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## Toward a better understanding of crowdfunding, openness and the consequences for innovation

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### ABSTRACT

Crowdfunding is now a commonly used tool for innovating entrepreneurs, yet many unresolved questions surrounding crowdfunding's effect on innovation remain. Often, crowdfunding backers play an active role in the innovation conversation. Thus, crowdfunding can be viewed as one form of open search (actively seeking out ideas from outsiders). Beyond open search, backers also generate word of mouth awareness for the crowdfunded product. Crowdfunding backers can be thought of as the earliest possible adopters, who may be even more valuable than traditional early adopting consumers. In this study, data pertaining to crowdfunded products from the Kickstarter platform is coupled with survey data from the respective innovating entrepreneurs to better understand the effects of elements of crowdfunding on the subsequent market success of the crowdfunded product as well as the innovation focus of the crowdfunding organization. Results indicate that the *amount of funding* raised during a crowdfunding campaign does not significantly impact the later market performance of the crowdfunded product, while the *number of backers* attracted to the campaign does. Open search depth (drawing intensely from external sources) enhances product market performance, while open search breadth (drawing from many external sources) induces a radical innovation focus. Interestingly, adverse effects from over-relying on external knowledge sources are not observed. The small size of the crowdfunding organizations in this study is seen as a boundary condition to previous findings of inverse U-shaped performance effects. Finally, the portion of product development complete when crowdfunding impacts the entrepreneurs' subsequent focus on radical innovation.

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### 1. Introduction

Crowdfunding has quickly evolved into a commonly used vehicle to help innovating entrepreneurs get products developed and is one of the ways that innovative, small organizations have been able to access capital since the financial crisis (Lee et al., 2015). Crowdfunding campaigns conducted via Kickstarter alone have raised over \$2B in pledges from millions of backers since the platform's inception in 2009 (Kickstarter, 2015). While crowdfunding has generated both tremendous public interest and financial backing, questions around crowdfunding and innovation are largely unanswered, both with respect to how elements of crowdfunding impact the success of the crowdfunded product once it is released to the market and with respect to how crowdfunding shapes the entrepreneurial organization's future innovation efforts. While it

might be intuitive to look at crowdfunding as a primarily financial exercise, we view the true value of crowdfunding as the ability to learn from backers and to use them as ambassadors for the crowdfunded product. To the authors' knowledge, this study is the first to investigate the effects of elements of crowdfunding on subsequent innovation outcomes. While research on crowdfunding has progressed in recent years (e.g., Agrawal et al., 2014; Belleflamme et al., 2014; Calic and Mosakowski, 2016; Mollick, 2014), examining the subsequent outcomes from crowdfunding is a necessary step to better understand crowdfunding's influence on technological innovation.

Since crowdfunding backers often take an active role in the innovation conversation (Mollick, 2016; Stanko and Henard, 2016), we view crowdfunding as one element of open search (actively seeking ideas from outsiders). Due to an inherent lack of resources, entrepreneurs and startups often turn to open innovation tactics out of necessity as it can be overwhelming for them to try to conduct product development activities in isolation (Henkel, 2006; Van de Vrande et al., 2009). Thus, we look to the growing open innovation literature to develop our conceptual framework. However, there

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are other benefits from crowdfunding (beyond open search) such as the word of mouth benefit that may come from having a large group of crowdfunding backers. Given this, we take an inclusive perspective to understanding the potential benefits and drawbacks of crowdfunding, rather than restricting ourselves exclusively to open innovation based arguments.

Backers are central to understanding crowdfunding's potential innovation effects. Crowdfunding allows early stage entrepreneurs access to capital; yet, it also allows them to potentially engage with a large number of individuals in ways that were previously unavailable. Crowdfunding backers not only offer their money, but also their opinions. Backers often want to become engaged in product development alongside the innovating entrepreneur, as that experience is typically considered by backers to be a rewarding part of the process (Agrawal et al., 2014; Gerber et al., 2012). This injection of large numbers of external voices into the product development process has the potential to dramatically impact innovation efforts. On one hand, backers' opinions could convince entrepreneurs to develop products closer to what is currently visible in the marketplace, effectively discouraging risk taking and dampening innovation. Conversely, backers could voice divergent or creative ideas that might lead to a heightened focus on radical innovation.

Given this dynamic, *open search* – the term used to describe the process by which organizations actively seek out ideas from outsiders – is thought to be a driver of key outcomes for crowdfunding innovators. Organizations draw from external entities, such as customers, suppliers, consultants and universities to aid their innovation efforts (Chesbrough, 2003). While previous research has focused on the outcomes of open search (e.g., Lee et al., 2010; Love et al., 2011; West et al., 2014), this research has not yet extended to the particular case of crowdfunding – despite an acknowledged need to better understand the effects of open innovation on startups (Lee et al., 2010). Crowdfunding can be viewed as an embodiment of the open innovation paradigm, given that backers often offer their personal opinions to the innovating entrepreneurs. Building on prior research into the performance effects of open search (e.g., Laursen and Salter, 2006; Lee et al., 2010) and informed by knowledge creation theory (KCT; Grant, 1996; Nonaka et al., 2000), we examine how both open search depth (the number of information sources used extensively for innovation) and open search breadth (the total number of information sources turned to for innovation) impact the innovating organization. As have other studies focused on open search (e.g., Chiang and Hung, 2010; Laursen and Salter, 2006), we ground our arguments in the organizational learning literature related to exploration and exploitation (see March, 1991). In some ways, the very permeable membrane between backers and the innovating organization (for instance, backers have worked side by side on product design with innovating entrepreneurs; Lewis-Kraus, 2015) makes crowdfunding an ideal context to explore questions regarding open search's effects on innovative outcomes. Extant research (e.g., Belderbos et al., 2010; Laursen and Salter, 2006; Salge et al., 2013) has found evidence of inverse U-shaped performance effects for larger organizations, whereby an over-reliance on openness can have negative performance implications. We believe that startups and very small businesses (common to crowdfunding initiatives) likely constitute a boundary condition to the noted inverse U-shaped effect. For these small businesses with limited knowledge built up inside the organization, we argue and subsequently demonstrate that there are not significant adverse performance effects to over-relying on external knowledge sources.

Research into the innovation implications of crowdfunding is in its infancy (Agrawal et al., 2014). The goal of this research is to broadly understand crowdfunding's subsequent effects on both the success of the crowdfunded product as well as on the entrepreneurial organization. Given this, our first outcome of inter-

est is *product market performance* (De Luca and Atuahene-Gima, 2007), defined as the degree of financial success experienced once the crowdfunded product is launched. Further, we posit that a firm's interaction with backers and other innovative outsiders via open search activities has the potential to impact their focus on radical innovation in future efforts (i.e., one to two years after the crowdfunding campaign). As such, our second outcome of interest is the organization's *radical innovation focus* (McGrath, 2001), defined as the degree that the organization focuses on radical innovation in subsequent efforts. Importantly, radical innovation focus concerns the product development activities that occur within the organization, and not strategy, culture, goals, or aspirations regarding future radical innovation, which are outside of this construct's conceptual domain. A better understanding of the implications for both these outcomes will prove valuable to crowdfunding entrepreneurs and can inform a broader policy discussion focused on encouraging innovation through crowdfunding while ensuring protection for various stakeholders.

In the following sections, we present a primer on crowdfunding and develop the conceptual foundation for each of the variables of interest. Hypotheses are presented, followed by a discussion of our methodological approach, which combines webscraped data on crowdfunded products from Kickstarter with a later survey of the respective innovating entrepreneurs. The manuscript concludes with a presentation of the results and implications for researchers, practitioners and policy makers. In summary, we hypothesize and empirically show that while the number of backers attracted to a crowdfunding campaign positively impacts the market success of the crowdfunded product, the amount of funding raised does not have a significant effect. Backers have importance beyond their financial contributions. Further, while open search breadth fosters a radical innovation focus, depth supports product market performance. We also show that the effect of breadth on radical focus is contingent on the portion of crowdfunding complete at the time of crowdfunding.

## 2. Crowdfunding and innovation

Crowdfunding takes several forms, such as equity-based, reward-based, lending-based and donation-based (Belleflamme et al., 2013). While lending-based crowdfunding generates substantial funding globally (Massolution, 2015), equity and reward-based crowdfunding have garnered the most interest with respect to their implications for innovation (e.g., Cholakova and Clarysse, 2015). Equity-based crowdfunding, in which investors receive an ownership stake, has grown in recent years in part due to the Jumpstart Our Business Startups (JOBS) Act. Equity-based crowdfunding websites (e.g., Crowdcube, CircleUp) are expanding, but remain relatively smaller (volume-wise) than reward-based crowdfunding sites (e.g., Kickstarter, Indiegogo). Reward-based crowdfunding offers a relatively risk free way for entrepreneurs and startups to generate new product awareness and gauge potential market response. In reward-based crowdfunding, backers typically pre-order the product being developed (or a different reward) in exchange for tiered levels of financial support. Generally, there is an expectation in reward-based crowdfunding that backers will be exposed to the product development process through ongoing updates and have the opportunity for direct communication with the innovating entrepreneurs (Agrawal et al., 2014; Gerber et al., 2012). Thus, with reward-based crowdfunding, backers represent a potential source of knowledge flow to innovating entrepreneurs that can be facilitated by open search tactics. While all forms of crowdfunding may be relevant to innovating entrepreneurs and startups, the focus of this research is on the relatively larger population of organizations conducting reward-based crowdfunding to

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