



Cluster life cycle and diaspora effects: Evidence from the Indian IT cluster in Bangalore

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ABSTRACT

The role of local clusters has been of interest to scholars and policymakers in international business alike. Research found that clusters enable a region to develop faster compared to dispersed economic activity, based mainly on a local concentration of competing and cooperating firms and sophisticated domestic demand. Locating in a cluster has certain benefits for firms stemming from pooling of human capital and supporting institutions varying by industry and international specialization.

In this paper, we extend the local view of clusters and emphasize the complementary role of non-local linkages, in particular diasporas, illustrating our model employing the case of the evolution of the Bangalore IT cluster. The novelty of our paper lies in its longitudinal character. We are thereby able to identify how the roles of local and non-local networks differ across life-cycle phases; moreover, we find that diasporas can trigger or accelerate local development. We discuss implications for managers and policy makers.

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1. Introduction

Scholarship on the importance of clusters for the competitive advantage of firms emphasizes proximity and *local* conditions as determining factors (Porter, 1990; Tallman et al., 2004; Bell, 2005; Folta et al., 2006). In particular local social networks serve as a conduit for flows of (tacit) knowledge (Audretsch, 1998), resource mobilization (Stuart and Sorenson, 2003) and support institutions (Kenney and Patton, 2005). An important result for practitioners, cluster-based firms are shown to maintain a high pace of innovation and higher productivity compared to firms not located in clusters (Baptista and Swann, 1998).

This locally-focused approach, however, has limited explanatory power for more recent (technology) clusters. For example, Saxenian and Hsu (2001) make the case that the Taiwanese diaspora in Silicon Valley leveraged alumni networks to develop Taipei-Hsinchu as a semi-conductor manufacturing cluster. Similarly, US venture capital played a significant role in the development of IT firms around Tel Aviv (de Fontenay and Carmel, 2004). Ireland's IT industry grew partly thanks to the international division and specialization of labor (Arora et al., 2004).

More recently, scholars of economic geography have begun to address the role of non-local factors for the development of clusters (Wolfe and Gertler, 2004) and firms therein, both SMEs (Chiarvesio et al., 2004) and multinational companies (MNCs) (Yeung et al., 2006). In addition, management researchers have paid closer attention to specific non-local linkages through diasporas (Nanda and Khanna, forthcoming; Oettl and Agrawal, 2008; Zaheer et al., 2009). While Oettl and Agrawal discuss diasporas as one form of international labor mobility, Nanda and Khanna (forthcoming) and Zaheer et al. (2009) explicitly investigate the role of diasporas and find them to be a substitute for (lacking) local networks or cluster capabilities. However, none

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of these studies actually looked at the mechanisms concerning *how* the diaspora can influence developments in the home country and how that influence varies *over time*. To the best of our knowledge, there is no longitudinal research on the interplay of effects between local and non-local clusters and we aim to contribute towards closing this gap.

In this paper, we expand the view on diasporas as we investigate it through a more fine-grained approach, differentiating between direct and indirect effects on cluster evolution. In order to do so, we integrate cluster life cycle (CLC) theory and distinguish the different roles of the diaspora according to CLC phase. We disentangle the web of local and non-local connections and contribute to the ongoing theoretical discussion: our findings correspond to earlier studies about the relevance of diasporas and partially support [Zaheer et al. \(2009\)](#) and [Nanda and Khanna \(forthcoming\)](#) while adding further research on a more disaggregate level with regard to temporal and spatial dimensions. We also draw implications for practitioners; while managers might wish to rethink location decisions based on this disaggregate perspective and the role of diasporas and other non-local linkages, policy makers might need to consider anew their efforts and incentives to attract foreign MNCs in regional development initiatives.

The rest of the paper is structured as follows: first, we outline our theoretical framework integrating literatures on cluster life cycle with existing social tie-based explanations of clusters. We then illustrate our model using a case study of the Bangalore IT cluster life cycle and emphasize the role of the diaspora. We discuss our findings, deriving three propositions, and conclude with implications for practitioners and further research.

2. Theoretical framework

2.1. Clusters and local networks

The role of geography for economic development and firm performance has been studied at least since the late 19th century ([Marshall, 1890](#)). Rooted in classical economics, Marshall theorized that three primary benefits from division of labor and specialization occur to firms locating in clusters: access to a pool of specialized labor, access to a pool of specialized input providers—and knowledge spillovers among competitors. In recent years there has been a resurgence of the study of local clusters, defined as agglomerations of firms and institutions, and their relevance for the competitive advantage of firms ([Tallman et al., 2004](#); [Bell, 2005](#)). This view emphasizes proximity and *local* social networks as an important conduit for flows of (tacit) knowledge ([Audretsch, 1998](#)), resource mobilization ([Stuart and Sorenson, 2003](#)) and support institutions ([Kenney and Patton, 2005](#)) conferring competitive advantage to firms in clusters ([Porter, 1990](#); [Folta et al., 2006](#)). Cluster-based firms are shown to maintain a high pace of innovation compared to firms not located in clusters ([Baptista and Swann, 1998](#)), reinforced by high levels of employee mobility which accelerate tacit knowledge flows ([Saxenian, 1994](#)). However, clusters are also subject to congestion costs when density drives inflation and local networks ossify, stifling new ideas, relationships and innovation ([Bergman, 2008](#)).

Many cluster effects arise because the physical proximity of firms in clusters reduces transaction costs ([Coase, 1960](#)). Buyers, suppliers, service providers and specialists can reduce search, negotiation and contracting costs. In particular, sophisticated domestic demand provides the necessary stimulus to be at the forefront of technological developments and derive a competitive advantage ([Porter, 1990, 1998](#)). More recent cluster explanations focus on the intangibles involved in cooperation between firms and the movement of people between different employers. New forms of external economies like knowledge spillovers ([Almeida and Kogut, 1999](#)) have been proposed. They rely on social capital ([Maskell, 2001](#)), trust and highly enduring relational assets, such as technology spillovers, conventions, rules and shared language for the development and interpretation of knowledge ([Storper, 1997](#)). These derive from collective efficiency, social capital or some other form of social cohesiveness ([Uzzi, 1997](#)).

2.2. Cluster lifecycle

Cluster development is path-dependent: comparatively minor factors—‘historical accidents’—can influence future development disproportionately ([David, 1985](#); [Arthur, 1989, 1990](#)). Also, factors external to a cluster will influence its characteristics and growth, e.g., national legal systems, regional geographic characteristics or global resource markets. Nevertheless, most existing clusters appear to follow a similar cycle of birth, growth and stability, followed by a crisis that leads to decline or renewal.

[Malmberg and Maskell \(2002\)](#) summarize the typical development of a cluster: a single enterprise is located in the region of choice (usually the place of residence) of the founder; as the enterprise grows, spinoffs and imitators are founded in the local milieu; as Marshallian economies—scale economies of cluster benefits with growing size—set in, the cluster grows and attracts more firms, capital and specialized labor; local institutions develop to meet the needs of the growing cluster; and a distinct local industry culture develops; finally, new technological and market developments require the cluster to rapidly, often radically, restructure. At this point the cluster either reinvents itself, triggering a new growth phase; or it stagnates, eventually losing its competitive advantage.

This process is related to [Utterback and Abernathy's \(1975\)](#) technology life cycle model and [Klepper's \(1996\)](#) industry life cycle model. [Bergman \(2008\)](#) recently proposed a cluster life-cycle model based on these two models and a synthesis of relevant cluster literature: In the first phase, a cluster is seeded and comes into existence; in the second phase it expands—at first through exploration and aggressive innovation, later through consolidation, scaling up and exploitation of the resources developed in the cluster; in the final phase, the cluster reaches exhaustion when industry maturity becomes a threat to the cluster's continued viability; at this point it will either experience a lock-in or a renaissance. [Bergman \(2008\)](#) acknowledges that not all clusters

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