

Additional case

Chapter 7:

External knowledge search, absorptive capacity and radical innovation in high-technology firms

Group/class size: any.

Activity time: depends on the reading time for the case. Reading might be done in advance of the class or during the class by referring to the paper at the end of the description below.

In Flor et al's. (2017) paper, the authors indicate that open innovation and absorptive capacity are two concepts allowing firms to leverage knowledge generated externally to improve their innovation performance. In particular, the joint effect of open innovation and absorptive capacity on a firm's radical innovation is analysed. Radical or **disruptive innovation** is one that has a significant impact on a market and on the economic activity of firms in that market. In other words, radical innovation is drastic and destroys or supplants an existing business model, or replaces an existing product or service with something entirely new. A good example is considerable change in technology that advances the price/performance of products or services much more than the existing rate of progress.

Prior research has explored the link between open innovation and innovation results by focusing on the relationship between external search strategies and innovative performance. External search strategies, being wide and deep, occur across a variety of channels and can produce resources and ideas that could help firms to gain and exploit innovative opportunities. Moreover, firms that have access to a broad knowledge base have the ability to facilitate its understanding of new information and potential changes. This in turn, enhances the firm's ability to detect remote technological or market opportunities, which in turn gives flexibility to adapt to unpredictable change. In addition, the company's knowledge pool can be expanded for radical innovation.

Absorptive capacity (AC) is considered one of the firm's fundamental learning processes as it signifies the firm's ability to identify, assimilate, and exploit knowledge from its environment. AC therefore facilitates the creation of radical innovation enabling the exchange of existing knowledge and learning, and combining it with new sources of knowledge. Two types of AC can be identified: potential AC and radical AC. Potential AC represents the knowledge-seeking capacities a firm has developed which may or may not be used to produce innovation. It consists of processes of external knowledge acquisition and assimilation. Realized AC represents a firm's ability to develop products and services based on the stock of its knowledge.

The paper uses AC, knowledge, and innovation literature to create six hypotheses that test the following arguments: open search breadth and open search width will each exert a positive influence on a firm's radical innovation, potential AC will exert a positive effect on both a firm's radical innovation and the relationship between open search breadth, depth and radical innovation. Realized AC will exert a positive effect on a firm's radical innovation and also exert a positive effect

on a firm's radical innovation. Finally, realized AC will also exert a positive effect on the relationship between open search breadth, depth and radical innovation.

A case study using medium-size large Spanish industrial firms was used to test the set of hypotheses. All participating firms came from high-technology industries such as pharmaceutical, office, accounting and computing machinery, radio TV and communications equipment, medical, precision and optical instruments, aircraft, and spacecraft. These sectors were R&D intensive and with a population size of 365 firms, the ultimate sample size of participating firms was 172. A telephone survey was used to collect data while two respondents from each firm were interviewed using different structured questionnaires. Data collected comprised: AC data, radical innovation data, innovation performance data, and open search strategy data. For the latter breadth and depth of search strategies were particularly important.

The data analysis comprised statistical analysis and correlations for all the study variables. Correlations indicated that potential and realized AC are positively related, and external search depth is positively related to both potential and realized AC. The study concludes firstly that neither external search breadth nor depth had a significant direct effect on radical innovation. Secondly, the direct effect of AC on innovation performance confirms that internal routines and processes to absorb external knowledge contribute to explaining radical innovation. Thirdly, realized AC is relevant for radical innovation. Fourthly, potential AC positively influences the relationship between open search breadth and depth and radical innovation. Finally, realized AC has a positive influence on organizational innovation breadth and depth search strategies

This study highlights that internal capabilities and external search strategies are relevant when pursuing radical innovation. So, external search strategies should be assessed in terms of benefits and costs, taking into consideration the searching and managing of the diverse knowledge sources firms are associated with.

Questions:

1. Reflect on this paper and its findings based on the data collected from high-tech industries. Do you think a study conducted in industries that are *not* high-tech would deliver the same results? If so, why or why not?
2. This paper concentrated on radical innovation. Do you think the results would be the same when open innovation is considered and not radical innovation?
3. What interventions would you introduce as a manager, to encourage and promote breadth and depth search options for radical innovation?

Source: Flor, M.K., Cooper, S.U. and Oltra M.J. (2017) *External knowledge search, absorptive capacity and radical innovation in high-tech firms*, *European Management Journal*, <http://dx.doi.org/10.1016/j.emj.2017.08.003>