



Localized competition in the knowledge spillover theory of entrepreneurship



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ARTICLE INFO

Article history:

Received 14 April 2011

Received in revised form 15 October 2012

Accepted 19 October 2012

Available online 17 November 2012

Field Editor: M. Minniti

Keywords:

Knowledge spillovers

New ventures

Geography

ABSTRACT

The knowledge spillover theory of entrepreneurship predicts that the relationship between new knowledge and entrepreneurial activity depends on the commercialization efficiency of incumbents. We extend the theory to contend that localized competition impedes entrepreneurial activity by reducing the incentive to exploit new knowledge, and we test this conjecture using spatial panel estimation. We find a positive relationship between new knowledge and entrepreneurial activity, which is negatively moderated by localized competition. We also find that greater agglomeration counteracts the moderating effect localized competition has on the relationship between new knowledge and entrepreneurial activity.

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1. Executive summary

The knowledge spillover theory of entrepreneurship (KSTE) explains the formation of new firms resulting from new knowledge created by incumbent firms (Acs et al., 2009a). The KSTE predicts that knowledge-driven entrepreneurial activity will be greater in regions where knowledge investments are higher depending on how efficiently incumbent firms commercialize the new knowledge they create (Audretsch et al., 2006). Studies corroborate the predicted effect of new knowledge, but as of yet, there is little evidence that incumbents' commercialization efficiency impedes the formation of new firms.

Our main contention is that the focus on commercialization efficiency as a constraint on the entrepreneurial opportunities available for *discovery* causes the KSTE to overlook the factors that reduce an entrepreneur's incentive to *exploit* the opportunity she does discover. Thus, in this study, our main effort is to generalize the KSTE and improve its plausibility as a regional model of entrepreneurship while preserving much of the theory's core logic. We do this by integrating Jane Jacobs' premise of localized competition into the KSTE (Feldman and Audretsch, 1999; Glaeser et al., 1992; van der Panne, 2004). According to Jacobs' view of knowledge externalities, intense local competition for knowledge begets more innovation and drives the emergence of many new ideas. While Jacobs' view implies that the local pool of knowledge expands with localized competition, we conjecture that localized competition also suppresses entrepreneurship as entrepreneurs increasingly forgo starting new firms when facing greater local rivalry for the same ideas. To corroborate this argument, we explore a key factor that counteracts the entrepreneurship-impeding effect of localized competition by suggesting that the density of a region facilitates access to knowledge and other resources and speeds new venture creation.

Our findings are broadly consistent with Jacobs' (1969, 1984) concept of localized competition. First, using simultaneous equations, we find that greater localized competition leads to more knowledge and higher rates of knowledge-driven entrepreneurship. Second, we find that the positive relationship between new knowledge and high-tech firm birth rates is negatively moderated by greater localized competition. This evidence supports the premise that localized competition has a two-fold effect on knowledge-driven entrepreneurship not only by increasing the pool of opportunities available for discovery by

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entrepreneurs but also by reducing the share of these opportunities entrepreneurs exploit. Finally, as expected, we find that population density blunts the moderating effect of localized competition.

This paper offers three contributions to the development of the KSTE. First, we generalize the core model of the KSTE to encompass a broader type of entrepreneurial activity than the theory currently captures. In particular, we show that while the extant KSTE is a plausible theory for new ventures like Martek Biosciences as spinoffs from incumbent firms, our extension of the KSTE captures the entrepreneurial activity exemplified by the case of the graphical user interface Xerox developed. Second, we enhance the plausibility of the KSTE as a regional framework by developing a model that explicitly includes the knowledge created by universities. That is, unlike the extant variants of the KSTE, all the knowledge created by universities and private industry is “in play” for entrepreneurial discovery, and the likelihood of exploitation is subject to competition for opportunity. Finally, we explicitly address the subtle disconnect in the KSTE between behaviors theorized at the individual level and hypotheses derived at the regional level.

2. Introduction

While knowledge spillovers are widely accepted as a driver of new venture creation, a complete and satisfactory picture of how knowledge spillovers seed new ventures remains elusive. Among the puzzle pieces missing is a full theoretical account of the complex relationship between incumbent firms and entrepreneurs in their pursuit of knowledge-driven opportunities. Thus, the purpose of the knowledge spillover theory of entrepreneurship (KSTE) is to understand and explain the formation of new firms resulting from the new knowledge created by incumbent firms (Acs et al., 2009a).

The core premise of the KSTE is “that new knowledge and ideas created in one context, such as a research laboratory in a large corporation or a university, but left uncommercialized or not vigorously pursued by the source, generates entrepreneurial opportunities” (Audretsch et al., 2006, p. 39). The KSTE explicitly incorporates Arrow's (1962) premise that harnessing the value of new knowledge requires its conversion into economic knowledge by the commercialization capabilities of incumbent firms or the process of creating new ventures (Braunerhjelm et al., 2010). In addition, the KSTE builds on the premise that the spillover of knowledge—especially its tacit component—is spatially bounded (Howells, 2002). The KSTE predicts that knowledge-driven entrepreneurial activity will be greater in regions where knowledge investments are higher depending on how efficiently incumbent firms commercialize the new knowledge they create (Audretsch et al., 2006). Studies corroborate the predicted effect of new knowledge, but as of yet, there is little evidence that commercialization efficiency impedes the formation of new firms.

While the lack of evidence for the efficiency conjecture is partly due to difficulty in measuring a firm's commercialization efficiency, we explore a different mechanism that impedes knowledge-driven entrepreneurship not presently addressed in the KSTE. Currently, the KSTE argues that incumbents limit the formation of new firms by restricting the opportunities available for entrepreneurial *discovery* (i.e., the knowledge created but not exploited by the incumbent) but does not yet encompass the competitive dynamic that would limit the *exploitation* of opportunities manifested in knowledge spillovers. In particular, the KSTE presently omits the possibility that an entrepreneur may choose not to exploit an opportunity when facing intense competition for the same opportunity (Casson, 2003). This issue is most apparent in the context of the knowledge created by a university. The entrepreneur's decision to start a new firm based on university knowledge is influenced by the extent to which such rivalry erodes the expected profits of the opportunity (Rothaermel et al., 2007).

The purpose of this paper is to extend the KSTE, to encompass the localized competition for new knowledge, and to explore the effects of such competition in impeding entrepreneurial activity at a regional level of analysis. We do this by integrating Jane Jacobs' premise of localized competition into the KSTE (Feldman and Audretsch, 1999; Glaeser et al., 1992; van der Panne, 2004). According to Jacobs' view of knowledge externalities, intense local competition for knowledge begets more innovation and drives the emergence of many new ideas. While Jacobs' view implies that the local pool of knowledge expands with localized competition, we conjecture that localized competition also suppresses entrepreneurship as entrepreneurs increasingly forgo starting new firms when facing greater local rivalry for the same ideas. To corroborate this argument, we explore a key factor that counteracts the entrepreneurship-impeding effect of localized competition by suggesting that the density of a region facilitates access to knowledge and other resources and speeds new venture creation.

This paper offers three contributions to the development of the KSTE. First, we generalize the core model of the KSTE to encompass a broader type of entrepreneurial activity than the theory currently captures. In particular, we show that while the extant KSTE is a plausible theory for new ventures like Martek Biosciences as spinoffs from incumbent firms, our extension of the KSTE captures the entrepreneurial activity exemplified by the case of the graphical user interface Xerox developed. Second, we enhance the plausibility of the KSTE as a regional framework by developing a model that explicitly includes the knowledge created by universities. That is, unlike the extant variants of the KSTE, all the knowledge created by universities and private industry is “in play” for entrepreneurial discovery, and the likelihood of exploitation is subject to competition for opportunity. Finally, we explicitly address the subtle disconnect in the KSTE between behaviors theorized at the individual level and hypotheses derived at the regional level.

The remainder of the paper is organized as follows. Following this introduction, we incorporate localized competition into the KSTE and derive several hypotheses. Foremost among these hypotheses is that the contribution of new knowledge to a region's level of entrepreneurial activity is negatively moderated by localized competition for knowledge. Next, we detail the data and methodology for testing these hypotheses and then report the results of the empirical analysis. Finally, we discuss the implications of our findings and offer suggestions for future research.

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