Effects of eco-innovation and market demand on sustainability performance

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Keywords: Eco-innovation, market demand, sustainability performance

ABSTRACT – This study used open system perspective to investigate the effect of eco-innovation on sustainability performance as moderated by market demand. Specifically, it is postulated that market demand interacts with the relationship between eco-innovation activities which lead to superior sustainability performance. A cross sectional survey among one hundred and twenty nine ISO 14001 certified manufacturing companies in Malaysia was conducted. Data were analysed using *PROCESS* SPSS to identify the moderation effect. The results showed that eco-innovation and market demand significant affect sustainability performance with R^2= 0.512. However, market demand does not moderate the relationship between eco innovation and sustainability performance.

1. INTRODUCTION

Sustainability is increasingly focused on in current studies to simultaneously achieve goals of environmental and organisational performances. Several Malaysian scholars suggested that eco-innovation could contribute to conserve sustainability performance [1-2]. Eco-innovation, refers to any product, process, technique, procedure and system that is new or modified to fulfil customer needs and satisfaction of avoiding or reducing environmental damage [3]. Adopting eco-innovation in manufacturing can increases firm performances, including profit and market share while also affecting sustainability performance [4].

In this study, open system perspective theory is used. This theory measures the equality of system boundary between input (flow of production and management) and output (external environmental factors) systems with its external environment in an organisation [5]. Based on this theory, the effect of eco-innovation products and processes on sustainability performance can be influenced by the external environment, especially market demand. Market demand and eco-innovation are determinants to fulfil customers' expectation and achieve sustainable performance [4]. Manufacturers apply this theory in their operational boundary to understand the current issues through environmental evaluation, for example the level of customers' demand and market competitiveness evaluations. This can be diagnosed the internal and external organisational problems.

Nevertheless, only one study has examined moderating effect of market demand among eco-innovation and sustainability performance in Taiwan [6], while no any studies are examined in the Malaysian context. Hence, to address this gap, this study aims to investigate the moderating effect of market demand on relationship between eco-innovation and sustainability performance. The research framework for this study as shown in Figure 1.

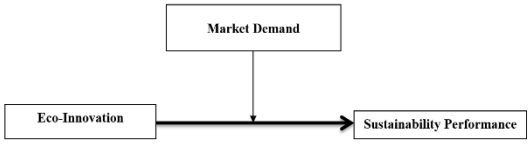

Figure 1 Research Framework

2. METHODOLOGY

This section describes the research methods undertaken to understand the relationship between eco-innovation and sustainability performance when moderated by market demand. Explanatory study was used as a research method in achieving research objective.

The questionnaire designed based on several studies [4, 9, 11-12]. Questionnaires were distributed to 214 Malaysian manufacturers with ISO 14001 certification. However, only 129 questionnaires were returned with a response rate of 60.28%. This response rate was sufficient considering the pattern of response rate in previous study [1]. Collected data were analysed using *PROCESS* in SPSS, version 22.

3. RESULTS AND DISCUSSIONS

Exploratory factor analysis was used to explore the underlying items that were highly interrelated [7] The measuring of sampling adequacy from preliminary result of Kaiser-Meyer Olkin (KMO) was more than 0.5 (KMO= 0.871) and it's significant (p< 0.001). All factors were extracted the linear components with each indicator accordingly. According to Hair et al. [7], the item with factor loading must be greater than 0.5 can be retained. As the result, 36 out of 48 items were retained. The Cronbach's alpha among all variables were more than 0.7. This indicated good internal consistency of the questionnaire.

Secondly, regression analysis. Table 1 shows the regression and moderation results for this study.

Table 1 Regression and Moderation Results

Dependent Variable	Sustainability Performance	
	Model 1	Model 2
Independent variables		
X: Eco-innovation	0.525**	0.536**
M: Market demand	0.251**	0.221*
XM: Eco-innovation x market demand		-0.051
F-statistics	66.1**	54.4**
R^2	0.512	0.514

Note: *p<0.05, **p< 0.001.

This regression result indicates eco-innovation and market demand had positive significant effects on sustainability performance (p< 0.05). The significant regression results are consistent with previous studies [1-2]. The analyses conducted indicate that eco-innovation is an important strategic tool in sustainable practices to reduce environmental impact of industrial activities, and improve economic performance and societal wellbeing [3]. Moreover, market demand is not only providing benefit to the eco-innovation [11], and also help companies improve their sustainability performance.

The last data analysis, moderation analysis. However, the moderating effect of market demand on eco-innovation and sustainability performance was not significance. The insignificant moderating effect result is inconsistent with previous studies [6]. This phenomenon might be attributed to the fact that eco-innovation activities are influenced by other factors such as advancement of technology and supplier involvement and not on market demand alone [9]. Malaysian manufacturers use those environmental technologies beyond innovation strategy implementation in developing eco-products to improve customer experiences, sales, and business development [10]. This implies the importance of environmental awareness among customers to boost market demand.

4. CONCLUSIONS

This study concluded that eco-innovation and market demand are importance in sustaining the sustainability performance among Malaysian manufacturers. This study also showed that market demand is not a significant moderator due to the presence of other determinants of eco innovation. Future studies are required to replicate this study further by including other determinants of eco innovation. Furthermore, market demand is probably better suited as mediator or independent variable.

ACKNOWLEDGEMENT

Authors are grateful to Universiti Tun Hussein Onn Malaysia for the financial support through GPPS, U764.

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