

# **Strategic innovation ambidexterity and the internationalization performance of small and medium enterprises: an insight into herbal-based small and medium enterprises (HbSMEs)**

## **INTRODUCTION**

Doing business internationally requires SMEs to allocate sum amount of distinctive resources in order to sustain competitiveness and to generate superior return for the business. Distinctive resources are those that are hard to be imitated by competitors (Teece et al., 1997; Luo, 2000). Yet, examining the impact of distinctive capabilities alone is insufficient to explain the internationalization performance of SMEs. It is more vital for firms to reconfigure or revise the existing capabilities as well as to develop new capacity or change the existing routines and integrate them into the operation in response to the rapidly changing environment (Teece et al., 1997; Zahra et al., 2006). The introduction of new rules and regulations, revolution in customers' lifestyles, technology, economy condition, competitors and so forth may affect business operation. Here, firms are said to be dynamic if the firms can respond appropriately to these changes.

Provided that SMEs business achievement and sustainability in the global market would enormously affect the economic growth and social well-being of a country, examining the critical factors for SMEs success in international marketplace is essentially imperative. Although external factor has been used to explain the achievement and sustainability of internationally operated SMEs (Singh et al. 2010), the internal environments have been largely recognized as the key survival toolkit to explicate the performance of internationally operated SMEs (Hutchinson et al., 2009). Nevertheless, extensive and in-depth explorations of the studies on internal capabilities and its impact on SMEs internationalization performance have somewhat indicated that research on the subject matter is still far from conclusive (Johansen & Knight, 2010). In addressing the issue, this paper consistently holds to the idea that strategic ambidexterity is supposed to absolutely create a positive impact on the growth and survival of internationally operated business firms (Han, 2005; Prange & Verdier, 2011).

The trend nowadays indicates that the global demand for herbal-based products is growing steadily since people are becoming more meticulous on the disadvantages of consuming artificial drugs and the high cost of drugs sold in the market (Euromonitor International, 2011). The value of herbal product in the world market in 2009 is RM708 billion (The Third Global Bio-Herbs Economic Forum, 2009), in which it indicates an increase from RM89 billion in 2002 (Global Information Hub on Integrated Medicine 2010-2011), and forecasted to record RM2 trillion by 2020 (National Food Technology Seminar (2012) with estimated value of RM17.7 trillion in 2050 (The Third Global Bio-Herbs Economic Forum, 2009; Symposium of Investment and Business Opportunities in the Herbal Based Industry, 2011). This scenario has actually provides herbal-based manufacturers with opportunities to exploit the potentials available in the open market. Hence, research pertaining to which internal capabilities to affect the internationalization performance of HbSMEs is significant to be conducted.

## **LITERATURE REVIEW**

Broadly, the study is governed by resource-based theory, which can be defined as the possession of tangible and intangible assets (Wernerfelt, 1984). The theory depicts unique, idiosyncratic and hard-to-duplicate resources as the source of competitive advantage (Barney, 1991; Teece, et al., 1997). In the current business atmosphere, capital, natural resources, and labour are no longer critical for firms' performance (Kiessling et al., 2009). Instead, Barney (1991) explains firms' resources such as capabilities of the owners-managers and firms are more significant to sustain the competitiveness and performance of business firms. Due to this development, as an extension of resource based-theory, scholars have started to look into the theory of dynamic capability (Teece et al., 1997). In particular, this theory emphasizes on the continuous effort undertaken in honing internal technological, organizational, and managerial processes inside the firm to address rapidly changing environments (Teece et al., 1997). The theory stresses on the urgency to reconfigure the existing competencies and establish new competencies in response to the dynamic business environment. To become dynamic, Tushman and O'Reilly (1996) explain firms should draw attention to establish strategic ambidexterity.

### **Strategic Ambidexterity as the Dimension of Dynamic Capability**

Strategic ambidexterity is defined as simultaneous actions undertaken by firms to address two heterogeneous things at the same time (Prange & Verdier, 2011; O'Reilly & Tushman, 2013). It is related to any actions undertaken to respond subsequently to the current and dynamic changes in business environment (Han, 2005). This capability allows firms to manage today's business demand and simultaneously adapt to the changes in the business environment (Raisch & Birkinshaw, 2008). The capability is closely related to establishing existing capabilities through exploitation activity, while at the same time not to neglect the effort in developing new capabilities through exploration activity (Tushman & O'Reilly, 1996; Lubatkin et al., 2006).

Exploitation activity is related to the utilization of the existing resources and capabilities i.e., technology, market, and knowledge (Stettner & Levie, 2013; Yu et al., 2014). It involves such activities as refinement, choice, production, efficiency, selection, implementation and execution (March, 1991). Exploitation is related to the development aspect in the firms' R&D activity (Chang et al., 2011). On the other hand, exploration is closely related to the actions undertaken by firms in response to the environmental changes by means of the creation of new knowledge, technology, capabilities and market (Stettner & Levie, 2013; Yu et al., 2014). It includes such activities as searching, variation, risk taking, experimentation, flexibility, discovery and innovation (March, 1991) and Chang et al. (2011) associate exploration activity with research aspect in R&D activity.

As innovation is more significant for internationally operated firms (Najib & Kiminami, 2011), the present study suggests firms to focus on simultaneous or subsequent action in exploiting and exploring innovation capabilities. Innovation is related with the generation and implementation of new ideas, processes and products (Fernández-Mesa et al., 2013). According to O'cass and Weerawardena (2009) innovation can be divided into two major categories, including technological innovation and non-technological innovation. While technological innovation is related to process and product development, non-technological innovation refers to the managerial and marketing approach. O'Reilly and Tushman (2004) suggest studies to think about these two aspects of innovation capability in studying strategic ambidexterity. Strategic ambidexterity is crucial

as firms that depend heavily on refining or improving its existing technology capabilities and do not invest in new technology, choosing wrong technology or not so much responsive to the culture of a particular market have high propensity to be unsuccessful in their businesses (O'Reilly & Tushman, 2004; Lubatkin et al., 2006; Chen & Ling, 2010; Chang et al., 2011; O'Reilly & Tushman, 2013; Scott, 2014; Wei et al., 2014). In order to sustain both short-term and long-term performance, firms are suggested to take a balance measure between these two acts; exploit the existing capabilities and explore new capabilities in the manufacturing capacity or technological innovation capacity (O'Reilly & Tushman, 2004; Lubatkin et al., 2006; Chen & Ling, 2010; Chang et al., 2011; Scott, 2014). Exploitative innovation according to Li et al. (2008) is meant to meet the needs of existing customers or market, whereas exploration innovation intentionally to grasp the latent needs of customers or markets. Hence, the present study views that in a stable business environment, firms should exploit the existing products, process and marketing capabilities and at the same time, in a dynamic market, firms should radically explore new products, process and marketing capabilities to better suit the changing environment.

Technological innovation in term of exploiting the existing product is related to action undertaken to increase return from the existing product and manufacturing capabilities (Voss & Voss, 2013). In particular, action such as upgrading, modifications, and extension of the existing products, improving existing product quality, improve product flexibility, reducing production cost, reduce material consumption (Yu et al., 2014), consolidation of the current process, and apply the mature technology to improve productivity (Wei et al., 2014) indicate innovation act in the exploitation activity. On the other hand, product innovation in term of exploration is related to the development of new product, technologies and product capabilities that is meaningfully distinct from firm's existing product (Voss & Voss, 2013). The product is basically developed based on knowledge and competence that the firm has not used in the past (Danneels & Sethi, 2011). Explorative product innovation can be in the form of introducing new generation of product as well as extending product range, and entering new technology field (Yu et al., 2014), create major changes to product, and achieve technological leadership (Wei et al., 2014).

On the contrary, exploitation of non-technological innovation is related to the application of marketing approach to address the changes in business environment. Innovation in marketing activity is related to understanding customers, competitors, channel and broader market environment (Morgan et al., 2004) as well as opening up new market (Yu et al., 2014). It covers several activities such as market research, advertisement, promotion activities (Lumpkin & Dess, 1996) and packaging (Najib & Kiminami, 2011). According to Voss and Voss (2013), market innovation in term of exploitation activity focuses on marketing programs designed to retain and increase sales from current customers, while market innovation from the view of exploration activity refers to marketing program aimed to attract new customers outside of the existing served market.

The study defines strategic innovation ambidexterity as:

*The exploitation of the existing technological and non-technological innovation in response to the stable international business environment, which can be obtained by using the existing products, process and marketing approach while simultaneously or subsequently explores new technological and non-technological innovation in response to the changing international business environment, which can be obtained through the establishment of new product, process and marketing approach.*

## Previous Studies on Strategic Ambidexterity

As the original idea of strategic innovation ambidexterity is to be applied on big and established firms, Chen and Ling (2010) have conducted study related to its impact on the performance of established information technology (IT) and manufacturing firms. The observation reveals such capability allows these firms to improve its existing performance, and promotes the improvement of long-term performance. Venkatraman et al. (2009) have monitored the importance of sequential and simultaneous strategic product innovation ambidexterity in determining the sales growth of software firms for over 12 years. The verdict indicates only simultaneous ambidexterity in product innovation significantly affects the sales growth of the subjects. In the other words, simultaneous strategic product innovation ambidexterity is more prevalent as compared to sequential ambidexterity. Organizational ambidexterity has also been found to positively and significantly affect the performance of manufacturing and service firms in China (Wei et al., 2014). Stettner and Lavie (2013) disclose other perspective of strategic ambidexterity, where they explain exploring external oriented modes such as acquisition or alliances and simultaneously exploiting firms' internal organization enhances the performance of US-based software firms. Gibson and Birkinshaw (2004) introduce the concept of simultaneous behaviour in alignment and adaptability at business-unit level. As expected, the study confirms this so-called contextual organizational ambidexterity has a significant effect on the performance of business units in multinational companies. Empirical studies related to strategic ambidexterity is compiled in Appendix 1.

Indeed, simultaneous development in heterogeneous capabilities i.e., exploitation and exploration activities required firms to split and balance the available resources into two different activities (March, 1991; Ho et al., 2011). These activities require different technical skills, financial and human resources (O'Reilly & Tushman, 2004; Tushman & O'Reilly, 2013). In large business organizations, two separate divisions will be established to capture different needs in exploitation and exploration activities (Lubatkin et al., 2006). The first division focuses on the enhancement of the existing capabilities, and the other division works on establishing new capabilities to address new trend in the existing market or new market. Nevertheless, it is almost impossible for SMEs, which in the first place are restricted in their resources to have separate divisions for different dimensions of ambidexterity. This situation may induce SMEs owners-managers to focus only on the existing capabilities and give up opportunities to establish new capabilities. However, Lubatkin et al. (2006) notice that the application of strategic ambidexterity is appropriate for SMEs as they are, (1) more closer to the firm's business operation; (2) engage more directly to the day-to-day business operation; (3) more knowledgeable in exploiting business competencies; and (4) more knowledgeable in exploring new competencies and opportunities – as they are more closer to the market. For that reason, it is interesting to examine the extent to which strategic ambidexterity applicable to SMEs as they are commonly described as resource-constrained entities.

Lubatkin et al. (2006) examine the impact of strategic ambidexterity on business performance among domestic oriented SMEs. The study has confirmed that SMEs' capabilities in exploiting its existing innovation capabilities and concurrently exploring new innovation capabilities are significantly critical to explain SMEs success and growth. In addition, Chang et al. (2011) have confirmed the role of strategic innovation ambidexterity on SMEs performance in Scotland. Other scholars, Wulf et al. (2010) have also found a consistent observation in Germany. In the service industry, Voss and Voss (2013) have

reported the positive impact of product ambidexterity on the revenue of older and larger SMEs, while market ambidexterity only affects the performance of large SMEs.

Although strategic ambidexterity has been explained to create positive impact on business performance, empirical studies focusing on this subject are still insufficiently available to verify its role in determining business performance (Zahra et al., 2006; Hung et al., 2010). The impact of strategic ambidexterity on internationalization performance has not been widely examined. In fact, studies are more interested in observing technological innovation as a dimension under strategic ambidexterity as compared to non-technological innovation (Lumpkin & Dess, 1996) since technological innovation is more prevalent in explaining business success (March, 1991). Nevertheless, in the challenging business world nowadays, where customers are becoming more demanding, simultaneous capability in exploiting and exploring non-technological innovation has to be built in sustaining business competitiveness. Based on this fact, instead of employing the composite dimension of innovation ambidexterity, this study uses individual dimension in measuring strategic innovation ambidexterity. In fact, applying individual dimension demonstrates unique contribution made by each dimension on the dependent variable (Kreiser et al., 2002). Thus, it is important to initiate research that integrates a holistic view of strategic technological and non-technological innovation ambidexterity and its individual impact on the internationalization performance of HbSMEs. Therefore, the present study is conducted to examine the impact of strategic technological and non-technological innovation ambidexterity on the performance of internationally operated business.

### **Hypothesis development**

Derived from the proceeding conceptual framework, strategic ambidexterity has been explained to create positive impact on business performance. This study put a great emphasize on the impact of strategic ambidexterity on the internationalization performance of HbSMEs. The first dimension of strategic ambidexterity is related to simultaneous or subsequent action in exploiting and exploring technological innovation (i.e., product and process innovation). To sustain HbSMEs internationalization performance, meeting and fulfilling customers' tastes and preferences in different markets is particularly critical. Nevertheless, in a more dynamic environment, where customers are more demanding, HbSMEs must develop and offer new products to fulfill customers' tastes and preferences, in which it requires HbSMEs to establish new manufacturing process. This simultaneous or subsequent capability is crucial as it is perceived to improve HbSMEs performance in their operations abroad.

H1: Technological innovation ambidexterity is positively related to the internationalization performance of HbSMEs.

The involvement in international business activity requires HbSMEs to respond to different market regulation and requirements. Firms may find the existing marketing style is not appropriate to be practiced in the foreign market. In the dynamic environment, establishing new marketing approach may be more relevant in promoting customers' awareness in consuming herbal-based products. HbSMEs that successfully manage to apply the existing marketing approach and concurrently or subsequently establish new marketing approach for HbSMEs operations abroad are likely to enhance its internationalization performance.

H2: Non-technological innovation ambidexterity is positively related to the internationalization performance of HbSMEs.

## **METHODOLOGY**

This study utilized self-administered survey as its data collection method. For the construct measurement, the items were adapted from previous studies using Likert-type questions for internationalization performance, strategic technological innovation and non- technological innovation ambidexterity. Items for internationalization performance were adapted from Jantunen et al. (2005), exploitative and explorative technological as well as exploitative and explorative non-technological innovation were adapted from Lubatkin et al. (2006) and Chang et al. (2011).

Innovations ambidexterity was outlined as reflective measures while internationalization performance was treated as formative construct. In this study, the measure of ambidexterity was estimated by using the additive approach since this approach is proven better than multiplicative and subtraction method in estimating ambidexterity (Lubatkin et al., 2006). The addition of these contradictory dimensions resulted in the formation of new variables known as strategic technological and non-technological innovation ambidexterity.

Pre-testing is an essential requirement for survey questionnaire (Presser & Blair, 1994; Rothgeb et al., 2001; Presser et al., 2004). This is a method where researcher can assess in advance for any issue in relation to the questionnaire. Such examination is mainly conducted to improve the instruments used in the survey and to avoid items with unnecessary idea, and inappropriate phrasing (Rothgeb et al., 2001; Presser et al., 2004). Expert review is one of the methods used in pre-testing the questionnaire. Experts are assigned to review and determine the problematic items in measuring the constructs (Rothgeb et al., 2001). This study views experts as individual who engage in academic research and HbSMEs owners-managers that involve in international business activity. Only after the panel of experts verified the appropriateness of the words, the items used in measuring certain construct and the sequence of the questionnaire, the questionnaires were distributed to the target respondents.

Variance-based structural equation model or Partial Least Square was utilized in analyzing the most significant among various exogenous variables (strategic technological and non-technological ambidexterity) and their nature of relations with endogenous variable (Internationalization performance). The analysis was performed using a program known as SmartPLS Beta 2.0 as introduced by Hair et al. (2014).

### **Result of Analysis**

Data was collected from the list of the homegrown HbSMEs exporters registered in the government publications. Based on the list, the whole population of 310 internationally operated HbSMEs in Malaysia was included in this research. The study managed to collect 103 responses. As far as position was concerned, 67% of the respondents composed of the owner-managers and export managers, 24.3% were export consultants and assistance managers while the remaining balance was the owners of the firms. Most of the respondents (90%) had between 1-15 years experience in exporting activity, 5.8% had not more than 20 years of experience and one of the respondents had conducted exporting activity for more than 20 years.

Three subsectors of herbal-based, namely drinks and foods, medicinal and supplements products as well as cosmetics products represented majority of the respondents. Most of the respondents export herbal-based drinks and foods (59.2%), while herbal supplements and medicinal products as well as herbal-based cosmetic accounted for 28.2% and 12.6% of the exporting volume respectively. Most HbSMEs exported their products to the neighbouring countries within Asian market, which accounted for 90.3% of export market. The rest of HbSMEs were found to export their product to Europe (7.8%) and North America (1.9%). In term of mode of entry, 49.5% engaged in direct exporting and 48.5 % appointed export agent for foreign expansion. The remaining HbSMEs (1.9%) used other mode of entries that were not listed in the questionnaire. As far as the length of foreign operation was concerned, 82.5% of HbSMEs had exported between 1-5 years and the remaining involved up to 21 years.

### **Assessment of the Measurement (Outer) Model**

Technological and non-technological innovation ambidexterity was modeled as single indicator measures where reliability and validity assessments were not required to be conducted. To validate the formative measurement items, the multicollinearity, outer weight and outer loading of the items were estimated (Hair et al., 2014). As for the multicollinearity, IOP4 recorded the highest VIF value (2.964). Since the VIF values were below the minimum cut-off value of 5 as suggested by Hair et al. (2014), multicollinearity was not an issue in estimating the PLS path model. Then, the outer weights for the significance and outer loadings for the relevance of formative constructs were checked. Only the outer weights for IOP1 and IOP4 were significant since the t-values clearly above the minimum threshold of 1.645 ( $p < 0.05$ ). On the other hand, the relevance of the measurement item was referred to the outer loadings scores, in which all indicators recorded high outer loadings with the minimum value of 0.538. Although most of the indicators were not significant, as the outer loadings met the minimum cut-off value of 0.5, the score of this indicator was interpreted in Hair et al. (2014) as absolutely important but not as relatively important. Therefore, the indicators in the formative performance constructs were retained to be used in testing the structural model.

### **Assessment of the Structural (Inner) Model**

In assessing the structural model, five conditions need to be examined to explain the impact of exogenous latent variable on the endogenous latent variable. The conditions are (1) collinearity issue, (2) path coefficient,  $\beta$  (3) coefficient determination, (4) the effect size,  $f^2$ , and (5) predictive relevance,  $Q^2$  and the  $q^2$  effect size (Hair et al., 2014).

The collinearity of the indicator was assessed by looking at the variance inflation factor (VIF). Based on the result, recorded the highest VIF value (2.964). The VIF values were below the minimum cut-off value of 5 which indicated that multicollinearity was not an issue for the estimation of the PLS path model. The VIF output is compiled in Appendix 2.

The  $R^2$  for internationalization financial performance was 0.289 indicating 28.9% of the variance can be explained by the exogenous variables (refer Figure 1). Further examination demonstrated that non-technological innovation ambidexterity ( $\beta = 0.330$ , t-value = 2.102,  $p < 0.05$ ) was significantly related to internationalization performance of HbSME, while technological innovation ambidexterity ( $\beta = 0.232$ , t-value = 1.379,  $p < 0.05$ ) was not significantly related to internationalization performance. Hence, only H2 were

supported. Appendix 3 portrays the result. On the other hand, the effect size of technological and non- technological innovation ambidexterity on internationalization performance was examined. The effect size was assessed based on Cohen (1988) who describes  $f^2$  values of 0.02, 0.15, and 0.35, respectively, has small, medium and large effects on endogenous variable. In accordance to the rule of thumb, the result indicated that the effect size of all exogenous variables on the endogenous variables could be considered small. However, Q2 was not conducted since internationalization performance was defined as formative construct. Appendix 4 compiled the result.

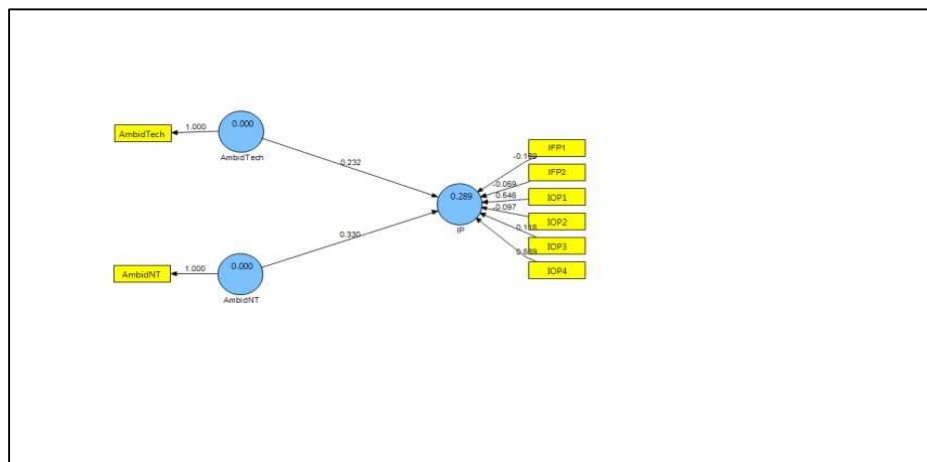


Figure 1 Result of Statistical Analysis

## DISCUSSION

The result indicated that only strategic non-technological innovation ambidexterity is significant to explain the internationalization performance of HbSMEs. Without doubt, it is the most important precursor to enhance the internationalization performance of SMEs particularly in herbal-based sector. The result is in line with the mainstream finding of studies conducted by few researchers, such as Lubatkin et al. (2006), Wulf et al. (2010), Chang et al. (2011) as well as Voss and Voss (2013) who have highlighted the importance of strategic ambidexterity in determining the performance of domestic-operated SMEs. It also has been supported by Varis and Littunen (2010) who indicate market innovation as a critical attribute to explain the long-term growth of SMEs. Many countries nowadays organize trade investment missions and trade fairs to provide appropriate access particularly for SMEs in marketing and promoting their products in the foreign market. With such support, it assists the homegrown HbSMEs to market high valued herbal-based products in the international marketplace, which in the end contribute to greater market access and improve its internationalization achievements. It clarifies why strategic non-technological innovation ambidexterity is significant in determining the internationalization performance of HbSMEs.

It is much unexpected when strategic technological innovation ambidexterity is found as a non significant element in determining the internationalization performance of HbSMEs. This discovery contradicts the findings of Chang et al. (2011) and Voss and Voss (2013), which showed strategic innovation ambidexterity as a significant factor for SMEs



performance. On the contrary to the existing studies, the plausible explanation to the non-significant finding could be, internationally operated HbSMEs are still striving hard to nurture innovation culture and most of them are not extremely engrossed in innovation activity. As mentioned previously, SMEs in common can be characterized as firms with limited resources (Prashantham, 2008; Westerlund et al., 2008; Aragón-Correa et al. 2008) such as in terms of capital (Schulz et al., 2009; Musteen et al., 2010), human resource, knowledge (Schulz et al., 2009) and the capability of the firms (Prashantham, 2008; Musteen et al., 2010; Singh et al. 2010). With the liability of smallness embedded in HbSMEs, investment in technological innovation becomes less attractive. As a result, HbSMEs have restricted their investment in developing new product and manufacturing process. This situation in particular, circumvents HbSMEs from simultaneously exploit and explore the existing and new innovation capability respectively, in response to the dynamic nature of international business environment.

## **THEORETICAL IMPLICATION**

Theoretically, this study contributes to the existing framework of dynamic capability model in determining the internationalization performance of SMEs in herbal-based sector. The result derived from this study has confirmed the significant role of strategic non-innovation ambidexterity in determining the internationalization performance of businesses, particularly SMEs in herbal-based sector. Second, this study views the individual impact of technological and non-technological innovation ambidexterity on the internationalization performance of HbSMEs. The study adds a variation to the study of SMEs as previous studies focused on the combined impact of strategic innovation ambidexterity on SMEs performance operating in the domestic market.

## **PRACTICAL IMPLICATION**

The study signals that in the turbulent nature of business world, HbSMEs should consider ways to facilitate the development of marketing capabilities to enhance their achievements in the foreign market. Effective strategic marketing ambidexterity allows HbSMEs to understand the best approach to market their products in response to the dynamic nature of international business environment. The capability is crucial for internationally operated HbSMEs so that these firms able to implement a better marketing approach, which can significantly affect their success and presence in the global marketplace. Hence, HbSMEs are suggested to focus more on developing dynamic capability of HbSMEs in the area of marketing.

## **LIMITATION OF THE STUDY**

The respondents were limited to HbSMEs that involved in international business activity. Therefore, since the finding of the present study took place under a specific set of condition, whereby not every sector in SMEs was represented, it must be cautioned that generalization may not be possible beyond its actual settings. As such, the result of the analysis must have to be taken in the context as they were presented.

## **SUGGESTION FOR FUTURE RESEARCH**

1. Since ambidexterity requires firms to balance two heterogeneous situations, future study is recommended to examine an appropriate conduct that can be undertaken for

- SMEs in allocating their restricted resources. It is critical for studies to provide some guideline for entrepreneurs to allocate resources efficiently to enable SMEs adopt ambidexterity in international business activity.
2. To ensure representativeness, the study should be replicated to other sector in SMEs or bigger industry.

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## APPENDICES

### Appendix 1

**Table 1      Empirical Studies on Strategic Ambidexterity and Business Performance**

Dimension	Scope	Studies	Result
Organizational ambidexterity	Firm performance	Wei et al. (2014)	In responsive market, organizational ambidexterity negatively affects performance (not significant).  In proactive market, organizational ambidexterity positively and significantly affects firm performance
Exploit internal organization and external oriented modes i.e. acquisition and alliances	Performance of software-based firms in US	Stettner & Lavie (2013)	Both have significant impact on business performance
Exploratory and exploitative innovation	New product performance	Fu et al. (2013)	Exploratory innovation positively affects new product performance
Technological and design innovation ambidexterity	Technology commercialization in high technology and computer manufacturers	Ho et al. (2011)	Innovation ambidexterity affects technology commercialization
Innovation ambidexterity	Performance of information technology (IT) and manufacturing firms	Chen and Ling (2010)	Innovation ambidexterity significantly related to business performance
Product innovation ambidexterity	Performance of software firms	Venkatraman et al. (2009)	Product innovation ambidexterity explains business performance of software firms
Innovation ambidexterity	Performance of business-unit in multiple industries	Gibson and Birkinshaw (2004)	Innovation ambidexterity is a determinant for business performance
Innovation ambidexterity	SMEs performance in Scotland	Chang et al. (2011)	Innovation ambidexterity significantly affects SMEs performance
Product and market ambidexterity	Revenue of small and medium-sized non-profit professional theatre	Voss & Voss (2013)	Product ambidexterity positively affects revenue of older and larger SMEs.  Market ambidexterity has positive effects on revenue for large SMEs.

Innovation ambidexterity	SMEs performance in Germany	Wulf et al. (2010)	Innovation ambidexterity influences SMEs performance
Innovation ambidexterity	SMEs performance in New England	Lubatkin et al. (2006)	Innovation ambidexterity positively affects SMEs performance

## Appendix 2

**Table 2 Variance Inflation Factor (VIF) Result for Formative Indicators**

Construct	Indicators	VIF	Outer Loadings	Outer Weights	t-value	Result
IP	IP1	2.110	0.935	0.619	1.138	Not Significant
	IP2	2.143	0.887	0.475	0.843	Not Significant
	IP3	2.101	0.825	0.486	2.026*	Significant
	IP4	1.752	0.538	-0.103	0.461	Not Significant
	IP5	2.605	0.805	0.131	0.426	Not Significant
	IP6	2.964	0.919	0.597	2.101*	Significant

\*p < 0.05; \*\*p < 0.01

## Appendix 3

**Table 3 Path Coefficient and Hypothesis Testing of the Direct Relationship**

Hyp.	Exogenous Variable	Std. Beta (Coefficient)	s.e.	t-test	Decision
H1	AmbidTech → Internationalization Performance	0.330	0.168	1.378	Not Supported
H2	AmbidNT → Internationalization Performance	0.231	0.157	2.102	Supported

AmbidTech = Technological Innovation Ambidexterity  
AmbidNT = Non-technological Innovation Ambidexterity

## Appendix 4

**Table 4 The Effect Size ( $f^2$ )**

Exogenous	Endogenous	Effect Size ( $f^2$ )	Effect
AmbidTech	IOP	0.022	Small
AmbidNT	IOP	0.043	Small

IP = Internationalization Performance

AmbidTech = Technological Innovation Ambidexterity

AmbidNT = Non-technological Innovation Ambidexterity