1042-2587

Start-Up Difficulties in Early-Stage Peripheral Clusters: The Case of IT in an Emerging Economy

Edward Kasabov

This paper studies the link between firm-level predicaments in high-technology start-ups and collective, cluster-level dynamics in early-stage peripheral locations. We investigate, first, the manner in which high-technology start-ups in early stage peripheral clusters accumulate and utilize resources; second, ways in which managers in start-up businesses and public sector officials work around inadequacies in order to move forward clusters composed mostly of high-technology start-ups; and third, the influence of such experiences on the development of clusters. Empirical findings from three IT clusters in Vietnam reveal resource inadequacies, private sector actors' inability to resolve such shortcomings, entrepreneurial passivity, risk aversion, and lack of confidence in governmental initiatives. These findings and the comparison with earlier studies about start-up difficulties in other high-technology peripheral locations form the basis for a theoretical framework of high-technology start-up difficulties in early-stage peripheral clusters.

Introduction

The association between start-up and firm-level dynamics on the one hand, and cluster-level formation and performance on the other, is under-researched in the entrepreneurship literature (Tan, 2006). Although studies about start-ups in clusters have recently grown in number (e.g., Delgado, Porter, & Stern, 2010; Gilbert, McDougall, & Audretsch, 2008; Tan), further research on the connection between difficulties at two distinct levels—individual companies and clusters—would add to the body of knowledge on high-technology clusters in peripheral areas (Kasabov, 2011), which face multiple obstacles in areas of unstable government, poorer education, and lack of business finance or technology, as well as geographical isolation. The formation of successful high-technology clusters is seen as a method of assisting peripheral locations, and governmental organizations around the world invest billions of dollars in promoting such initiatives (e.g., Broll & Roldán-Ponce, 2011; Virkkala, 2007). Such programs aimed at addressing poor local development and boosting employment (Rychen & Zimmerman, 2008; Spencer, Vinodrai,

Please send correspondence to: Edward Kasabov, tel.: 0044-798-1568528; e-mail: E.Kasabov@exeter.ac.uk.

DOI: 10.1111/etap.12058

Gertler, & Wolfe, 2010; Torre, 2008) include various European Union initiatives as detailed by the Observatory of European SMEs, among others (see http://www.ec.europa.eu). However, in spite of the proliferation of these initiatives, the precise linkages among firm-level and cluster-level dynamics and the development of peripheral locations are inadequately understood. Furthermore, the performance of high-technology industries and ambitious companies does not always meet expectations, as such companies and industries sometimes fail to act as engines of local and regional development (see Karlsen, Isaksen, & Spilling, 2011; Rosiello & Orsenigo, 2008). With analyses still prioritizing the study of established and successful locations, at the expense of the investigation of struggling start-ups in early-stage peripheral (e.g., Al-Laham & Souitaris, 2008; Gilbert et al.; McCann & Folta, 2011) and emerging locations (Cumbers, Leibovitz, & MacKinnon, 2007; Scheel, 2002), knowledge about significant factors that cause failure or stunted growth is needed.

In an attempt to address the above-noted gaps in entrepreneurship scholarship, this paper seeks to empirically explore the difficulties faced by high-technology start-ups in early-stage peripheral clusters in an emerging economy. While emerging and developing economies seek to emulate successful high-technology clusters in developed economies, some developing country authorities establish high-technology clusters without necessarily possessing the knowledge, resources, and experience needed for successful cluster formation (see Karlsen et al., 2011). This may be a problem not only in developing countries but also in developed economies where high-technology aggregates, such as IT clusters, have been championed in peripheral regions, and deindustrialized locations suffering from out-migration, high unemployment, deprivation, and in need of renewal and regeneration. Therefore, knowledge of why clusters and entrepreneurship in such locations may fail to flourish is not only important from a theoretical point of view but is also critical to managerial practice and public policy.

By analyzing these issues, the authors aim, first, to explore the interplay between public policy, start-up characteristics, and cluster performance in an emerging economy; and second, to empirically explore the possibility for a theory of entrepreneurship that takes into account levels of economic organization other than that of the individual enterprise. This is a non-mono-level approach to theorizing entrepreneurship that, although not being fully multilevel in the sense of analyzing three or more levels of business and economic organization, adopts aspects of the multilevel sensibilities advocated by Phan (2004), and Bøllingtoft and Ulhøi (2005). Such an approach remains less common, apart from a select few studies, including Delgado et al. (2010). The simultaneous conceptualization of start-up problems and cluster-level difficulties is also justified by our expectation that both types of obstacles may be attributable to common factors and may be closely related.

The specific setting of Vietnamese IT was chosen not just because of its periphery in geographical terms but also with respect to its innovation and commercial outputs, reflected in lower rankings of the clusters (Vietnamnet, 2012), their recent appearance, and the lack of academic research and practitioner reports on this phenomenon. The setting was conceptually attractive also because of its early stage of development and its potential to make a substantial contribution to a growing, dynamic economy not the least in view of the importance of IT sectors to development. By researching IT, it was also expected to uncover and report practices in terms of local innovation within research-intensive and innovative, entrepreneurial standalone businesses, rather than low-skill companies with low labor competencies operating in traditional manufacturing sectors, such as clothing and footwear. This is a relatively new and evolving sector that has not previously been studied and documented. Vietnamese IT clusters are currently being

formed within a developing industrial setting, and in a country that lacks the beneficial legacy of electronics and other types of manufacturing. Throughout the paper, the three case studies of Vietnamese IT clusters also provide an interesting context and an illustration of the gap between aspiration and achievement for those promoting clusters through indigenous entrepreneurship.

Two research questions have guided this research:

1. What issues do high-technology start-ups face in peripheral locations, and why?

While research in the entrepreneurship and cluster literatures details the role of resources in fostering entrepreneurial and cluster success, less well understood are, first, the link between resources and stunted entrepreneurial development; second, the association between resources and inhibited cluster growth; and third, the role that other factors may play in such dynamics. The last point is particularly pertinent, in view of the propensity of past entrepreneurship research to analyze and theorize resource deficiencies, and especially financial resource constraints, while downplaying the complexity of other sources of slow and impeded entrepreneurial development. There is, therefore, a need for a wider exploration of possible difficulties faced by start-up companies, assuming there are complex associations among variables affecting stunted entrepreneurship in peripheral economic spaces.

2. How do start-up managers and policy officials move forward clusters composed mostly of high-technology start-ups?

High-technology start-ups operating in early-stage peripheral clusters, such as the three IT locations in Vietnam studied by us here, are likely to face difficulties in terms of accumulating and applying resources. Therefore, this second research question captures a significant consideration, both conceptually and from a practical managerial and public policy point of view by identifying how such difficulties could be managed and possibly reversed.

The complexity of factors that may underlie entrepreneurial difficulties in peripheral locations require an exploratory qualitative approach which was organized in two studies in 2011 and 2012 with 34 start-up chief executive officers (CEOs), managing directors (MDs), functional-level managers, private sector staff, and public sector managers. Findings highlight resource inadequacies across the three IT clusters of Ha Noi, Ho Chi Minh City, and Da Nang. While the entrepreneurship literature has long argued that resources are key to nurturing core competencies in high-technology industries (Allen & Hevert, 2007; Jack & Anderson, 2002; Katz, Aldrich, Welbourne, & Williams, 2000; Rauch, Frese, & Utsch, 2005; Shrader & Siegel, 2007), and has uncovered examples of resource difficulties (Scozzi, Garavelli, & Crowston, 2005; Woodcock, Mosey, & Wood, 2000), less expected are our findings of entrepreneurial passivity, risk aversion, distrust in governmental initiatives, inability to uncover solutions to current deficiencies, and vicious cycles containing mutually reinforcing suboptimal behaviors. Such findings about the challenges faced by high-technology start-ups in peripheral early-stage clusters have either not been researched before, or have not been researched in much detail. They are synthesized in a theoretical framework that not only investigates the question of start-up problems in "constrained" environments (Kodithuwakku & Rosa, 2002) but also links distinct literatures of entrepreneurship and clusters that rarely recognize each other's achievements.

Central to our analysis are the concepts of "entrepreneurship" and "start-up." "Entrepreneurship" and "entrepreneurial" have been defined differently in extant research, at

times creating some confusion (Luger & Koo, 2005). Of the many definitions, we adopt Parker's (2011) conceptualization of "entrepreneurship" in terms of "developing a new venture outside an existing organization" (p. 19). While not negating the importance of innovation to entrepreneurship, this frequently cited definition avoids equating entrepreneurship with innovation, innovativeness, or the undertaking of innovation in an effort to transform inventions into products. As will be revealed in the sections on the empirical research, this latter use of the term "entrepreneurial" in terms of equating entrepreneurship with innovation and innovativeness would have not described accurately many of the companies studied by us here. Therefore, we position our study as one on high-technology start-ups and entrepreneurship, where Parker's definition of "entrepreneurship" and Luger and Koo's theorization of "start-ups" as new, active, and independent ventures are applied.

The paper opens with an overview of the relevant entrepreneurship literature that is complemented with the assessment of the little that has been written about emerging clusters and the difficulties faced by such early-stage, typically peripheral locations and the start-ups in those clusters. A section on literature gaps and the need for this research precedes the description of the research site of Vietnamese IT. Separate sections on data collection, data analysis, and key empirical findings are presented next. Findings are compared with those from an earlier study about start-ups in another high-technology peripheral cluster, and are summarized in a new framework that advances theory of start-ups in peripheral locations in emerging economies. Implications for conceptualizing, studying, and managing such ventures in early-stage clusters bring the discussion to a close.

Conceptual Background

Entrepreneurship Literature

Relevant to our argument are studies in the entrepreneurship literature that assess the contribution that resources, or lack thereof, make to start-up founding, growth, difficulties faced by start-ups, and cluster-level competitiveness. We assess such scholarship thematically. Resource-related themes identified here will be linked to our empirical findings in later parts of the paper.

Entrepreneurship Research Related to Factors Affecting Start-Up Success. Resource contributors to entrepreneurship and start-up performance dominate extant research. Most common thematically are studies that identify human resources and the effect that they have on start-ups and other small and medium-sized enterprises (SMEs) (Rauch et al., 2005; Shrader & Siegel, 2007). Human resources have been shown to yield competitive advantage and mitigate the problems faced by early-stage start-ups (Bruton & Rubanik, 2002; Eisenhardt & Schoonhoven, 1990). More recently, associations have been identified among human capital, entrepreneurial alertness (Westhead, Ucbasaran, & Wright, 2005), planning (Frese et al., 2007), and performance (Bosma, van Praag, Thurik, & de Wit, 2004; Dimov & Shepherd, 2005). Haber and Reichel's (2007) conclusion that human capital is the greatest contributor to early-stage venture sustainability has more recently been confirmed by Colombo and Grilli (2010), who maintain that founders' human capital attracts superior venture capital (financial) resources, and thus affects performance both directly and indirectly. Similarly, Unger, Rauch, Frese, and Rosenbusch's (2011) meta-analysis of human capital research in entrepreneurship reinforces the claim that there is a significant positive relationship between human capital and success, especially in younger firms and start-ups.

Another influential theme of resource contributions to start-up success is found in a separate, equally voluminous academic tradition which attributes the survival and vitality of such ventures to their membership in technology alliances, social networks, and other forms of (typically local) collaboration (Hoang & Antoncic, 2003). Jack's (2010) comment that "networks are increasingly perceived as a key element of entrepreneurship" (p. 120) builds upon earlier conclusions that formal and personal networks have a role to play in promoting the progress of young firms (see Dubini & Aldrich, 1991; Jarillo, 1988). Strong personal relations founded on different types of (cognitive, affective, general, relation-specific, calculative, etc.) trust have been described as the most critical strategic resource during and following founding. Such relations provide start-up founders with access to tangible resources and emotional support (Bruderl & Preisendorfer, 1998). As start-ups grow, formal networks gradually displace personal relationships (Lorenzoni & Baden-Fuller, 1995).

Eisenhardt and Schoonhoven's (1996) early study concluded that new small ventures may be inhibited in forming alliances by a lack of internal resources. However, more recent empirical analyses have uncovered examples of successful start-up networks (Nicolaou & Birley, 2003). Such alliances and relationships appear to have a strong positive effect on opportunity recognition (Bøllingtoft & Ulhøi, 2005; Singh, 2000), access to valuable information (Rangan, 2000), and product innovation (Kelley & Rice, 2002). A growing body of research addresses issues as diverse as networks in new venture creation processes, relationships as signaling and reputation-building devices, governance mechanisms in start-up webs, and trust, among others. In spite of the diversity of constructs and analytic approaches in these studies, success and drivers of start-up growth are commonly emphasized. For example, earlier findings of the positive effects of individual and collective social networks on founders' ability to exploit opportunities (Aldrich & Wiedenmayer, 1993) have influenced recent reports about the strong positive connections among integration, linkages (Kah, Olds, & Kah, 2005), and successful advancement of start-ups (Bøllingtoft & Ulhøi; Davidsson & Honig, 2003). Relationships and network membership are commonly treated as endowments that affect success of young and small firms. Better connected founders, we are told, appear to be more adequately prepared to recognize and exploit profitable opportunities by extracting rents from social networks and structures, not the least because of their tendency to make decisions based on advice in friendship circles (Bruderl & Preisendorfer, 1998).

Research About Factors Leading to Entrepreneurial Difficulties and Failure. As noted at the start of this paper, a minority of entrepreneurship scholars have more recently questioned the absence of analyses of failure, difficulties, and lack of success (Dimov & Shepherd, 2005). Such an emphasis on success in the literature has been described as "puzzling" more than a decade ago (see McGrath, 1999). Start-up constraints, capability limitations faced by them, and factors behind their failure remain relatively overlooked as legitimate topics of exploration (Miles & Darroch, 2006). However, some analysts have more recently started a line of investigation into start-up weaknesses, deficiencies, difficulties, and exits (Pe'er & Vertinsky, 2008; Wennberg, Wiklund, DeTienne, & Cardon, 2010). Factors affecting start-up difficulties and failure mirror the above-identified resources-related sources of success. Human, relational, and networking resources appear to be central to the vitality of start-ups and small ventures. Equally significant is the contribution that weaknesses in any of these areas make to start-up demise. Woodcock et al.'s (2000) is one of few studies that have looked into the obverse of drivers of start-up success, and in the process of doing so have uncovered problematic capability endowments of young and small firms. Woodcock et al. single out resource weaknesses as the

most significant impediment to young venture growth and sustained competitive advantage. With resource inadequacies shown to affect negatively early-stage ventures across sectors and firm types (Scozzi et al., 2005), some entrepreneurship researchers have identified and theorized resource deficiencies in areas as diverse as marketing, direction-setting, inspiring employees, training, and strategic thinking. Certain start-up founders and managers allegedly exhibit limited analytic understanding (Beal, 2000; Hauser, Tellis, & Griffin, 2006). Some of them suffer from short-term thinking (MacGregor, 2004), and lack a vision or a clear sense of direction (Scozzi et al.).

Gaps in the Literature and the Question of Start-Ups in Clusters

As noted in the Introduction and as discussed in greater detail in the preceding section, relatively more is known these days about sources of start-up difficulties, even though entrepreneurship as a discipline has only begun to research and understand such issues. There exists some empirics-informed knowledge about the predicaments of start-ups and other SMEs in accumulating and utilizing resources. Nonetheless, knowledge of the ways in which founders, start-up managers, and policy officials attempt to address and possibly reverse such inadequacies remains inadequate. This has prompted Phan (2004) to recommend that future research "must be capable of explaining why and when . . . firms do *not* emerge" (p. 617). Scholarly understanding of the mechanisms through which start-ups in early-stage peripheral clusters attempt to address potentially similar deficiencies is also nascent. Apart from the occasional reference to such issues (e.g., Delgado et al., 2010), studies of start-ups and entrepreneurship are rarely combined with work on clusters in order to generate a framework or even a theory of the manner in which start-up and entrepreneurial experiences of resource deficiencies shape the dynamics and development of the clusters to which they belong.

Addressing such issues requires studying the link between start-up difficulties and compositional or developmental impediments experienced by early-stage peripheral clusters—the obverse of Delgado et al.'s (2010) focus on incentive enhancement. Our study of difficulties and impediments to development at start-up, and cluster levels of economic and business organization, is also distinct from Delgado et al.'s empirical findings about causality—the positive impact of clusters on entrepreneurship. Some extant research has studied associations between resources and networking. However, interactions among start-up resource weaknesses, cluster-level configurations, and the development of a location such as a cluster are more rarely explored. Only recently have a few analysts recognized the value of inquiring into a topic as complex as start-ups and entrepreneurship in clusters (Tan, 2006) by exploring the role of young firms in established, successful locations (McCann & Folta, 2011), or by attributing enterprise competitiveness to enabling institutional conditions such as "regional entrepreneurship capital" (Audretsch, Bönte, & Keilbach, 2008). Illustrative of this stream of research is Gilbert et al.'s (2008) study, which concludes that cluster membership positively influences young venture growth. However, less commonplace is interest in contexts such as emerging peripheral clusters, which face obstacles that may also inhibit start-up formation and growth. In order to address this gap, relevant studies of clusters illustrating start-up difficulties are reviewed next.

Clusters are usually defined as geographical concentrations of interconnected organizations, and interlocking industries and institutions (Porter, 1998). These entities have attracted much attention on the part of academics, practitioners, and policy makers since they are typically assumed to benefit member organizations and drive national competitiveness (Dohse, 2007; Petruzzelli, Albino, & Carbonara, 2007; Scott & Storper, 2003).

Companies operating in clusters have been shown to grow stronger and innovate faster by capitalizing on knowledge spillovers and local externalities (Baptista & Swann, 1998). Such an emphasis shares some of the claims and assumptions of the triple helix literature (Etzkowitz & Leydesdorff, 2000; Leydesdorff, 2012) as an extension of national innovation systems thinking, more specifically in terms of its analytic focus on actors, their unique roles, and the relationships that they build among themselves in inducing innovation and competitiveness. Furthermore, by delineating and theorizing the role of universities as knowledge providers, industry as creators of new products and services, and governments as suppliers of public services (Etzkowitz & Leydesdorff), this strand of thinking is reminiscent of the links drawn among different actors and levels of analysis in Porter's (1990) work on competitive advantages of nations. By studying diverse industries across national contexts, Porter seeks a deeper understanding of how and why firms and industries achieve, or fail to sustain, competitive advantage. Although Porter offers a multilevel sensibility of historical patterns of development and insights about the cumulative, path-dependent character of such processes, it is firms and not nations that act as the principal drivers of such dynamics in his narrative. His linking issues of competitiveness relating to individual companies and industries with success at the national level is not too dissimilar from the associations that we seek to empirically research between entrepreneurial/start-up and cluster organizing dynamics. Similar to Porter's view of (national) contextual variables affecting the fate of individual firms and industries is our conviction that start-up and cluster destinies may be intimately connected.

The above claims, and more generally the review of research in this area, reveal an analytic bias similar to the earlier mentioned favoring of "positive" issues in the entrepreneurship literature. Research of cluster competitiveness and success dominates intellectual and practical managerial agendas. It has been achieved at the expense of an understanding of sources of failure and suboptimal performance of some clusters (see Dohse & Soltwedel, 2006; Kasabov & Sundaram, 2011). For example, arguments that cluster membership produces distinct human resource advantages dominate research about clusters. Cluster presence and membership are believed to stimulate competition in two ways: by boosting productivity and by facilitating new business formation (Wennberg & Lindqvist, 2010). Local labor markets have been shown to act as sources of specialized labor. Furthermore, there seem to exist strong knowledge flows among colocated firms that facilitate social interaction, knowledge, and human resource exchanges. This is perhaps what turns some clusters into the highly innovative localized "cognitive systems" which Petruzzelli et al. (2007) describe. Kitagawa (2007) and Perry and May (2007) are among those who advocate the centrality of human resource and institutional infrastructures to cluster growth, and Foreman-Peck, Makepeace, and Morgan (2006) approach competencies of small firms within clusters through the prism of investments in human resources embedded in general (cluster-wide) human resource practices. This positive impact of cluster membership on human resource accumulation and mobility has been recently confirmed in Hoffmann, Molina-Morales, and Martinez-Fernandez's (2011) empirical work. Hoffmann et al. maintain that locational proximity facilitates information and knowledge exchanges, for instance when employees of firms located in clusters seek employment within, and not outside, the specific location.

A second dominant theme in cluster scholarship concerns networking benefits of cluster membership. Commentators often equate colocation in clusters with the establishment of mutually advantageous relationships (Belussi, 2005; Dohse, 2007; Petruzzelli et al., 2007). Determinants of competitiveness within such locations have almost invariably included relations and collaboration ever since Porter (1998) defined clusters in terms of colocated activities, deep involvement with partnering organizations, and webs of

exchanges. Illustrative is Saxenian's (1994) explanation of the success of Silicon Valley in terms of networks that promote knowledge exchange and collective learning. Relations seem to underpin success in such locations by assisting the transmission of tacit knowledge, thanks to shared norms and worldviews. It is dynamic and flexible, yet enduring and rich, networks of local exchanges that turn some clusters into the highly innovative and creative supra-organizational entities that we have come to assume them to be. Such a belief informs, among others, Belussi, Sammarra, and Sedita's (2008) explanation of the success of Emilia-Romagna's life sciences in terms of fruitful dense interactions. Elsewhere, Oliver, Garrigos, and Porta (2008) attribute innovativeness to the relations in ceramic tile clusters. Researchers remain fascinated with networks (cf. Quere, 2008; Rosiello, 2008; Virkkala, 2007; Waters & Smith, 2008) and cooperation (Hauser, Tappeiner, & Walde, 2007; Lorenz & Detlef, 2008; Maskell, Bathelt, & Malmberg, 2006). They continue to attribute firm-level growth and collective, cluster-level competitiveness to the presence and specificities of human and relational resources and competencies.

In summary, and in terms of what the literature emphasizes and what is missing in extant research, analysts of clusters tend to be intrigued by a handful of established successful locations. References to early-stage, emerging clusters (Coviello & Munro, 1995) and to start-up problems in "constrained" environments (Kodithuwakku & Rosa, 2002) are less common. The literature offers little in the way of knowledge or advice as to how start-ups in peripheral clusters accumulate and utilize resources, how entrepreneurs compensate for resource inadequacies, and how such dynamics affect cluster development. Investigators have also only now begun to realize the significance of analyzing and knowing less developed countries and emerging markets, demonstrating a need to consider more seriously less developed yet promising aggregations (Cumbers et al., 2007; Scheel, 2002), which may become properly functioning clusters or may ultimately fail (Menzel & Fornahl, 2009). The place of start-ups and the role of entrepreneurship in such locations should be empirically explored and properly conceptualized. Certain early-stage clusters fail to develop into fully grown, coherent entities if there is "thinning out" of already dispersed companies; if young ventures and other SMEs pursue incompatible technological directions, thus expanding technological distances among themselves; and if inadequate infrastructure is matched by the absence of "anchor" firms and research institutions (Kasabov, 2011). In view of the paucity of research examining the interrelationship among start-ups, cluster setup, and development of early-stage clusters, the authors' aim was to empirically analyze start-up and cluster performance in the context of early-stage Vietnamese IT clusters. Studies that focus on explaining strong performance in clusters, as those reviewed earlier, were taken as the starting point of our empirical investigation. This choice is justified not only by the dearth of research on start-up and cluster difficulties, as explained in the literature review section, but also by the authors' expectation that arguments in studies focused on good performance may need to be reversed and contrasted against cases of less successful cluster development. Such studies tend to identify constructs that, we felt, may be found at low levels in cases of poor performance.

The Empirical Research Site: Vietnam and Vietnamese IT

Collecting reliable data on the history and current state of Vietnamese IT and the three clusters where most of the IT start-ups in the country are concentrated proved difficult. There were a handful of reports at the time of writing this article in 2012–2013, none of which were in the public domain as most had been produced by governmental departments and associated agencies, and were for internal consumption only. These were

complemented with occasional analyses or announcements about specific initiatives, most of which were produced and communicated through official channels controlled by the government. Almost none of these materials were published by independent third parties as of 2013. Academic research about IT in Vietnam was even scarcer. From the evidence accumulated by the authors, and following interviews with key players in the sector, it seemed that the Vietnamese IT sector had started only in the mid- to late 1990s. Most significant developments had taken place at the start of the twenty-first century. It was only in the period 2005–2013 that Vietnamese authorities had selected IT as a critical sector (Vietnam Competitiveness Initiative [VNCI], 2003; see also Hosman, Fife, & Armey, 2008) in an attempt to benefit from global economic pressures driving multinational corporations in this sector to seek low-cost outsourcing solutions (Schwartz, 2002) in places such as Vietnam.

Vietnamese IT appeared considerably less experienced than comparable sectors in Taiwan, South Korea, and Singapore, partly because of the late development of the country (Do, Dieu, & Goodman, 1996). For example, Vietnam's figures for Internet usage were the lowest among all countries in the Association of Southeast Asian Nations, apart from Laos, for 1996–2000 (Evers & Gerke, 2004). National indicators for local knowledge production for that period were also unfavorable (Evers & Gerke). They might have been affected by certain national information policies (Moore, 2008) and "insufficient capabilities" in technology development (Wang & Chien, 2007). However, initiatives aimed at addressing such deficiencies had been introduced or announced only during the 2008–2013 period. These included attracting Intel's U.S.$300 million investment in a chipset assembly and a testing plant, Foxconn's computer and consumer electronics factories, Compaq's U.S.$500 million laptop plant, and Meiko Electronics' PCB investment worth U.S.$300 million (Dost, Frias, Liu, Ngo, & Taussig, 2008). All of these foreign direct investment projects were hailed as the start of a new chapter in the history of Vietnamese industry. A benchmarking study undertaken by VNCI (2003) attributed such success to the availability of high-quality cheap labor, low geopolitical risk, and proximity to China and India's growing economies. However, Intel had already reported difficulties in operating in Vietnam (two interviews carried out by the authors). Outdated and inadequate infrastructure, poor language knowledge and business experience, low commitment to e-government, and weak intellectual property safeguards were identified as hindrances to future IT growth in the country.

In late 2010, the Vietnamese Ministry of Information and Communications completed a 10-year governmental strategy on the national IT infrastructure (Business in Asia, 2010). Initially mentioned in the very late 1990s (Do et al., 1996), IT's significance to national competitiveness and job creation was affirmed in the early 2000s. Among the priorities of the 10-year strategy were increased support for international IT cooperation, further improvements in national technology infrastructure, and assistance for key sectors in IT such as software outsourcing, which had grown by about 30% in the 2005–2008 period (see also Business Times, 2010), and which was expected to grow by about 40% and achieve sales of U.S.$800 million by the end of 2010. A second strategic sector singled out in the report, computer hardware, had reported U.S.$4 million turnover in 2009 and had attracted U.S.$5.7 billion in foreign investment from the likes of Canon and Fujitsu. As part of further development of national IT, Vietnamese authorities pledged support for IT parks. In the 2 years, Vietnam's government had also vowed to champion key IT projects aimed at encouraging indigenous enterprises. Such announcements came at a time of a "frozen IT market" in the country, scaling down of the operations of a number of small players, and cuts in governmental spending in IT (Business Times, 2012a). Announcements were also made about planned interventionist SME-enabling measures on the part

of national authorities. Such measures included setting up funds to support cash-strapped and struggling high-technology Vietnamese start-ups that faced unstable domestic and international macroeconomic conditions (Business Times, 2012b). In 2012, Deputy Prime Minister Nguyen Thien Nhan met representatives of high-technology parks in Ha Noi and Ho Chi Minh City in order to discuss proposals for removing the remaining obstacles to the development of these parks, including clearing sites, making capital available, attracting investors, and introducing new administrative procedures (Business Times, 2012c).

As of 2013, there were two IT clusters in Vietnam: Ha Noi and Ho Chi Minh City. Both clusters were a bit less than a decade old. There was also a smaller aggregation in Da Nang, which had been more actively promoting itself only in the past 5–6 years, despite attempts to promote Vietnamese IT extending back to the 1990s (Do et al., 1996). The birth of the IT industry, and consequently the formation of the two clusters and the Da Nang aggregation, could be traced back to Resolution 49/CP titled "Resolution of the government on the development of IT in the country during the 1990s" from August 1993. This resolution was further detailed in the 1994 National IT Plan. It was backed by the establishment of the Steering Committee of the National Program on IT. While Ha Noi's cluster had a superior technical and management capacity, the business environment in Ho Chi Minh City was considered to be more conducive to start-up growth, benefiting from the city's relatively skilled workforce.

Having more recently become aware of the delayed and slow development of the three IT clusters and aggregates compared with their rivals in Southeast Asia, Vietnamese authorities announced plans to replicate Singapore's success in IT. Singapore was singled out as a location that had successfully repositioned itself from an assembly destination for multinational corporations to a regional IT hub by benefiting from *dirigiste*, enabling national policies (Finegold, Wong, & Cheah, 2004; Koh & Wong, 2005). Singapore's National Science and Technology Board—the Agency for Science, Technology and Research as of 2013—was focused on bringing science and technology to Singaporean students and the public (Heng & Yam, 1998). It also nurtured an enabling IT environment through its Infocomm 21 Master Plan by promoting investment, encouraging entrepreneurship, and strengthening the nation's technology infrastructure (Hanley, 2004). From the vantage point of Vietnamese policy making in the early 2000s, Singapore represented a positive example of the importance of investing in education and actively promoting indigenous start-ups (Agrawal, 2001). It was generally agreed among insiders in the Vietnamese IT clusters that Vietnamese authorities were studying the experience of technology park policies and initiatives trialed in China, as well as the internationalization success of IT in Korea and Taiwan commonly attributed to firm-level learning, start-up willingness to tap into the expertise of international markets, emphasis on export-led growth, and continuous enhancement of labor capital and other resources (Pack, 2000).

Both IT clusters in Ha Noi and Ho Chi Minh City, as well as the aggregation in Da Nang, suffered from certain shortcomings, which had attracted some attention in publicly available documents. These included the lack of efficiency in IT parks, and inconsistent support both for the parks and the clusters housing them (Business in Asia, 2010). In spite of their membership of clusters populated by companies with similar and complementary strengths, many IT start-ups that were established in and around Ha Noi, Ho Chi Minh City, and Da Nang appeared to face significant resource-related deficiencies, including financial difficulties. Some start-ups in these locations had started scaling down, shedding skilled staff for the past 2 years preceding our empirical research (Business Times, 2012a). To these predicaments, one may add the worsened international reputation of all three locations, reflected for instance in lower rankings of Ha Noi and Ho Chi Minh City in

global software outsourcing rankings (Vietnamnet, 2012). For example, Ha Noi, the highest ranked among the three Vietnamese aggregates, experienced a 50% decrease in its ranking during the 2009–2012 period.

Methods

Data Collection and Data Analysis

With little research available about early-stage and less successful or emerging clusters, Vietnamese IT clusters, and links between start-up and early-stage cluster development, empirical research was organized in 2011 and 2012 in Vietnam's three IT locations. Absence of a readily available body of knowledge on the subject matter, subsequent lack of expectations and hypotheses, and the relative complexity of the research questions necessitated the adoption of an inductive research strategy focused on deriving socially constructed conceptualizations (Corbin & Strauss, 2008; Denzin & Lincoln, 2005) aimed at developing an understanding (Husserl, 1970) of the perceptions of key players in the sector while avoiding abstract generalizations. It was felt that a qualitative research design would facilitate the examination of complex interrelationships, such as those identified at the outset of this paper.

Data were collected during in-depth, semi-structured interviews (Flick, 2006) reliant upon interview guides (Holliday, 2007; Patton, 2002). Interviewees were asked to describe and make sense of the following:

- nature of their business, its resource strengths and weaknesses;
- effect of resources on start-up success;
- actions taken to address current and past resource weaknesses of the start-up;
- opportunities for combining resources with companies positioned in the same cluster, other Vietnamese clusters, or internationally;
- resource accumulation involving public sector organizations, such as universities and research laboratories;
- role of national and regional public sector policy in facilitating the accumulation and exploitation of resources;
- role of national and regional public sector policy in nurturing high-technology start-ups;
- effect of cluster location on company success; and
- comparative standing of Vietnamese IT companies regionally and globally.

Although the structure and contents of interviews built on extant literature, the empirical research was exploratory and flexible. Data and themes emerged during interviews, with themes and findings from earlier interviews incorporated into subsequent interviews.

Sample selection was guided not by convenience and accessibility, but by the need to address the specific research aims and objectives (Yin, 2003). The nature of the research questions necessitated purposeful sampling. The final sample consisted of managers of private sector companies, which were Vietnamese-owned and in one of the three IT locations. The selected companies were also young and small, and operated in one of the three sectors most prominent in Vietnamese IT (computer hardware, software solutions, and business process outsourcing). Separate publicly available lists of Vietnamese IT companies were compiled from multiple, independent sources and were triangulated, producing a final list consisting of 58 companies meeting the above criteria. The

companies in the list also met Luger and Koo's (2005) definition of start-up companies with respect to all three literature criteria: "newness," "activity," and "independence." All three criteria were applied when classifying a business as a start-up, in accordance with Luger and Koo's suggestion, meaning that, first, these were "entirely new enterprises" (p. 18) that had not formerly existed; second, these companies existed not only on paper but also engaged in some activities, such as production or trading; and third, they had not been created by existing businesses, thus excluding branches and subsidiaries created by existing businesses. All 58 CEOs and MDs were approached, and 34 individuals from 21 companies agreed to be interviewed—a sample that is at the high end of Yin's (1994) recommendation for qualitative research sampling. The sample was balanced, representing companies in all three clusters and across the three sectors of interest, as documented in Table 1. For example, 16 interviewees were CEOs and MDs, nine were functional-level managers, and seven were staff members. In order to capture public sector sensibilities, interviews were also organized with two national-level public sector managers in charge of Vietnamese IT.

Interviews lasted 42 minutes on average. During the first stage of data collection, which comprised about half the interviews, face-to-face interviews were conducted. During the second stage, which closely followed stage 1, interviews were conducted over Skype, and were recorded and transcribed. Those informants who had already been identified and had agreed to be interviewed but did not have a Skype account—five in total—had to be interviewed over the phone, thus attempting to address potential sampling bias due to lack of access to Internet technology. Almost 40% of interviews were conducted in English, only in situations when the preselected respondents were capable and willing to interact in English. The remainder of the interviews was carried out by two research assistants who were experienced researchers. Translation was performed by the research assistants, while the veracity of the translations was checked by a qualified translator. Interview language choices did not, therefore, affect the selection process for informants. Data covered over 1,800 pages of transcribed text, reflective statements, company documentation, literature on the three IT clusters, and internal company reports. This provided the authors with an opportunity to analyze documentary evidence in addition to interview transcripts. Interviews were verified for mistakes by the authors and research associates (Creswell, 2009), and the transcribed text was coded and categorized (Corbin & Strauss, 2008; Kvale, 2009). Coding involved attaching keywords to text segments, and was followed by categorization through systematic conceptualization of interviewees' statements. With little prior research available on the subject matter, codes typically emerged from interview texts. Thus, although two codes about entrepreneurial resources and weaknesses were derived from concept-driven categories recurrent in the entrepreneurship literature, coding was generally flexible, emergent, and inductive. Nine codes dominated interviews (see Table 2), representing persistent and principal themes in terms of key players' perceptions about the developments and current conditions in Vietnamese IT:

- **Code 1:** "role of resources to company success" (e.g., *The quantity and quality of* [one's] *labor force are very important*) was borrowed from research of entrepreneurship and early-stage clusters; the code was confirmed in accounts of interviewees 1, 2, 7, 19, and 20 (functional-level managers), and 3, 5, 6, and 17 (CEOs and MDs of SMEs in Ha Noi and Da Nang);
- **Code 2:** "current and past resource deficiencies" (e.g., *It is difficult to find good and reliable partners*; *We need many more employees with expertise and skills to be able to develop and install software solutions for businesses. It is very hard to find them in Vietnam because the overall quality of labor is poor*) was borrowed from research of

Table 1

Sample Characteristics

Interviewee	Position and responsibilities	Information about company	Main themes mentioned during interview
1	CEO	Slightly bigger and older software manufacturer, Ha Noi	Little government support; networking problems
2	Staff member (technician)	Hardware manufacturer, Ha Noi	Human resource problems
3	HR manager	Small software solutions start-up, Da Nang	Human resource problems
4	Sales manager	Small, slightly older software firm, Da Nang	Networking problems; human resource problems; entrepreneurs' passivity
5	CEO	Small, new, software start-up, Ho Chi Minh City	Little government support; networking problems; human resource problems
6	Staff member (engineer)	Slightly bigger and older software manufacturer, Ha Noi	Not entrepreneurs' fault
7	CEO	Hardware start-up, Ha Noi	Little government support; networking problems; human resource problems; minor outsourcing location; few networking opportunities
8	Public sector manager	Ha Noi	Human resource problems; entrepreneurs' passivity
9	CEO	Small, new software solutions, Da Nang	Little government support; networking problems; human resource problems; minor outsourcing location; few networking opportunities
10	Public sector manager	Ha Noi	Entrepreneurs' passivity
11	MD	Software start-up, Ha Noi	Networking problems; human resource problems; entrepreneurs' passivity
12	Staff member (engineer)	Small, new, software start-up, Ho Chi Minh City	Little government support
13	MD	Ho Chi Minh City	Little government support; networking problems; human resource problems
14	Operations manager	Process outsourcing, Ho Chi Minh City	Networking problems; human resource problems; entrepreneurs' passivity; not entrepreneurs' fault
15	Sales manager	Small, new, software start-up, Ho Chi Minh City	Networking problems; human resource problems
16	Staff member (technician)	Small, new software solutions, Da Nang	Entrepreneurs' passivity
17	Staff member (coder)	Small, new software solutions, Da Nang	Entrepreneurs' passivity
18	Operations manager	Process outsourcing start-up, Da Nang	Human resource problems
19	MD	Process outsourcing, Ho Chi Minh City	Little government support; networking problems; human resource problems; not entrepreneurs' fault
20	CEO	Process outsourcing, Ha Noi	Little government support; networking problems; human resource problems
21	CEO	Hardware start-up, Ha Noi	Networking problems; human resource problems
22	CEO	Small, slightly older software firm, Da Nang	Little government support; human resource problems
23	Staff member (technician)	Hardware start-up, Ha Noi	Entrepreneurs' passivity
24	Marketing manager	Process outsourcing, Ho Chi Minh City	Networking problems; human resource problems; entrepreneurs' passivity
25	Sales manager	Small, slightly older software firm, Da Nang	Human resource problems
26	MD	Software start-up, Ha Noi	Little government support; networking problems; human resource problems; minor outsourcing location
27	Sales manager	Process outsourcing, Ha Noi	Entrepreneurs' passivity
28	CEO	Software solutions start-up, Ha Noi	Networking problems; few networking opportunities
29	MD	Small software manufacturer, Ha Noi	Little government support; human resource problems; entrepreneurs' passivity; few networking opportunities
30	Staff member	Mid-sized firm, Ho Chi Minh City	Minor outsourcing location
31	Operations manager	Small software manufacturer	Entrepreneurs' passivity
32	MD	Slightly older, larger gaming company	Little government support; human resource problems; minor outsourcing location
33	MD	Bigger software manufacturer	Little government support; entrepreneurs' passivity; few networking opportunities
34	MD	Micro-gaming company, Ha Noi	Little government support; minor outsourcing location

CEO, chief executive officer; MD, managing director; HR, human resource.

Table 2

Interview Codes, Their Sources, and First-Order Quotations

Second-order code		Sources in the literature	Sources in interviews (illustrative first-order quotations)
1	Role of resources to company success	Bosma et al. (2004); Dimov and Shepherd (2005); Rauch et al. (2005); Westhead et al. (2005); Frese et al. (2007); Haber and Reichel (2007); Shrader and Siegel (2007); Colombo and Grilli (2010); Unger et al. (2011)	*The quantity and quality of* [one's] *labour force are very important.*
2	Resource weaknesses	Eisenhardt and Schoonhoven (1996); Beal (2000); Woodcock et al. (2000); MacGregor (2004); Scozzi et al. (2005); Hauser et al. (2006); Pe'er and Vertinsky (2008); Wennberg et al. (2010)	*It is difficult to find good and reliable partners.* *We need many more employees with expertise and skills to be able to develop and install software solutions for businesses. It is very hard to find them in Vietnam because the overall quality of labour is poor.*
3	Resolving resource deficiencies	Eisenhardt and Schoonhoven (1990); Bruton and Rubanik (2002)	*It has always been hard to find talented people. So, we have a training pipeline which is quite robust, and we have developed it ourselves over the years. But the challenge for most companies like us is finding talent.*
4	Building resources through networking	Aldrich and Wiedenmayer (1993); Lorenzoni and Baden-Fuller (1995); Bruderl and Preisendorfer (1998); Rangan (2000); Singh (2000); Kelley and Rice (2002); Davidsson and Honig (2003); Hoang and Antoncic (2003); Nicolaou and Birley (2003); Bøllingtoft and Ulhøi (2005); Jack (2010)	*Now we have more people to work with than even five years ago.*
5	Constraints to networking	Eisenhardt and Schoonhoven (1996)	*All players in the market suffer from similar problems.* *My company had a bad experience with one partner . . .* [we] *do not trust authorities to help us in such situations . . . there is little we can do*
6	Lack of trust in other companies		*My company had a bad experience with one partner locally, they stole one of our ideas recently.*
7	Passivity and risk aversion of entrepreneurs		*They* [Vietnamese entrepreneurs] *are risk-averse. They want something safe. You know, risk is very important for entrepreneurs. But in Vietnam and in other Asian countries, people want something safer. If they find opportunities, but it's risky, they may refuse.*
8	Weak public sector assistance		*The policy support we get is insufficient and haphazard.*
9	Deleterious effect of specific actions of authorities		*When we started our project, there was an order to stop it from the government. When our project was almost one year, they told us to stop it . . . This is because of the rules, the laws.*

entrepreneurship, early-stage clusters, and Vietnamese IT; the code was confirmed in accounts of interviewees 1, 2, 7, 12, 13, 19, and 20 (functional-level managers); 3, 4, 5, 6, 8, 9, 10, 11, and 17 (CEOs and MDs of start-ups); and 22 and 23 (public sector managers);

- **Code 3:** "actions taken to address resource deficiencies" (e.g., *It has always been hard to find talented people. So, we have a training pipeline which is quite robust, and we have developed it ourselves over the years. But the challenge for most companies like us is finding talent*) mostly emerging from interview texts, especially from accounts of interviewees 3, 5, 6, 9, 10, and 17 (CEOs and MDs in Ha Noi and Da Nang);
- **Code 4:** "opportunities for combining resources through networking" (e.g., *Now we have more people to work with than even five years ago*) mostly emerging from interview texts, especially from accounts of interviewees 1 and 13 (functional-level managers from Ha Noi and Ho Shi Minh City), and 22 and 23 (public sector managers);
- **Code 5:** "constraints to networking" (e.g., *All players in the market suffer from similar problems*; *My company had a bad experience with one partner . . .* [we] *do not trust authorities to help us in such situations . . . there is little we can do*) emerged from interview texts, especially from accounts of interviewees 3, 6, and 10 (CEOs and MDs in Ha Noi and Da Nang);
- **Code 6:** "lack of trust in other players in the market, especially local companies" (e.g., *My company had a bad experience with one partner locally, they stole one of our ideas recently*) emerged from interview texts, especially from accounts of interviewees 7, 12, 13, and 20 (functional-level managers);
- **Code 7:** "passivity and risk aversion of Vietnamese entrepreneurs" (e.g., *They* [Vietnamese entrepreneurs] *are risk-averse. They want something safe. You know, risk is very important for entrepreneurs. But in Vietnam, and in other Asian countries, people want something safer. If they find opportunities, but it's risky, they may refuse*) emerged from interview texts, especially from accounts of interviewees 3, 5, 6, 9, 10, and 17 (CEOs and MDs in Ha Noi and Da Nang), and 22 and 23 (public sector managers);
- **Code 8:** "lack of active assistance on the part of public sector authorities" (e.g., *The policy support we get is insufficient and haphazard*) was partly borrowed from research of early-stage clusters; the code was confirmed in accounts of interviewees 1, 2, 7, 12, 13, 19, and 20 (functional-level managers), and 5, 9, 10, and 17 (CEOs and MDs);
- **Code 9:** "harmful effect of specific actions on the part of public sector authorities" (e.g., *When we started our project, there was an order to stop it* [our project] *from the government. When our project was almost one year, they told us to stop it . . . This is because of the rules, the laws*) emerged from interview texts, especially from accounts of interviewees 3, 5, 6, 9, 10, and 17 (CEOs and MDs in Ha Noi and Da Nang).

Data analysis was inductive and did not involve the *a priori* generation of hypotheses. The process of collecting codes, categorizing, and systematizing them into themes (Kvale, 2009) was iterative, following Layder's (2005) suggestion that researchers should engage with data collection and analysis simultaneously. As part of such "constant comparison," we also followed rules of data collection and data analysis in grounded theory (Corbin & Strauss, 2008). This meant that the data and themes that emerged during an interview guided the questions that the authors asked during subsequent interviews—similar to Carson, Gilmore, Gronhaug, and Perry's (2001) "convergent" interviewing methodology whereby the contents of each interview are informed by the data emerging from previous interviews. Therefore, data collection and data analysis were simultaneous and structured, while interviews retained the advantages of in-depth interviewing which facilitates probing and the search for insights by allowing deviation from the interview structure. The convergence that Carson et al. seek through this method was achieved when no new data

were uncovered. Saturation started emerging after the twentieth interview, against the 12 interviews in Carson et al.'s case; however, interviews were continued in order not to miss important issues relating to Vietnamese IT. The final stages of data analysis involved comparing codes across cases (the 21 companies), clusters (two clusters and an aggregate), sectors (computer hardware, software solutions, and business process outsourcing), levels of decision making (staff, functional-level managers, CEOs/MDs), and stakeholders (private sector staff, public sector managers).

Table 1 suggests a number of preliminary patterns regarding the nine codes that dominated interviews. More often than not, an interviewee discussed more than one of these nine dominant codes. On average, two to three of the nine codes appeared in a single interview; however, an interview could still be dominated by one code alone if references to the code appeared in more than 50% of the coded interview text. This was the case with 13 interviews, which could be described by one code each, most notably code 7 ("entrepreneurial passivity"), which was the single most prominent code in seven interviews. Interviews with CEOs and MDs, on the other hand, tended to contain a number of dominant codes, with 13 interviews being defined in terms of a complex mix of three to five codes. Analyzing the patterns regarding interview codes might lead one to develop theories of how suboptimal cluster development is maintained. For instance, codes 2 and 5, including "networking problems" and "human resource problems," were often colocated with codes 1 and 4—"lack of resources" and "role of networking"—suggesting interviewees' knowledge and awareness of the importance of resources and actions to be taken in order to alleviate resource-related deficiencies. Equally significant, codes 2 and 5 of "resource weakness" and "constraints to networking" often appeared alongside code 8 ("little government support"), demonstrating a certain attribution of blame for past and present difficulties in the sector. While nonattribution of self-blame defined interviews with entrepreneurs (MDs, CEOs) and is evidenced by the interview theme of "problems not being the entrepreneur's fault," codes attributing start-up difficulties to entrepreneurs' passivity (code 7) defined narratives by public sector managers, and private sector staff members and middle managers.

Interview Themes

Themes that dominated interviews are presented next, clustered into two groups of, first, "resource constraints," and second "inadequacies in entrepreneurial orientation, state-level guidance, and intervention."

Resource Constraints

Stories of scarcity of experienced staff and inadequate networking dominated wholly or partly—in association with other codes—26 out of the 34 interviews. Such dominance explains the prominence of codes about such scarcity and problems (codes 2–6 "resource weakness and deficiencies," "networking resources and constraints," and "lack of trust"). These stories were complemented by interviewees' perceptions of insufficient, changeable, and unpredictable national IT policy, lack of assistance on the part of local administrations (code 8 "weak public sector support"), and detrimental and disenfranchising public sector initiatives that at times seem to significantly hinder the growth of early-stage high-technology start-ups (code 9 "deleterious effects of public sector actions"). In spite of minor differences across companies and individuals, these stories and codes were

confirmed across clusters (Ha Noi, Ho Chi Minh City, and Da Nang), as well as across sectors (computer hardware, software solutions, and business process outsourcing), and levels of decision making (CEOs and MDs, functional-level managers, and staff). Evidence that IT start-ups face considerable challenges in areas of resource accumulation, strategizing, and venture development is not unexpected. However, somewhat surprising—considering findings in past research—is the inability of founders, start-up managers, and policy makers to effectively work around these inadequacies, and therefore move the three clusters forward.

Contrary to expectations of national, public sector authorities, IT has not developed as rapidly and in the direction envisaged. All three locations were described by interviewees as "minor outsourcing positions" (interviewee 32) internationally, and "far from developing into regional hubs" (interviewee 34) by following the example of Singapore and other more successful IT clusters in the region. The MD of a games software company compared unfavorably the IT sector in Vietnam with those in Singapore or Taiwan, concluding the interview with a wish "to add more and more stronger effort to catch [up with] them" (interviewee 34). Similarly, the director of a software start-up from Ha Noi described the "IT sector in Vietnam [as being] . . . in lower level than those in Singapore or Taiwan. IT . . . in Vietnam is still very weak" (interviewee 26), while the MD of a medium-sized Ho Chi Minh City-based firm noted:

> I think . . . the R&D in Singapore in software solutions and in Taiwan in hardware is much better than here. . . . In Vietnam, as you know, IT is a new activity. . . . Singapore is a hub, an economic hub. Everyone is going to Singapore, including IT. It's easier to develop IT there. But in Singapore the government invested much more money to develop the IT infrastructure and in R&D. . . . The future for Vietnam is to follow that path, otherwise we will remain peripheral. (interviewee 30)

When asked to identify and analyze the sources of Vietnam's IT difficulties and alleged "peripherality," 21 interviewees repeatedly highlighted problems in attracting, retaining, and growing human resources. All but two private sector interviewees claimed that skills- and experience-related shortages are persistent and at times severe. A CEO's reflection on difficulties he had faced in attracting engineers and programmers captures the general mood in the sector.

> We need many more employees with expertise and skills to be able to develop and install software solutions for businesses. It is very hard to find them in Vietnam because the overall quality of labour is poor. (interviewee 21)

All interviewed start-up CEOs and MDs had experienced, or heard about, "the poor supply of highly qualified people" (interviewee 13), particularly people "who speak foreign languages" (interviewee 13), have "business knowledge," "training in commercial matters," or "actual experience in running such [IT] companies or [similar] businesses" (interviewee 32). However, most pronounced appeared to be comments on the relative scarcity of "technical talent" of "software engineers . . . technicians" (interviewee 34) with specialist technical skills, including "people who can develop games for us" (interviewee 32). This issue was possibly most prominent in the narrative of the CEO of a Ha Noi-based computer hardware start-up but was mentioned across interviews with CEOs and MDs, especially those working with, or for, overseas clients.

> Human resource shortages? Of course! . . . also difficulties in keeping labour . . . [due to resource issues] our company cannot be bold . . . [but] all players in the market suffer from similar problems. (interviewee 7)

"Ambitious companies" in the sector "struggle to meet the growing and changing needs of [overseas] clients" if they lack "technical preparedness" simply because they may be unable to "find [the] right technical people at [the] right time" (interviewee 34). The MD of a slightly older and larger games software firm commented:

> It's always been hard to find talented people . . . the challenge for most companies like us is finding talent. And I mean finding talent both in Vietnam and internationally, but mostly in Vietnam. (interviewee 32)

Similarly, the MD of a software manufacturer identified:

> . . . management . . . [as] a very very big issue. We've been lucky because we train our managers from the bottom up. . . . But in most other companies, that's often the biggest challenge. . . . And that prevents them from growing. (interviewee 29)

Human resource scarcity and quality problems were almost invariably attributed to factors external to enterprises. The most frequently mentioned factors were the low quality of education provided by some educational institutions (mentioned by 13 interviewees), inadequate technical preparedness of university graduates (noted by 12 interviewees), paucity of relevant degrees (discussed by 8 interviewees), and candidates' business inexperience (noted by 8 interviewees). For instance, a functional-level manager from a start-up in the Ho Chi Minh City cluster shared his concerns about:

> the quantity and quality of our high-technology labour force. . . . Vietnam has too limited a number of universities teaching and training information-technology-related subjects and, even worse, the quality of graduates is still low to [allow us to] compete with other countries in the region. (interviewee 14)

Most private sector CEOs and MDs denied responsibility for inadequacies in areas of human, technological, and relational resources. "We have little power over [these deficiencies]," argues interviewee 14. When asked why his company had been unsuccessful in finding partners, developing new relational opportunities, and thus resolving the staffing deficiencies that he had noted earlier in the interview, a manager's response that "this is something we can do little about . . . on our own" (interviewee 19) captured widely held perceptions. Although it may have been expected for start-ups to attempt and leverage human and technological resources through formal and informal networking, especially as part of local webs which also develop local critical mass of resources and skills, there was little evidence of founders and managers actively searching for or engaging in local collaborative projects. Interviewees admitted that Vietnamese IT start-ups addressed technology deficiencies "as much as we can . . . internally" and rarely sought local opportunities (interviewee 21). The sales manager from a Da Nang start-up repeatedly pointed out that "partnering opportunities . . . are not provided," alluding to common expectations among private sector actors that public sector authorities should have played a more prominent role in assisting and managing local collaborative networks.

Private sector managers' participation in formal networks, such as symposia and trade fairs, appeared to be low. The companies of 23 private sector interviewees did not seem to be active members of chambers of commerce and professional associations. Nineteen interviewees reported no knowledge of, or participation in, networking events and platforms. There were only three references to networking events discussed by interviewees. However, even these networking events were described as "low profile" (interviewee 7) and failing to "generate enthusiasm" (interviewee 9) within the practitioner community. Local ties were almost invariably "relations developed from personal relations" (interviewee 29), while interest in "attend[ing] conferences and seminars . . . is low. We are not

interested to join an association" (interviewee 29). Although one of the bigger providers of software solutions had pursued networking opportunities and was an active member of one such association, the company's MD commented:

> in my opinion, we don't have much benefit [from the membership]. Seems it [the association] is not serious about caring about small and medium companies . . . they do not often contact [us] to know what our needs [are] . . . and sometime don't reply [to] our questions and comments. (interviewee 33)

Similar was the view of this association of the director of a smaller software start-up:

> We prefer to use other channels to do everything. For example, we work with clients and we find new clients in LinkedIn. Or we work with the embassies of foreign countries which are in Ha Noi. We have a number of partners or potential partners in Finland, Norway, Denmark. They have . . . some programme called B2B Business Matching to match companies in Vietnam with companies in their countries. And I think it's a better way to find new partners and customers. (interviewee 29)

A single positive assessment of the impact of associations on IT start-ups was provided by the CEO of a start-up specializing in software solutions. He noted that the association to which his company belonged "has done a few good things in the past several years" (interviewee 28), although adding that "they have limits," "the number of companies they invite . . . is not adequate and enough," and "they need to understand better the needs of their members."

Inadequacies in Entrepreneurial Orientation, State-Level Guidance, and Intervention

Criticisms of inadequate state-level intervention, minimal information provision, and guidance from local authorities reveal interviewees' preference for an interventionist and *dirigiste* policy approach. Greater supervision and assistance from public sector authorities appear not only anticipated but also desired by CEOs. Alternative routes for achieving individual and collective success by growing resources organically through local participation, individual activism on the part of start-up managers, and building up networks within clusters were rarely mentioned by most private sector interviewees, most notably CEOs and MDs. Instead, CEOs and MDs placed emphasis on the successful IT agglomeration in Singapore, where determined long-term national strategies and programs, such as the Cluster Development Fund, Innovation Programme, and the "Intelligent Nation" Initiative, have allegedly provided the Singaporean state with an "adequate armory" (interviewee 9) to lead innovation and ensure competitiveness by building a knowledge-based economy. Perceptions of "hands-on state intervention [in places like] Singapore" (interviewee 7) were contrasted with stories of deficient government guidance in Vietnam, "absent information from authorities [and] little advice . . . available to us" (interviewee 12). Such commonly held perceptions are captured in the following quote by a Da Nang-based CEO:

> I know that other companies are having the same difficulties so we would try to solve the problem ourselves. . . . We would welcome advice [from national and local authorities] so that to know who to approach and who to avoid [referring to potential partners]. None of that is provided to us. (interviewee 9)

Interviewees' perceptions need to be assessed against writings about the role of national public sector policy in nurturing high-technology clusters through resource

provision (Collewaert, Manigart, & Aernoudt, 2010), especially in emerging economies and in successful Southeast Asian competitors, such as Singapore (Cordeiro & Al-Hawamdeh, 2001; Meier & Stiglitz, 2001; Ng, 2012; Wong, Ho, & Singh, 2009). The stories of private sector actors in Vietnamese IT reveal high expectations from national and local, cluster-level authorities, even though the actual assistance which managers find useful may be—according to them—inadequate. Public sector policies are consistently described as "limited," with CEOs reiterating that "we all [referring to local start-ups] need better advice, when we need it . . . not just hear about good intentions" (interviewee 20), and that "[I have] heard of some sort of policies [but have] never seen anything in action" (interviewee 19).

Thirteen of the interviewed CEOs and MDs called for concerted efforts in areas of "national level of promotion in IT" and "facilitat[ing] capital resources for small IT companies" (interviewee 26). These 13 narrators described state-level support as:

> not enough . . . I think the government should do some promotion to help or to improve the image of Vietnam IT in the eyes of other countries or potential clients . . . they need to do much more . . . to help us speak. (interviewee 32)

It was felt that authorities were "let[ting] us down in that respect" (interviewee 33), and were "mak[ing] political football for different factions within the government. They politicize issues . . . [which is] basically . . . quite a big hindrance to growth" (interviewee 32). Some instances of interference on the part of national authorities seemed to have thwarted the growth of a number of start-ups, as appeared to be the case with the MD of a very small games software company whose product had recently been banned:

> because of the rules, the laws. . . . Because they think that games online have some very bad impact on the people, on our customers. So they said that we need to wait until a new law [comes into force]. They said it would be 6 months to change the law, but we have been waiting for nearly 2 years. And our project is not yet finished because of that. And the law has not changed yet. (interviewee 34)

Not unexpectedly perhaps, interviewee 34 compared unfavorably the Vietnamese regulatory regime with those in neighboring countries: "Policies are not good, and policies should be predictable. They should not be changing all the time."

Although not readily acknowledged by some private sector interviewees, it seems that weaknesses in entrepreneurial culture, risk aversion, and passivity on the part of at least some start-up founders and managers seem to exacerbate the above-noted inadequacies. All public sector managers, three staff members, and five middle-level managers suggested that "managers expect others to solve their problems" (interviewee 8), and "look to government and local [cluster-level] authorities . . . to find solutions . . . train and attract good people to [the location]" (interviewee 23). Therefore, at least some education- and training-related issues that managers described as "inherited" and "more or less imposed upon us [SMEs]" (interviewees 7 and 18) were viewed by other stakeholders as internal and more directly attributable to entrepreneurial "inaction," "docility," and even "apathy" (interviewee 23). We uncovered very few specific references to and examples of entrepreneurial initiative and risk taking. The MD of a small software manufacturer described start-up managers in Vietnamese IT as "doing great works . . . but I think we need more creative and professional people" (interviewee 29). When asked to identify two dominant features of such managers, the director of a software start-up in Ha Noi mentioned "risk averse" and "weak in business management." His comments reaffirmed earlier narrative themes of "entrepreneurial passivity" dominating the interview with another MD who described his colleagues as:

> risk-averse. They [Vietnamese entrepreneurs] want something safe. You know, risk is very important for entrepreneurs. But in Vietnam, and in other Asian countries, people want something safer. If they find opportunities, but it's risky, they may refuse. (interviewee 33)

Such narratives about weaknesses in entrepreneurial culture, risk aversion, and passivity could potentially be contextualized in the World Values Survey findings for Vietnam, which show how Vietnam compares with some other regional players mentioned by our interviewees. We have extracted publicly available World Values Survey data about China, Indonesia, Malaysia, Taiwan, Thailand, and Vietnam, and present briefly select few variables in order to make sense of some peculiarities of Vietnamese IT presented and analyzed here. First, "political action" in its various manifestations, such as "signing a petition" or "attending lawful/peaceful demonstrations," is low across the studied countries; however, Vietnam's indices are lower than those of most other regional players. Second, similarly low are Vietnam's readings for variables signifying individual activism and risk taking, including "active membership of a professional organization." Vietnam's indices are low relative to all but two of the other regional players studied here. Finally, and particularly important from an entrepreneurial point of view, similar to the above are Vietnam's readings for "adventure and taking risks are important to me," both in absolute and relative terms.

There seem to exist few if any concerted efforts to actively and collectively resolve difficulties encountered by many Vietnamese IT start-ups, and thus move forward not only the companies in question but also the clusters. To this, one must add common interviewees' perceptions of the low priority and prominence of local environments. Such environments seem to be typically assigned a less prominent place in entrepreneurs' plans for future development of their companies and the IT sector as a whole. Stories of cluster-related advantages, cluster membership benefits, and advantages from participating in a cluster were absent across interviews. We uncovered no references to "clusters" and similar constructs in narrators' stories. This absence is a significant finding that suggests that, as far as perceptions and lived experiences of interviewees are concerned, first, there was little if any awareness of the existence or the potential of clusters; or second, clusters seemed to have negligible effects on start-up strategies, survival, and success. Although some interviewees, such as the MD of a games software company, acknowledged the existence of a sizeable number of "similar companies" "located nearby," local cooperation appeared to be rare. Similarly, while certain interviewees educated in Western universities appeared knowledgeable of the term "cluster," they tended to respond negatively to questions about benefits from cluster membership. Even when this generic question was supplemented with more specific questions about cluster spillover effects and within-cluster local knowledge transfers, responses tended to be either negative or vague, lacking in understanding, or unenthusiastic.

Discussion

Although IT start-ups within Vietnamese clusters are the research context, and much of this paper has investigated aspects of start-up difficulties specific to this context, the analysis is also positioned at a higher theoretical level. Next, we draw some generalities and develop a conceptually and practically significant understanding of high-technology start-ups in early-stage, peripheral clusters, or in the context of an emerging economy such as that of Vietnam. From this, we aim to derive a more systemic and theoretical knowledge of the empirically identified start-up difficulties.

Attracting, retaining, and accumulating resources that are critical to start-ups and cluster-level competitiveness are challenges that dominate interview narratives of Vietnamese IT start-ups. Such challenges negate the prevalence of success stories in the literature (see Dimov & Shepherd, 2005; Patzelt & Shepherd, 2011), but empirically confirm expectations of difficulties, suboptimal performance, and failure that have been theorized by authors such as Bosma et al. (2004), Bryan (2006), Cassar (2006), and Colombo and Grilli (2010). The magnitude of resource problems confirms conclusions reported elsewhere of inadequate internal training and career development in young and small ventures (Katz et al., 2000; Sarasvathy, 2001). Findings are significant from managerial and public sector policy perspectives since the start-up ventures studied here appear particularly weak in areas of training, informal recruitment, development of local networks, and within-cluster relations.

Some interviewees tend to attribute difficulties to state-level inaction and inadequate public policy intervention both at the national and local, cluster levels. Private sector managers contrast their experiences of inaction on the part of the Vietnamese public sector with the state-led investments in education, training, and promotion reported elsewhere in Southeast Asia and especially in Singapore. Recent successes of Singapore's IT cluster are frequently mentioned, and narrators openly envy Singaporean public sector initiatives, such as the international search for talent carried out by the Singaporean government and the sponsorship of top international students studying in the country. To many Vietnamese interviewees, education and training are not the "responsibility of [start-ups]" (interviewee 6), and should be planned by national authorities and local institutions such as universities. Repeatedly mentioned are "poor infrastructure," "low number of universities" (interviewee 19), and insufficient national-level budgets earmarked for the development of indigenous IT companies. These conditions contrast with long-standing initiatives elsewhere in Southeast Asia, including the Infocomm Development Authority (Cordeiro & Al-Hawamdeh, 2001) and the Cluster Development Fund (Ng, 2012).

Dominance of interview narratives about resource deficiencies and expectations of active governmental involvement may reflect conditions not only in emerging markets but also in other early-stage locations, such as the three biotechnology clusters in Europe studied by the authors (Kasabov, 2008, 2010). Thus, it is worth mentioning that some of the more significant start-up and early-stage venture problems reported by Vietnamese managers and founders have also been prominent in narratives about three peripheral biotechnology clusters in two developed Western economies. Comparison across these six case studies may, therefore, suggest that some of the early venture problems identified in this paper are not specific to the Vietnamese context only, but help describe peripheral and early-stage locations more generally as a step toward the development of a general theory of start-up difficulties in early-stage, peripheral clusters and regions. Common problems reported in this and the previous studies include delayed and stunted development due to weaknesses in local networking, disagreements among major stakeholder groups, and inadequate institutional support and encouragement for networking not only locally but also globally. Such difficulties impede the accumulation of firm-specific and regional know-how, collective innovation and solutions to common problems, knowledge sharing, and fostering a cognitive community of like-minded private sector and public sector actors working toward a common vision to resolve barriers to development (see also Kasabov, 2010). Consequently, as in the case of the biotechnology clusters studied earlier, the three Vietnamese IT locations continue to suffer from low international visibility and reputation, as well as peripheral positioning in the global IT industry. In contrast to the Singaporean experience, Vietnamese attempts to address such visibility issues and to reposition the clusters have been few and unsuccessful.

Findings about reactive and risk-averse attitudes of many Vietnamese start-up founders and managers are new and were not found in our previous research of biotechnology clusters in Europe. Few interviewed CEOs, MDs, and functional-level managers seem to appreciate the significance of private sector action and the search for solutions independently of governmental initiatives. Therefore, in terms of addressing research question 2, it could be concluded that many interviewees rarely adopt an entrepreneurial orientation with respect to resource accumulation and upgrading, and that risk taking and alertness appear deficient. Experimentation in terms of resource investments is weak, reflecting predominantly reactive attitudes toward entrepreneurship and competitiveness. Such findings are significant partly because they were absent from our earlier analysis of peripheral biotechnology clusters. Overreliance on the public sector; lack of initiative-taking; and failure to develop relationships with neighboring start-up ventures, universities, and other stakeholders within clusters are recurrent themes in Vietnamese interviews. Although based on a relatively small sample in one sector of the Vietnamese economy only but including most businesses in the sector and locations studied, such findings may suggest significant differences in the attitudes of managers in Western European and some Vietnamese contexts. Thus, while self-organized networks among biotechnology start-ups were reported in our earlier research, they appear to be the exception in Vietnamese IT, in spite of accumulating empirical evidence of the prevalence of such webs elsewhere and of their beneficial effects (Zahra, Matherne, & Carleton, 2003). It is this passivity, manifested in inadequate personal contact, absent informal and formal networking arrangements, and little in the way of local cooperation, which not only defies literature expectations (Bosma et al., 2004; Chaston, 2000; Grant & Baden-Fuller, 2004; Ozgen & Baron, 2007; Simpson, Padmore, Taylor, & Frecknall-Hughes, 2006; Street & Cameron, 2007) but also helps explain to some extent the slow venture growth witnessed in the Vietnamese IT sector.

Inaction, reactive planning, and weak initiative-taking are further intensified by start-up managers' distrust in their direct competitors, other SMEs, and public sector competency and capacity to actively assist the IT sector in the country. Relationships between the public and private sectors, local networking, and cluster-specific collaborations have been hampered by the absence of trust (Mayer, Davis, & Schoorman, 1995), with trust being defined here in terms of confidence in the competence and capacity of authorities to resolve problems faced by start-ups and other SMEs. Sporadic and ineffective involvement and support provided by national authorities, the absence of local initiatives at the cluster level, coupled with start-up docility and relative inaction, prompt many of the private sector managers interviewed by us to view relationships with external actors, such as multinational corporations operating in Vietnam, as the sole solution to their resource and networking deficiencies. However, such expectations may be contributing to the preservation of the relational setup in the IT clusters and aggregates, for IT in Vietnam continues to be marked by weak horizontal and local relations among indigenous companies colocated in a cluster and stronger vertical, arm's length interactions with foreign multinational corporations. This model of development shares the strengths and weaknesses of hub-and-spoke organizational arrangements similar to those uncovered by the authors in another early-stage high-technology location (Kasabov, 2008, 2010). From the point of view of Vietnamese start-up management and public sector policy, such an organizational arrangement does not allow Vietnamese IT to rapidly develop internally. It also preserves the peripheral standing of the IT sector and its international positioning as a second-order outsourcing location. For their part, multinational corporations seem to have had a limited positive effect on local high-technology development. They do not appear to have compensated for the internal weaknesses of Vietnamese IT studied by us here.

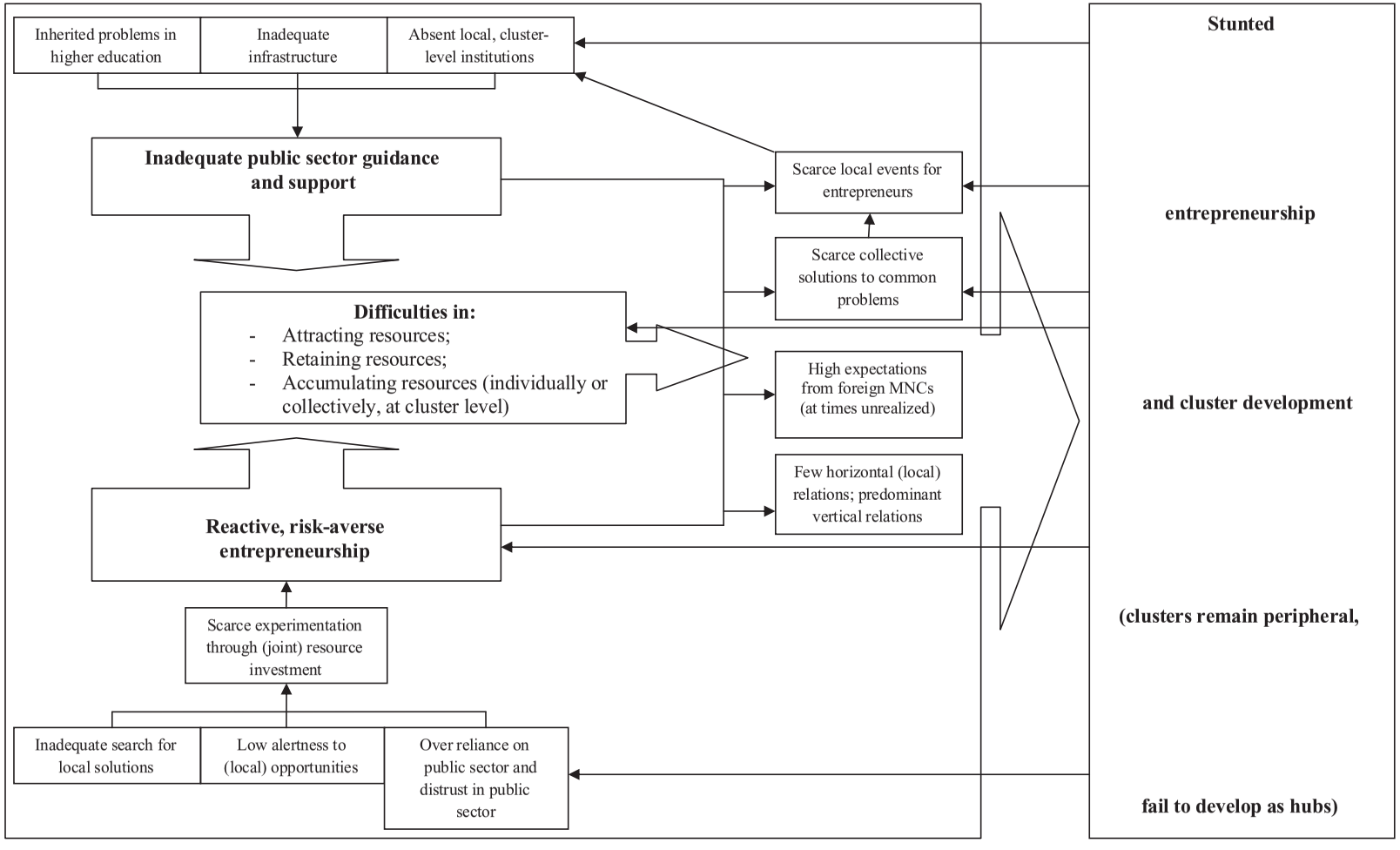
Start-up inadequacies and entrepreneurial difficulties are synthesized in a theoretical model as an initial attempt to link issues of entrepreneurship with national policy making, public policy issues at the local cluster level, and matters of collective development of early-stage peripheral locations (see Figure 1). First, and disregarding the more obvious findings of resource deficiencies, the study provides specific lessons for "entrepreneurial flair" and enthusiasm as drivers of start-up and cluster competitiveness in early-stage peripheral locations in emerging economies, thus linking distinct levels of individual/firm and collective/cluster-level organization that are less frequently noted in the literature. Narratives reveal that "reactive entrepreneurship" could act as a significant contributor to the preservation of cluster periphery and the inability of a location to develop both at the individual/start-up and collective/cluster levels of economic and business organization. Therefore, even though young and small start-ups in early-stage peripheral locations may suffer from resource shortages, more damaging in the longer term seems to be the negative effect of entrepreneurial passivity and the paradoxical combination of dependence on public sector authorities and the lack of confidence in the capacity or willingness of such authorities to resolve complex problems faced by start-ups. The only remaining option—overreliance on multinational corporations—may further undermine the need for developing indigenous and indigenously managed solutions at the local level, including through founding local cluster forums.

Simultaneous, closely interrelated resource and other difficulties uncovered at the individual/start-up and collective/cluster organizing levels demonstrate links between two levels of organization that have not been systematically studied, and consequently remain less well understood both in studies of clusters and in entrepreneurship research but which may have a significant combined negative effect on the long-term development prospects of locations such as those studied by us here. By linking two distinct levels of organization and the dynamics of interaction within and between them—the level of individual entrepreneurial start-ups, their managers and staff members on the one hand, and the level of cluster developments on the other hand—the nature and sources of stunted development in all their complexity can be explored in greater depth. Inadequacies, difficulties, and hindrances at micro- and meso-levels of IT organization have helped uncover a vicious cycle of stunted development that could be contrasted with virtuous cycles of sustained development reported much more consistently in both literatures of clusters and entrepreneurship—a contribution not only to entrepreneurship research but also a complement to existing cluster theory. Studies of virtuous cycles have uncovered recurrent sets of characteristics that seem to be responsible for sustained economic success (Brenner, 2006), including financial and human resources, as well as other significant resources such as knowledge. Although there have been calls for a more critical approach to be adopted toward the analytic emphasis on issues of "success," "successful clusters," and the few "winner" regions in the global economy (Hadjimichalis & Hudson, 2007), and even though Phelps (2008) has sought to problematize the tendency of cluster research to describe positive cumulative causation, competitiveness and virtuous cycles in their different variants still dominate the research agenda. However, contrary to our expectations that difficulties, and ultimately the vicious cycle that has been empirically uncovered, would be driven by low levels or the absence of sources of success and virtuous cycles, we have empirically demonstrated that resource weaknesses are not the sole explanation of stunted development, vicious cycles, prolonged periphery, and under-performance. Additional, unanticipated factors that are less frequently documented by researchers, such as passivity and risk aversion, appear to be more prominent as drivers of stunted growth, as shown in Figure 1.

In the figure, we have also sought to illustrate the direction of causation of developments in Vietnamese IT, with resource deficiencies, risk aversion, passivity, and

Figure 1

A Theoretical Framework of Entrepreneurship in Early-Stage Peripheral Clusters in an Emerging Economy



overreliance upon public sector solutions to common problems shown to affect stunted entrepreneurship and cluster development. However, the empirical data suggest that vicious cycles contain mutually reinforcing suboptimal behaviors in the system, with stunted entrepreneurship and cluster development in turn further exacerbating reactive, risk-averse attitudes; subsequent overreliance on the public sector; the absence of (search for) collective, private sector solutions to common problems; and ultimately deepening difficulties in attracting and retaining resources, all of which represent significant ingredients in the aforementioned stunted growth.

Conclusions and Further Research

This paper attempted to link the analysis of difficulties faced by early-stage high-technology start-ups with the predicaments in developing peripheral locations in emerging economies. Such two-level analysis revealed the operation of vicious cycles of stunted growth which help develop our understanding of entrepreneurship in resource-constrained, cluster environments but also complement existing cluster theory of, first, weaknesses and difficulties (e.g., Aharonson, Baum, & Plunket, 2008; Mets, 2006; Zabala-Iturriagagoitia, Gutiérrez-Gracia, & Jiménez-Sáez, 2008); and second, less developed regions in less developed and postcommunist, transition economies (e.g., Mets; Scheel, 2002). A contribution has also been sought by bringing entrepreneurs and entrepreneurial ventures into cluster research, as suggested by Tappi (2005). This is a suggestion that, as far as the authors are aware, has not been empirically explored more systematically. We also demonstrated the role of the local environment in the form of a cluster in entrepreneurship research advised by Tamasy (2006) and encapsulated in the conclusion that such environments "matter" for entrepreneurship research. Vietnamese IT ventures within peripheral clusters were chosen as a research topic to empirically study some literature claims and draw conclusions. The empirical research demonstrates the benefits of bringing together distinct fields of academic inquiry and policy analysis. The combined interest in problems of start-ups and peripheral locations suggests commonalities and opportunities for cross-disciplinary work, as well as the necessity for a theory of entrepreneurship that accounts simultaneously for different levels of organization (Bøllingtoft & Ulhøi, 2005; Phan, 2004). Combining and simultaneously addressing problems at disparate levels of economic and business organization is a legitimate conceptual task, for empirical findings presented here illustrate common problems at the start-up and cluster-organizing levels that cannot be adequately explored and understood in isolation.

As regards practice-relevant conclusions and implications, the nature and magnitude of inadequacies unearthed during this research present an empirically derived picture that should be contrasted with the official rhetoric of success and public policy commitment to IT. Vietnam has so far positioned itself as an attractive outsourcing location, with an emphasis on low labor costs. However, as the experience of Vietnamese IT clusters demonstrates, low wages do not necessarily translate into superior efficiency, innovation, and competitiveness. Apart from the more obvious suggestions about adopting a more *dirigiste* treatment and focused public sector support in areas of education, training, technological upgrading, and networking which incorporate lessons from Vietnam's neighbors, factors such as "entrepreneurial flair" and zeal have been shown to act as two significant drivers of firm- and collective, cluster-level success. Entrepreneurial orientation, in terms of risk taking, readiness to invest in uncertain outcomes, and acting proactively, is somewhat wanting in the context analyzed here. Such findings, backed by

the earlier mentioned World Values Survey indices, contradict, first, Chen's (2005) conclusion about Vietnam's capitalist experimentation, and second Dalton and Ong's (2003) notion of the extensive engagement and activism of Vietnamese citizenry, including in community and political groups. We find a rather skeptical attitude on the part of our interviewees toward risk taking, agency, and activism. For many centuries, Vietnamese society has centered on "narrowly defined" "village structures" (Dalton & Ong) that have been fundamentally patriarchal, conservative, and averse to individual experimentation. Participation outside of these structures has only recently increased, and the Vietnamese still appear to be "less autonomous" and not as "assertive" as their counterparts in other transition economies. Authoritarianism of the type experienced by Vietnam during the past few decades may also have produced lasting "scars" in terms of "deformed perceptions" by limiting the number and variety of social spheres where "cooperative associations" may be allowed to engender "mutual trust," "shared values," and initiative-taking. The inherited situation in Vietnam, as in other transition economies, is one of low involvement and paucity of initiative-taking, "passivity," and suspicion toward individualism and individuals. These are the social-cultural and economic outcomes of the interpenetration of economic, political, and ideological systems of management that have effectively atomized and distanced individuals in the past, and which may need to be overcome in order to generate circumstances that are favorable to high-technology entrepreneurship not only in Vietnam but also in similar locations.

Although our research has unearthed certain pathologies within the IT sector of a developing nation, other industry clusters in Vietnam have been shown to be more vibrant and sustainable. Examples include textiles, food processing, and tourism, which have also been developing within clusters. Therefore, we do recognize that one may need to exercise some caution in extrapolating our findings to all Vietnamese clusters, and especially low-technology industries and clusters that are not as complex in their setup and rely more on simpler, typically hierarchical outsourcing arrangements with Western client organizations. High-technology clusters have more complex human resources, knowledge, infrastructure, and other requirements (Audretsch & Feldman, 2003; Huber, 2012), making in turn informal knowledge networks (Keeble, 2000), complex collaborations, and greater initiative-taking and coordination based on various forms of trust on multiple levels a more significant prerequisite for success than is the case with the low-technology clusters where Vietnam appears to have experienced greater success in recent years. Therefore, and in spite of the incorporation of certain sociological, cultural, and historical explanations of the economic and business dynamics uncovered here, it is not our intention to suggest that all Vietnamese clusters should necessarily face all difficulties described by us here, or that predicaments of the type analyzed by us would be equally deep and lasting across all sectors of the economy, especially the low-technology ones.

Further research about the difficulties encountered by early-stage ventures in peripheral clusters in emerging economies may shed light on inadequately understood aspects of economic competitiveness. While our empirical research unearthed links among deficiencies at individual- and collective-level decision making and resources, future analysis could replicate the theoretical model across national and sectoral environments. Some of the empirical material collected by us documented the views of managers. The stories of other significant stakeholders are also captured and researched, including the perceptions of two public sector managers and a former university lecturer who was interviewed in his role as a manager in one of the start-ups. Our attempts to interview more public sector decision makers and stakeholders in universities were unsuccessful. Still, one may not conclude that our findings have been colored by such coverage of the views of stakeholders holding different roles across strands of the triple

helix. The sample was balanced, comprising 17 CEOs and MDs, 10 middle-level managers, 7 members of staff, and 2 public sector managers. The variety of codes also attests to the diversity of views that have been collected and analyzed, demonstrating the nondominance of perceptions of MDs and CEOs only. Nonetheless, further empirical research may seek to extend this study by soliciting the views of additional stakeholders involved in start-up and cluster development.

REFERENCES

Agrawal, A. (2001). University-to-industry knowledge transfer. *International Journal of Management Reviews*, *3*(4), 285–298.

Aharonson, B., Baum, J., & Plunket, A. (2008). Inventive and uninventive clusters. *Research Policy*, *37*(6–7), 1108–1131.

Aldrich, H. & Wiedenmayer, G. (1993). From traits to rates. *Advances in Entrepreneurship, Firm Emergence and Growth*, *1*, 145–195.

Al-Laham, A. & Souitaris, V. (2008). Network embeddedness and new-venture internationalization. *Journal of Business Venturing*, *23*(5), 567–586.

Allen, S. & Hevert, K. (2007). Venture capital investing by information technology companies. *Journal of Business Venturing*, *22*(6), 262–282.

Audretsch, D., Bönte, W., & Keilbach, M. (2008). Entrepreneurship capital and its impact on knowledge diffusion and economic performance. *Journal of Business Venturing*, *23*(6), 687–698.

Audretsch, D. & Feldman, M. (2003). Knowledge spillovers and the geography of innovation. In J. Henderson & J. Thisse (Eds.), *Handbook of urban and regional economics* (pp. 2713–2729). Amsterdam: North Holland.

Baptista, R. & Swann, P. (1998). Do firms in clusters innovate more? *Research Policy*, *27*(5), 525–540.

Beal, R. (2000). Competing effectively. *Journal of Small Business Management*, *38*(1), 27–47.

Belussi, F. (2005). Are industrial districts formed by networks without technologies? *European Urban and Regional Studies*, *12*(3), 247–268.

Belussi, F., Sammarra, A., & Sedita, S. (2008). Managing long distance and localized learning in the Emilia Romagna life science cluster. *European Planning Studies*, *16*(5), 665–692.

Bøllingtoft, A. & Ulhøi, J. (2005). The networked business incubator. *Journal of Business Venturing*, *20*(2), 265–290.

Bosma, N., van Praag, C., Thurik, A., & de Wit, G. (2004). The value of human and social capital investments for the business performance of startups. *Small Business Economics*, *23*(3), 227–236.

Brenner, T. (2006). Identification of local industrial clusters in Germany. *Regional Studies*, *40*(4), 991–1004.

Broll, U. & Roldán-Ponce, A. (2011). Clustering in Dresden. *European Planning Studies*, *19*, 949–966.

Bruderl, J. & Preisendorfer, P. (1998). Network support and the success of newly founded businesses. *Small Business Economics*, *10*(3), 213–225.

Bruton, G. & Rubanik, Y. (2002). Resources of the firm, Russian high-technology startups, and firm growth. *Journal of Business Venturing*, *17*(6), 553–576.

Bryan, J. (2006). Training and performance in small firms. *International Small Business Journal*, *24*(6), 635–648.

Business in Asia. (2010). Telecommunications in Vietnam. Available at http://www.business-in-asia.com/telecommunication_in_vietnam.htm, accessed 29 June 2012.

Business Times. (2010). Software sector to see rapid growth. Available at http://businesstimes.com.vn/software-sector-to-see-rapid-growth, accessed 29 June 2012.

Business Times. (2012a). Government proposed to restart key IT projects. Available at http://businesstimes.com.vn/govt-proposed-to-restart-key-it-projects, accessed 29 June 2012.

Business Times. (2012b). Fund proposed to prop up Vietnamese SMEs. Available at http://businesstimes.com.vn/fund-proposed-to-prop-up-vietnamese-smes, accessed 29 June 2012.

Business Times. (2012c). Hi-tech parks seek breakthroughs. Available at http://businesstimes.com.vn/hi-tech-parks-seek-breakthroughs, accessed 29 June 2012.

Carson, D., Gilmore, A., Gronhaug, K., & Perry, C. (2001). *Qualitative marketing research*. London: Sage Publications.

Cassar, G. (2006). Entrepreneur opportunity cost and intended venture growth. *Journal of Business Venturing*, *21*(6), 610–632.

Chaston, I. (2000). Organisational competence. *Journal of Research in Marketing and Entrepreneurship*, *2*(1), 37–56.

Chen, X. (2005). Magic and myth of migration. *Asia-Pacific Population Journal*, *2*(3), 57–77.

Collewaert, V., Manigart, S., & Aernoudt, R. (2010). Assessment of government funding of business angel networks in Flanders. *Regional Studies*, *44*(1), 119–130.

Colombo, M. & Grilli, L. (2010). On growth drivers of high-tech start-ups. *Journal of Business Venturing*, *25*(6), 610–626.

Corbin, J. & Strauss, A. (2008). *Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage Publications.

Cordeiro, C. & Al-Hawamdeh, S. (2001). National information infrastructure and the realization of Singapore IT2000 initiative. *Information Research*, *6*(2), 96–105.

Coviello, N. & Munro, H. (1995). Growing the entrepreneurial firm. *European Journal of Marketing*, *29*(7), 49–61.

Creswell, J. (2009). *Research design: Qualitative, quantitative and mixed method approaches*. Thousand Oaks, CA: Sage Publications.

Cumbers, A., Leibovitz, J., & MacKinnon, D. (2007). Institutional features, path dependencies and regional industrial change. *International Journal of Entrepreneurship and Innovation Management*, *7*(2–5), 424–444.

Dalton, R. & Ong, N. (2003). Civil society and social capital in Vietnam. Available at http://www.worldvaluessurvey.org/wvs/articles/folder_published/publication_499, accessed 2 January 2013.

Davidsson, P. & Honig, B. (2003). The role of social and human capital among nascent entrepreneurs. *Journal of Business Venturing*, *18*(1), 301–331.

Delgado, M., Porter, M., & Stern, S. (2010). Clusters and entrepreneurship. *Journal of Economic Geography*, *10*(4), 495–518.

Denzin, N. & Lincoln, Y. (2005). *The Sage handbook of qualitative research*. Thousand Oaks, Ca: Sage Publications.

Dimov, D. & Shepherd, D. (2005). Human capital theory and venture capital firms. *Journal of Business Venturing*, *20*(1), 1–21.

Do, J., Dieu, P., & Goodman, S. (1996). Vietnam: Information technology for the transition. *Computer*, *29*(3), 88–94.

Dohse, D. (2007). Cluster-based technology policy—The German experience. *Industry and Innovation*, *14*(1), 69–95.

Dohse, D. & Soltwedel, R. (2006). Recent developments in the research on innovative clusters. *European Planning Studies*, *14*(1), 1167–1170.

Dost, N., Frias, J., Liu, I., Ngo, Z., & Taussig, M. (2008). *Analysis and recommendations on the development of Vietnam's electronics cluster*. Cambridge, MA: Harvard University Press.

Dubini, P. & Aldrich, H. (1991). Personal and extended networks are central to the entrepreneurial process. *Journal of Business Venturing*, *6*(5), 305–313.

Eisenhardt, K. & Schoonhoven, C. (1990). Organization growth. *Administrative Science Quarterly*, *35*(3), 504–529.

Eisenhardt, K. & Schoonhoven, C. (1996). Resource-based view of strategic alliance formation. *Organization Science*, *7*(2), 136–150.

Etzkowitz, H. & Leydesdorff, L. (2000). The dynamics of innovation: From systems and "mode 2" to a triple helix of university-industry-government relations. *Research Policy*, *29*(2), 109–123.

Evers, H. & Gerke, S. (2004). *Closing the digital divide*. Centre for East and South-East Asian Studies series, 25–27 May.

Finegold, D., Wong, P., & Cheah, T. (2004). Adopting a foreign-direct investment strategy to the knowledge economy. *European Planning Studies*, *12*(7), 921–941.

Flick, U. (2006). *An introduction to qualitative research*. London: Sage Publications.

Foreman-Peck, J., Makepeace, G., & Morgan, B. (2006). Growth and profitability of small and medium sized enterprises. *Regional Studies*, *40*(4), 307–319.

Frese, M., Krauss, S., Escher, S., Grabarkiewicz, R., Luneng, S., Heers, C., et al. (2007). Business owners' action planning and its relationship to business success in three African countries. *Journal of Applied Psychology*, *92*(6), 1481–1498.

Gilbert, B., McDougall, P., & Audretsch, D. (2008). Clusters, knowledge spillovers and new venture performance. *Journal of Business Venturing*, *23*(4), 405–422.

Grant, R. & Baden-Fuller, C. (2004). A knowledge-accessing theory of strategic alliances. *Journal of Management Studies*, *41*(1), 61–84.

Haber, S. & Reichel, A. (2007). The cumulative nature of the entrepreneurial process. *Journal of Business Venturing*, *22*(1), 119–145.

Hadjimichalis, C. & Hudson, R. (2007). Rethinking local and regional development implications for radical political practice in Europe. *European Urban and Regional Studies*, *14*(2), 99–113.

Hanley, R. (2004). *Moving people, goods and information in the 21st century*. New York: Routledge.

Hauser, C., Tappeiner, G., & Walde, J. (2007). The learning region. *Regional Studies*, *41*(1), 75–88.

Hauser, J., Tellis, G., & Griffin, A. (2006). Research on innovation: A review and agenda for marketing science. *Marketing Science*, *25*(6), 687–720.

Heng, T. & Yam, Y. (1998). *Competitiveness of the Singapore economy*. Singapore: Singapore University Press.

Hoang, H. & Antoncic, B. (2003). Network-based research in entrepreneurship. *Journal of Business Venturing*, *18*(2), 165–187.

Hoffmann, V., Molina-Morales, X., & Martinez-Fernandez, M. (2011). Evaluation of competitiveness in ceramic industrial districts in Brazil. *European Business Review*, *23*(1), 87–105.

Holliday, A. (2007). *Doing and writing qualitative research*. London: Sage Publications.

Hosman, L., Fife, E., & Armey, L. (2008). The case for a multi-methodological, cross-disciplinary approach to the analysis of ICT investment and projects in the developing world. *Information Technology for Development*, *14*(4), 308–327.

Huber, F. (2012). Do clusters really matter for innovation practices in information technology? *Journal of Economic Geography*, *12*(1), 107–126.

Husserl, E. (1970). *The crisis of European sciences and transcendental philosophy*. Evanston, IL: Northwestern University Press.

Jack, S. (2010). Approaches to studying networks. *Journal of Business Venturing*, *25*(1), 120–137.

Jack, S. & Anderson, A. (2002). The effects of embeddedness on the entrepreneurial process. *Journal of Business Venturing*, *17*(5), 467–487.

Jarillo, C. (1988). On strategic networks. *Strategic Management Journal*, *9*(1), 31–41.

Kah, J., Olds, D., & Kah, M. (2005). Microcredit, social capital, and politics. *Journal of Microfinance*, *7*(1), 119–149.

Karlsen, J., Isaksen, A., & Spilling, O. (2011). The challenge of constructing regional advantages in peripheral areas. *Entrepreneurship and Regional Development*, *23*(3–4), 235–257.

Kasabov, E. (2008). The challenge of devising public policy for high-tech, science- and knowledge-based communities. *Environment and Planning C*, *26*(1), 210–228.

Kasabov, E. (2010). Why every cluster cannot be a successful community? *European Planning Studies*, *18*(9), 1445–1469.

Kasabov, E. (2011). Towards a theory of peripheral, early stage clusters. *Regional Studies*, *45*(6), 827–842.

Kasabov, E. & Sundaram, U. (2011). A stakeholder approach to branding clusters. *Regional Studies*, *47*(4), 530–543.

Katz, J., Aldrich, H., Welbourne, T., & Williams, P. (2000). Special issue on human resource management and the SME. *Entrepreneurship Theory and Practice*, *1*(1), 7–10.

Keeble, D. (2000). Collective learning processes in European high-technology milieux. In D. Keeble & F. Wilkinson (Eds.), *High-technology clusters, networking and collective learning in Europe* (pp. 199–229). Aldershot, U.K.: Ashgate.

Kelley, D. & Rice, M. (2002). Advantage beyond founding. *Journal of Business Venturing*, *17*(1), 41–57.

Kitagawa, F. (2007). The regionalization of science and innovation governance in Japan. *Regional Studies*, *41*(8), 1099–1114.

Kodithuwakku, S. & Rosa, P. (2002). The entrepreneurial process and economic success in a constrained environment. *Journal of Business Venturing*, *17*(5), 431–465.

Koh, W. & Wong, P. (2005). Competing at the frontier. *Technological Forecasting and Social Change*, *72*, 255–285.

Kvale, S. (2009). *Interviews: Learning the craft of qualitative research interviewing*. Thousand Oaks, CA: Sage Publications.

Layder, D. (2005). *Sociological practice: Linking theory and social research*. London: Sage Publications.

Leydesdorff, L. (2012). The triple helix, quadruple helix . . . and an n-tuple of helices. *Journal of the Knowledge Economy*, *3*(1), 25–35.

Lorenz, B. & Detlef, S. (2008). Patterns of social capital in West German regions. *European Urban and Regional Studies*, *15*(3), 229–248.

Lorenzoni, G. & Baden-Fuller, C. (1995). Creating a strategic centre to manage a web of partners. *California Management Review*, *37*(3), 146–163.

Luger, M. & Koo, J. (2005). Defining and tracking business start-ups. *Small Business Economics*, *24*(1), 17–28.

MacGregor, R. (2004). Factors associated with formal networking in regional small business. *Journal of Small Business and Enterprise Development*, *11*(1), 60–73.

Maskell, P., Bathelt, H., & Malmberg, A. (2006). Building global knowledge pipelines. *European Planning Studies*, *14*(8), 997–1013.

Mayer, R., Davis, S., & Schoorman, F. (1995). An integrative model of organizational trust. *Academy of Management Review*, *20*(3), 709–734.

McCann, B. & Folta, T. (2011). Performance differentials within geographic clusters. *Journal of Business Venturing*, *26*(1), 104–123.

McGrath, R. (1999). Falling forward: Real options reasoning and owner-managerial failure. *Academy of Management Review*, *24*(1), 13–30.

Meier, G. & Stiglitz, J. (2001). *Frontiers of development economics*. Oxford: Oxford University Press.

Menzel, M. & Fornahl, D. (2009). Cluster life cycles—Dimensions and rationales of cluster evolution. *Industrial and Corporate Change*, *19*(1), 205–238.

Mets, T. (2006). Creating a knowledge transfer environment: The case of Estonian biotechnology. *Management Research News*, *29*(12), 754–768.

Miles, M. & Darroch, J. (2006). Large firms, entrepreneurial marketing processes, and the cycle of competitive advantage. *European Journal of Marketing*, *40*(5–6), 485–501.

Moore, N. (2008). Stimulating the growth of the information services sector. Available at http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.133.3101, accessed 27 June 2012.

Ng, P. (2012). High technology cluster growth initiatives in Singapore. In T. Bas & J. Zhao (Eds.), *Comparing high technology firms in developed and developing countries* (pp. 26–36). Hershey, PA: IGI Global.

Nicolaou, N. & Birley, S. (2003). Academic networks in a trichotomous categorization of university spinouts. *Journal of Business Venturing*, *18*(3), 333–359.

Oliver, J., Garrigos, J., & Porta, J. (2008). Knowledge asymmetries among clusters within global value chains. *European Planning Studies*, *16*(1), 507–520.

Ozgen, E. & Baron, R. (2007). Social sources of information in opportunity recognition. *Journal of Business Venturing*, *22*(2), 174–192.

Pack, H. (2000). Research and development in the industrial development process. In L. Kim & R. Nelson (Eds.), *Technology, learning, and innovation* (pp. 69–94). Cambridge: Cambridge University Press.

Parker, S. (2011). Intrapreneurship or entrepreneurship? *Journal of Business Venturing*, *26*(1), 19–34.

Patton, M. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage Publications.

Patzelt, H. & Shepherd, D. (2011). Negative emotions of an entrepreneurial career. *Journal of Business Venturing*, *26*(2), 226–238.

Pe'er, A. & Vertinsky, I. (2008). Firm exits as a determinant of new entry. *Journal of Business Venturing*, *23*(3), 280–306.

Perry, B. & May, T. (2007). Governance, science policy and regions. *Regional Studies*, *41*(8), 1039–1050.

Petruzzelli, A., Albino, V., & Carbonara, N. (2007). Technology districts: Proximity and knowledge access. *Journal of Knowledge Management*, *11*(5), 98–111.

Phan, P. (2004). Entrepreneurship theory: Possibilities and future directions. *Journal of Business Venturing*, *19*(5), 617–620.

Phelps, N. (2008). Cluster or capture? *Regional Studies*, *42*(4), 457–473.

Porter, M. (1990). *The competitive advantage of nations*. New York: The Free Press.

Porter, M. (1998). Clusters and the new economics of competition. *Harvard Business Review*, *November*, 77–90.

Quere, M. (2008). Innovation networks in the life sciences industry. *European Planning Studies*, *16*(3), 411–427.

Rangan, S. (2000). The problem of search and deliberation in economic action. *Academy of Management Review*, *25*(4), 813–828.

Rauch, A., Frese, M., & Utsch, A. (2005). Effects of human capital and long-term human resources development on employment growth of small-scale businesses. *Entrepreneurship Theory and Practice*, *29*(6), 681–698.

Rosiello, A. (2008). Rethinking innovation systems in life sciences. *European Planning Studies*, *16*(3), 329–335.

Rosiello, A. & Orsenigo, L. (2008). A critical assessment of regional innovation policy in pharmaceutical biotechnology. *European Planning Studies*, *16*(3), 337–357.

Rychen, F. & Zimmerman, J.-B. (2008). Clusters in the global knowledge-based economy. *Regional Studies*, *42*(6), 767–776.

Sarasvathy, S. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, *26*(2), 243–263.

Saxenian, A. (1994). *Regional advantage*. Cambridge, MA: Harvard University Press.

Scheel, C. (2002). Knowledge clusters of technological innovation systems. *Journal of Knowledge Management*, *6*(4), 356–367.

Schwartz, M. (2002). IDG plans major expansion in Vietnam. *B to B*, *87*(13), 3.

Scott, A. & Storper, M. (2003). Regions, globalization, development. *Regional Studies*, *37*(6–7), 579–593.

Scozzi, B., Garavelli, C., & Crowston, K. (2005). Methods for modeling and supporting innovation process in SMEs. *European Journal of Innovation Management*, *8*(1), 120–137.

Shrader, R. & Siegel, D. (2007). Assessing the relationship between human capital and firm performance: Evidence from technology-based new ventures. *Entrepreneurship Theory and Practice*, *31*(6), 893–908.

Simpson, M., Padmore, J., Taylor, N., & Frecknall-Hughes, J. (2006). Marketing in small and medium sized enterprises. *International Journal of Entrepreneurial Behaviour and Research*, *12*(6), 361–372.

Singh, R. (2000). *Entrepreneurial opportunity recognition through social network*. New York: Garland.

Spencer, G., Vinodrai, T., Gertler, M., & Wolfe, D. (2010). Do clusters make a difference? *Regional Studies*, *44*(6), 697–715.

Street, C. & Cameron, A. (2007). External relationships and the small business: A review of small business alliance and network research. *Journal of Small Business Management*, *45*(2), 239–266.

Tamasy, C. (2006). Determinants of regional entrepreneurship dynamics in contemporary Germany. *Regional Studies*, *40*(4), 365–384.

Tan, J. (2006). Growth of industry clusters and innovation. *Journal of Business Venturing*, *21*(6), 827–850.

Tappi, D. (2005). Clusters, adaptation and extroversion. *European Urban and Regional Studies*, *12*(3), 289–307.

Torre, A. (2008). On the role played by temporary geographical proximity in knowledge transmission. *Regional Studies*, *42*(6), 869–889.

Unger, J., Rauch, A., Frese, M., & Rosenbusch, N. (2011). Human capital and entrepreneurial success. *Journal of Business Venturing*, *26*(3), 341–358.

Vietnam Competitiveness Initiative (VNCI). (2003). *Software/ICT cluster strategy*. Ha Noi: Southeast Asia Competitiveness Initiative.

Vietnamnet. (2012). Ha Noi's high ranking in software outsourcing gives Vietnamese the start. Available at http://english.vietnamnet.vn/en/science-technology/24097/hanoi-s-high-ranking-in-software-outsourcing-gives-vietnamese-the-start.html, accessed 27 June 2012.

Virkkala, S. (2007). Innovation and networking in peripheral areas. *European Planning Studies*, *15*(4), 511–529.

Wang, T. & Chien, S. (2007). The influences of technology development on economic performance. *Technovation*, *27*(8), 471–488.

Waters, R. & Smith, L. (2008). Social networks in high-technology local economies. *European Urban and Regional Studies*, *15*(1), 21–37.

Wennberg, K. & Lindqvist, G. (2010). The effect of clusters on the survival and performance of new firms. *Small Business Economics*, *34*(3), 221–241.

Wennberg, K., Wiklund, J., DeTienne, D., & Cardon, M. (2010). Reconceptualizing entrepreneurial exit: Divergent exit routes and their drivers. *Journal of Business Venturing*, *25*(4), 361–375.

Westhead, P., Ucbasaran, D., & Wright, M. (2005). Decisions, actions, and performance. *Journal of Small Business Management*, *43*(4), 393–417.

Wong, P., Ho, Y., & Singh, A. (2009). Industrial cluster development and innovation in Singapore. In A. Kuchiki & M. Tsuji (Eds.), *From agglomeration to innovation* (pp. 50–117). Basingstoke, U.K.: Palgrave Macmillan.

Woodcock, D., Mosey, S., & Wood, T. (2000). New product development in British SMEs. *European Journal of Innovation Management*, *3*(4), 212–221.

Yin, R. (1994). *Case study research*. Beverly Hills, CA: Sage Publications.

Yin, R. (2003). *Applications of case study research*. Thousand Oaks, CA: Sage Publications.

Zabala-Iturriagagoitia, J., Gutiérrez-Gracia, A., & Jiménez-Sáez, F. (2008). Benchmarking innovation in the Valencian community. *European Urban and Regional Studies*, *15*(4), 333–347.

Zahra, S., Matherne, B., & Carleton, J. (2003). Technological resource leveraging and the internationalization of new ventures. *Journal of International Entrepreneurship*, *1*(2), 163–186.

Edward Kasabov is an associate professor at the University of Exeter Business School, Rennes Drive, Exeter EX4 4PU, UK, and is a fellow in ESRC/EPSRC AIM (Advanced Institute of Management Research), London, WC1B 5DN, UK.