relationship on the innovation activities. Policies and incentives by the government in promoting the growth and output of R&D varies across countries as different government have different target and approach.

In Malaysian context, government-support programmes (GSPs) has been introduced to assist SMEs in terms of financial, credit assistance, marketing, market research, training assistance, advisory services, and infrastructures (Ismail & Othman, 2014). In terms of scholars' perspective, government support plays a vital role in promoting entrepreneurship (Keat, Ahmad, & others, 2012) and SMEs in Malaysia (Zainol & Daud, 2011). The effectiveness of government support is translated through the increase of growth among targeted firms. In order to gain some insight on the effectiveness of government support toward the growth of SMEs, Ismail & Othman (2014) has conducted a study among 118 SMEs in one of the state in Malaysia. The study has found that the Government-Support Programmes have a positive significant relationship in explaining growth among SMEs. Apart from growth, scholars also investigate the impact of government support toward innovation. A recent study by Sahrom, Tan, & Yahya (2016) aimed to investigate the relationship between government support (regulation, incentives and policies) and innovative behavior among biotechnology SMEs in Malaysia. The study has taken 218 sample of R&D engineers and the results pointed out that the government policies have a positive relationship on innovative behavior. This indicates that innovation could be improved through government support. Another study by Hanifah, Abdul Halim, & Ahmad (2017) has stressed out that the innovation performance among SMEs can be improved through the support by government. Policies, incentives and support programs by the government aims to provide SMEs with a conducive environment for them to grow as well improving their performance in innovation. Therefore, based on the above discussion, the following hypotheses is proposed:

H2: Government support will have a positive influence on the innovation performance among manufacturing SMEs.

In particular, SMEs faced various constraint in resources that act as barriers toward innovation. In order to understand the innovation in resource scarce environment researcher adopted the concept of entrepreneurial bricolage into this study. By recombining existing resources, entrepreneurs able to create a new products, services or improvising existing processes in the company. However as the innovation performance among SMEs could be improved through government support, the extent of influence from government support on the relationship between entrepreneurial bricolage and innovation performance is still unknown. Therefore, the study postulates the following hypothesis:

H3: Government supports strengthen the relationship between entrepreneurial bricolage and innovation performance among manufacturing SMEs.

The body of literature in the context of Malaysian has addressed the linkage of government support toward growth and innovative behavior. However, studies which provide an empirical evidence on the linkage between government support and innovation performance among SMEs are limited. Therefore

this study aims to propose a framework and come out with the empirical evidence that enable us to understand the interaction between government support and innovation performance among manufacturing SMEs in Malaysia.

3. Research Methodology

This study has adopted quantitative approach in order to draw the empirical evidence regarding relationship between government support and innovation performance among manufacturing SMEs. The collection of data was gathered through a survey where questionnaires were distributed through electronic mail. Dual language questionnaire (English-Bahasa) was employed in this study to ensure that all respondents were able to answer the questionnaire.

This study targeted firms that were listed in the list of manufacturing SMEs in the Federation of Malaysian Manufactures (FMM) Directory 2016. Out of 1869 manufactures listed in the FMM Directory 2016, the study randomly selected 500 manufactures as target respondents. One of the reason why this study choose FMM Directory as the sampling frame was due to its reputation as being considered as the most comprehensive list of SMEs database (Chelliah, Sulaiman, & Yusoff, 2010). All manufactures in the list have been selected based on 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 not exceeding RM50 million

This approach was taken in order to ensure that all respondents in the study were SMEs. After the distribution of questionnaire, follow-ups through telephone and email has been conducted in order to improve the response rate. The study managed to collect a total of 217 questionnaires out of 500 with respond rate of 43.4%.

The framework of this study consist of three constructs namely entrepreneurial bricolage, government support and innovation performance. The collection of data aims to generate an empirical findings that will explain the interactions among constructs in the framework.

The construct of entrepreneurial bricolage consist of eight items. Five point Likert scale ranging from "strongly disagree" to "strongly agree" have been employed for every items this construct. This study adapted the measurements by Gundry et al (2011). The previous internal consistency for the construct of entrepreneurial bricolage was at 0.87. The value Cronbach's alpha ($\alpha \geq 0.8$) for entrepreneurial bricolage was high and therefore the construct was considered reliable to be adopted for this research.

Measures for the construct of government support were derived from previous study by Fakhrul and Daud (2011) where all 7 items have been adapted for this study. All items in this construct were measured based on five point Likert scale ranging from "strongly disagree" to "strongly agree". The value of Cronbach's alpha for the construct of government support from previous study was at 0.82 indicating that the construct do have a high amount of internal consistency and considered reliable to be adopted in this research.

In order to provide the empirical evidence, the data for this study have been analyze by using PLS-SEM. According to Hair, Hult, Ringle, & Sarstedt (2014), PLS-SEM is suitable for exploratory study and also offers high level of statistical power. This study is an exploratory research which aimed to explore the influence of government support toward innovation performance among manufacturing SMEs and also its moderating effect between entrepreneurial bricolage and innovation performance. The analyses of data

through PLS-SEM has been conducted in two stage. In the first stage, researcher had establish the evaluation of measurement model by confirming the existence of indicator reliability, convergence validity. Internal consistency and discriminant validity. After confirming the existence of convergence validity and internal consistency, the evaluation proceed toward structural assessment where hypotheses has been tested. Apart from testing the significance of the relationship, this study also examine the relevance of relationship path and predictive accuracy of the model. Therefore PLS-SEM is appropriate to be taken as statistical tool for this study.

4. Findings

4.1 The evaluation of measurement model

As a common routine in PLS-SEM, the evaluation of measurement model aims to establish the validity and reliability of the construct. The assessment will involves the establishment of indicator reliability, convergent validity, internal consistency and discriminant validity. The results are summarized in Table 1.

According to Table 1, the outer loading for every items in the constructs are greater than the common threshold of 0.708. According to Hair et al. (2014), high outer loadings indicate that the constructs is capturing similar characteristics from the associated indicators and confirming the existence of indicator reliability for the proposed model. In order to establish the convergent validity, the value of average variance extracted (AVE) for each construct needs to be greater than 0.50 (Hair et al., 2014). As presented in Table 1, the value for every constructs in the model are exceeding than the threshold value of 0.50 which indicates the existence of convergent validity. The internal consistency will be evaluated by examining two types of measures namely cronbach's alpha and composite reliability. Though the cronbach's alpha is known as conventional ways in evaluating the internal consistency, PLS-SEM uses composite reliability by taking account on different outer loadings of indicator variables (Hair et al., 2014). According to Hair et al. (2014) the value of composite reliability ranges from 0 to 1 and the value should be above than 0.7 although greater than 0.6 is still acceptable for exploratory research. According to the outcome in Table 1, the composite reliability and cronbach's alpha for every constructs are greater than 0.7, therefore confirming the existence of internal consistency among the constructs in the model.

Table 1: Summary of the evaluation of measurement model

Dimension	Items	Outer Loading	AVE	Composite Reliability	Cronbach's Alpha
Entrepreneurial Bricolage	EB1	0.835	0.712	0.952	0.942
	EB2	0.878			
	EB3	0.844			
	EB4	0.817			
	EB5	0.865			
	EB6	0.868			
	EB7	0.883			
	EB8	0.752			
Government Support	GS1	0.786	0.640	0.926	0.906
	GS2	0.806			
	GS3	0.803			
	GS4	0.853			
	GS5	0.800			
	GS6	0.797			
	GS7	0.753			
Innovation Performance	IP1	0.860	0.734	0.943	0.927
	IP2	0.862			
	IP3	0.877			
	IP4	0.856			
	IP5	0.883			
	IP6	0.800			

The next phase is to examine the discriminant validity of the construct. Discriminant validity assessment will confirm whether or not the items are actually measures the variance for their respective constructs. Since all of the construct are reflective type, this study will use the approach of Fornell-Larcker criterion to establish the discriminant validity. According to Hair et al. (2014), Fornell-Larcker criterion utilizes latent variable correlation table and the value from the square root of AVE of each constructs have to be larger than its highest correlation with other constructs in the model. The discriminant validity assessment using the Fornell-Larcker criterion is presented in Table 2. By comparing each correlation in every row and column, the outcome shows that, all square root of AVE for each construct are larger than the correlation with any other constructs in the model. The results indicate that all constructs in the model are capturing its own unique variance through their associated indicators and thus proving the existence of discriminant validity.

Table 2: Discriminant validity assessment

	Entrepreneurial bricolage	Government support	Innovation performance
Entrepreneurial bricolage	**0.844**		
Government support	0.733	**0.800**	
Innovation performance	0.709	0.842	**0.857**

4.2 Structural model Assessment

After confirming the existence of internal consistency, convergent validity and discriminant validity, the analysis will move toward structural model assessment. In the structural assessment, researcher will test the proposed hypotheses and also evaluate the predictive capabilities. However, in order to proceed with structural model assessment, it is essential to inspect for collinearity issue among predictor constructs. According to Hair et al. (2014) collinearity can be evaluated through VIF value and in order to confirm that the collinearity is absence, the value should be less than 5. Table 3 shows the result on collinearity assessment where VIF value for both predictor constructs are less than 5 indicating the absence of collinearity issue in the model.

Table 3: Collinearity Assessment

Model		Collinearity Statistics	
		Tolerance	VIF
1	Entrepreneurial bricolage	.465	2.152
	Government support	.465	2.152

a. Dependent Variable: Innovation performance

Since the collinearity assessment proves that there is no collinearity issue among predictor constructs, the evaluation shall proceed toward hypotheses testing. This study aims to investigate the moderating effect of government support on innovation performance and by using PLS-SEM, one new path has been created in order to study the interaction among entrepreneurial bricolage (EB), government support (GS) and innovation performance (IP). The proposed framework for this study consist of three paths that represent the relationships among constructs in the framework. According to the result in Table 4, out of three paths, two paths are statistically significance as the *p*-value for both relationships are less than 0.01. The result from this study implies that, both constructs of entrepreneurial bricolage and government support does have a positive significant relationship on innovation performance. However the study fail to acknowledge the moderating effect of government support on innovation performance since the relationship is not significant as the *p*-value is larger than 0.1.

Table 4: Hypotheses testing

Path relationship	Path coefficient	Standard Deviation	Standard Error	T-value	*p*-value	Level of significant
EB -> IP	0.221	0.068	0.068	3.249	0.001	***
GS -> IP	0.692	0.060	0.060	11.522	0.000	***
EB * GS -> IP	0.045	0.044	0.044	1.016	0.311	NS

*$p < .1$. **$p < .05$. ***$p < .01$.

The next stage in structural model assessment is the evaluation of predictive capabilities. This evaluation will examine the model's predictive accuracy and predictive relevance. Predictive accuracy is measured through coefficient of determination (R^2 value) while predictive relevance will be measured by using the

Q^2 value which can be obtained by using cross-validated redundancy approach. According to the result presented in Table 4, the R^2 value for innovation performance is quite profound at 0.728. This outcome indicate that the combined effects on innovation performance by the construct of entrepreneurial bricolage and government support is substantial. In other word, the construct of entrepreneurial bricolage and government support are able to explain more than half of the variance in the construct of innovation performance. Furthermore, the result on cross validated redundancy shows that the model have an acceptable Q^2 value at 0.523, which suggests that the model has predictive relevance for this construct (Hair et al., 2014).

Table 4: Results of R^2 and Q^2 values

Endogenous latent variable	R^2 Value	Cross validated redundancy (Q^2 Value)
Innovation performance	0.728	0.523

The final assessment will address the f^2 and q^2 effect sizes. According to the result in Table 5, the f^2 effect size value for government support is substantial (0.827) if compared to the construct of entrepreneurial bricolage (0.066). According to Hair et al. (2014), results of 0.02, 0.15, and 0.35 on f^2 effect size are taken as small, medium and large, respectively. Therefore this outcome indicates that the construct of government support have a pronounce contribution in explaining variance in the construct of innovation performance. On the other hand, the f^2 effect size of entrepreneurial bricolage is considered small toward innovation performance.

According to Hair et al. (2014), the evaluation of q^2 effect sizes uses the same critical values for the assessment of f^2 effect size. According to the result in Table 5, the q^2 effect size of government support can be considered as medium at 0.331. On the other hand, q^2 effect size for entrepreneurial bricolage can be taken as small.

Table 5: Result of f^2 and q^2 effect sizes

Construct	f^2 Effect size	q^2 Effect size
Government support	0.827	0.331
Entrepreneurial bricolage	0.066	0.018

5. Discussion and conclusion

The objective of the study is to investigate the influence of government support on the innovation performance among manufacturing SMEs in Malaysia. In addition, this study also aims to examine the interaction of government support on the relationship between entrepreneurial bricolage and innovation performance and also providing the empirical evidence that contribute to the body of literature in academic research.

The framework of this study consist of three dimensions namely, entrepreneurial bricolage, government support and innovation performance. In the context of this study, entrepreneurial bricolage and government support served as predictor variables in explaining innovation performance among manufacturing SMEs and two hypotheses was proposed (H1,H2). At the same time, the study also aims to investigate the interaction of government support toward relationship between entrepreneurial bricolage and innovation performance and hence, the third hypothesis was proposed (H3).

The result from PLS-SEM revealed that, both relationships among predictor constructs on innovation performance were significant with *p*-values that less than 0.01. This outcome has shown that government support and entrepreneurial bricolage does positively influencing the innovation performance among manufacturing SMEs in Malaysia. Therefore hypotheses H1 and H2 were accepted. In terms of the strength of relationship that portrayed through the path coefficient, government support have a larger path coefficient (0.692) if compared to entrepreneurial bricolage (0.221). Furthermore, by comparing both predictor constructs in terms of explanatory power, government support have a much larger effect size where the f^2 value at 0.827 while the value of f^2 for entrepreneurial bricolage scored at 0.066 which considered small. Based on the empirical evidence, the government support does have a significant role in promoting innovation performance among manufacturing SMEs in Malaysia.

Last but not least, this study attempted to study the interaction of government support on relationship between entrepreneurial bricolage and innovation performance. However the moderation effect by government support was not significant as the *p*-value was greater than 0.1. It seems that the government support has no interaction with the bricolage behaviour among SMEs. Despite having one non-significant relationship, this study has provided an empirical evidence on the influence of government support and entrepreneurial bricolage among manufacturing SMEs in Malaysia. In addition, this study also contribute toward the body of literature in academic research and hopefully that this modest study filled the research gap.

Acknowledgement

We would like to thank to Ministry of Higher Education for funding this research under Fundamental Research Grant Scheme- FRGS 203/PMGT/6711585

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