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Paper Title: Does industrial diversity promote innovative entrepreneurship? A study of United States metropolitan areas

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Extended abstract

Theoretical background

The link between cities and economic growth requires further elucidation (Polèse, 2006; Taylor, 2006) and remains topical in the context of a predominantly urban and still rapidly urbanizing world. ‘Jacobs economies’ encapsulate the idea that economically diverse and turbulent cities grow more (Glaeser, Kallal, Scheinkman, & Shleifer, 1992). Since 1992, Jacobs economies have consistently been evaluated as the linkage between industrial diversity and economic growth (Beaudry & Schiffauerova, 2009). This stream of research has been nested within the broader framework of innovation as the primary engine of growth. Accordingly, innovation has been viewed as the almost exclusive mediator between diversity and growth.

However, Jacobs’s (1969) own narrative of urban dynamics clearly establishes innovative entrepreneurship rather than ‘generic’ innovation as the source of growth. What may have appeared initially as a benign difference has become increasingly difficult to brush over in the context of three observations. Firstly, entrepreneurship, in the form of the growth of select young firms, has been shown to be the almost exclusive source of employment growth, at least in the United States (Decker, Haltiwanger, Jarmin, & Miranda, 2014). Secondly, more "creatively destructive" entrepreneurship can be associated with the rise of the knowledge economy (Wennekers & Thurik, 1999). The ensuing rise of the digital economy appears to intensify similar factors of creative destruction (as Yoo, Boland, Lyytinen, & Majchrzak, 2012 illustrates). Thirdly, innovation tends to be measured upstream of the innovation process (as formal R&D spending or patent registrations), with associated strong biases toward invention (which precedes innovation and focuses on technology at the expense of other areas of innovation) and large established innovators (whether firms, governments, or research institutions) (Ratanawaraha & Polenske, 2007). Thus, both economic fundamentals and recent economic trends indicate that innovative entrepreneurship is important, but it is not well captured by traditional metrics of innovation.

A large literature has been devoted to how innovation is stimulated by diversity, which enables imitation, sharing, and recombination of ideas and practices across industries
Such knowledge spillovers likewise support innovative entrepreneurship (Desrochers & Leppälä, 2011) and even more specifically firm formation (Oort & Stam, 2006).

Furthermore, the benefits of diverse economic activities are organizational as much as they are cognitive (Jacobs, 1969). The organizational economies of diversity, such as heightened competition or the availability of corporate service offerings, are especially important for entrepreneurs (Chinitz, 1961; Scott, 2006), who emphatically depend on market access and external resources for success.

However, in the opposite direction, entrepreneurship can also lead to industrial diversification, as entrepreneurs regularly pioneer entirely new activity branches (Neffke, Henning, & Boschma, 2011). As a result, diversity and entrepreneurship can appear interlocked in cities (Chinitz, 1961). This pattern poses the challenge of extricating the mutual influences of diversity and entrepreneurship. According to the framework of related variety, past technological trajectories make intra-sectoral knowledge spillovers more relevant to innovation (Frenken, Oort, & Verburg, 2007), but may confine it to a pattern of path-dependency. Conversely, entrepreneurial innovation can be understood as relatively uninhibited by past technological trajectories and current sectoral boundaries (Desrochers & Leppälä, 2011; Jacobs, 1969) and thus potentially ‘surprising’ (Kirzner, 1997) and disruptive (Schumpeter, 1943). From this less deterministic perspective, greater diversity is always better for entrepreneurship, which is in turn freer to lead to greater diversification.

**Research questions**

Empirically, the link between industrial diversity and entrepreneurship remains a black box in need of unpacking (Desrochers & Leppälä, 2011). This gap fits in a more general pattern in economic geography and regional economics of paying much more attention to innovation than to entrepreneurship.

To advance our understanding of Jacobs economies, Desrochers and Leppälä (2011) advocate the exploration of the micro-foundations of the knowledge spillovers of industrial diversity for entrepreneurship. However, our study constitutes a preliminary step to first establish empirically that innovative entrepreneurship is indeed a component of Jacobs economies at the scale of cities.

Industrial diversity has traditionally been relied upon to capture the sources of Jacobs economies in condensed form (as reported e.g. in Beaudry & Schiffauerova, 2009). However, our study separates out a new component in the form of innovative entrepreneurship, before proceeding to investigate whether industrial diversity leads to more innovative entrepreneurship. We believe this relationship is in keeping with a faithful reading of Jacobs (1969).

Accordingly, special attention is devoted to the development of a metric of innovative entrepreneurship. The bulk of new firms may be considered imitative and oriented towards limited growth, rather than innovative and oriented towards high growth. The difficulty in
empirically separating innovative entrepreneurship from the rest may explain the relative neglect of entrepreneurship as a source of growth in the scholarship of economic geography.

**Methodology**

Our method consists in a large-sample statistical analysis of the correlation between industrial diversity and innovative entrepreneurship across all metropolitan areas of the United States. Innovative entrepreneurship is measured as a count of innovative firm births distilled from CrunchBase, a worldwide database of declared new ventures and their funding. Birth is based on headquarter organization founding date. Entrepreneurial innovativeness (in the sense of an effort to innovate) is inferred from the pursuit of venture capital. In several ways, this metric presents a view of innovation which complements that of conventional metrics like R&D spending and patent registrations. Firstly, it skews downstream of the innovation process toward implementation and marketing instead of upstream toward invention. Secondly, it focuses on firm formation instead of large established firms.

Moreover, conventional metrics bias toward physical technology (Ratanawaraha & Polenske, 2007), whose development and production benefit from scale. By contrast, late value creation has increasingly centered on virtual goods and services, which are associated with the more entrepreneurial and relatively scale-independent structure of the knowledge and digital economy. Fittingly, our metric is more likely to capture more diverse forms of innovation across more diverse industries, including those which have lately focused more (the most) value creation.

We represent industrial diversity as dispersion across industries (calculated as an inverse Herfindahl-Hirschman index), which we apply conventionally to total local employment, and additionally to the total count of local firms. CrunchBase does not provide a readily usable industrial classification of firms, so that we are unable at this stage to control for relatedness between new firms and existing ones or in other words for economies of specialisation.

**Results/findings**

Our analysis finds a positive correlation of the level of innovative firm births with industrial diversity across U.S. metropolitan areas between 1999 and 2016, controlling for local employment size. This relationship is susceptible to endogeneity because new firms are themselves a source of industrial diversification. However, causality flow from diversity to entrepreneurship is supported because the independent variable of industrial diversity is much more stable than the relatively volatile dependent variable of firm births and because the independent variable represents an entire population whereas the dependent variable only represents a sample of declared data.

This result supports the validity of the innovative-entrepreneurship construct and the positive contribution of industrial diversity to innovative entrepreneurship in cities. In doing so, it provides the first empirical evidence that Jacobs economies do indeed comprise innovative
entrepreneurship. Moreover, innovative entrepreneurship is a more precise metric of innovation and adheres closely to Jacobs’s original thesis. A limitation of our approach is an inability to control for relatedness between the existing industrial base and new firms.

More broadly, because entrepreneurship is so central to economic growth (Decker et al., 2014), this finding supports the importance of industrial diversity as a source of growth in cities and the debated (Polèse, 2006; Taylor, 2006) role of (large diversified) cities as the “primary economic organs” (Jacobs, 1969, p. 6).

Significant/general conclusions

Our study introduces the new construct of innovative entrepreneurship to the scholarship of Jacobs economies, and thereby reinstates an almost forgotten (except by Desrochers & Leppälä, 2011) yet central component of Jacobs’s thesis. The construct clarifies and extends our understanding of Jacobs economies, and enables the corroboration of Jacobs’s thesis that the diversity and density of economic activities found in cities promote entrepreneurial innovation and economic growth. At the same time, the study furthers the geographical analysis of entrepreneurship, which appears under-researched relatively to its economic importance.

The study opens multiple avenues for further data-backed research on urban entrepreneurship: on the topic of Jacobs economies by tweaking the research design in multiple possible directions; more widely in the field of economic geography by exploring a class of entrepreneurship-related phenomena, including under-researched ones; and perhaps even beyond economic geography by leveraging a newfound capability to empirically separate innovative entrepreneurship from entrepreneurship.

References


