Abstract

Theoretically, market knowledge should be associated with innovation positively but the results indicated a positive, non-significant and negative relationship between market knowledge and innovation. This study asserts that the inconsistent outcomes were resulted of treating market knowledge and innovation as single overall construct and because of the assumption of linear linkage. The reason is because that every firm in an industry might focus on different market knowledge and emphasizes on different innovation. Then, this study investigates the impacts of two knowledge characteristics (depth and breadth dimension) on two different innovations (product and process), especially testing their non-linear relationship. The results indicated that the breadth of market knowledge was positively associated with product innovation. Moreover, the positive effect of market knowledge breadth is increasing positively, which means its effect is non-linear. Similarly, the breadth of market knowledge also has a non-linear positive effect on process innovation. However, the depth of market knowledge only has a positive effect on product and process innovation. Finally, this study offers some management implications and suggestion in further studies according to the result in the future.

Key Words: Market knowledge depth, market knowledge breadth, product innovation, process innovation, emerging markets

JEL Classification: M 31, O32
1. Introduction

Managers and scholars in service industry research have paid attentions on the relationship between market knowledge and innovation (Chang, Bai, and Li, 2015; Nguyen et al., 2015). Taking tourism and hospitality industry as an example, travel industry is a kind of knowledge-based and knowledge-intensive industry. Tour operators or travel agents should are operating in increasingly complex worlds that require them to apply large amounts of knowledge to their activities. A traveler’s requirement or service might not be done by neither a tour operator nor a travel agent. Instead, it achieves expansion in the fast-changing travel industry by constantly providing dynamic B2B and B2C service solutions in product development or service innovation. All service firms almost situate in a fast-changing environment but there has been a lack of comprehensive model elaborating the key dimensions of knowledge management in the tourism field (Chen and Lee, 2017).

Due to radical market changes, firms need continuously updated market information so they can innovate and create sustainable competitive advantages (Chang, Bai, and Li, 2015). Research has found that it is not market orientation but rather unique market knowledge and the capability to operationalize such knowledge to innovate that enables firms to maintain their long-term competitive advantages (Kumar, Jones, Venkatesan, and Leone, 2011). This is because, despite their market-oriented business operations, firms possess different levels of market knowledge and those with higher levels of market knowledge are more likely to bring forth innovations (De Luca and Atuahene-Gima, 2007). Hence, it is more important to examine the relationship between market knowledge and innovation performance rather than the relationship between market orientation and innovation performance (Ferreras-Méndez, Newell, Fernández-Mesa, and Alegre, 2015).

Theoretically, market knowledge should be positively associated with innovation but the results indicated a positive, non-significant and negative relationship between market knowledge and innovation (e.g., Bao, Sheng, and Zhou, 2012). This study asserts that the inconsistent outcomes were resulted of treating market knowledge and innovation as single overall construct and because of the assumption of linear linkage. The reason is because that every firm in an industry might focus on different market knowledge and emphasizes on different innovation. Bao et al. (2012) believe that such inconsistent results could be attributed to the fact that these studies failed to thoroughly examine what is brought about by the specific aspects of market knowledge, such as knowledge breadth and depth. Therefore, viewing market knowledge as a single overall construct when examining its relationship with innovation would actually taint this research (Chen and Lee, 2017; Ferreras-Méndez et al., 2015).
In sum, market knowledge was categorized as diversity characteristics (like depth and breadth dimensions) by knowledge-based theory (KBT) but there is less empirical study to explore market knowledge from KBT. Therefore, this study tries to explore market knowledge as depth and breadth dimensions based on KBT. Then, this study investigates the impacts of two knowledge characteristics on two different innovations (product and process), especially testing their non-linear relationship. Finally, this study offers some management implications and suggestion in further studies according to the result in the future.

2. Literature Review

2.1 The Depth and Breadth of Market Knowledge

Market knowledge can be referred to as the systematic and organized combination of information (Glazer, 1991). Li and Calantone (1998) proposed the concept of market knowledge competence in their study and stated market orientation and market knowledge as two different concepts in the literature on market knowledge. Market knowledge was defined by Li and Calantone as “systematic and organized market information” (1998, p. 14).

Drawing from the knowledge-based theory of the firm, De Luca and Atuahene-Gima (2007) proposed the following four attributes of market knowledge: depth, breadth, tacitness, and specificity. In particular, information depth and breadth have been examined the most frequently by scholars in fields as wide and varied as science and technology and customer service. The depth of market knowledge refers to the degree of knowledge that firms possess about certain market aspects. In other words, the sum of knowledge that firms possess about a particular market aspect (Bao et al., 2012). For example, customer information on the market for firms are very critical to conduct marketing strategies. The depth of market knowledge may pertain to customer relationship management as well as customer’s psychology and behaviors. In addition, customer profiling—whether or not firms can accurately profile their target customers based on demographics (converting information into knowledge)—is a key that impacts their profitability (Chen and Lee, 2017).

On the other hand, the breadth of market knowledge describes the firm’s knowledge about customers or competitors in their respective industries, or other types of knowledge. Therefore, the concept of knowledge breadth is used as the basis of investigation in the current study. Schindehutte, Morris, and Kocak (2008) expands the definition of market knowledge to include not only customer knowledge but also suppliers’ needs and the knowledge related to all the stakeholders. Knowledge about all these aspects allows firms to function and manage all operational activities.

2.2 The Product and Process Innovations

Innovation encompasses a broad range of topics. Some studies focus on innovation of products and services, while others examine new technologies. There are also studies that focus
on administrative management by investigating management innovation (Camison and Monfort-Mir, 2012; Orfila-Sintes and Mattsson, 2009). Firm’s creation of value through product innovation and process innovation is still based on a product or effective operational process that can only then enable the creation of exchange value (Casadesus-Masanell and Zhu, 2013; Vaccaro, Jansen, Van Den Bosch, and Volberda, 2012). More importantly, the literature that investigates the effect of knowledge resources on market performance or sustained competitive advantages from the KBV or the perspective of marketing strategy mostly centers on product or commercial process innovation (with some studies illustrating it as management innovation) (Chang et al., 2015; Lewin, Massini, and Peeters, 2011; Martín-de Castro, 2015).

In this study, product innovation can be manifested in the use of new raw materials, the introduction or development of new ingredients, the combination of existing products, or the development of new product functions or features (Casadesus-Masanell and Zhu, 2013; Chang et al., 2015; Vaccaro et al., 2012). Process innovation is manifested in significant improvement and enhancement of processes through combined innovations of cost structure, quality, service, and speed (Damanpour and Gopalakrishnan, 2001), or even by lowering marginal production costs (Lambertini and Mantovani, 2009).

**2.3 Market Knowledge Depth and Two Different Innovations**

As Christensen (2006) documents, when a firm has developed deep knowledge and core competencies, in the form of technical or professional expertise, it tends to engage in activities in its existing, specialized domains. By activating the integration and use of best practices within the firm, knowledge sharing accentuates its self-reinforcing cycle of competence. As a result, the firm develops increasingly efficient processes and routines (Zhou and Li, 2012). This is because process innovation is extremely knowledge-intensive at the technological level and is enabled through changing tools and apparatuses in the process (Gopalakrishnan and Damanpour, 1997). In general, firms with depth of market knowledge also possess stronger powers of perception and a more advanced knowledge hierarchy. In the past, scholars argued that the advantage of such firms could be manifested in product innovation (Bao et al., 2012). This is because firms have built a more thorough understanding about products or services on the market of a particular field—depth of market knowledge—and become knowledgeable about the history and the background of these products or services.

However, Bao et al. (2012) stated that deeply embedded knowledge also bars the creative construction of an innovation that defies the governance of existing organizational routines. Some scholar also mentioned that as a firm reinforces its core competence, it runs the risk of turning the competence into a form of rigidity that hampers innovation. For new product development or process innovation, a higher manager’s cognitive rigidity prevents a firm’s product upgrades from deviating from a dominant logic (Tripsas and Gavetti 2000). As a result, innovations in management, product or IT etc. show path-dependent features. New ideas or
attributes from these innovations thus evolve continuously from previous generations, without a display of discontinuous or ground-breaking novelty. Based on the logic of path-dependent perspective, managers may hardly combine or absorb new market information that is incongruent with their beliefs (Bao et al., 2012). Therefore, the entrenched cognitive schema creates the problem of organizational inertia and narrows vision of managers (Danneels 2003; Day 1994). Based on the above, the following hypothesis is formulated:

H1: Market knowledge depth has a non-linear effect on product innovation.
H2: Market knowledge depth has a non-linear effect on process innovation.

2.4 Market Knowledge Breadth and Two Different Innovations

In general, broad market knowledge could mean possessing a lot of information that covers a wide spectrum, which could stimulate a firm’s ability to quickly develop new ideas and formulate new product management views (De Luca and Atuahene-Gima, 2007; Bao et al., 2012). As firms become more knowledgeable about the entire market landscape (like the breadth of market knowledge), they will be more capable of providing products or services to meet the market demands (Morgan, Zou, Vorhies, Katsikeas, 2003; Wu and Shanley, 2009). Therefore, in the process of broadening the market knowledge, firms need to reach a certain level of knowledge-breadth before they can innovate.

Because business processes involve multiple departments, it will be easier for firms with broad market knowledge to engage in the creation of value. As market knowledge can come from customers, products, information technology, suppliers, competitors, other stakeholders, or the Internet (e.g., Schindehutte, Morris, and Kocak, 2008), it will be easier for firms with broader knowledge to establish operational processes that reduce production costs and increase production efficiency (Johnson, Christensen, & Kagermann, 2008).

However, as the firm expands the scope of its market knowledge gained from external ties, it may be prone to make more mistakes in knowledge integration, again reducing product innovativeness or new ideas of process management (Bao et al., 2012). Previously, market knowledge breadth implies a wide range of information on customer behaviors, needs, and characteristics, as well as competitors’ product offerings, target market segments, strategies, and so on (De Luca and Atuahene-Gima, 2007). Thus, an innovation needs a knowledge recombination mechanism. The knowledge recombination mechanism new product development or process innovation that gives rise to creativity is an outgrowth of higher order learning, including discrimination, unlearning, and experimentation (Dougherty 1992; Karim 2009). Unfortunately, not all firm could be capable of higher-level learning. In summary, the reconfiguration of market knowledge is not simply a process of stitching and patching discrete knowledge nodes but rather an organized effort with complicated, higher-level learning activities (Bao et al., 2012). For example, Karim (2009) finds that a firm’s innovation productivity drops continuously over a sequence of reorganization events as a result of
improper generalizations from prior experience. This argument is consistent with recent studies related to firm resource recombination. Based on the above, the following hypothesis is formulated:

H3: Market knowledge breadth has a non-linear effect on product innovation.

H4: Market knowledge breadth has a non-linear effect on process innovation.

3. Methodology
3.1 Sample and Data Collection

To test the hypotheses, this study utilized a sample of Taiwanese travel agencies listed on the official website of the Tourism Bureau of the Taiwan Ministry of Transportation and Communications in 2017. Previous studies have shown that tourism innovation is strongly related with other economic and social fields (Hjalager, 2015). Given the intensely competitive nature of the tourism industry, travel agencies are compelled to develop new travel products or improve their existing services to enhance their competitive positions in the market (Abou-Shouk, Lim, and Megicks, 2016). The survey recipients in this study consisted of CEOs or senior managers of travel agencies in the capital city of Taipei, Taiwan, which is one of the well-established headquarters for business in East Asia.

3.2 Measures

All of these measures were drawn from the existing literature, after which they were translated and adapted for the context of the present study. This study focused on four primary constructs: the depth and breadth types of market knowledge (Zhou and Li, 2012), and product and process innovations (Chang et al., 2015; Paladino, 2008; Wang and Ahmed, 2004). Each of the constructs included three items that were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Since the measurement scales were established in the West and the surveys were administered in Chinese, back translation was performed to ensure the accuracy of the translation (Brislin, 1980). In addition, potential key informant bias was examined by performing t-tests on the constructs’ mean differences between the informants in the first wave and those in the second wave (Vorhies, Orr, and Bush, 2011). No significant differences were found at the p-value < 0.05 level, thus providing confidence that non-response bias was not an issue in the present study (Armstrong and Overton, 1977).

4. Results and Discussion

Under the setting of travel service industry, the empirical results indicate that market knowledge disparity has a non-linear effect on product and process innovations, and its positive effect is significant increasingly. On the other hand, market knowledge embeddedness only has positive effect on product and process innovations. Finally, this study offers some management implications and suggestion in further studies according to the result in the future. Basically,
some of the hypotheses were confirmed, whereas the others were not supported (see Table 1) under the significance level of $p < 0.05$ (t-value of > 1.65).

Table 1: The Non-Linear Relationship between Market Knowledge and Innovation

<table>
<thead>
<tr>
<th></th>
<th>Product innovation</th>
<th>Process innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta (t value)</td>
<td>Beta (t value)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.65*(5.73)</td>
<td>1.70*(4.06)</td>
</tr>
<tr>
<td>MKD</td>
<td>0.46*(6.29)</td>
<td>0.56*(8.32)</td>
</tr>
<tr>
<td>MKD square</td>
<td>0.21(0.29)</td>
<td>-0.10(-0.15)</td>
</tr>
<tr>
<td>$F$</td>
<td>39.62</td>
<td>69.34</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.21</td>
<td>0.32</td>
</tr>
<tr>
<td>$R^2_{adj}$</td>
<td>0.20</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>Beta (t value)</td>
<td>Beta (t value)</td>
</tr>
<tr>
<td>Constant</td>
<td>4.10(11.42)</td>
<td>3.41(9.81)</td>
</tr>
<tr>
<td>MKB</td>
<td>0.32*(4.08)</td>
<td>0.43*(5.79)</td>
</tr>
<tr>
<td>MKB square</td>
<td>1.37*(3.26)</td>
<td>1.27*(3.17)</td>
</tr>
<tr>
<td>$F$</td>
<td>16.61</td>
<td>33.52</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.10</td>
<td>0.18</td>
</tr>
<tr>
<td>$R^2_{adj}$</td>
<td>0.09</td>
<td>0.18</td>
</tr>
</tbody>
</table>

*: $p < .05$ ; $t > 1.65$

Note: MKD as market knowledge depth; MKB as market knowledge breadth

5. Conclusions and Recommendations

5.1 Theoretical Contribution

Today, in the 21 century, the majority of firms are already market-oriented. In order to deliver different performance, firms will rely on their knowledge about the market of their respective industries. Under the setting of travel service industry, the empirical results indicate that market knowledge breadth has a non-linear effect on product and process innovations, and its positive effect is significant increasingly. On the other hand, market knowledge depth only has positive effect on product and process innovations. Based on the analysis results of the current study, the management implications are as follows: First, the study clarifies and specifies the dimension of market knowledge. This may also explain why some studies find no impact of market knowledge on innovation performance (Ferreras-Méndez et al., 2015; Jansen et al., 2005). Second, the inconsistency in the study findings about the effect of market knowledge on innovation performance could also be attributed to not examining innovation performance more thoroughly. Under the setting of travel service industry, the empirical results indicate that market knowledge disparity has a non-linear effect on product and process...
innovations, and its positive effect is significant increasingly. On the other hand, market knowledge embeddedness only has positive effect on product and process innovations. Finally, this study offers management implications in further studies according to the result in the future.

5.2 Limitation and Recommendation

Despite its obvious contributions and procedural preventions (CMV and robustness check), this study includes some inherent limitations. First, due to the cross-sectional nature of the data, additional research should adopt a longitudinal approach and the data should be collected at different times. Second, the empirical results of this study were only obtained in Asia. Thus, future research should test for nationality bias (e.g., in the United States or Europe) to overcome any context-specific issues. Finally, this study utilized the depth and breadth of knowledge to represent the antecedents of innovation performance. Although it was valid and meaningful, future research should develop multidimensional measures (De Luca & Atuahene-Gima, 2007) that consider more specific knowledge characteristics, and empirically test their effects on various innovation indices.

References


