

Mediating Effect of Technological Innovation on the Relationship between HRM, and Performance in Selected SMEs in Malaysia

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ABSTRACT

The study is to examine the relationship between Human Resource Management (HRM), technological innovation and firm performance among small and medium enterprises (SMEs) in Malaysia. The mediating effect of technological innovation on the relationship between HRM and firm performance was also measured. Data was collected by using survey technique to 165 SMEs that participated in the study. The correlation tests in this study indicated that all the variables are significantly related. The technological innovation was found giving partial mediating effect which signifies the importance of inculcating the spirit of technological innovation among SMEs ($R^2=.402$, $F=19.338$, $p<.01$). The test also showed that technological innovation ($\beta=.328$, $p=.000$) as the strongest predictor for firm performance and outweighed the explanatory power of the HRM practices. The findings also provide support to resource-based theory and human capital theory.

Keywords: Technological Innovation, HRM, Firm Performance, SME.

1. INTRODUCTION

1.1 Background of the Study

Changes in markets and the competitive strategies of large organisations have increased the pressure on SMEs to focus on innovation, innovation capabilities and innovation management (McAdam, McConvery & Armstrong, 2004). Accelerating technological and scientific developments and ever shortening product lifecycles generate a particular innovation imperative as well as opportunities for SMEs (Keizer, Dijkstra and Halman, 2002; O'Regan, Ghobadian & Sims, 2005). Studies to date suggest that the SME sector in general still demonstrates an innovation management deficit (O'Regan et al., 2005; Musteen & Ahsan, 2013) or finds innovation management a challenge (Bessant, Lamming, Noke & Phillips, 2005). A vast amount of research has proved the positive relationship between Human Resource Management (HRM) and a given firm performance (Huselid, 1995; Schuler & Jackson, 1987; Saridakis, Lai & Cooper, 2017). Research has also been done on the relationship between technological innovation and firm performance (Foster, 1986; Hill & Rothaermel, 2003; Tripsas & Gavetty, 2000; Gërguri-Rashiti, Ramadani, Abazi-Alili, Dana & Ratten, 2017). Despite that, the effect of HRM on technological innovation is still understudied. Thus, the objective of this study is to examine the contribution of HRM practices to technological innovation of SMEs in Malaysia. At the same time, this study aims to examine the mediating effects of technological innovation on firms' performance.

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1.2 Malaysian SMEs and Innovativeness

The Malaysian Economic Census 2016 recorded a total of 907,065 SMEs operating in Malaysia representing 98.5 percent of total business establishments. The results showed that 89.2 percent of the establishments were in the services sector, 5.3 percent in the manufacturing sector and 4.3 percent in the construction sector. Malaysian SMEs contribution to the country gross domestic product (GDP) has increased from 32.5 percent in 2011 to 36.6 percent in 2016 (SME Annual Report 2016/2017, 2017).

Innovation is a key to both increasing productivity through process improvement and the creation of new, higher value, products and services. To ensure the competitiveness of Malaysian SMEs, Malaysian government has launched SME Master plan 2012-2020 which focuses on a new beginning in SME development; a fresh approach to bring SMEs to the next level by accelerating growth through productivity gains and innovation. The target is for SMEs to achieve an average GDP growth of 8.7 percent per annum in the period from 2012 to 2020.

The Malaysian government recognises that SMEs may be unable to exploit new products due to the limited organizational and marketing capabilities, thus Technology Commercialisation Platform (TCP) has been included in the Master Plan. TCP aims to provide a national network of privately-managed platforms to promote innovative ideas and breakthroughs from proof-of-concept all the way to the commercialisation stage. The government has introduced Innovation Certification for Enterprise Rating and Transformation (1-InnoCERT) as an effort to encourage innovation within SMEs. It is a certification programme used to recognise and certify innovative enterprises and SMEs and to encourage entrepreneurs to venture into high technology and innovation-driven industries (SME Annual Report 2016/2017, 2017). Emphasis was given on innovation for the SMEs and the constraint they face, this study is believed to bring valuable contribution not only to the Malaysian SMEs but also to other SMEs elsewhere. As the competition in many markets intensifies and world economies continue to falter, firms are becoming more reliant on innovation efforts for basic survival.

2. THEORETICAL FRAMEWORK

Resource-based theory suggests that a firm's resources are extremely important for the firm's development and that human capital is a key resource of a firm (Galbreath, 2005; Davis & Davis, 2017). The function of this resource depends on the employees' ability and enthusiasm, and on efficient human resource management (Mumford, 2000). In HRM practice, training of the employees, motivation and effective appraisal and control are important issues (Huselid, 1995, Schuler & Jackson, 1999). First, the employee can rapidly acquire new knowledge and further develop innovation competencies through training (Chi, Bassock, Lewis, Reitman & Glaser, 1989). Second, employees motivation has direct influence on technological innovation (Liu, Gong, Zhou & Huang, 2017) though there are, as is inevitable, different results from different researchers (Amabile, Hennessey & Grossman, 1986; Baer, 1997; Eisenberger & Cameron, 1996; Hennessey & Amabile, 1998; Redmond, Mumford & Teach, 1993). Thirdly, technological innovation is a process accompanied with high risk thus it is necessary to use effective controls to reduce risk and enhance efficiency (Li Y, Zhao Y & Liu, 2006).

Investment in human capital by firms starts from the recruitment and selection process. The efforts and time invested is imperative to ensure the right candidates are selected. This activity need to be continued by other human resource (HR) related activities in order to promote employees performance.

Human capital theory is another theory that is relevant to the present study. According to human capital theory, greater investments in employees are expected to result in improved

performance to firms via superior skills and knowledge (Lepak & Snell, 1999). Spending on education, and training, are considered as investments in human capital because employees need their knowledge, skill, and abilities, and those capital cannot be separated from the employees like how other financial and physical assets (Becker, 2009). The investments will add value to the employees by increasing their knowledge throughout their lifetime (Becker, 2009). They work by accessing, creating, and using the new acquired information, which consequently add value to the firms (Tymon & Stumpf, 2003). Knowledge and skill are shown to benefit innovation by increasing opportunity recognition and problem solving, while limiting the ability of competitors to duplicate it.

2.2 Innovation

Innovativeness and innovation have been defined in many ways depending on the context of the study. In the present study, we refer an innovation as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations (Gunday, Ulusoy, Kilic & Alpkan, 2011). At a general level, there have been various classifications of innovation types in large firms such as innovation in products, services, processes and organisation. Product innovation may include new product offerings or improvements in existing products which appear to be the most common form of innovation. Technological innovation in its widest sense is some change in the way technology relates to its uses. This includes introduction of new products ideas into production process, radical improvement in the company's technology and frequently renewal of equipment.

Organizational supports such as organisational policies and practices are argued to be important for innovation. For instance, definitions of innovation such as "...a firm's tendency to engage in and support new ideas, experimentation, and creativity for the development of new processes" by Lumpkin & Dess (1996) emphasized the importance of organizational support for innovation (Das & Joshi 2007). In this regards, authors argue that HRM practices as part of organisational support are necessary for technological innovation in firms.

2.3 HRM Practices and Performance

HRM is widely defined in the literature (Daniels, 2006; Huselid, 1995) but for the purpose of this discussion HRM is defined as a set of practices used to manage the workforce of an organisation. It reflect attempts by the management to create a work environment that emphasises employee development through practices such as training, participation and communication, and the importance of having innovative, flexible, committed employees who are valuable resources (Beer, Spector, Lawrence, Quin and Walton, 1984; Guest, 1989; Walton, 1985).

A significant body of research has suggested specific HRM practices which are expected to promote inimitable attributes in human resources that can help an organisation to obtain a competitive advantage and enhance its performance (e.g. Ahmad & Schroeder, 2003; Frits & MacDuffie, 1996; Guest, 1997; Guest, Michie, Conway and Sheeman, 2003; Huselid, 1995; Michie & Sheehan, 2001, Saridakis et al., 2017). Certain HRM practices may have different consequences. However, Delaney and Huselid (1996) argued that researchers still do not know how HRM practices affect organisational outcomes. Becker and Huselid (1998) and Huselid (1995) asserted that HRM practices affect organisational performance through their effect on employee development and behaviour.

2.4 HRM Practices and Innovation

Central to the discussion of effective people management in innovating companies is the management of creativity and innovation potential within individuals (Mumford, Scott, Gaddis & Strange, 2002), and the required supporting mechanisms, systems and context variables. Relatively few studies addressed innovation-related people management practices in the SME context because HR practices are still considered emerging rather than fully developed and relatively little focus has actually been placed on people management practices in the SME context (Reid, Morrow, Kelly and McCartan, 2002). However, those studies are in agreement that people management practices for innovation and organisational variables supporting creativity and innovation are likely to apply to all organisational contexts (Amabile et al., 1996; Bommer & Jalajas, 2002).

According to Scarbrough (2003), there are three aspects of HRM activity which are seen as particularly important in shaping the flow of people and their impact on the development of innovations: selection methods, compensation strategies, and career systems. Selection of individuals with both appropriate skills and attitudes has been identified as an important influence on the development of the project teams which are often an integral feature of the innovation process. The influence of HRM on SMEs innovation which Abdullah, Wahab & Shamsuddin (2010) found in their study that 57 percent of variance in innovation in SMEs has been explained by HRM practices. However, among the HRM practices, only recruitment, selection and job security are significant predictors of innovation (Abdullah et al., 2010).

According to human capital theory, it is imperative to properly compensate individuals for skills and knowledge that contribute to innovation. For firms seeking innovation, compensation should be designed specifically to engender creativity, problem solving, and risk taking (Fox, 2009). A study by Takeuchi, Osono & Shimizu (2008) made an interesting observation on this issue at Toyota. Toyota really does invest heavily in people and the ideas that flow from everyone and as a result, shop floor workers and managers alike enable the company to keep getting better. However, Toyota actually does not do many of the things associated with successful enterprises. For instance, in terms of compensation, dividends are low – from 1995 to 2006, they averaged only 20 per cent of earnings (Takeuchi et al., 2008). Their executives are not on huge wages, and there are few rapid rises to the top of the company: two years ago, the average age of the company's executive vice-presidents was 61. Nevertheless, it is an attitude which is, in part at least, is fostered by good HRM practices which in turn yield beneficial innovatory effects.

Scarbrough (2003) considered career systems as rewards, control, appraisal and promotion. He argued that career systems are important to reward the individualistic acquisition of knowledge, to promote the sharing of knowledge among wider communities of practice. This practice encourages sharing of ideas and knowledge which leads to innovation. HRM is considered as key element of successful innovation since human element is involved in the whole innovation process. This perspective is rooted in contingent perspective of HRM where effective HRM practices are those that are consistent with organizational aspects and strategies. In fact, studies on the relationship between HRM practices and innovation showed that good HR practices have significant effect on innovation performance of organizations (Jimenez-Jimenez & Sanz-Valle, 2005).

2.5 Technological Innovation as a Mediator

Several previous studies have examined the direct relationship between HRM practices on firm performance (Huselid, 1995; Schuler & Jackson, 1987; Saridakis et al., 2017). Past studies have proven the positive relationship between the two constructs. In addition, past studies also have examined the relationship between technological innovation and firm performance (Abdullah et

al., 2010; Foster, 1986; Hill & Rothaermel, 2003; Mumford, 2000; Tripsas & Gavetty, 2000; Gërguri-Rashiti et al., 2017). Thus, we argued that technological innovation as a result of HRM practices would influence firm performance.

The ultimate motivation for firms to innovate is to gain benefits such as competitive advantage and improved performance. The growth and firm performance of SMEs can be measured in various ways, for example using employment, assets, market share, physical output or various measures of profitability (Dobbs & Hamilton, 2007). Researchers have used absolute, relative, subjective or objective measures in their analysis of firm performance. It is difficult to select a single best measure for firm performance, since performance indicators such as employment, income growth and profitability do not always evolve in the same direction (Freel & Robson, 2004). Based on the above review, the following hypotheses are developed:

- H1:** There is a positive relationship between HRM practices and firm performance.
- H2:** There is a positive relationship between HRM practices and technological innovation.
- H3:** There is a positive relationship between technological innovation and firm performance.
- H4:** Technological innovation mediates the relationship between HRM practices and firm performance.

3. METHODOLOGY

3.1 Measurement

There are three main constructs involved in this study namely HRM practices, technological innovation and firm performance. Based on past studies on HRM and innovation (Abdullah et al., 2010; Li et al., 2006; Scarbrough, 2003), this study measure HRM practices in four main activities: recruitment and selection, training, appraisal and compensation.

The instrument of this study was adapted mainly from Li et al. (2006). However, items for recruitment and selection were self-developed by the researchers. Three items were used; emphasizing on innovative characteristics of job candidates; testing the innovative capability of candidates; and increasing efforts to recruit innovative applicants. Measures of employee training were developed based on the research by Snell and Lau (1994). Employee training was measured by three items: increasing more investment in employee training in the last five years; emphasizing professional training for employees; and encouraging employee learning through systematic courses and learning by doing. Responses were made on a seven-point scale ranging from 1- strongly disagree to 7- strongly agree.

In order to study the influence of appraisal on firms' technological innovation, process appraisal and outcome appraisal were measured. For process appraisal, the measurable items were mainly taken from the research by Prowse (1995) and Xu and Wang (1997). The items are: permitting the employees to make mistakes during the innovation process; a high degree of trust between leaders and subordinates; and building benign relationships between collaborators. Responses were made on a seven-point scale ranging from 1- strongly disagree to 7- strongly agree. For the measures of outcome appraisal and control, items are mainly taken from the research of Hitt, Hoskisson, Johnson & Moesel (1996). They are: high requirement on the Return on Investment (ROI) to the innovation; cash currency being abundant through the innovation; and high increasing speed of net assets through the innovation. Responses were made on a seven-point scale ranging from 1- strongly disagree to 7-strongly agree.

In terms of compensation, material incentive and non-material incentive were included. The three items that measured material incentive are mainly based on the scales of Kuratko, Hornsby & Naffziger (1997). They are: increasing individual material fortune; increasing

opportunity to gain an economic interest in the firm; and a guarantee of future income for family members. Responses were made on a seven-point scale ranging from 1- strongly disagree to 7- strongly agree. For non-material incentive, three items were used and they are mainly based on the scales of Kuratko et al. (1997). They are, acquiring social acceptance, praise and honour; obtaining individual opportunity by accepting the challenge of the innovation; and progress of personal in business or work. Responses were made on a seven-point scale ranging from 1- strongly disagree to 7- strongly agree.

Items that measure technological innovation were mainly taken from the scales of a research done by Zahra, Neubaum & Huse (2000). Technological innovation was measured by five items: frequent introduction of new product ideas into production process; high probability of success for new products being tested; spending shorter periods in new product research and development; radical improvement in the company's technology; and frequent renewal of equipment. Responses were made on a seven-point scale ranging from 1- strongly disagree to 7- strongly agree.

Finally, a firm's financial performance was measured using four items based on the research of Daily and Johnson (1997). The items are: increasing rate of sales revenue; increasing rate of profit; increasing rate of net asset ROI; and increasing rate of market share. Responses were made on a seven-point scale ranging from 1- strongly reduced, to 7- strongly increased.

3.2 Population and Sampling Procedures

As mentioned earlier, 98.5 percent of establishments in Malaysia are SMEs and the majority (i.e. 76.5 percent) was made up of the micro-sized enterprises. 2.3 percent was made up of medium establishments (which employed more than 100 full time employees) and small establishments made up 21.3 percent (employed between 5 and 50 full time employees). For the sake of the study which aimed to examine the HRM practices, technology innovation and firm performance, all the respondents must qualify certain criteria –they must be the HR managers of the enterprise and the enterprises were chosen based on the definition set by SME Corporation Malaysia (SME Corp). The actual definition by SME Corp is based on either one of two criteria (by number of employees or by annual sales turnover) and there are respective criteria for different sectors as indicated in the definition (manufacturing related, agricultural related, services and ICT) (SME Corporation Malaysia, 2017). Given the difficulty in getting the responses in terms of the annual sales turnover, this study used the first criterion, i.e. by the number of employees. This is due to the practicality in data collection in obtaining full cooperation by the respondents to participate in the study.

Due to the same reason, the sampling procedure used in the study was based on convenience sampling. Most of the potential respondents approached refused to participate and in order to accomplish the data collection process, the researchers only managed to obtain responses from those who were willing to cooperate.

3.3 Pilot Test

A pilot test was conducted before the actual data collection was done. 30 respondents who met the criteria of the intended participants for the study were asked to fill up the questionnaires. This was to ensure the internal consistency of all the items in the respective variables studied. Table 1 showed the reliability coefficient of all the studied variables based on the 30 responses. Given the favourable values of the coefficient for all the variables, the actual data collection was initiated.

Table 1 Reliability coefficient of the variables (N=30)

Variables	Reliability coefficient (Cronbach's alpha)
Employee training	.866
Material incentive	.616
Non-material incentive	.781
Process appraisal and control	.848
Outcome appraisal and control	.864
Recruitment and selection	.872
Technological innovation	.869
Firm performance	.935

3.4 Data Collection

Given the strong internal consistency of all items in the respective variables (refer to Table 1); data collection was done without any changes to the items in the questionnaire. The questionnaires were self-administered by the researchers and each respondent was personally approached. A total of 500 survey forms were distributed in Selangor and Kuala Lumpur and finally 165 survey forms were returned. Selangor and Kuala Lumpur were chosen due to several reasons. First, the statistics (as reported in Economic Census 2016) indicate that the two states have the highest percentage in terms of number of establishments (19.8 percent and 14.7 percent respectively) as compared to the other states in Malaysia. This is due to the active economic activity and high population density in the states. Second, given the constraint in terms of time and effort, it is perceived as cost-effective to just concentrate on the two states.

3.5 Data Analysis and Reliability Analysis

All items were analysed using principal component analysis with an orthogonal (varimax) rotation. The detail items in each factor with the respective statistics are depicted in Table 2.

Table 2 Statistics and principal component loadings of the variables

Factors	Factor Loadings	Eigen Values	Percentage Explained Variance	Cronbach's Alpha
Factor 1: Firm Performance				
Increasing rate of sales revenue.	.885	9.83	12.80	.915
Increasing rate of profit.	.817			
Increasing rate of net asset ROI (return on investment).	.778			
Increasing rate of market share.	.761			
Factor 2: Technological Innovation				
Radical improvement in the company's technology.	.789	2.17	12.75	.866
Spending shorter periods in new product research and development.	.771			
Frequently renewal of equipment.	.717			
High probability of success for new products being tested.	.646			
Frequent introduction of new product ideas into production process.	.604			
Factor 3: Incentives				
A guarantee of future income for family members.	.711	1.75	10.10	.760

Factors	Factor Loadings	Eigen Values	Percentage Explained Variance	Cronbach's Alpha
Increasing opportunity to gain an economic interest in the firm.	.655			
Increasing individual material fortune.	.586			
Obtaining individual opportunity by accepting the challenge of the innovation.	.568			
Building benign relationships between collaborators.	.548			
<i>(originally was an item under Process Appraisal and Control)</i>				
Progress of personal in business or work.	.392			
Factor 4: Recruitment and Selection				
Emphasizing on innovative characteristics of job candidates.	.875	1.48	9.46	.892
Testing the innovative capability of candidates.	.832			
Increasing efforts to recruit innovative applicants.	.776			
Factor 5: Outcome Appraisal and Control				
Cash currency being abundant through the innovation.	.796	1.34	9.01	.808
High increasing speed of net assets through the innovation.	.747			
High requirement on the ROI (return on investment) to the innovation.	.669			
Acquiring social acceptance, praise and honour	.402			
<i>(originally was an item under Non-Material Incentive)</i>				
Factor 6: Employee Training				
Emphasizing professional training for employees.	.722	1.13	8.21	.765
Encouraging employee learning through systematic courses and learning by doing.	.698			
Increasing more investment in employee training in the last five years.	.655			
Factor 7: Process Appraisal and Control				
Permitting the employees to make mistakes during the innovation process.	.753	1.05	7.10	.563
A high degree of trust between leaders and subordinates.	.741			

As for Factor 3 which was labelled 'incentive', the items were actually intended to be loaded in two separate factors (namely material and non-material incentives). However, the factor analysis output indicated that all items were highly inter-correlated that they were all loaded as one factor. There were also items which were cross-loaded in the other factors, as indicated in Factor 3 and Factor 5. Given the high factor loading in the respective factors and high reliability coefficient, it was decided that the items should remain in the loaded factors.

4. FINDINGS

4.1 Demographic Characteristics of Respondents (Participating Establishments)

Table 3 indicate that the majority participating establishments in the study were in consumer products/retail and wholesale (19.4 percent) and followed by food and beverages (18.2 percent). Non-service categories such as manufacturing had 4.2 percent respondents and construction had 7.3 percent.

It is also indicated in Table 3 that 80.6 percent of the establishments are in private sector and the remaining are in public and government sectors (17.6 percent and 1.2 percent respectively). In terms of number of employees, 6.1 percent of the establishments employed 10 employees or less, followed by those employing 11 to 20 employees (21.8 percent) and 21 to 50 employees (4.8 percent).

Table 3 Demographic characteristics of the respondents' establishments (N=165)

Industry	Frequency	Percentage
Advertising/Public Relations	7	4.2
Biotechnology/Biomedical	1	0.6
Contractors/Construction	12	7.3
Consumer products/Retail/Wholesale	32	19.4
Consulting	9	5.5
Education	10	6.1
Engineering/Architecture	2	1.2
Entertainment	2	1.2
Finance/ Banking/Accounting	1	0.6
Food and Beverages	30	18.2
Insurance	1	0.6
Industrial tech	2	1.2
Manufacturing	7	4.2
Medical/Health services	8	4.8
Real-estate	1	0.6
Technology/Telecommunications/Information technology	10	6.1
Training	4	2.4
Transportation	1	.6
Travel/ Hospitality	1	0.6
Utilities	2	1.2
Others	22	13.3
Sector		
Public	29	17.6
Private	133	80.6
Government	2	1.2
Did not respond	1	0.6
No. of employees		
1 - 10	74	44.8
11 - 20	36	21.8
21 - 50	28	17.0
51 - 100	8	4.8
101 - 500	10	6.1
Did not respond	4	2.4

4.2 Hypotheses Testing

Table 4 presents the means, standard deviations, and inter correlations of the study variables. All the variables (HRM practices, technological innovation and firm performance) were significantly related to each other with positive correlations. The significant positive correlations showed support to the hypotheses forwarded in the study.

H1 which hypothesized positive relationship between HRM practices and firm performance was supported. As indicated in Table 4, all dimensions which made up the HRM practices (namely incentives, recruitment and selection, outcome appraisal and control, training; and process appraisal and control) were correlated with firm performance with significant positive relationships.

In H2, HRM practices are expected to have positive relationship with technological innovation. Again, as shown in Table 4, all the five dimensions of HRM practices were positively correlated with technological innovation.

In the third hypothesis (H3), technological innovation and firm performance are hypothesized as positively correlated. Results in Table 4 support the hypothesis.

Table 4 Descriptive statistics and intercorrelations among study variables (N=165)

		M	SD	1	2	3	4	5	6	7
1	Incentives	4.88	0.96	1						
2	Recruitment and selection	4.88	1.31	.505*	1					
3	Outcome appraisal and control	4.74	1.33	.495*	.389*	1				
4	Training	4.86	1.30	.574*	.496*	.545*	1			
5	Process appraisal and control	4.86	1.91	.269*	.273*	.320*	.234*	1		
6	Technological innovation	4.50	1.26	.456*	.447*	.549*	.479*	.226*	1	
7	Firm performance	5.08	1.31	.502*	.321*	.529*	.414*	.219*	.556*	1

** Correlation is significant at the .01 level (1-tailed).

To test H4 which hypothesized the mediating effect of technological innovation, a hierarchical regression analysis was used. It was found that the five dimensions of HRM practices were significantly related to both firm performance and technological innovation. Firm performance and technological innovations were also significantly correlated and thus, the regression test on the mediating effect of technological innovation can be conducted. Table 5 shows the full results of the regression analysis.

Table 5 Summary of hierarchical regression analysis of firm performance on predictor variables (N=165)

Model no.	Predictor variables entered	p	Standardized beta	R	Adj. R ²	F
1	Incentives	.001	.293	.598	.338	17.719**
	Recruitment and selection	.893	.010			
	Outcome appraisal and control	.000	.350			
	Training	.592	.046			
	Process appraisal and control	.831	.015			
2	Incentives	.002	.256	.651	.402	19.338**
	Recruitment and selection	.494	-.052			
	Outcome appraisal and control	.004	.236			
	Training	.963	.004			
	Process appraisal and control	.831	.014			
	Technological innovation	.000	.328			

**Significant at .01 level

As displayed in Model 1 of Table 5, when all the five HRM practices were simultaneously tested as predictors for firm performance, only incentives and outcome appraisal and control were found to be significant predictors ($\beta=.293$, $p=.001$ and $\beta=.350$, $p=.000$ respectively). All the five variables contributed 33.8 percent of the variance in firm performance.

In Model 2 of Table 5, after the inclusion of the mediator variable (i.e. technology innovation), the R² increased from 33.8 percent to 40.2 percent and the change in the F-values was significant (from 17.719 to 19.338) at .01 level. It shows that technological innovation has given significant contribution in explaining the variance in firm performance. In order to determine whether technological innovation is a partial or full mediator, the results in Model 2 of Table 5 indicated that it only serves as a partial mediator between all the five HRM practices and firm performance. This is because two HRM practices, which are incentives and outcome appraisal and control, were still significant predictors to firm performance. Hence, H4 is supported with technological innovation serves as the partial mediator.

However, despite the significant effects of incentives and outcome appraisal and control, the standardized beta coefficient of the two HRM practices have decreased from .293 and .350 (incentives and outcome appraisal and control respectively) to .256 and .236. The decrease signified the reduction in their strength as the predictors for firm performance after technological innovation is included. As shown in Model 2 of Table 5, technological innovation has the highest standardized beta coefficient ($\beta=.328$, $p=.000$) which reflected its strongest predictor for firm performance after the other five HRM practices.

5. DISCUSSION

The objectives of the study were to examine the relationship between HRM practices and firm performance mediated by technological innovations. The results from the data analysis show support to all the hypotheses forwarded. As hypothesized in H1, effective HRM practices indeed have positive relationship with the performance of the SMEs as indicated in prior research (Huselid, 1995; Schuler & Jackson, 1987, Saridakis et al., 2017). The findings also provide strong support to the human capital theory which suggested that employers who are committed in investing their resources for employees' skills and talents will be reciprocated with higher level of competencies and dedication which will result in better company performance. The performance can be in various forms such as higher sales revenues, increased market share and profit.

Well managed human capital is very pertinent in business that it is not only positively affecting the firm performance but the technological innovation as well. The findings indicated positive relationship between HRM practices and technological innovation revealed the importance of good HR policies. The finding is in line with the finding by Abdullah et al. (2010) which found that 57 percent of variance in innovation among SMEs is explained by HRM. Chi et al. (1989) found that when employees are provided with the opportunity to acquire knowledge and skills, they tend to be more innovative. As posited by Takeuchi et al. (2008) based on his observation on Toyota's business practices, the company is willing to make huge investments in its employees right from the lowest level positions to top with the aim to spark creative thinking and risk-taking mentality. The practices are strongly supported by the resource-based theory which promotes the idea that when employees are well trained, highly motivated with attractive incentives and evaluated fairly, they are likely to be more engaged and committed in their jobs.

Nevertheless, SMEs has one pertinent constraint, i.e. financial resources. In Malaysia, as indicated in the Economic Census (2016), 72.8 percent of the SMEs used internally generated funds for financing. The funding was mainly used to buy or rent vehicles, equipment, land and computer software. The census also showed that 79.8 percent of the financial resources are mainly used as working capital and thus the budget allocated for research and development (R&D) such as innovation and human capital development is very restricted. Thus, given the limited fund available for employees' skill development and R&D, the SMEs are not likely to achieve innovation and creativity in any ways. It is plausible to see why SMEs in Malaysia remain less competitive than the other larger counterparts despite their substantial size which make up 98.5 percent of the total number of establishments in Malaysia.

The significant relationship between technological innovation and firm performance yield from the study has added more support to the idea that employers must emphasize the need to make the employees innovative. In any business, regardless of size and sector, all employers aim at maximizing profit through increased sales, higher market share and return on investment and one major contributor to profit is technological innovation. Similar findings were found in other studies by Foster (1986), Hill and Rothaermel (2003) and Tripsas and Gavetty (2000). Innovative minds require risk-taking and thus, it makes employers in SMEs less willing to commit due to the uncertainty which might lead to failure. Employees' tendency to explore new ways of doing things and implement new ideas are highly influenced by the consequences of their action by the employers. At this juncture, it is very important for employers to allow employees to make mistakes and try out new ways of doing things. To reduce the possibility of making losses due to mistakes, proper control on employee performance can be done by setting standard operating procedures and key performance indicators coupled with monitoring and observation.

The finding of this study revealed that technological innovation acting as a partial mediator between HRM practices and firm performance further signify the importance of inculcating the spirit of technological innovation among SMEs. The regression analysis conducted (refer to Table 5) revealed technological innovation as the strongest predictor for firm performance and outweighed the explanatory power of the HRM practices. Therefore, SMEs should not hesitate to invest their resources in upgrading the employees' skills and competencies and they must embark on the endeavour to research and development. There has to be effort in generating ideas in new products and production process which might require radical change and improvement in the company's technology and methods.

6. IMPLICATIONS OF THE STUDY

The study findings have contributed significantly to the body of knowledge on SME innovation and growth in relation to the HRM practices. As indicated in the earlier section, most studies

done previously focused more on larger firms and thus limited studies were done among SMEs particularly in Malaysia. The significant relationships among the variables (namely HRM practices, technological innovation and firm performance) in line with the previous studies done in same area provided stronger support to the related theories. Resource-based theory stated that firm's resources in any forms (financial, human capital, tangible assets, etc.) is the key to business success. It is well understood that SMEs (especially in Malaysia) have to operate side by side with the larger counterparts and here comes the importance of juggling the restricted resources wisely in order to make profit. The findings of this study are also in line with the human capital theory which suggested that SMEs should implement good human capital management through recruitment and selection, appraisal and control, incentive scheme and employee training (Lepak & Snell, 1999; Becker, 2009).

Despite the limited resources available for SMEs, they have to rethink and reconsider the need to allocate more resources for employee training and development. This is the part when the employers have to take risks and change the normal ways of doing things. They have to adopt a radical way in organizing the limited resources in order to allow employees to acquire new knowledge. At this juncture, it is also pertinent to select only the right employees who have the innovative characteristics by testing their innovativeness during the selection stage. It is also a good idea for them to employ various selection methods such as pen and paper tests, interviews and background check in order to gauge their potential and talents. Given the restricted resources, SMEs should make full use of the incentives provided by the Malaysian government which serve as the lubricants for business operation. The government has various schemes and programs which are provided and formulated through various ministries such as the Ministry of Human Resource, Ministry of International Trade and Industries, Ministry of Finance and Ministry of Science, Technology and Innovation. The SMEs have to take advantage of these avenues and platforms to develop the skills and talent in innovation and at the same time getting access to more financial resources which eventually lead to innovation and success in business.

7. LIMITATION OF THE STUDY

The study had several limitations. First major limitation is in sampling. The respondents were identified using convenience sampling which might result in sampling bias. This is because the sample taken may not represent the entire population. Given the small number of respondents in the study (i.e. 165 SMEs out of 907, 065 in total establishments), the findings and the results may not reflect the reality of the entire SME population in Malaysia and thus, inferences made from the study results must be made with caution.

Second, the R^2 yielded from the hierarchical regressions on HRM and technological innovation was only 40.2 percent (refer to Table 5) which means there are other predictor variables which explain the variance in firm performance. There are other variables which significantly contribute to firm performance such as financial resources, leadership and management style.

8. FUTURE RESEARCH DIRECTION

The study findings only managed to indicate that technological innovation serves as a partial mediator between HRM and firm performance. The study confined its focus on examining innovation from technology aspect only and possibly, HRM might have meaningful effect on other types of innovations as well. Therefore, for future research, it might be good to study other aspects of innovations (as expounded earlier in the text) such as innovation in marketing methods, business practices and management initiative which have potential contribution to firm performance.

Given the moderate R^2 value (i.e. 40.2 percent) from the hierarchical regressions on HRM and technological innovation, the future research should consider examining other variables such as the management practices and leadership style. Other potential predictor variables for firm performance are the marketing and sales approach used in promoting and selling the products as well as the ability to manage financial resources.

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