

EXPLORING THE IMPACT OF PRODUCT AND PROCESS INNOVATIONS ON FIRM SECTOR, OWNERSHIP TYPE, SIZE AND ACTIVITY PERFORMED

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ABSTRACT: *This study was carried out to assess the impact of firm's demographic information on their perception about product and process innovation. Four demographic variables, namely: sector, type of ownership, company size, and main activity of the firms were chosen as predictors, and their relationship with the two dependent variables: product and process innovations were studied. A total of eight hypotheses were formulated, linking each predictor to both dependent variables, individually. Based on the questionnaire designed, the questions were aimed at determining firms' perceptions towards product and process innovations in their firms. A simple random sampling was employed to choose firms within the manufacturing and service sector from SMEcorps Malaysia data based, and contact was established via survey to all the selected firms. The data collected was processed using SPSS and analyzed through One-Sample T-test and ANOVA. It was seen that none of the predictors caused a significant variation in SMEs firm perceptions with respect to the firm's responses on the demographic variables of the firm.*

KEYWORDS: Small and Medium Scale Enterprises (SMEs), Firms Perception, Product Innovation, Process Innovation

INTRODUCTION

In today's global and changing world, small and medium enterprises (SMEs) are seen by policymakers as the ideal way to increase innovation because they are pivotal to the growth and development of a nation's economy in addition to enhancement of economic activities, job creation, and employment within disadvantaged communities. To this effect, SMEs have a valid claim to intensify their relevance to expand and integrate this sector into the mainstream of economic activities (Li, and Atuahene-Gima, 2001; Laforet and Tann, 2006). Product innovations are thus, seen as the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics. Product innovations can utilize new knowledge or technologies, or can be based on new uses or combinations of existing knowledge or technologies. Process innovations on the other hand are the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software. Process innovations can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products. For example, the introduction of GPS tracking devices for transport

services, the implementation of a new reservation system in a travel agency, and the development of new techniques for managing projects in a consultancy firm (NSI, 2009-2011). Several other studies have indicated that SMEs are currently at the forefront of local economic development and are purported to resolve socio-economic problems and entrepreneurs/SMEs owners may act as catalysts of activity for an entire economy.

REVIEW OF LITERATURES

The term innovation is a generic term that is often used without stating a definition or an exact meaning. Notable authors in the economic literature have that have made statements about what innovation really means is Joseph Schumpeter who defined innovation in 1911 (translated in 1934) as ideas applied successfully in practice;

“The introduction of new goods (...), new methods of production (...), the opening of new markets (...), the conquest of new sources of supply (...) and the carrying out of a new organization of any industry”.

Later definitions of the concept were often based on Schumpeter’s statement and recently an increased focus is continually made on softer definition of innovation to include products or service that has increasing capabilities (Andersson et al, 2011). Some earlier definition are thus summarize in the table below:

Table 1: Definition of Innovations

Authors	Definitions
Freeman, 1982	Industrial innovation includes the technical, design, manufacturing, management and commercial activities involved in the marketing of a new (or improved) product or the first commercial use of a new (or improved) process or equipment
Drucker, 1985	Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or service
UK, DTI, 2004	Innovation is the successful exploitation of new ideas”
Albury, 2005	Successful innovation is the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes, efficiency, effectiveness or quality
Hartley, 2006	Innovation is “the successful development, implementation and use of new or structurally improved products, processes, services or organizational forms”.
Jacobs and Snijders, 2008	Innovation is “something new being realized with (hopefully) added value”

Since innovation is invariably acknowledged as the key factor for achieving competitiveness of firms and increasing economic growth of nations. Rapid technological developments, burgeoning global competition and shortening product life cycles have amplified the pressure on firms to innovate. Empirical results have shown that innovative firms perform better in term of output, profitability or employment growth than the firms without innovation (Cox and Frenz 2002). However, the susceptibility of the firms’ disengagement with innovative practices

is due to the barriers and risks involved in the innovation process (Eveleens, 2010). Innovation comes in varieties due to the nature and sector of firm, ownership form, size, and the nature of activities carried out within them in form of either product, services, organisational and processes. More recently, a survey of over 800 company respondent's worldwide result shows that companies state that innovation is the most important aspect for profit growth. Further on the study reveals that innovation can increase EBIT-margins with more than 4 percent and that the top innovators have 2.5 times more sales of new products and obtain more than 10 times higher returns on their innovation investment (Arthur D. Little, 2009).

Empirical investigations by Baker, (2002) identified types of innovation as process, product/service, and strategy with radical and incremental innovations seen as the degree of their newness. Cumming, (1998) also stated that process innovation embraces reengineering the business process and therefore implied the improvement of the internal operations and capacities. He further went on to say that the importance of process innovation was quite well understood, especially in companies under threat since it may help them to improve in their firm productivity. On the same note, Baker (2002) stated that incremental product/service innovation is those oriented toward improving the features and functionality of existing products and services with radical product/service innovation oriented toward creating wholly new products and or services. Hamel (1996) on another dimension contended that radical business concept of innovations is paramount to ensure organizational success by continually revolutionizing the basic organizational strategy.

While empirical studies have continue to demonstrated that to manage the innovation successfully, firms must develop specific practices to do that (Tidd, Bessant and Pavitt, 1997, Eveleens, 2010) which often refers to as *'the way we do things around here as a result of repetition and reinforcement'* Eveleens, (2010). Firm practices usually differentiate one firm from the other, and thus determine the level of success or failure that the firm can attained in general. With this, innovation management is thus referred to as a process towards searching for effective practices. Studies on innovation management practices defined it as the activities undertake in order to provide in new solutions for firm products, production, marketing and administration to cope with changing markets dynamics. Developing a well-established firm practice could be difficult to come by since they are often developed through trial and error of methods, values, behaviour and experiences that may be involved for a long period of time. The practices often at times may also be firm specific.

Pitt and Clarke (1999) in their studies highlight that innovation requires practices that cut across structural boundaries of a firm. With respect to these interactions, SMEs are naturally advantaged because in principle they react quickly and efficiently to cope with market changes. Studies of small firms confirm that SMEs' entrepreneurial characteristics and structural flexibility do not have a long chain decision-making process. SMEs can serve a narrow market by establishing close contact with customers (Rothwell and Zegveld, 1982; Dewa and Read, 2007).

It is thus, arguably that SMEs can achieve high growth by focusing on particular product groups, avoiding spreading their marketing activities too widely, and avoiding operating in markets dominated by large firms by choosing carefully the markets in which they operate (Adams and Hall, 1993; Karpak and Topcu, 2010).

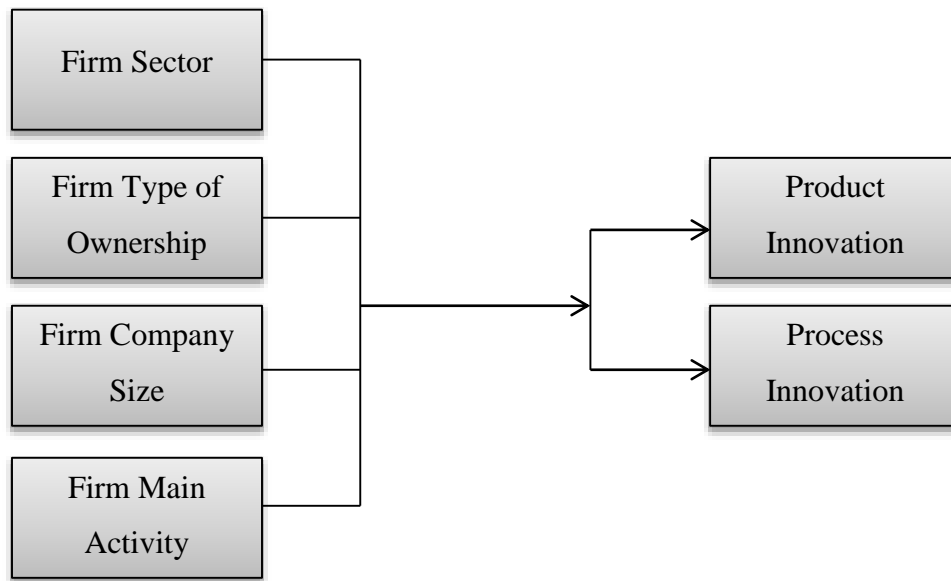


Figure 1: The Study Conceptual Model Developed

Allocca and Kessler (2006), stress that the ability to develop and launch innovative new products and process using the latest technology has become a key factor in gaining first-mover advantage towards achieving product success, capturing market share, increasing return on investment, and long-term viability. Terziovski (2010) also alluded to the contribution of SMEs to making a significant contribution to economic growth, while most of the research on innovation management has focused on large organizations; little has been done on SMEs. In this vein and base on the study framework conceptualized in figure 1 below, a survey on SMEs firm perception based on the product and process innovation within manufacturing and service industries in Malaysia be carried out in line with following hypothesis.

Product Innovation hypothesis

- H1: Firms perception of Product Innovation is independent of firm's sector
- H2: Firms perception of Product Innovation is independent of firm's type of ownership
- H3: Firms perception of Product Innovation is independent of firm's company size
- H4: Firms perception of Product Innovation is independent of firm's main activity

Process Innovation hypothesis

- H5: Firms perception of Process Innovation is independent of firm's sector
- H6: Firms perception of Process Innovation is independent of firm's type of ownership
- H7: Firms perception of Process Innovation is independent of firm's company size
- H8: Firms perception of Process Innovation is independent of firm's main activity

RESEARCH METHODOLOGY

The following research methods and techniques were employed in this study: A survey was conducted on SMEs firm of different organizations. The simple random sampling technique was used with the sample size consisting of 1778 firms participating in the survey across Malaysia. The instrument of data collection was principally questionnaire which comprised of structured questions. Some questions were aimed at unearthing firms perception on product innovations, others measured their perception on process innovations in addition to questions

related to their demography such as sector, type of ownership, company size, and main activity within the firm. An independent sample T-Test is used to measure difference in the firm's perception of product and process innovations due to differences in their sector, while, ANOVA is used to measure difference in the perception of the firm's product and process innovation due to differences in their types of ownership, company size, and main activity involved in the firms.

RESULTS AND FINDINGS

Table 1: Group Statistics Sector

	Sector	N	Mean	Std. Deviation	Std. Error Mean
Product Innovation	Manufacturing	445	1.0022	.04740	.00225
	Services	733	1.2415	.43145	.01594
Proses Innovation	Manufacturing	445	.7079	.45526	.02158
	Services	733	.4052	.49126	.01815

Table 2: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Product Innovation	Equal variances assumed	1141.834	.000	11.652	1176	.000	-.23923	.02053	-.27951	-.19895
	Equal variances not assumed	14.865		14.865	760.905	.000	-.23923	.01609	-.27082	-.20763
Proses Innovation	Equal variances assumed	68.521	.000	10.537	1176	.000	.30268	.02872	.24632	.35904
	Equal variances not assumed			10.735	992.719	.000	.30268	.02820	.24735	.35801

Table 3: ANOVA Type of Ownership

		Sum of Squares	df	Mean Square	F	Sig.
Product Innovation	Between Groups	40.412	3	13.471	140.334	.000
	Within Groups	112.692	1174	.096		
	Total	153.104	1177			
Proses Innovation	Between Groups	10.687	3	3.562	14.759	.000
	Within Groups	283.364	1174	.241		
	Total	294.051	1177			

Table 4: ANOVA Company Size

		Sum of Squares	df	Mean Square	F	Sig.
Product Innovation	Between Groups	43.512	2	21.756	233.263	.000
	Within Groups	109.591	1175	.093		
	Total	153.104	1177			
Proses Innovation	Between Groups	4.609	2	2.305	9.355	.000
	Within Groups	289.442	1175	.246		
	Total	294.051	1177			

Table 5: ANOVA Main Activity

		Sum of Squares	df	Mean Square	F	Sig.
Product Innovation	Between Groups	38.558	38	1.015	10.090	.000
	Within Groups	114.546	1139	.101		
	Total	153.104	1177			
Proses Innovation	Between Groups	89.306	38	2.350	13.074	.000
	Within Groups	204.745	1139	.180		
	Total	294.051	1177			

Based on the result of the independent t-test from table 1&2, the significant value of 0.000 obtain for product innovation which is less than 0.01 at test of significance of 99% confidence level shows that the hypothesis which state that firms perception of product innovation is independent of firm's sector is rejected because it says that firm perception regarding product innovation does vary between both sectors. In the same vain, the value obtain for process innovation which is less than 0.000 at the test of significance of 99% confidence level indicate that the hypothesis which state that firms perception of process innovation is independent of firm's sector is rejected as well.

Similarly, Table 3, 4 and 5 shows the ANOVA of firm's product and process innovations. The results of the ANOVA indicates that the significant value of 0.000 was obtain for both product

and process innovations in the analysis of variance (ANOVA) for type of ownership, company size and main activity undertaken and less than 0.01 at the test of significance of 99% confidence level and shows that all the six hypothesis will be rejected because it says that firm perception regarding product and process innovations does vary between the sectors in type of ownership, company size and main activity carried out.

SUMMARY OF HYPOTHESIS RESULTS

Hypothesis	Sig. Value	Result
H1: Firms perception of Product Innovation is independent of firm's sector	0.000	Rejected
H2: Firms perception of Product Innovation is independent of firm's type of ownership	0.000	Rejected
H3: Firms perception of Product Innovation is independent of firm's company size	0.000	Rejected
H4: Firms perception of Product Innovation is independent of firm's main activity	0.000	Rejected
H5: Firms perception of Process Innovation is independent of firm's sector	0.000	Rejected
H6: Firms perception of Process Innovation is independent of firm's type of ownership	0.000	Rejected
H7: Firms perception of Process Innovation is independent of firm's company size	0.000	Rejected
H8: Firms perception of Process Innovation is independent of firm's main activity	0.000	Rejected

CONCLUSIONS

The result of the study have evidently indicates that employees were not clearly aware of their sectors innovation, type of innovation, size of the company, and type of firm ownership. This could be due to lack of explicit communication from the management. Furthermore, what is pertinent to note in this study is that the results are partially contradictory to the findings given by literature, which suggests that demographic variables do have an influence on employee perceptions about organizational factors. This could be due to several factors, one of which constitutes the unique multi-cultural differences among Malaysians. Also, no study has directly been carried out relating product and process innovations using demographic information's and thus make its findings become credible and original to build upon by future studies. Though, this study has provide evidence suggesting that employee perceptions related product and process innovations is not affected in any significant degree by differences in the firms demographic makeup. In all other cases, no clear relationship emerged.

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