The impacts of spatial positioning on regional new venture creation and firm mortality over the industry life cycle

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ABSTRACT

The conventional explanation of the geographic concentration of economic activities attributes the persistence of industry clusters to the local agglomeration externalities within each cluster. By overemphasizing local agglomeration externalities, the existing literature essentially treats clusters as separate and isolated entities and thus risks overlooking competitive and collaborative dynamics across clusters. We argue that the spatial distribution of an industry matters as well because regional competitiveness is affected not only by its local agglomeration externalities but also by the agglomeration externalities in nearby clusters. Furthermore, to complement previous agglomeration research, which tends to take a static view, the impact of spatial distribution on regional competitiveness is examined across two stages of the industry life cycle. The findings from a longitudinal study of Canada's telecommunication equipment manufacturing industry reveal that being close to strong agglomeration externalities in other places increases a place's ability to create more new ventures when an industry grows but decreases a place's ability to sustain existing firms and its ability to create more new ventures when an industry shakes out.

1. Introduction

Recent years have seen renewed interest among management scholars in economic geography (McCann & Folta, 2008; Sorenson & Baum, 2003) because of the profound implication of location for entrepreneurship (e.g., Ács & Varga, 2005; Gilbert, McDougall, & Audretsch, 2008) and competitive advantage (e.g., Shaver & Flyer, 2000). Substantial research effort has been devoted to understanding why firms in most industries tend to cluster in a few places rather than scatter in various locations (Dumais, Ellison, & Glaeser, 2002). Furthermore, recent research has focused on why startups agglomerate around certain types of incumbents (Tan & Tan, 2017). As an overarching framework, agglomeration theory suggests that co-located firms in industry clusters outperform isolated firms due to the benefits that they earn from knowledge spillovers and pools of labor and suppliers (Krugman, 1991; Marshall, 1920). An industry cluster is further sustained as it attracts more entrepreneurs from outside who are lured by regional economic externalities (Pe'er, Vertinsky, & King, 2008; Qian, Ács, & Stough, 2013) or creates more spinoffs from existing firms (Klepper, 2007, 2010). Empirical studies along these research lines typically emphasize heterogeneity across places and use the degree of

agglomeration of a region, often measured as the density of the local organizational population, as an independent variable to predict its capability to sustain existing businesses and/or attract new investments.

In a broader sense, the intellectual dialogue between business research and geography in the agglomeration literature comprises two categories: a theory of *place*, which emphasizes regional differences, and a theory of *space*, which examines the spatial distribution of business activities within an industry (Sorenson & Baum, 2003). Most existing empirical agglomeration studies prioritize differences across places (e.g., cities), such that they generally fall into the first category (e.g., Dumais et al., 2002). Despite the insights obtained from these studies, this emphasis on the theory of place unintentionally overlooks considerations of the spatial positions of places in space. As a result, agglomeration theory overlooks the possibility that regional advantages depend not only on how firms cluster in a place but also on how the place itself is geographically positioned in the spatial distribution of the industry. Specifically, a place's capacity to sustain existing businesses and/or attract new investments is affected not only by the place's local knowledge and resources but also likely by its proximity to and connection with other places with complementary resources. For example,

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even if two cities have the same degree of agglomeration of an industry, the competitiveness of the two cities can differ, depending on their distances to the other geographic centers of the industry. In other words, the *space* aspects of an industry's geographic distribution, such as the agglomeration economies in nearby places, can affect the competitiveness of a *place*. Without a thorough consideration of space, an analysis of place runs the risk of ignoring the interactions and dynamics among different places and creates a potential to confound agglomeration impacts. In other words, the conventional agglomeration wisdom, as representative of the theory of *place*, risks missing the forest for the trees in that it overlooks the competitive and collaborative dynamics across different places.

Another important issue residing in the place-space facets of agglomeration research that remains unclear is the condition of *time*, i.e., the impact of temporal dynamics on spatial distribution (Wang, 2017). Whereas previous agglomeration literature primarily takes a static perspective, a growing trend in this field is the incorporation of industry life cycle (ILC) theories in explaining the development of cities and regions (Boschma & Wenting, 2007; Potter & Wattsy, 2011; Wang, Madhok, & Li, 2014). The ILC is argued to play a critical role in determining the rise and fall of agglomerations across geographical space, and these two realms of theories are closely interrelated (Boschma & Frenken, 2006; Potter & Wattsy, 2011). Nevertheless, the theoretical convergence has been largely understudied in the current literature, with a few notable exceptions (Potter & Wattsy, 2011; Wang et al., 2014). For example, scholars have used ILC theories in conjunction with agglomeration theories to investigate agglomeration economies across various stages of the ILC (Potter & Wattsy, 2011), to compare spinoff dynamics and agglomeration economies in different phases of the ILC (Boschma & Wenting, 2007), to study the relationship between agglomeration economies and firm financial performance in early and late stages of the ILC (Kukalis, 2010), and to examine the conditioning effects of the ILC on the surviving and founding mechanisms of agglomerations (Wang et al., 2014). However, to the best of our knowledge, none of these studies investigated how the interplay between *place* and *space* is conditioned by temporal particularities. Given that agglomeration economies are argued to have different impacts on regional and economic development across different stages of an industry's evolution (Peltoniemi, 2011), it is therefore important and natural to examine the impact of spatial positioning on a place's competitiveness by taking an industry life cycle perspective. The growth/decline of one industry can be offset or mitigated by the growth/decline of adjacent agglomerations. Without scrutinizing the condition of temporal dynamics, research insights may be rather limited since each stage of an industry evolution would exert distinct impacts on how spatial proximity affects regional competitiveness.

As such, business research must consider both *place* and *space* to determine the true implications of geography under the condition of *time*. A theory of *space* in conjunction with *ILC theories*, with the spatial distribution of an industry as the explanatory variable, is thus needed to complement agglomeration theory. Certainly, such a theoretical advancement is beyond the scope of a single empirical study such as ours. However, as a small step toward that goal, this study investigates the following research questions: *how is a place's competitiveness affected by the place's spatial proximity to the agglomeration externalities in other places*, and *how are the impacts conditioned by temporal dynamics*? We examine a place's competitiveness as its ability to both attract new investments and to help existing firms survive market competition.

In the following sections, we first develop hypotheses to predict local new venture creation and firm survival according to a place's spatial position in an industry across different stages of industry evolution. We use data from Canada's telecommunication equipment manufacturing industry during a turbulent period (1995–2005) to test the hypotheses. The industry is geographically concentrated in a small number of Canadian municipalities, the equivalent of Metropolitan Statistical Areas (MSAs) in the United States. Because the businesses

and economies of different municipalities are relatively independent, according to Statistics Canada, this empirical context allows us to examine how the competitiveness of a municipality, a relatively independent economic region, is affected by other municipalities. Additionally, the widely acknowledged tipping point of the burst of the dot-com bubble in 2000 allows us to examine the conditioning effects of temporal dynamics. We attempt to incorporate the consideration of *space* and *time* into the existing agglomeration literature, which overemphasizes the *place* aspect, and thus provide a more holistic view of the phenomenon of industry geographic concentration.

2. Theory and hypotheses

2.1. Spatial distribution and agglomeration

Empirical studies of agglomeration confirm that firms engaged in similar businesses tend to cluster, even after controlling for the regional variations of natural resources (e.g., Audretsch & Feldman, 1996; Head, Ries, & Swenson, 1995; Rosenthal & Strange, 2003). The existing rationales for agglomeration effects center on the externality of co-location: by locating near one another, competing firms share access to greater demand (Marco-Lajara, Claver-Cortés, Úbeda-García, & Zaragoza-Sáez, 2016; McCann & Folta, 2009), a pool of specialized labor and suppliers, and knowledge spillovers (David & Rosenbloom, 1990; Fu, 2012; Hoover, 1948; Krugman, 1991; Marshall, 1920). The proposed benefits of agglomeration are generally confirmed by empirical evidence (Ciccone & Hall, 1996; Henderson, 2003; Rotemberg & Saloner, 2000); thus, the practical implications of agglomeration theory seem clear. Locating a business within industry clusters, co-located with related firms, offers a firm competitive advantage over its more isolated competitors.

However, the determination of the geographic boundaries of an industry cluster seems to be arbitrary (Martin & Sunley, 2003). As the literature suggests, they can be measured "at several geographic levels (for example, nations, states, metropolitan regions and cities)" (Porter, 1998b, p. 204) and even "extend to cover a network of neighboring countries" (McCann & Folta, 2008, p. 541). In the case of information technology, both San Jose and San Francisco as well as many other smaller surrounding cities, nestle in the so-called Silicon Valley in northern California. One can afford to ignore the competition and cooperation dynamics between these cities when the place is defined at an aggregate level, i.e., Silicon Valley. However, when cities or sub-regions become the unit of analysis, this approach will leave open the question of why some cities rise and others fall in the same region as a result of cross-city competition and cooperation. By treating these sub-regions as separate entities, one's assumptions dismiss the possibility that these sub-regions host interdependent local business activities whose economic impacts can stretch outside the sub-regions (Kukalis, 2010), which is not a problem if some real barriers, such as legal restrictions and tax policy, sharply limit the interactions between economic regions. However, if regional borders do not present such strong barriers, then empirical investigation of a place's agglomeration economies must account for the possible competition and cooperation dynamics across places (Chen & Yeh, 2012; Cuervo-Cazurra, de Holan, & Sanz, 2014). Using the terminology proposed by Pouder and St. John (1996), one may wonder why some cities become hot spots in a region whereas others remain blind spots as a result of cross-cluster dynamics.

Some scholars have begun to conceptualize the spatial distribution of industry clusters as a nested system where the scale of clusters is defined at a geographically definable level (e.g., cities), but at the aggregate level, these clusters are viewed as being nested in a regional-, national- or even global-level structure (Bathelt & Li, 2014). In such a nested system, both local networks within clusters, and the pipelines that link the clusters, must be explained and theorized in a manner that does not discount the power of localization (Sturgeon, Van Biesebroeck, & Gereffi, 2008). Therefore, the agglomeration literature, which has