WHAT IS THE ROLE OF ORGANIZATIONAL CREATIVE CLIMATE IN OPEN INNOVATION?

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ABSTRACT

This study focuses on: Which kind of open innovation activities is most strongly influenced by organizational creative climate? The results suggest organizational creative climate positively moderates the relationship between open innovation activities and innovation performance. Especially, inside-out open innovation activities have significantly stronger moderating effects than outside-in and coupled activities.

Keywords: Organizational Creative Climate, Open Innovation

INTRODUCTION

Creativity, defined as the construction of ideas which are new and potentially useful (Amabile, 1998), enables managers to create competitive advantage for their firms. This is because creativity can provide the basis for meaningful and individual design (Czarnitzki & Thorwarth, 2012) and innovation (Im, Montoya & Workman, 2012). In order to create any kind of innovation, some element of creativity has to be involved (Georgsdottir & Getz, 2004). Researchers, however, disagree on the source of creativity. Some argue that certain individuals possess creative potential and managers need to manage their potential (Cummings & Oldham, 1997, Sternberg, 1999), while others argue that the environment determines who can be creative (Amabile, 1998). Extensive research has acknowledged the importance of the creative environment, particularly in the form of organizational creative climate (e.g., Amabile, 1996; Ekvall, 1996; Im, Montoya & Workman, 2012). Actively managing the firm’s organizational creative climate seems to be important for all firms with the desire to generate innovations, especially in relation to the growing concept of open innovation.

Open innovation refers to the use of inbound activities, outbound activities, and coupled activities that is widely thought to be able to improve internal innovation and expand the markets for external exploration of innovation (Chesbrough, 2003; Gassmann & Enkel, 2004). Creativity has been described as viewing an issue from multiple perspectives, while open innovation enlarges the potential number of perspectives, by including external knowledge. However, while open innovation has been widely examined in management literature, a review of that literature indicates there is a dearth of research examining the relation between organizational creative
climate and open innovation. This is particularly notable because researchers have shown that organizational creative climate is an important driver of innovation performance (Hirst et al., 2009). In addition, open innovation requires a different way of thinking and a change in employees’ practices in a sense that they need to deal with, or at least consider, more ideas, knowledge, or technologies in their innovation processes. In this study, we focus on the extent to which organizational creative climate can make open innovation strategies more effective. This is important because it aids in understanding how open innovation activities in practice, instead of in theory, can create value for innovating firms. Thus, we may expect that organizational creative climate is especially important for firms pursuing an open innovation strategy.

Considering the rise of open innovation and the important role of organizational creative climate in innovation development, the objective of this study is to determine to what extent organizational creative climate influences the performance of open innovation activities. Specifically, this study focuses on two research questions:

(1) Does organizational creative climate increase the performance of open innovation activities? We determine whether open innovation activities are more successful in firms with a better organizational creative climate.

(2) The performance of which kind of open innovation activities (outside-in, inside-out, coupled activities) is most strongly influenced by organizational creative climate?

**HYPOTHESES DEVELOPMENT**

Since Chesbrough (2003) proposed the open innovation concept, this concept has gained a lot of interest by both practitioners and academics. Researchers generally agree that firms engaging in open innovation can achieve greater innovation performance for the following reasons. First, according to the rationale of open innovation, firms cannot possess all types of knowledge and capabilities to create innovation they want. However, they are able to acquire innovative knowledge through purchasing licenses or collaborating with third parties for the generation of innovation that they need. Second, previous research suggests that internal R&D capabilities and the ability to access external knowledge can affect innovation performance (Veugelers, 1997). This is because R&D investment or effort can facilitate new knowledge creation and improve the absorptive capacity to exploit the external knowledge (Cohen & Levinthal, 1990). Finally, building on strong ties with innovation network partners and co-development partnerships, firms performing coupled activities can also lead to positive innovation performance, because firms can combine inflows and outflows of knowledge to efficiently accelerate internal innovation.

Research on work-related environmental features often uses the concept of “climate”, representing employees’ descriptions of an area of strategic focus or organizational functioning (Patterson et al., 2004). A wide range of climate aspects have been proposed, including creative climate (Ekvall, 1996), service climate (Tsai & Wu, 2001), or innovativeness climate (Bock et al., 2005). For the purpose of this study, organizational creative climate refers to factors that stimulate or block creativity and innovations in everyday life (Ekvall, 1996). Organizational creative climate includes values, opinions and agreed upon norms which result in creative behaviors. Essentially, organizational creative climate consists of challenge, freedom, openness, tolerance of uncertainty, and support (Ekvall & Ryhammar, 1999).
Previous research regarding organizational creative climate has indicated that organizational creative climate is an important predictor of organizational performance (see Amabile, 1996; Ekvall, 1996; Ismail, 2005). For example, Ismail (2005) found organizational creative climate to influence firm innovation; using the KEYS measurement developed by Ekvall (1997), Lin and Liu (2012) found that organizational creative climate has a positive impact on perceived innovation; and Isaksen and Ekvall (2010) indicated that a highly organizational creative climate is related to high organizational performance in terms of market share or sales volume.

While numerous studies have shown that innovation is influenced by organizational creative climate, it seems that none has focused on the impact of organizational creative climate within the open innovation setting. According to George (2007), the value of organizational creative climate can be determined by the different stakeholder groups. In addition, George suggested that there might be differences in what different stakeholder groups consider useful and creative. Fey and Birkinshaw (2005, p. 616) also indicated that “Openness to new ideas emerged as the single most important predicator of R&D performance, with a direct effect on performance”. Furthermore, according to Du Chatenier et al. (2009), collaborative knowledge creation with open innovation partners can spark creativity.

The above discussion suggests that open innovation could benefit from organizational creative climate because organizational creative climate is able to facilitate open innovation partners to search for novel ideas, and encourages partners to think creatively and to solve problems through collaborative knowledge. Therefore, this study expects the organizational creative climate to positively moderate the relationship between open innovation activities and innovation performance.

**RESEARCH METHOD**

The field study consists of a survey in which the main concepts are measured by means of multi-item constructs. Where possible, measurement scales from previous studies are used. Organizational creative climate is measured by an adapted scale from Sundgren et al. (2005) which includes 6 items. The scale for open innovation activities consists of 12 items reflecting open innovation (Gassmann & Enkel, 2004). Since innovation performance is a multi-dimensional phenomenon, we investigate this issue for four innovation performance indicators, namely new product innovativeness, new product success, customer performance, and financial performance. The four dimensions of innovation performance are measured with existing scales, namely new product/service innovativeness (Salomo, Talke & Strecker, 2008; 4 items), new product/service success (Baker & Sigula, 1999; 6 items), customer performance (Blazevic & Lievens, 2004; 4 items), and financial performance (Im & Workman, 2004; 4 items). Finally, to account for the effects of extraneous variables, firm size, industries, market turbulence, technological turbulence, and competitive intensity (adapted from Han et al. 1998; Citrin et al., 2007; Zhou et al., 2005) were included as control variables.

A survey was conducted by using data from the Top 1000 firms in Taiwan. Senior managers are selected as key respondents as they take responsibility for new product/service development and innovation performance. Excluding firms that had closed down, a total of 842 questionnaires
were mailed. This procedure yielded 223 usable questionnaires and a response rate of 26.48%. With respect to the firm characteristics, 72.6% of the firms had been established over 15 years at the time of survey, 21.5% had fewer than 1000 employees, and 35.0% had 81%-100% service proportion of sales. The responding companies are from various industries, namely finance (30.0%), information and electronics (28.7%), retail and logistics (21.5%), and others (19.7%). Using a t-test, there is no significant difference at the .05 alpha level between early respondents and late respondents in terms of years of working experience within new service/product development area.

**DATA ANALYSIS**

The reliability analyses indicate that all Cronbach’s alphas values are well above the threshold value of 0.7 that Nunnally (1978) recommends. To understand the factor structure and the measurement quality, a principal component analysis is conducted with varimax rotation and an evaluation of the eigenvalues is used to identify the number of factors to retain. Throughout this process, all initial eigenvalues are greater than one. These results indicate the unidimensionality of the various constructs. This study further evaluates measurement properties with Confirmatory Factory Analysis to assess convergent and discriminant validity. The results indicate the composite reliabilities of all indicators exceed the usual 0.60 benchmark (Bagozzi & Yi, 1988). Discriminant validity is examined by using a procedure suggested by Fornell and Larcker (1981). We compute the average variance extracted (AVE) by the indicators and compare it with the variance that each factor shares with the other factors in the model. The results show the value of the square root of each AVE is greater than the values of the inter-construct correlations, indicating that the constructs are more strongly correlated with their own items. To this end, the measurement model fits the data satisfactorily and exhibits convergent and discriminant validity.

To assess the structural model, the items for each scale are averaged to create single indicators for each latent variable (Jap, 1999). This approach has been used in several studies to correct for random measurement error (e.g., Netemeyer, Johnston & Burton, 1990) and to reduce model complexity (e.g., Li & Calantone, 1998). The CFA model fit is acceptable ($X^2 / \text{d.f.}=2.12$, CFI=0.92, GFI=0.92, TLI=0.91, IFI = 0.93, RMSEA=0.06). Accordingly, the main effect for the open innovation activities construct has a significant positive impact on all four innovation performance measures, new product/service innovativeness ($\beta = .329, p < .001$), new product/service success ($\beta = .212, p < .01$), customer performance ($\beta = .206, p < .01$), and financial performance ($\beta = .241, p < .01$).

We then test the moderating role of environmental turbulence. As expected, the interaction of organizational creative climate with open innovation activities significantly enhances new product/service innovativeness ($\beta = .133, p < .05$), new product/service success ($\beta = .121, p < .05$), customer performance ($\beta = .129, p < .05$), and financial performance ($\beta = .136, p < .05$). For all four indicators, we find a positive and significant moderation effect for organizational creative climate.

The results reveal that the magnitude of the moderation effects is not the same for each of the three open innovation activities. We then run a chi-square difference test by comparisons of two structural models (Anderson & Gerbing, 1988). The first model includes all the direct and
interaction effects (a constrained model), while the second model is a model without one of the interaction effects (a baseline model). We compare these two models and obtained chi-square values of each open innovation activity. We further compare their chi-square differences values. Accordingly, the results indicate that organizational creative climate has a significantly stronger moderating effect for the inside-out open innovation activities than for outside-in activities and coupled activities.

**DISCUSSION**

This study contributes to the literature on open innovation in following ways. First, we empirically show the importance of organizational creative climate for open innovation performance. In firms with strong creative organizational climate, open innovation activities have a stronger effect on innovation performance than in firms with weaker organizational creative climate. In addition, the increase in open innovation performance is not limited to a single measure of open innovation success. We employ four different measures of open innovation performance, and for each of those four dimensions of innovation performance, we find a positive moderating effect for organizational creative climate. Second, because open innovation is a broad concept, we have tested three types of open innovation activities: outside-in, inside-out, and coupled activities. We find that organizational creative climate positively moderates the relationship between each of these three open innovation activities and innovation performance. However, the effects are not equal. We find significantly stronger moderating effects for inside-out open innovation activities than for outside-in and coupled open innovation activities. This is the case for all the four measures of innovation performance. Therefore, it seems that especially for inside-out open innovation activities strong organizational creative climate is crucial.

The results offer two implications for managers. First, the findings show that open innovation activities enhance innovation performance most strongly when the organizational creative climate is strong. This implies that the expected pay off of opening innovation activities is larger for firms with a strong organizational creative climate environment. On the other hand, managers intending to open up their innovation process may consider further strengthening the firm’s organizational creative climate, as this will increase the performance of an open innovation strategy. Second, managers need to be aware of the fact that for inside-out open innovation activities, an organizational creative climate environment has a stronger enhancing effect on innovation performance than for outside-in and coupled open innovation activities. This means that when inside-out activities comprise of a larger part of the entire open innovation strategy having strong organizational creative climate is even more important, than when most of the open innovation strategy is focused on outside-in activities.

**REFERENCES**


