The Impact of Firm Age and Size on the Relationship among Organizational Innovation, Learning, and Performance: A Moderation Analysis in Asian Food Manufacturing Companies

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Abstract
The impact of Organizational innovation (OL) and Organizational learning (OI) on organizational performance (OP) are examined. By integrating congruence and organizational lifecycle literature, the authors hypothesized that the impacts of both values are moderated by organizational age and size, such that collectivism exerts stronger beneficial effect in order and larger companies, whereas novelty exerts stronger beneficial effects in younger and smaller companies. This research explores those linkages using structural equation modelling (SEM) and moderation analysis with data from 168 manufacturing companies in food industry was selected from China, Taiwan, and Malaysia. The research model includes three latent variable including OL, OI, OP, and two measurement variables contain age and size of the company. The finding of this paper support that firm age and size are two moderators which are control the relationship among OL, OI, and OP.

Keywords: firm age, firm size, organizational learning, organizational innovation, organizational performance, moderation analysis.

1. Introduction
The relationship between OL & OI (Asheim, 2011; Chiva, Ghauri, & Alegre, 2013; Liao, Fei, & Liu, 2008; Salim & Sulaiman, 2013; Wignaraja, 2012), OL & OP (Baker & Sinkula, 1999; Battor & Battor, 2013; Cho, Song, Yun, & Lee, 2013; Som, Nam, Wahab, Nordin, & Mashkuri, 2012; Yeh, 2013), OI & OP (Damanpour & Evan, 1984; Damanpour, Szabat, & Evan, 1989; Hitt, Hoskisson, & Kim, 1997; Kuswantoro, M Mohd, Abdul, & Ghorbani, 2012), and OL & OP & OP (Fonseca & Baptista, 2013; Jiménez-Jiménez & Sanz-Valle, 2010; Salim & Sulaiman, 2011; Santos-Vijande, López-Sánchez, & González-Mieres, 2012) were confirmed by previous researches in organizational studies. Unfortunately, the number of studies in moderating of organizational age or size on the relationship among OL, OI, and OP is scarce.

Organization’s age moderates the impact of learning & innovation (Calantone, Cavusgil, & Zhao, 2002; Dixon, 1992; Sinkula, 1994) and learning and performance (Hitt et al., 1997). The efficient and effective supply of market information in older firms is influenced by firm age (Sinkula, 1994). Innovative ideas can come from diverse areas – both internally and externally from firm suppliers, customers and others in the relationship chain. Younger firms are often at a disadvantage as it takes long time to build these relationships. Older firms are better experienced in choosing and employing information (Lukas, Hult, & Ferrell, 1996). According to a study by Sørensen and Stuart (2000), experience and organizational competencies provided by age help firms to develop their operations in
more efficient way, especially the operations relating innovation. Therefore, the relationship between OL and OP and also between OL and OI increases with firm age as they efficiently use information. As widely reflected in the literature, the effect of size of a company is positive both on OP and OI since the biggest ones normally allocate more resources to be invested in innovation (Kimberly & Evanisko, 1981). Furthermore, size is usually considered as a control variable in the studies relating the performance (Kimberly & Evanisko, 1981) and innovation (Damanpour & Schneider, 2006). Raw organizational management in some nascent firms can impede development of innovation in those companies. Therefore, age and size can lead to improvement of the innovation effects on performance and the impact of OL on both OP and OI.

This article attempts to thoroughly analyze the likelihood of moderating impact of some external and internal variables such as firm age and size on the relationships among organizational learning, innovation and performance in Asian manufacturing food industry. These variables are frequently cited in the literature as precursors for organizational innovation and performance and, according to some research outcomes, they have capability to moderate the relationships suggested in the current research study.

2. Method

2.1 Research model and hypotheses

Figure 1 show the research framework which is including three constructs and two measurements.

Based on objective of the study we have four hypotheses. These are:

H1: OL has a positive impact on OI
H2: OL has a positive impact on OP
H3: OI has a positive impact on OP
H4: Firm age and size are moderators in the relationship among OL, OI, and OP

2.2 Sampling

A quantitative research survey is employed to examine the hypotheses proposed in the research framework. The data collection period spanned between October 2012 and February 2013 for a period of five months. The prepared questionnaires were distributed among 650 randomly selected from food manufacturing in Malaysia, Taiwan, and China. Senior manager, director manager, or CEO, were chosen as the key informants. Only 168 food manufacturing companies returned the completed (without missing and outlier data) questionnaires which provided this study with a response rate of 26%.

2.3 Measures

Three constructs and two measurements were used in the research model. These are OL, OI, and OP as constructs and firm age and size a measurement. OL is independent construct and measured based on Jerez-Gomez, Céspedes-Lorente, and Valle-Cabrera (2005) research. Four dimensioned are determined include; management commitment (OL1), system perspective (OL2), openness and experimentation (OL3), and knowledge transfer and integration (OL4). OI as second construct is measured from Damanpour (1991) theory that divided in
two dimensions contain administrative (OI1) and technical (OI2) innovation. The third construct, dependent variable, is OP and measured in three dimensions from Emden, Yaprak, and Cavusgil (2005) research. These dimensions are financial (OP1), marketing (OP2), and partnership (OP3) performance. Furthermore, we measured firm age as the number of years passed from the foundation of the company and firm size as the number of employees, part time or full time, of the company.

3. Results

3.1 General Model

Table 1 presents the overall path model fit and the all hypothesis. As shown, the statistic indicators of path analysis proof an adequate fit: adjusted goodness-of-fit index [AGFI] =0.912; incremental fit index [IFI] =0.918; comparative fit index [CFI] =0.933; goodness-of-fit index [GFI] =0.911; normed fit index [NFI] =0.931; Tucker–Lewis index [TLI] =0.901 and root mean square error of approximation [RMSEA] =0.044. The impact of the OL to OI (H1; β1 =0.44, C.R=5.602) is significant. The positive impact of OL to OP (H2; β2 =0.19, C.R=3.184) is also supported by our findings. While we have expected to illustrate a strong positive significant impact of OI to OP (H3; β3 =0.87, C.R=9.564), our findings yield a significant impact among these three constructs.

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Path</th>
<th>Standardized coefficient</th>
<th>C. R.</th>
<th>p</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>OL → OI</td>
<td>0.44</td>
<td>5.602</td>
<td>&lt; 0.01</td>
<td>Supported</td>
</tr>
<tr>
<td>H2</td>
<td>OL → OP</td>
<td>0.19</td>
<td>3.184</td>
<td>0.01</td>
<td>Supported</td>
</tr>
<tr>
<td>H3</td>
<td>OI → OP</td>
<td>0.87</td>
<td>9.564</td>
<td>&lt; 0.01</td>
<td>Supported</td>
</tr>
</tbody>
</table>

AGFI = 0.912   CFI = 0.933   IFI = 0.918   CFI = 0.933
GFI = 0.911   NFI = 0.931   TLI = 0.901   RMSEA = 0.044

3.2 Moderation Analysis

Finally, as per H4, firm age, size, and type play the role of moderator on the relationships among OL, OI, and OP. To assess the moderation effects of firm age and size, this paper utilizes the two-group comparison of path model. For this purpose, the database are divided into two type of companies along the each factor level’s median. Therefore, food companies with moderators of higher grades are involved in one group, call it higher age (or older) or higher size (or bigger), and those with lower grade moderators are categorized in another group which is called lower age (or younger) and lower size (or smaller).

To examine the differences in firm size and age among the regression weights, the Critical Ratio (C.R.) test (> ±1.96, p < .05) should be used to obtain the statistics of the critical ratio for the differences among regression weights of subjects of lower and higher sizes or ages (R. Ho, 2006). As Arbuckle and Wothke (1999) state, the critical ratio of an estimate pair tests the hypothesis to arrive at confirmation of the two parameters’ equality.

Figure 2 and 3 shows the graphical research model for younger and older food companies and figure 4 and 5 presents the graphical research model for smaller and bigger food companies. Table 2 demonstrates that the relationships among three main constructs are significantly positive in case of all groups, and the three variables in question affect the intensity level of these relationships. Therefore, the variable of firm age and size play the role of moderators in the model which, in turn, supports the H4 proposed in this research.
Figure 2: Younger age companies’ research model

Figure 3: Older age companies’ research model
Figure 4: Smaller size companies’ research model

Figure 5: Bigger size companies’ research model
The findings of this study confirm that in Asian manufacturing food industry, OL and OI are positively interlinked and this positivity is extendible to all the groups although this linkage is stronger in older, bigger. The obtained conclusion in this section is in line with the findings of the previous researches as reflected in the literature.

On the other hand, the findings indicate that the relation between OL and OP is always positive and stronger both in nascent and smaller food manufacturing firms. These outcomes are just partially in accordance with the previous studies in the literature.

And ultimately, according to the findings of this study, age and size in food industry moderate the relation between OI and OP although moderating effects are not always consistent with the expectations. Specifically in organizational study, the results demonstrate more intensity of the positive relationship between OI and OP within groups of smaller and older food manufacturing firms.

4. Discussion

The findings this study also indicate that, in manufacturing food industry, OI significantly impacts on OP, which are confirmed by previous studies (Darroch, 2005; L.-A. Ho, 2011; McDermott & Prajogo, 2012; Ndubisi & Iftikhar, 2012). Specially, the current paper determines that while technical innovation has the highest factor loading which means this element is the most important element influencing on overall innovation in food manufacturing industry in Malaysia, Taiwan, and China. The outcomes denote that the most effective way to improve OP is through appropriate and effective technical planning and implementation.

As mentioned in the introduction section, this article contributes to the literature through analysis of the likelihood of moderating. The impact of firm size and age on the relationships among OL, OI, and OP are confirmed respectively. The main finding of this study is the stability of significance and positivity of these relationships regardless of the moderators levels although their intensity changes.

As suggested in literature, firm’s size helps increase the positive linkage between OI and OP (Damanpour & Evan, 1984). Nevertheless, the significant positive impact of OL on OI and OP is more significant in companies of smaller size. Large companies usually have access to more resources to be invested in OI. Thus, these companies may be less dependent on OL processes than smaller companies.

As consistent with the previous studies, the outputs of this research reveal that age intensifies the linkage between OI and OL (Aiken & Hage, 1971; Sørensen & Stuart, 2000). The findings apparently demonstrate that age enables firms to develop organizational routines to be able to perform their activities with more efficiency and better performance. Nevertheless, younger companies suffer from missing consolidated routines meaning that innovation needs further attention and work from the organizational learning process.

The procedures and contributions of the present article to literature can be summarized as below:

1. This article concentrates on sample Asian food manufacturing industry which acts in a setting where the empirical studies are not sufficient.
2. By examining the links within the same model between OL, OI, and OP, and by applying broad measures of all of the relationships together in food industry.
3. This article strongly supports existence of these relationships and demonstrates that these links are positive and significant regardless of the size and age although these factors affect the level of intensity of the links among them.

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References


