Absorptive capacity and the identification of opportunities in new technology-based firms

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A B S T R A C T

The purpose of this work is to investigate relationships between knowledge and opportunities in new ventures. More specifically, this work proposes and empirically tests how potential absorptive capacity is related with the identification of opportunities in new technology-based firms (NTBFs). To take into account the unique nature of NTBFs we divide potential absorptive capacity into problem absorptive capacity, i.e. the ability to identify and acquire knowledge of the goals, aspirations and needs of current and potential customers, and solution absorptive capacity, i.e. the ability to identify and acquire external knowledge of solutions to fulfill them. We develop three hypotheses, which predict that both problem absorptive capacity and solution absorptive capacity will be positively related with the identification of opportunities in NTBFs and that they will reinforce each other. The findings support the importance of making a distinction between the two proposed dimensions of potential absorptive capacity and shed light on their effectiveness and interaction for the identification of opportunities.

1. Introduction

The opportunity concept is central in entrepreneurship research. Instead of focusing separately on either the enterprising individual or the opportunities that the environment has to offer, researchers are encouraged to investigate both in concert (Venkataraman, 1997; Shane and Venkataraman, 2000). In this approach, the subjective nature of human action can be taken into account without putting too much emphasis on the unhelpful exercise of dividing the world into entrepreneurs and non-entrepreneurs (Sarasvathy, 2004). A central tenet in this line of thinking is the importance of knowledge and learning for identifying and exploiting opportunities (e.g. Shane, 2000; Corbett, 2005). Previous experiences and accumulated knowledge are believed to shape the opportunities individuals discover and develop into viable business activities. It follows that the ability to understand and assimilate knowledge developed by others—for example new technologies—will affect the ability to identify and exploit entrepreneurial opportunities (Corbett, 2007; McMullen and Shepherd, 2006).

In management research, the concept of absorptive capacity has been used to refer to the ability to acquire, assimilate, transform and exploit knowledge for innovation (Cohen and Levinthal, 1989, 1990; Lane et al., 2006; Zahra and George, 2002). On one hand the ability to acquire and assimilate knowledge (potential absorptive capacity) provides firms with strategic flexibility and opportunities for adaptation in high-velocity environments, while on the other hand the ability to transform and exploit knowledge (realized absorptive capacity) provides firms with the ability to generate innovation outputs based on the knowledge they have acquired and assimilated (Zahra and George, 2002). This literature has mostly focused on innovation in large organizations and has suffered from something of a reification of the concept of absorptive capacity (Lane et al., 2006; Patterson and Ambrosini, 2015; Spithoven et al., 2011).

Despite obvious similarities between these two streams of literature, few attempts have been made to reconcile them and adapt them to the context of new ventures. A notable exception is work by McKelvie and colleagues (McKelvie and Wiklund, 2004; McKelvie et al., 2007), who studied the role of absorptive capacity for innovation and adaptation in dynamic markets. Like the majority of studies on absorptive capacity their studies focused on innovation outcomes, which primarily reflect ventures’ realized absorptive capacity (Zahra and George, 2002). Less is known about how potential absorptive capacity, or perhaps more importantly, changes in potential absorptive capacity, influence the ability to identify opportunities in new ventures. This is an important concern for managers of new technology-based firms (NTBFs) who face the challenges of uncertain technological development and need strategic flexibility in order to adapt and survive in changing environments (Andries and Debackere, 2006; Roberts and Meyer, 1991; Candi et al., 2013). Furthermore, capability building in NTBFs is an important issue

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for policy makers and other actors supporting technology-based venturing, such as incubators and accelerators (Djokovic and Souitaris, 2008; Klofsten, 2005; Klofsten and Jones-Evans, 1996).

The purpose of the present work is to reconcile the two streams of inquiry to increase our understanding of the relationship between potential absorptive capacity and the identification of opportunities in new ventures. More specifically, we propose that potential absorptive capacity can be divided into two distinct dimensions, namely problem absorptive capacity and solution absorptive capacity, and hypothesize how changes in problem absorptive capacity and solution absorptive capacity, as well as their interaction, are related to opportunity identification in NTFBs. Doing this allows us to make three important contributions. First, we propose a nuanced view of how absorptive capacity promotes innovation outcomes by focusing on opportunity identification, which is a necessary but not sufficient condition for innovation outcomes, and the separate influences of problem absorptive capacity and solution absorptive capacity. Second, we extend on previous studies of absorptive capacity by studying absorptive capacity in the context of new ventures, more specifically in new technology-based ventures. Finally, by bringing together the absorptive capacity literature and the entrepreneurship literature we increase conceptual clarity for studying the evolution of opportunity identification and exploitation from early stage entrepreneurship to new venture growth.

This article is structured as follows. First, a theoretical framework and hypotheses are developed. Second, the methods used to test the hypotheses are described, and finally, the results are presented, followed by discussion and conclusions.

2. Theory and hypotheses

2.1. Opportunities, innovation and absorptive capacity

Despite a focus on the opportunity concept in entrepreneurship research, it is fair to say that there has yet to emerge a consensus on its definition or meaning. Following Casson (1982); Shane and Venkataraman (2000) define entrepreneurial opportunities as “those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production” (p. 220). They add that entrepreneurial opportunities should be viewed as a subset of a larger set of profitable opportunities, the distinctive characteristic of entrepreneurial opportunities being the discovery of new means-ends relationships. Means-ends relationships are relationship between results sought through action (ends) and the means that serve to attain these results (von Mises, 1998). New means-ends relationships may include new means, new ends, or new ways of linking the two to satisfy human wants. Shane and Venkataraman (2000) further argue that opportunities are objective phenomena, not known to all parties at all times, because their recognition is a subjective process. The discovery of an opportunity occurs when a conjecture is made about differences in the current and future value of resources, and if the conjecture is correct, entrepreneurial profits are created, but if the conjecture is wrong, losses are incurred.

Sarasvathy (2003) offers what seems to be a similar definition, but takes a fundamentally different stance in terms of the ontology of the opportunity. She defines an entrepreneurial opportunity as consisting of a “set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them” (p. 142, italics in the original). Ideas refer to conjectures—correct or not—about how economic ends can be achieved. Beliefs refer to judgments of conditions favorable to the achievement of sought ends. Actions refer to the generation and implementation of the sought ends through the introduction of new economic artifacts, such as goods, firms, markets or institutions. By including cognitive aspects of the opportunity, Sarasvathy (2003) presumes an actor “for whom it is perceived as an opportunity” (p. 143, italics included in the original), which makes it a subjective phenomenon. By including action, Sarasvathy (2003) argues that she transcends a purely subjective or objective notion of the opportunity, since the meaning of the opportunity is obtained through individual action in the real world, within which it has to take shape.

Despite the difference between the two ontological assumptions discussed above, the two definitions appear to differ less as regards the degree and kind of novelty required for an opportunity to be considered an entrepreneurial opportunity. In both positions, entrepreneurial opportunities are required to be innovative, e.g., opportunities for introducing new goods into the economy or new methods of supplying them (Schumpeter, 1934). This requirement has consequences for the cognitive aspects of the opportunity. It requires ideas about the new goods or methods being proposed, how they create economic value and how appropriation of returns takes place (Holmén et al., 2007). This means that information such as information about price differences is not sufficient; entrepreneurs also need to possess and act upon knowledge about products, customers and markets.

In this work we define entrepreneurial opportunities as consisting of a set of ideas and beliefs about creating economic value and appropriating returns through innovation. We stress the subjective and cognitive aspects of the opportunity by representing it as individuals’ ideas and beliefs; ideas and beliefs whose validity has yet to be confirmed, altered or denied. Action is not considered to be a part of the opportunity, but instead, the ideas and beliefs are opportunities for action and can be refined, revised, or abandoned through action.

Representing entrepreneurial opportunities as individuals’ ideas and beliefs provides a direct connection between knowledge and opportunities. This is empirically demonstrated by Shane (2000) as he describes how the opportunities recognized by eight different entrepreneurs, when becoming aware of the same invention, were shaped by the entrepreneurs’ prior knowledge, leading to vastly different applications of the invention.

Similarly, Cohen and Levinthal (1989, 1990) point to the double role of research and development (R & D) for innovation. They argue that not only are investments in R & D necessary for firms to translate or adapt external knowledge to their specific needs, but also determine firms’ learning ability, or absorptive capacity. The knowledge that the firm is able to “identify, assimilate, and exploit” (Cohen and Levinthal, 1989, p. 569) from the environment is dependent on the knowledge accumulated previously through R & D activities (Cohen and Levinthal, 1990). Thus, firms’ absorptive capacity will influence their ability to innovate as it determines the extent to which they can take advantage of external knowledge.

Zahra and George (2002) provide a reconceptualization of the absorptive capacity concept equating it with four organizational capabilities, which taken together produce a dynamic organizational capability. The four organizational capabilities are acquisition, assimilation, transformation, and exploitation each builds on the other in a sequential way. Zahra and George also make a distinction between potential absorptive capacity and realized absorptive capacity. Potential absorptive capacity represents the capability to value and acquire external knowledge, whereas realized absorptive capacity represents the capability to transform and exploit external knowledge. They base this distinction, among other things, on the observation made by Baker et al. (2003), who found that some firms possess a strong understanding of technical problems and how to solve them, but lack the ability to transform this knowledge into successful innovation strategies.

The distinction between potential absorptive capacity and realized absorptive capacity is similar to the distinction between the knowledge needed to identify opportunities and the knowledge necessary to exploit them (Politis, 2005). Thus, one would expect an increase in potential absorptive capacity to increase the ability to identify entrepreneurial opportunities, whereas an increase in realized absorptive capacity would increase the ability to exploit them. In this paper we focus exclusively on potential absorptive capacity as we are only concerned with the identification of opportunities.
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