Does Your Open Innovation Mode Matter?  
Implications for a Firm’s Innovation Performance

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Extended Abstract

1. Introduction

Not long ago, ICT multinationals like IBM, AT&T and Merck were the leading research-based organizations, gaining competitive advantage grounded on internal research and development activities. However, the new way of innovation (i.e. open innovation), leveraging the knowledge and initiatives of external partners, enabled new smaller companies, to enter the market and gain competitive position. Yet, open innovation is not a dichotomous phenomenon; it has several distinct dimensions. As such the multidimensional phenomenon has been rarely explored in its whole, since existing research mostly has focused on only one of its dimensions. This narrow view hinders the understanding of the complexity of open innovation phenomenon, its activities and influence on firm’s innovation performance.

With this study we aim to contribute to the existing knowledge on open innovation in organisations in the following ways. First, in contrast to existing studies that focus on partial aspects of open innovation, we take an integrative perspective on open innovation, taking into consideration its multidimensional nature and its role in a firm’s success. Drawing from an in-depth literature review of open innovation, we assess the role and contribution of an individual dimension of open innovation as well as the joint impact on innovation-related outcomes in organisations. In so doing we provide integrated framework of open innovation to facilitate managerial decision making processes. Second, in assessing an organisation’s open innovation, we take a bottom-up perspective. We use an integrative measure of open innovation based on evaluating a proclivity (e.g., attitude) that a CEO of an organisation has
towards various open innovation activities. Finally, by means of cluster analysis we identify different modes of open innovation – that is, to ascertain different combinations of open innovation dimensions that may be related to specific firm size and/or industry. Identification of different modes of open innovation may be of a great help for innovation leaders who are initiating open innovation programs in their companies and need grounds to prioritize among various open innovation activities. By illustrating a prototype company from each open innovation mode we facilitate managerial decision making in developing overall innovation strategies and business model innovations. Integrating results from our statistical analysis with insights gained from structured interviews with innovation leaders we develop guidelines for successful implementation of open innovation that acknowledges the human centeredness of open innovation processes.

2. Methodology and data analysis

2.1. Sampling and data collection

The data for the empirical study were gathered via online surveys administered to CEOs of Italian, Slovenian, and Belgian companies. A random sample of 1250 Italian companies was compiled from the Amadeus database in October 2012, the random sample of 2000 Slovenian manufacturing and service firms was compiled in May 2013 from the Business Directory of the Republic of Slovenia (PIRS), and 1500 Belgian companies were randomly selected from the BELFirst database in June 2013. We received 99 valid responses in Italy (7.9% response rate), 421 valid responses in Slovenia (21.1% response rate), and 173 valid responses in Belgium (11.5% response rate). The total sample was thus comprised of 693 companies from three countries. The sample included different firm’s sizes and a wide range of industries (the majority belonging to manufacturing, information and communication, and service activities).

2.2. Data analyses

We performed cluster analysis using IBM SPSS Statistics 20. Hierarchical technique (using Ward’s method and squared Euclidian distances) was initially used in cluster analysis to help us determine initial solutions on the number of clusters and starting points (i.e., cluster seeds for the non-hierarchical cluster analysis). We performed k-means for a range of initial suggestions by the hierarchical technique, taking into account four, five, and six cluster solution. The final decision for the four cluster solution was made following the suggestions provided by
Hair, Black, Babin, Anderson and Tatham (2010). We performed ANOVA test, which supported the significant differences across the clusters between the variables that presented bases for the cluster analysis. In addition, significant differences across the clusters were found on firm size (Kruskal–Wallis test=31.59; p<0.001), innovation (Kruskal–Wallis test=91.51; p<0.001) and the percentage share of R&D investments of total sales (Chi-Square=57.23; p<0.001); on the other hand, the differences related to firm industry were non-significant (Chi-Square=18.63; p=0.116).

3. Results

3.1. Results of the cluster analysis

Results of the cluster analysis suggest that most companies are involved with at least one dimension of proclivity for open innovation, which denotes a more general strategic orientation among practitioners to open their innovation processes. We identified the following modes: open innovators, systems engineering companies, R&D outsourcers, and customer oriented. With the aim of finding out why companies choose different combinations of open innovation activities and how effective they are in implementing selected open innovation dimensions, we collected additional qualitative data from the companies. Several semi-structured interviews were conducted with CEOs of companies in each cluster.

3.2. The relationship between open innovation mode and innovation performance

To evaluate whether meaningful differences exist among a firm’s innovation performance in different clusters, we further analysed innovation performance of the companies. As already mentioned significant differences across the clusters were found on innovation (Kruskal–Wallis test=91.51; p<0.001) and the percentage share of R&D investments of total sales (Chi-Square=57.23; p<0.001). Separate Kruskal-Wallis tests revealed that there exist significant differences among all the clusters regarding innovation performance (p<0.001), with open innovators having superior innovation performance (median = 5.33) and investing the most in R&D. In addition we examined how particular open innovation dimension impact a firm’s innovation performance. The results of the regression analysis exhibited the strongest relationship between employee involvement and a firm’s innovation performance (β=+0.36, p<0.001), following by venturing (β=+0.12, p<0.001), outsourcing R&D and external networking (β=+0.11, p<0.001), and customer involvement (β=+0.09, p<0.05). The relationship
between inward IP licensing and external participation and a firm’s innovation performance was positive but not significant.

4. Discussion

This study provides theoretical and empirical grounds for addressing fundamental questions in open innovation literature, such as: How can different open innovation dimensions be implemented? Do different modes of open innovation exist? Are companies that are highly intense on all open innovation dimensions superior innovators? In providing such answers, we are able to address pressing questions in business practice, such as, “Which open innovation dimensions should be stimulated the most” and “how do leaders effectively implement open innovation process within their organisations”. The aim of our research was to contribute to a deeper understanding of how aspects of open innovation are implemented in companies and how they correlate with a firm’s innovation performance. We began with a systematic overview of possible dimensions of open innovation, specific benefits of those dimensions, and through what mechanisms they may impact a firm’s innovation performance. In so doing we have aimed to help managers to recognize the rich and abundant opportunities of open innovation, which is comprised of several activities. We continued with cluster analysis on a large cross-cultural and cross-industry sample of companies based on their involvement with specific dimensions of open innovation. In so doing we presented different modes of open innovation that may be implemented by firms related to their industry focus and size. Moreover, we carried out regression analysis, underscoring the influence of the individual dimension of open innovation on a firm’s innovation performance. Our empirical findings suggest that all open innovation dimensions are positively associated with a firm’s innovation performance, with the strongest impact of employee involvement. Finally, based on the interviews with CEOs, we are able to provide guidelines for successful implementation of open innovation.