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Extending organizational antecedents of absorptive capacity: Organizational characteristics that encourage experimentation

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ABSTRACT

Absorptive capacity has generally been perceived as a 'passive' outcome of R&D investments. Recently, however, a renewed debate on its 'proactive' dimensions has emerged. We tap into this development and complement the existing discussion on combinative capabilities with a perspective that focuses on organizational characteristics that encourage experimentation. Specifically, we argue that characteristics such as slack resources, tolerance for failure, willingness to cannibalize and external openness are important organizational antecedents for knowledge absorption activities as they prevent inertia. Drawing on multi-informant survey data collected from SMEs in Denmark ($n = 169$), we find empirical support for the impact of these characteristics (except for tolerance for failure) on various aspects of absorptive capacity (both potential and realized). Before concluding, we discuss the theoretical and managerial implications of our study.

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1. Introduction

The competitive landscape in which many firms operate today, especially in technology-intensive industries, is characterized by increased customer demands and a rapidly growing knowledge base which is becoming increasingly more complex, convergent and widely distributed across the globe. In such contexts, firms need to intensify their innovative efforts while at the same time they find virtually impossible to both unite all the necessary competencies in-house and capture all the social benefits of their research and development (R&D) endeavors [1]. Therefore, firms have become more and more reliant on each other to create and sustain innovation [2–5]. As a result, the efficiency and efficacy of innovation systems depend on the extent to which its actors are able to simultaneously generate externalities and benefit from knowledge spillovers [6].

Greater reliance on external parties implies that the ability to recognize and utilize outside knowledge has become a critical component of a firm's innovative capabilities and consequently an important subject of technology and economic policy [7–9]. In theoretical terms, this ability is linked to the concept of 'absorptive capacity' [10]. While there is a rich body of conceptual and empirical work on this concept which emphasizes its positive outcomes with respect to competitive advantage, exploitation/exploration orientation and economic growth [8,11,12], the crucial issue from both a practical and a theoretical perspective is its organizational antecedents. In other words, how can firms increase their absorptive capacity?

The literature provides two sets of complementary answers. The first, which relates back to Cohen and Levinthal [10,13], suggests that firms should invest in prior related knowledge (i.e. specifically through R&D) in order to keep abreast of the latest research findings and developments in the industry. The second solution draws on the work of van den Bosch et al. [14] and Jansen et al. [15] on combinative capabilities. It recommends that firms secure a well-functioning internal exchange of knowledge among employees so that new pieces of knowledge drawn from outside can be properly integrated with in-house expertise and thus lead to the generation of new products and services.

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Although the importance of prior related knowledge and combinative capabilities must be acknowledged as important drivers of absorptive capacity, our paper emphasizes that they may not suffice. We argue that this perspective needs to be complemented with one that focuses on the characteristics of an organization that encourage experimentation and prevent inertia. This is because, in order to create the capability to leverage external knowledge, organizations need to ensure that enough resources are shifted from routinized tasks to novel activities in due time. Absorbing knowledge from outside is costly, difficult and risky [16–20], as well as contentious, as it may be subject to employee resistance in the form of the ‘not-invented-here’ syndrome [21]. It often falls outside the scope of exploitative activities to which managerial attention and effort is normally directed and hence, it tends to be crowded out by more routinized activities [22,23]. Innovative activities fundamentally rely on extra-organizational knowledge and the creative recombination of existing knowledge and production factors [24], which seldom is entirely possible within the constraints of a firm’s internal knowledge base [25–29]. As empirical evidence from technology-intensive industries has revealed, new technological and market trends, along with shifts in consumer preferences, emerge mainly in the realms of research institutions, R&D alliances, and user communities, or among lead users [4,28,30–38]. Besides, available extra-organizational technological knowledge is rarely entirely ready to be commercialized [39]. Due to its ambiguity and complexity, it typically requires an adaptation or developmental process before it can be assimilated and utilized effectively – a potentially time-consuming and costly process that may involve adding new skills and/or filling existing gaps in competence.

In fact, recent evidence suggests that some companies need to embark on novel learning trajectories in order to exploit knowledge from outside [20,40]. Beta Electronics,³ for example, a medium-sized producer of electromechanical products such as volume controls and speakers, decided in the 1990s to exploit MEMS technology (Micro ElectroMechanical Systems) in order to develop the world’s smallest silicon microphone. That innovation was possible despite the fact that the company’s competencies were very different from the ones needed to exploit MEMS technology (e.g. clean room facilities). Neither knowledge investments nor the improvement of communication channels among employees (that is, prior to related knowledge and combinative capabilities) were self-reliant options for the company in this case. In order to complete the development of the microphone, the company had to purchase new equipment, hire external consultants, establish a partnership deal (with a university and three other companies), as well as retrain its staff. In other words, the company had to acquire new skills and resources and it had to experiment with new technological fields in order to support the absorption activities related to MEMS technology.

Against this background, we address the following research question: *Which organizational antecedents affect the development of absorptive capacity?* Our focus is directed toward proactive organizational antecedents that influence experimentation with regard to the acquisition, assimilation, transformation, and

exploitation of external knowledge, thereby complementing the knowledge-related antecedents (i.e. R&D investments) and the organizational antecedents related to combinative capabilities [15]. The concrete organizational characteristics investigated are: 1) existence of slack resources, 2) willingness to cannibalize, 3) tolerance for failure and 4) external openness. While these characteristics have been previously studied in relation to other constructs, such as second-order competences [41] and radical innovation [42], they have not been associated to absorptive capacity. They constitute the core contribution of our study in that they are qualitatively distinct from previously studied antecedents. They underline the fact that the absorption of external knowledge is an effortful, risky and challenging activity that demands more from organizations than internal communication.

The remainder of the paper is organized as follows: In the next section, we provide a discussion of theoretical considerations and develop our conceptual framework. Based on this framework, we develop our hypotheses. We then describe our research methodology in detail, after which we present the findings of our empirical study. Finally, we conclude and address key implications for research and practice.

2. Theoretical considerations and framework

Cohen and Levinthal [13] defined ‘absorptive capacity’ in the management field as “the firm’s ability to identify, assimilate and exploit knowledge from the environment” (p. 569) in order to emphasize the dual role of R&D activities. By dual role, they meant that R&D served both for the creation and utilization of new knowledge (innovation) and for the ability of firms to absorb and deploy external knowledge (learning). The willingness to invest in R&D was a central theme in their paper and was modeled as a function of two exogenous factors: 1) the scope of technological opportunities and 2) the propensity toward knowledge spillovers in the industry. In this way, Cohen and Levinthal’s initial work placed great emphasis on the role of the external environment in determining the absorptive capacity of a firm. In their 1990 paper, they developed a more robust theoretical basis for the concept, including its determinants [11]. As a result, the sources of a firm’s absorptive capacity were extended to include its internal communication structure. The existence of gatekeepers, shared language systems, cross-functional interfaces and diversity across individuals were discussed as key aspects of a communication system capable of enhancing absorptive capacity.

Yet, in most subsequent studies throughout the 1990s, past R&D expenditures were employed as the key measure and/or driver of absorptive capacity [11]. It was not until Zahra and George’s [43] work that the view of absorptive capacity as embedded in organizational processes and structures was revitalized. They emphasized the proactive dimension of the construct, suggesting that absorptive capacity should be seen as a manifestation of a dynamic capability pertaining to knowledge creation and utilization. They further argued that the concept could be split into two constituent dimensions: potential and realized absorptive capacity. While ‘Potential Absorptive Capacity’⁴ was said to comprise the initial processes

³ We use a fictitious name here due to confidentiality agreements.

⁴ It should be noted that potential absorptive capacity constitutes an integral part of the construct and is not a hypothetical one.

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