

Industry Clusters, SMEs and Public Policy

A Review, and Recommendations for Peripheral Regions

Meir Russ^a and Jeannette K. Jones^b

^aAustin E. Cofrin School of Business, University of Wisconsin - Green Bay, Green Bay, WI
54311-7001, USA e-mail: russm@uwgb.edu

^bAmerican Intercontinental University Hoffman Estates, Illinois 60192, USA
e-mail: jeannette.jones@faculty.aiuonline.edu

Abstract

Research suggests that small and medium size enterprises (SMEs) are major contributors to job creation and are stabilizing factors for economic development since they are locally bound and less mobile. It is believed, however, that those economic development advantages are diminished if the SME is situated in a knowledge deprived region. Our own research suggests however, that in knowledge deprived regions, small, knowledge intensive companies can endure if they network out of the region and collaborate with suppliers and/or customers. Since psychological distance often overrides physical distance as the principal barrier for collaboration, creating channels of networking are critical. One question of interest is how SMEs in knowledge deprived regions can be supported by regional and/or national economic development entities so it can participate effectively in the global knowledge economy. This paper will propose a number of ideas and policy guidelines for such support, taking into consideration the unique aspects of policy making in regard to knowledge management of SMEs situated in a peripheral region. The central idea is the support and creation of an appropriate infrastructure; for example, telecommunication and transportation infrastructures (which are obvious), and less obvious, regulatory (e.g., regulating capital transfer) and administrative (e.g., regional sister relationships) supports. Among other policy guidelines are supports for meeting opportunities, (e.g., supporting international conferences), formal recognition of clusters such as university-industry collaboration, and regional and international activities. In this paper we will also address pitfalls such as, “don’t pick winners,” and “let the business community drive the process.”

Key words: Industry clusters, peripheral regions, public policy, SMEs

Introduction

The new, knowledge-based economy where intangible products, services, and resources are playing an increasingly important role (Teece, 1998), presents unique challenges to individual entrepreneurs, companies, regions, national governments (e.g., Statistics Canada, 2005), and international organizations (e.g. OECD, World Bank, see Roelandt and den Hertog,

The paper was accepted by Associate Editor J. Michael Geringer, who also arranged for the peer review of the manuscript.

1999). One of the challenges is the growing importance of tacit knowledge and the impact this has on company strategies, on industry clusters, and on economic development policies and practitioners (e.g. Audretsch, 2003). The importance of tacit knowledge as the foundation of an exogenous source of economic growth and the engine of economic development is now widely accepted by economists for regions and nations (e.g. Statistics Canada, 2005), and as an endogenous source of growth by business strategists it is acknowledged at the individual/entrepreneur and company levels (e.g. Bergman and Schubert, 2005; Audretsch, 2003). Also, the importance of the stickiness of tacit knowledge is increasing (e.g. Audretsch, 2003; Sternberg, 2003). At the same time, it has become clearer that the “long tail” - exponential distribution of wealth and growing inequality among individuals, companies, regions, and nations is one outcome of the proliferation of Information Communication Technologies (ICT) and globalization. One can see the increasing importance that mega-regions have on economic development (e.g. Florida et al., 2007), the increasing market share and consolidation of the leading companies in numerous industries (e.g., UNCTAD, 2007; Baldwin et al., 2001; appendix C, pp. 89-93), or the growing wealth of the top deciles--what some people call the growing gap between the “haves” and the “have nots” (e.g., Piketty and Saez, 2006).

Is this suggesting that only a few mega-metropolitan areas will thrive in the new knowledge-based economy (Florida et al., 2007)? Will the “long-tale” theory of the creative economy win as Florida (2005) suggested? Recent experience suggests that government policy can reverse this trend in only a few cases, and only with heavy investment and a complementary set of policies (The World Bank, 2008). But can the new generation of ICT’s reverse that trend? Counter-intuitively, until recently this was not the case. The major reason being that the shortened half-life and sticky nature of knowledge greatly increased the importance of face-to-face (F2F) exchanges for innovation which played a major role in business success and wealth creation (e.g. Dohse, 2003). In addition, the increased pace of new knowledge creation resulted in a higher concentration of industry clusters in major urban areas. If knowledge in the new economy is the most important asset (e.g., Lytras et al., 2008), then learning and regional networks of knowledge development are of critical importance. This tacitness and the stickiness of knowledge impose new characteristics on public policy toward economic development (e.g., Koschatzky, 2005; Johansson et al., 2001). For example, the need to support collaborative relationships between different actors within the region (e.g., Fedderke and Klitgaard, 1998), or the need to develop strategic foresight as a governance process, is new to many policy makers and/or economic development practitioners (Koschatzky, 2005). In addition, the need to support “brain circulation” by promoting supportive venture capital policies (Saxenian, 2005) that might at first appear contradictory to political traditions, was at least initially counter-intuitive.

The growing income gap between the munificent regions and the poor, rural areas is one of the major concerns that drive this paper. Another concern is the misconception about the role of public policy in the new, knowledge-based economy. This paper will propose that in order for a public policy to be effective, the policy makers need to be able to understand the role of the economic, social, and educational background against which their policy is operating. This includes understanding the nature of the life cycle of the industry clusters, specifically the stage at which the industry cluster is within the life cycle, the unique nature of tacit knowledge and the effect it has on the specific industry cluster (Gertler and Wolfe, 2006; Cooke, 2007), and the implications of the next generation ICT- specifically, Web 2.0, video-conferencing and mobile telecommunication (e.g., Stephens, 2008). The importance of the life cycle of the industry clusters will be discussed along with a focus on the impact of early stages, namely the infancy and the growth stages. Some examples of policy that could have an impact on a region and also policies that will focus on specific clusters will be identified. Two mega-trends seem to be the

major drivers behind this new environment: the “decoupling” of the value added chain (unbundling) which allows for a major industry revamp (e.g., Enright, 2000) and the younger generation’s adoption of social media (e.g., Xenos and Foot, 2008).

The paper will proceed as follows. First, we will discuss different types of economic and educational regions. Specifically, this paper will identify four types: the mega-region, the stand-alone region, the marginal region, and the peripheral region. Second, we will discuss the recent research development regarding industry clusters which we believe will have a major impact on public policy, such as a cluster’s life cycle. Third, we will continue with a discussion of some of the more successful policies and guidelines implemented in support of traditional industry clusters. Fourth, we will propose our recommendations.

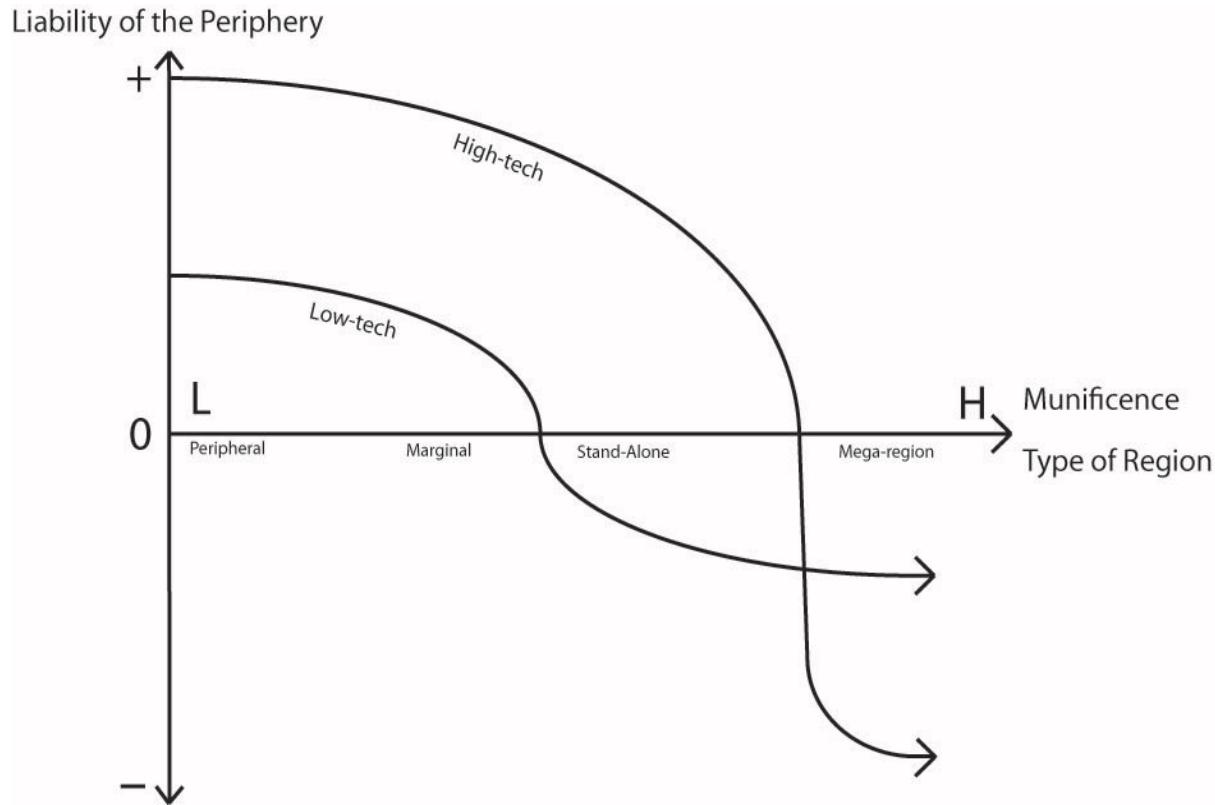
Regional Scope

Previous research (e.g. Malerba and Orsenigo, 1995) as well as our earlier paper (Russ and Paterni, 2007) identified two types of economic regions when considering the richness of the geographical region: the munificent, rich in resources regions, and the peripheral, poor in resources regions. In this paper we propose to improve the two region framework by splitting them into four types of economic regions. The munificent regions can be divided into mega-regions and stand-alone regions. Specifically, in Europe one can identify: Amsterdam and Rotterdam in the Netherlands, Ruhr and Cologne in Germany, Brussels and Antwerp in Belgium, and Lille in France as a mega-region, or Boston-NY-Washington in the US, or the Shanghai-Nanjing-Hangzhou triangle in China. The stand-alone economic regions can be seen as Bordeaux in France, Helsinki in Finland, the Denver-Aurora-Boulder, CO or the Albuquerque, NM Metropolitan Statistical Area (MSA) in the US. In the Middle East one can identify Tel-Aviv, its suburb, Haifa, and Jerusalem or Abu-Dhabi and Dubai as stand-alone regions. The peripheral regions can be divided into marginal-- those that are on the outskirts of the stand-alone region, or on the margins of a mega-region (e.g. Northeast Wisconsin), or at a hole within the mega-region (e.g. Akron, OH); or peripheral--regions that are far away from the centers of the munificent regions, rural, poor, and/or uneducated (e.g. Sicily). Additional discussion regarding the four types of regions in the policy context will be elaborated in Part 4 of this paper and will be summarized in Table 1.

Similar to the “liability of newness” (Stinchcomb, 1965), “liability of adolescence” (Bruderl and Schussler, 1990), and “liability of foreignness” (Zaheer, 1995), we propose the concept of “liability of the periphery” meaning that companies and entrepreneurs that are located in less successful regions (either marginal or in the periphery) must develop strategies to compensate for the additional costs they acquire due to their spatial location or lack of opportunities (e.g., Copus et al., 2008). This liability appears to be even higher for a knowledge intensive business (e.g., Cooke, 2007). Figure 1 describes, conceptually, the cost of the liability of the periphery as a function of the munificence (and type) of the region. As a result, some companies may relocate to areas that are more munificent, while some may adopt their strategy to use other resources such as the International Virtual Industry Cluster (IVIC) as a solution, if they are located in a marginal region (Russ and Paterni, 2007). The story of Wachovia (in Geis, 2008 pp. 6-7) can be seen as an example of how a company is successfully handling the “liability of the periphery”. The bank, now headquartered in Charlotte, North Carolina relocated from Winston-Salem, North Carolina, which is not known to be a financial cluster center, creatively resolving it’s “liability of the periphery” using previous knowledge and experience of outsourcing in India. Another illustrative example of relocating to a more munificent area might be Bank One relocating its headquarters from Columbus, OH to Chicago, IL or the WPS utility

company relocating its headquarters from Green-Bay, WI to Chicago, IL. This may suggest that the knowledge intensity of the industry might have an impact on the liability of the periphery (Bristow, 2005).

Figure 1. Liability of the periphery, region type, and knowledge intensity



The academic support for the types of region taxonomy is beyond the scope of this paper (see examples in Rosenfeld, 2002; Todtling and Trippl, 2005; Clark, 2006, pp. 16-17; Schwartz and Bar-El, 2007), but one can use, for example, the three measures used by Raspe and van Oort (2008) to define knowledge economy: knowledge workers, innovation and R&D intensities, or a number of other indicators (e.g., Light-based Regional Product, Florida et. al., 2007) to ascertain the type of the region. One way to look at the constellation of a mega-region is to see it as a “small world” (see Rychen and Zimmermann, 2006 for preliminary discussion of the concept in the context of clusters), meaning a complex network that is dense in certain areas. These dense areas are then connected through “bridges” such as high-speed rail, or a venture capitalist, and the bridges have connectors into the “holes” between the “dense” areas. The holes can be regions that are less population dense or less active economically, or a cluster of industries in the well connected areas that are declining. One illustration of this concept in our context is the decline of the steel and automobile industries in Cleveland, OH. We would also identify those areas as marginal or as running a risk of becoming marginal.

It is not obvious that regions are the most appropriate unit of analysis for policy purposes. In fact, Hassink (2005) asserted that regions might not be the most effective learning entities, partially due to rigidity of their policy-makers, and that a more effective learning entity might be an industry cluster. At the same time, it seems self-evident that different types of regions require different types of policies in regard to SMEs since each region provides a very different

environment (eco-system), and will have different resources to implement such policies. For example, since successful companies in a peripheral region might be forced to reach outside their home environment earlier than similar companies in a region that has resource munificence, policies helping them to reach out of the region to be better prepared for future geographic expansion, network building, and innovation in satisfying customer needs, might be of critical importance in their future. This requires, from the successful companies' perspective, the systematic development of a unique set of skills and knowledge base and from the policy makers' perspective, a set of supportive public policies. Such supportive policies must include acquiring knowledge and training from outside the region (e.g., Vaessen and Keeble, 1995). Since different regions have different histories and as a result, different absorptive capacities (path dependency), their liability of the periphery might be different. For example, a region that had a successful manufacturing cluster which failed the transition to the new economy has different issues to deal with than a region that had no such experience (see example in Rosenfeld, 2002). In any case, if left on their own, the situation could deteriorate and become a permanent disadvantage or what the literature names a "spatial poverty trap" (e.g. Statistics Canada, 2005).

In summary, the same way small companies are not small big companies (e.g., Karlstun, 2007) and microloans are not small big loans (e.g., Rosengard, 2000), marginal areas (both marginal regions and peripheral regions) are not poor munificent regions (either mega-regions or stand-alone regions). As such, clustering in marginal areas will be different from clustering in munificent areas, similar to the difference of clustering in smaller regions and in larger regions (Karlsson, 2008). If path dependency and absorptive capacity matters for economic development and, if increasing return on knowledge resulting from human and social capital is becoming the standard, (e.g. Guinet, 2003) then supranational, national, and regional policies, as well as firm strategies, must be different and incorporate those human capital and social capital spatial aspects in their growth strategies.

Industry Clusters

Industry clusters have received much attention from economic development professionals (e.g., Waits, 1998) and policy makers trying to duplicate the success of Silicon Valley and viewing them as an effective vehicle for economic development (e.g., Chen, 2006, p. 191). Porter (1998) advanced the argument about the importance of industry clusters in the context of regional economic development and firms' strategy focusing on competitive advantage. But the discussion about industry clusters is not new. As early as the end of the 19th century, Marshall (1890) suggested that market externalities could be produced by firms concentrated in geographic proximity through localization and agglomeration. This regional clustering outcome seems to be driven by a shared labor pool, by knowledge spillover (or information exchange), by a combination of capital pooled with social capital (Castilla, 2003), and by the networking relationships the firms have in the local market (Porter, 1998; Krugman, 1991), resulting in lower costs, increased revenues, and reduced risks. Some common terms frequently used in the academic literature include spatial proximity (Doeringer and Terkla, 1995), vertical and horizontal relationships between the cluster constituencies (Porter, 1990), as well as the use of a common labor pool, technology, a central research center, and the quality of the social network between the cluster players (e.g., Jacobs and DeMan, 1996). Porter (1998: 197) defines clusters as "Geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also co-operate." However, beyond these simplistic basic notions, there is very little agreement about the specific

definitions of clusters (Jacobs and DeMan, 1996). There is also minimal agreement about the appropriate public policies with regard to industry clusters and their success indicators (LeVeen, 1998).

Clusters might deliver a number of benefits for their members. Chief among the benefits are facilitation of knowledge spillover among the members, facilitation of new knowledge creation (or innovation), cost savings along the vertical value added chain, and risk sharing among the members. Until recently, the first two roles were bounded by geographical proximity and the sticky nature of tacit knowledge. Paradoxically, the more complex the knowledge and the faster the knowledge changed, the more important the role tacit knowledge had, resulting in the growing importance of geographically localized clusters. This paradox subsists despite the advances in ICT and their ubiquity, accelerating the dominance of fewer and fewer larger urban clusters supported by the demographic mobility of the creative and skilled labor. On the other hand, the trends seem to reverse with the creation of a few new knowledge intensive centers like Ireland, Singapore, or Bangalore. In fact, government policies in these new knowledge intensive centers seem to be successful in serving as magnets for companies looking for talent and attracting young talent (e.g., Hornidge, 2006). Still most of the policies and monies directed toward support of SME or lagging regions have failed.

Steinle and Schiele (2002) identified the necessary and sufficient conditions for the creation of industry clusters. The two necessary conditions in their analysis are the divisibility of the process and the transportability of the final product. We claim that ALL tangible products and services fall partially into those conditions since even in tangible products (that account for only about 20% or less of the developed economies; 80% or more are services) some critical aspects, like product design, or after sales service, deal with data and information and the disaggregation of the production can easily support that trend. See, for example, the creation of the aircraft industry in China and Japan, which would suggest that most industries, at different points in time, have the appropriate conditions for new clusters to rise (e.g., Goldstein, 2005; MacPherson and Pritchard, 2007; Niosi and Zhegu, 2005).

Cluster Types

The academic literature suggests that one of the reasons why there is little agreement about clusters is because there are different types of clusters, and that when collapsing them into one unit of analysis the researchers are comparing “apples to oranges.” Sverrisson (2004, ch. 2) discusses three types of clusters: the buyer-driven (BD) clusters, the producer-driven (PD) cluster (based on Gereffi, 1994) and the trader-driven (TD) cluster (based on Gibbon, 2001). Each is driven by different constituencies and “game plans.” Another taxonomy suggested by Gordon and McCann (2000) identified three “ideal-types” of clusters: the classic agglomeration type, the industry-complex type, and the social-network model (see also Iammarino and McCann, 2006). A complementary, but different approach was offered by Enright (2003), that suggested a complete taxonomy of the dimensions of clusters including: the geographic scope, density, breath, depth, activity base, geographic span of sales, strengths of competitive position, stage of development (life cycle), nature of technological activities, innovative capacity, and ownership structure. In this paper we will be referring to some of these dimensions explicitly.

Industry Clusters’ Life Cycle (ICLC) and Networks

One way to look at industry clusters is to think of them as being living entities and therefore as having a life cycle (Bergman, 2008; Menzel and Fornahl, 2007). For example, Bergman (2008) identified the following stages of industry cluster life cycle: pre-emergence (or embryonic, see also Avnimelech and Teubal, 2006), expansion (exploratory and/or exploitative),

and exhaustion (including lock-in and/or renaissance). Avnimelech and Teubal, (2006) documented the case of development of the Venture Capital industry in Israel and its co-development with the high-tech cluster, while in the embryonic stage. Their study suggests that the pre-condition for the creation of the industry or cluster might be of critical importance, since if there are not enough resources (for example, human capital) in the eco-system, even the apt vision or offering will fail. This is where appropriate policies may come into play (e.g., The World Bank, 2008). Avnimelech et al., (2006) proposed a five stage model of cluster development, suggesting that the background conditions phase and the pre-emergence phase might be of critical importance for future cluster success as well as for potential successful restructuring (Avnimelech and Schwartz, 2009).

Another way to describe the industry cluster is to identify the intensity or the level of activity/maturity of the cluster. Enright (2003) describes the following five levels of activity/maturity: “wishful thinking”, policy driven, potential, latent, and working clusters.

Two interesting questions are: What are the types of networks that constitute or have the potential to exist in an industry cluster? At what stage of an industry cluster’s life cycle might they play a critical role? Cappellin and Orsenigo (2000) developed the following typology of networks: technological integration, integration with the local labor market, production integration between the firms, integration between the service sector and the manufacturing firms, financial integration of the firms, territorial integration at the local level, social and cultural integration, relationships of institutional integration, and territorial integration at the inter-regional and international level.

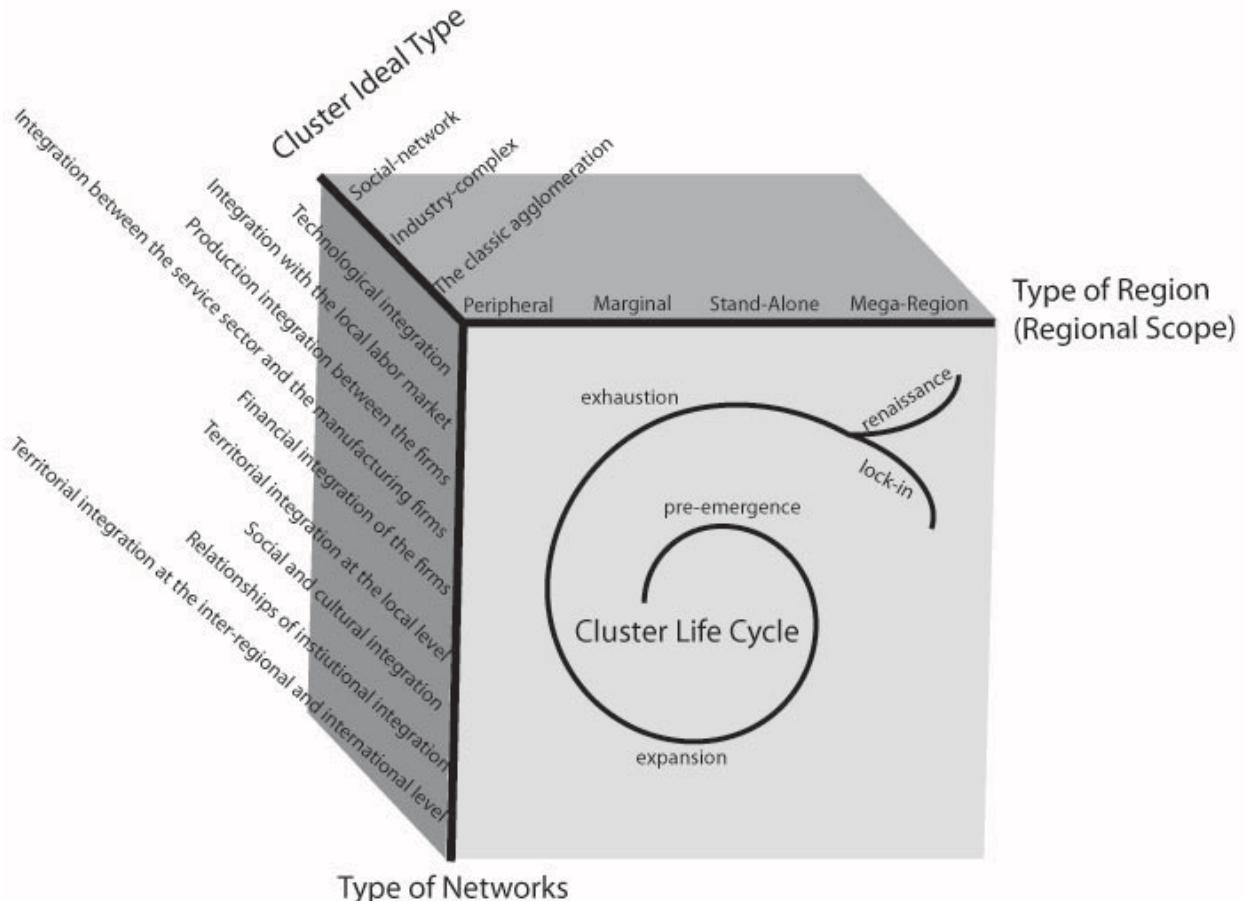
To summarize, Figure 2, presents the four dimensional space which the decision makers have to consider when contemplating their policies.

Economic Development Policies Regarding SMEs and Industry Clusters

The last twenty five years saw significant transition in the academic and practitioner approaches to regional economic development. In the late 1980s, the theories and practices moved from the national geographic scope to the regional scope. This was closely followed by the realization of the importance of human/knowledge capital and social capital at the regional level and the need to adjust the policies to the growing importance of geographically based industry clusters. This importance resulted in the growing role of private and /or public actors at the regional level (e.g., Diez, 2001; Garrett-Jones, 2004). Probably no one spent more money and devoted more attention to this subject than the European Union (EU). In fact, some years, about one third of the EU budget went to regional economic development. Despite the heavy investment, the EU can show few very successful examples and many failures (e.g., Midelfart, 2004; Formica, 2003). The EU is not alone in this area (see also Enright, 2003; p. 122). Garrett-Jones (2004) describes the difficulties of similar policies in Australia. Recently, The World Bank published a report that analyzed the few known successes, described a framework with regard to governmental policies, and suggested that there is still very little known about how to build and sustain high growth industry clusters (The World Bank, 2008; Easterly, 2008). There is a need to develop cluster policies that reflect region specificities and unique characteristics while at the same time allow the region to fit within a global competitive space and global trade (Bergman and Schubert, 2005). Turpin and Garrett-Jones (2002) suggested that one outcome of the increased pressure of globalization, is the complex interaction between regional, national, and transnational innovation systems (and supporting policies) but they stopped short of identifying the vehicle to drive this interaction, assuming that policy makers and/or business leaders would

resolve that complexity. We propose that the IVIC is a mechanism that will contribute to the solution to this dilemma (Russ and Jones, 2008; Russ, 2009).

Figure 2. The four dimensional space of industry clusters



It seems that research is suggesting that successful clusters are the result of a co-evolution of complex relationships between market structure, institutions, knowledge, labor markets, social setting, proximity advantage, and path dependency. The successful replication of such success by public policy is very difficult due to the unique circumstances of each specific policy and the unique characteristics of each region, (e.g., Breschi and Malerba, 2005). Still, the risks of doing nothing and falling behind are even higher (Guinet, 2003).

Feser (2005) reviewed the policies that countries and regions in Latin America have in relationship to industry clusters and found that they seem to focus on four areas: export promotion, attracting inward investments, value chain integration, and networking of SME. In the US he found that most states and regions do not have a formal policy, but use cluster analysis as a tool. In fact, states and localities were using cluster “policies” to attract investments, as a planning tool, and for workforce development. Garrett-Jones and Xielin (2002) compared the regional policies in China and Australia and were critical of direct government involvement in research and development (R&D) in peripheral regions, while being supportive of the policies

that encourage cross sectional collaborative R&D, training, and technology development (p. 54). For a useful review of industry cluster policies see OECD (1999) and Anderson et al., (2004).

A number of issues were recently identified as challenges for regional policies: 1. The objectives of the policies are complex and difficult to define and measure. Job creation or the cost of job creation (cost/benefit) is not the only goal today. Other objectives include capacity building and learning and knowledge capabilities. 2. Innovation and entrepreneurship are seen as a complex system resulting in non linear responses due to time delays and feedback loops. 3. Regional and cluster policies are context specific and have to consider the cultural and social context background in which they are deployed. 4. Policies have to be seen as dynamic, needing the flexibility to change, and requiring ongoing learning from what works and what does not. 5. Successful policies engage the subjects and key actors at the local, regional, national, and inter-regional level to include both vertical and horizontal inputs (based on Diez, 2001, p. 916). 6. Knowledge spillovers are critical for successful regional and cluster policies. These externalities are mostly localized, within regions and within industries (Midelfart, 2004, p. 3).

Economic Development Policies Regarding SMEs and Industry Clusters in a Peripheral Region

Most of the current literature refers to clusters without distinguishing between those in peripheral regions, marginal regions, or munificent regions. This suggests that the literature assumes that the munificence of the economic context has marginal effect on the industry cluster. We want to claim that peripheral regions are not poor munificent regions; like SMEs are not small large corporations; they are very different. It is not clear what learning from successful cluster experiences in the US and in Europe (that are mostly in highly munificent regions) can be transferred to developing countries or to peripheral regions worldwide (Bergman and Schubert, 2005; p. 164).

Specifically, for peripheral cluster policies, Rosenfeld (2002) identified the following challenges: deficits in physical infrastructures, lack of access to capital, weak technology institutional infrastructure, regional insularity and cultural lock-in, lack of skills and lack of opportunities to acquire them, organizational, and structural barriers (for SMEs) created by the large players within the region/cluster. Todtling and Trippl (2005) took that analysis one step further suggesting that different types of peripheral regions may have to deal with different aspects of the same challenge. For example, lack of skills in the peripheral regions might result in a low to mediocre level of qualifications, while in declining manufacturing regions it would result in a focus on technical skills and lack of managerial skills. The lack of skills in a marginal region might have a different manifestation, since in those regions there will be a variety of educational institutions, but there will be a lack of critical mass of worldwide class of expertise (Todtling and Trippl, 2005, p. 1209). Still, there is very little research conducted within the peripheral regions, and the lack of consistent successes and agreed-upon definitions makes it difficult to make authoritative recommendations (e.g. Statistics Canada, 2005). Two frameworks and some specific additional recommendations for policies supporting clusters in a peripheral region are described below.

Rosenfeld (2002, p. 15) suggested the following framework:

- Actions for understanding and benchmarking regional economics;
e.g., identify clusters, map systematic relationships, benchmark against competitors.
- Actions for engagements;

- e.g., create cluster association, formalize communication channels, foster inter-firm collaboration.
- Actions for organizing and delivery services;
e.g., establish one-stop cluster hubs, disseminate information by clusters, facilitate external connections.
- Actions for building a specialized work force;
e.g., establish cluster skill centers, form partnerships between educational institutions and clusters, create inter-regional cluster alliance.
- Actions for stimulating innovation and entrepreneurship;
e.g., establish cluster-based technology hubs, create entrepreneur and innovation networks, create cluster-based incubators.
- Actions for marketing and branding the region;
e.g., brand regions and promote clusters, form export networks.
- Actions for allocating resources and investments;
e.g., invest in cluster R&D, provide incentives for multi-firm projects, fund critical infrastructure.

Pietrobelli and Rabellotti (2004, pp. 49-50) suggested the following characteristics of successful cluster policies within the framework of cluster policies that they considered more relevant for Latin America:

- Cluster policies should use enhancement of regional innovation capacity as means to support structural change in a region.
- Policies should support social capital by promoting collaboration and networking.
- Policies should link intra-regional and inter-regional players (universities, R&D institutions) to bring new technologies to SMEs.
- Policies, especially in the early stages of cluster development, should support third party roles as intermediaries for the above mentioned processes.
- Underlying those policies there should be an understanding of building localized industry specific absorptive capacity.
- In peripheral regions, due to resource constraints, especially financial resources, there might be a need to select (“picking the winners”) the clusters to be supported.
- Policies must allow for change and follow or drive the development of the industry clusters along their life cycle.

Formica (2003) recommends that the cluster development agency responsible for initiating and managing cluster development policies should have a market orientation and should have a number of characteristics (that we consider important, especially in light of the six recommendations above). Chief among them are: ethical formal values, accountability, transparency, flexibility, and support of collective outcomes (see pages 257-259 for detailed discussion).

Avnimelech and Teubal (2006) describe the critical role that the Israeli government had in starting two government Venture Capital (VC) programs that were the seeds of private venture capital, initially Israeli, then international. This example suggests that in some cases the government has a positive role even when it is replacing market forces, especially when the market is not yet existing or in the embryonic stage of cluster development. More interestingly, Avnimelech and Teubal (2006) describe the first intervention as a failure, resulting in government learning, as well as the increase of the cluster companies’ activity which led to the

introduction of the second fund that became a success. It seems that Avnimelech and Teubal, (2006) are suggesting that the first introduction might have been premature, as the preconditions were not ripe for the co-evolution of the high-tech cluster and the VC seeding. Such pinpointed government intervention at a phase change stage of cluster maturation can be critical to the cluster success. It requires the policy makers to have a deep understanding of the dynamics of the specific industry and a willingness to experiment, make mistakes, learn, and act again.

One interesting issue resulting from the nexus of the growing importance of global value chains is the realization that regional clusters are probably the most effective regional learning systems (e.g., Gereffi, 1999). Prahalad and Krishnan (2008) looked at the same set of issues from a company perspective, focusing on innovation as a major challenge, use of ICT, process and competencies, and the need to access global talent and resources, and proposed a framework for a new set of strategic options for successful firms. One illustration of this is the critical (for the SMEs) knowledge exchange relationships with different constituencies in the region. For SMEs in peripheral (or marginal regions), vertical relationships with suppliers and customers seem to be more important than horizontal relationships with universities and research institutions (e.g. Mohannak and Aylward, 2002). It is the large companies in the marginal regions that dominate the relationships with universities and research institutions. Peripheral regions would lack research universities and research institutions completely. If there were a university, it would be a teaching only institution. This networking effect of connecting higher educational institutions and business companies will have major implications for policy makers.

To summarize, the section above suggests that the policy aspects of cluster development are complex, inimitable, and require “soft-touch” and sophistication by the policy makers. Table 1 summarizes and generalizes the need for policy interventions across industry clusters by region type and by the critical aspects as identified by the preceding review.

Policy Content – Early Remarks for peripheral regions

We will now introduce a few suggestions for policy makers, regarding the guiding principles for the most essential policies supporting clusters in a peripheral region. Public policy must relate to and be specific to the life cycle stage of the specific industry cluster (Maskell, 2005). For example, at the infancy stage, Maskell suggested that the most important aspects of public policy should be to support (not guide) the leading and successful companies by providing them with much needed resources that might be in short supply. These include resources such as focused educational and training initiatives, support of targeted labor mobility, relevant infrastructure enhancements, support for the creation of “angel” investors, and venture capital needed by the cluster’s companies by providing direct funding or by creating a supportive environment, (e.g., tax relief, initiatives and structure) that will support early collaboration, etc.

Policy formulation must also take into account the phases/stages of the program and how they fit with the stages of cluster life cycle, and the competitive environment of the specific industry (Bergman and Schubert, 2005: 174). Such dynamic interaction between phases of the specific program and the life cycle stage of the specific industry make it very difficult, if not impossible, to present a “cookie cutter” solution. Policy planners and makers must be careful when adopting solutions that worked in other spatial areas or clusters. Copying solutions for clusters is even more complex than trying to copy a best practice solution within a corporation, which to the surprise of many, has been found to be very difficult to do even within the same company (e.g., Ohno, 2011).

Cluster policy has to avoid the trap of resource allocation, which usually will allocate scarce resources to an existing cluster. Politicians seem to prefer such an approach since it is easy, and it also sounds scientifically solid, since it is supported by numbers. The policy should

focus on building linkages and future inter-industry synergies (Feser and Bergman, 2000). At the same time, the government, both at the national and regional level, must be willing to adopt a proactive role in investing in knowledge and social infrastructure directly, since the market for such industry is not mature yet.

Table 1: Need for policy intervention across industry clusters by region type

Policy aspects	Type of Region			
	Peripheral	Marginal	Stand-Alone	Mega-Region
Absorptive Capacity & Educational Infrastructure	High	Medium	Low	Very low
Financial capital for SMEs	Low	Very low	Very low	Very low
Building Administrative Infrastructure	Medium	Low	Very low	Very low
Supporting the development of Social Capital	High	Medium	Low	Very low
Building Transportation and ICT Infrastructure	High	Medium	Low	Low

Rothaermel and Ku (2008) and Bergman and Schubert (2005) emphasize the role of research universities as hubs for intellectual capital creation and for anchoring human capital contributors as well as anchors for venture capital, creativity, and innovation. Knowledge spillover from research universities or large corporate R&D laboratories as an input for SME innovation is seen by Audretsch, (2003) as a source of sustainable competitive advantage within regional dense/munificent industry clusters. Sternberg (2003) pointed out that to his surprise policy makers pay little attention to start-up clusters. Trying to understand why, he suggested a number of hypotheses. First, high uncertainty and long timeframes for success make it difficult to show cause and effect relationships and take credit for success. Second, it might be difficult to recognize the early stages of cluster creation and to correctly time the appropriate policies needed for the support in human and social capital plus infrastructure. His solution is to use the regional competence centers that concentrate around research universities and support those incubators which should allow the successful clusters (within the global competition) to surface. Such a choice is obviously not an option for peripheral regions since they will lack direct geographical proximity to research universities. This is a major reason why belonging to an IVIC might be one of a very few options a knowledge intensive company might have to successfully survive in a peripheral or marginal region. In our opinion, any policy will have to address the need to support the creation or utilization of research universities in at least one of the anchors of IVIC and, at least initially, subsidize the creation of venture capital funds that are cluster specific (see more in-depth discussion in Russ and Jones, 2011). This creation and subsidizing should only happen in the early stages of the cluster development and should be replaced later by private venture capital funding.

Chiavescio et al., (2004) found that the percentage of SMEs that have video-conferencing and cell phone networks (in Italy) is relatively small which might be a barrier for SMEs joining IVIC. Their conclusion was that leading companies have a crucial role in driving the adoption of new ICT technologies within an industry cluster of SMEs. Since adopting new ICT in a peripheral region will be a prerequisite for the possibility of the sub-cluster to participate in an

IVIC, policies supporting such an adoption are of critical importance. Chiarvesio et al., findings may suggest that policies that target the use of ICT might be better directed to those companies specifically since they will behave as role models for the geographically bounded cluster. This conclusion was supported by Tucker (2008) which suggested that boundary spanners (individuals in her case, or companies) that are central to communication networks, and those individuals that have formal sources of influence, should be targeted by policy makers as well.

Conclusions

Policy Conclusions

The case described in Russ and Jones (2006) suggests that cultural changes might be required (at least in the case of peripheral regions) prior to a successful implementation of policies that would attempt to address and affect the complex environment of regional economies. The case also demonstrated the crucial importance of cultural changes as a prerequisite for accumulating intellectual capital in a knowledge deprived region. This suggests that cultural distance has temporal (Ogburn, 1964) as well as value/norm dimensions. Ogburn (1964) suggested that when technological and material advancements occur faster than cultural or social changes, a “cultural lag” will take place. Bowan and Schwartz (2005, p. 314) suggest that such gaps within a regional economy can be reduced by importing and by dissemination of new social norms and values, in which the local universities play a major role. This might be one of the major drivers for the “liability of the periphery” mentioned earlier as well.

There are aspects of public policy that have the potential to impact the prerequisite for establishing a cluster, and there are those that can sustain, support, and accelerate the cluster-fostering after its inception. In our opinion, the most tortuous stages for policy intervention are the early stages of cluster development due to the fuzzy and messy nature of those stages.

Research Conclusions

Finally, it is very clear from this review that much more research needs to done in this area. Given the magnitude of public monies expended, the policy makers require a richer knowledge base to support their decision. The research required must be significantly more sophisticated. It must be specific to region type and specify the industry cluster stage of life cycle, type of cluster, role of networks, and the maturity level of the cluster, at the very least. This can be illustrated by adding additional dimensions to Table 1. For example, adding the life-cycle stage of the cluster as a third dimension, and identifying the specific implications for policy makers for each stage.

References

- Anderson, T., Schwaag-Serger, S., Sorvik, J. & Hansson, E. W. (2004). *The Cluster Policies Whitebook*. IKED. Malmo: Holmbers.
- Audretsch, D. B. (2003). Globalization, innovation and the strategic management of places. In J. Brocker, D. Dohse & R. Soltwedel (Eds.), *Innovation Clusters and Interregional Competition* (11-27). Berlin: Springer-Verlag.
- Avnimelech, G. & Schwartz, D. (2009). Structural changes in mature Venture Capital industry: Evidence from Israel. *Innovation: Management, Policy & Practice*, 11(1), 60-73.

- Avnimelech, G., Schwartz, D. & Teubal, M. (2006). An evolutionary model of entrepreneurial high tech cluster development. In C. Karlsson (Ed.), *Handbook of Research on Clusters: Theories, Policies and Case Studies*. Cheltenham, UK: Edward Elgar.
- Avnimelech, G. & Teubal, M. (2006). Creating venture capital industries that co-evolve with high tech: Insight from an extended life cycle perspective of the Israeli experience. *Research Policy*, 35, 1477-1498.
- Baldwin, L. H., Camm, F. & Moore, N. Y. (2001). *Federal Contract Bundling: A Framework for Making and Justifying Decisions for Purchased Services*. RAND Corporation. Retrieved June 28, 2008, from http://www.rand.org/pubs/monograph_reports/MR1224/
- Bergman, E. M. (2008). Cluster life-cycles: An emerging synthesis. In C. Karlsson (Ed.), *Handbook of Research on Cluster Theory* (114-132). Northampton, MA: Edward Elgar Publishing.
- Bergman, E. M. & Schubert, U. (2005). Spillovers and innovation, environment and space: Policy uncertainties and research opportunities. In G. Maier & S. Sedlacek (Eds.), *Spillovers and Innovations: Space, Environment, and the Economy* (157-177). Berlin: Springer-Verlag/Wien.
- Bowen, W. M. & Schwartz, M. (2005). *The Chief Purpose of Universities: Academic Discourse and the Diversity of Ideas*. Lewiston, Queenston, Lampeter: The Edwin Mellen Press.
- Breschi, S. & Malerba, F. (2005). Clusters, networks and innovation: Research results and new directions. In S. Breschi & F. Malerba (Eds.), *Clusters, Networks and Innovation* (1-26). Oxford: Oxford University Press.
- Bristow, G. (2005). Everyone's a 'winner': problematizing the discourse of regional competitiveness, *Journal of Economic Geography*, 4, 285-304.
- Bruderl, J. & Schussler, R. (1990). Organizational mortality: The liability of newness and adolescence. *Administrative Science Quarterly*, 35, 530-547.
- Cappellin, R. & Orsenigo, L. (2000). The territorial dimension of modern industry and the scope of regional industrial and labour market policies. In P. Klemmer & R. Wink (Eds.), *Preventing Unemployment in Europe: A new Framework for Labour Market Policy* (166-187). Cheltenham, UK: Edward Elgar.
- Castilla, E. J. (2003). Networks of venture capital firms in Silicon Valley. *International Journal of Technology Management*, 25(1/2), 113-135.
- Chen, S. (2006). How much does urban location matter? A comparison of three science parks in China. In F. J. Carrillo (Ed.), *Knowledge Cities: Approaches, Experiences, and Perspectives* (191-204). Burlington, MA: Elsevier Butterworth-Heinemann.
- Chiavescio, M., Di Maria, E. & Micelli, S. (2004). From local networks of SMEs to virtual clusters? Evidence from recent trends in Italy. *Research Policy*, 33(10), 1509-1528.
- Clark, G. (2006). *Metropolitan Regions: Strategies and Development Agencies*. Paper prepared for BAK Basel Economic Forum, June. Retrieved June 28, 2008, from <http://www.gregclark.net/papers/Metropolitan%20Strategies%20and%20Development%20Agencies%20BAK%20Basel%20Greg%20Clark%20June%202006.pdf>
- Cooke, P. (2007). Regional innovation systems, asymmetric knowledge and the legacies of learning. In R. Rutten & F. Boekema (Eds.), *The Learning Region: Foundations, State of the Art, Future* (184-205). Cheltenham, UK: Edward Elgar.

- Copus, A., Skuras, D. & Tsegenidi, K. (2008). Innovation and peripherality: An empirical comparative study of SMEs in six European Union member countries. *Economic Geography*, 84(1), 51-82.
- Diez, M. A. (2001). The evaluation of regional innovation and cluster policies: Towards a participatory approach. *European Planning Studies*, 9, 907-923.
- Doeringer, P. B. & Terkla, D. G. (1995). Business strategy and cross-industry clusters. *Economic Development Quarterly*, 9, 225-237.
- Dohse, D. (2003). Taking Regions seriously: Recent innovations in German technology policy. In J. Brocker, D. Dohse & R. Soltwedel (Eds.), *Innovation Clusters and Interregional Competition* (372-394). Berlin: Springer-Verlag.
- Easterly, W. (2008, May 29). Trust the development experts – all 7bn of them. *Financial Times*, p. 9.
- Enright, M. J. (2000). The globalization of competition and the localization of competitive advantage: Policies toward regional clustering. In N. Hood & S. Young (Eds.), *The Globalization of Multinational Enterprise Activity and Economic Development* (303-331). Basingstoke: McMillian Press.
- Enright, M. J. (2003). Regional clusters: What we know and what we should know. In J. Brocker, D. Dohse & R. Soltwedel (Eds.), *Innovation Clusters and Interregional Competition* (99-129). Berlin: Springer-Verlag.
- Fedderke, J. & Klitgaard, R. (1998). Economic growth and social indicators: An exploratory analysis. *Economic Development and Cultural Change*, 46(3), 455-489.
- Feser, E. (2005). Industry cluster concepts in innovation policy: A comparison of U.S. and Latin American experience. In G. Maier & S. Sedlacek (Eds.), *Spillovers and Innovations: Space, Environment, and the Economy* (135-155). Berlin: Springer-Verlag/Wien.
- Feser, E. J. & Bergman, E. M. (2000). National industry cluster templates: A framework for applied regional cluster analysis. *Regional Studies*, 34(1), 1-25.
- Florida, R. (2005). *The flight of the creative class. The new global competition for talent*. New York, NY: Harper Business.
- Florida, R., Gulden, T. & Mellander, C. (2007). *The Rise of the Mega-Region*. The Martin Prosperity Institute, University of Toronto, October. Retrieved June 28, 2008, from <http://www.rotman.utoronto.ca/userfiles/prosperity/File/Rise.of.%20the.Mega-Regions.w.cover.pdf>
- Formica, P. (2003). Corporate governance of cluster development agencies: The case for market orientation. In J. Brocker, D. Dohse & R. Soltwedel (Eds.), *Innovation Clusters and Interregional Competition* (241-271). Berlin: Springer-Verlag.
- Garrett-Jones, S. (2004). From citadels to clusters: The evolution of regional innovation policies in Australia. *R&D Management*, 34(1), 3-16.
- Garrett-Jones, S. & Xielin, L. (2002). Contrasting policies for regional and national innovation systems in China and Australia. In T. Turpin, L. Xielin, S. Garrett-Jones & P. Burns (Eds.), *Innovation, Technology Policy and Regional Development: Evidence from China and Australia* (31-65). Cheltenham, UK: Edward Elgar.
- Geis, G. (2008) *The Space Between Markets and Hierarchies*. University of Virginia Legal Working Paper Series. University of Virginia. Retrieved June 28, 2008, from <http://www.law.virginia.edu/pdf/workshops/0708/geis.pdf>

- Gereffi, G. (1994). The organization of buyer-driven global commodity chains: How U.S. retailers shape overseas production networks. In G. Gereffi & M. Korzeniewicz (Eds.), *Commodity Chains and Global Capitalism* (95-122). London: Praeger.
- Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain. *Journal of International Economics*, 48(1), 37-70.
- Gertler, M. S. & Wolfe, D. A. (2006). Spaces of Knowledge Flows: Clusters in a Global Context. In B. Asheim, P. Cooke & R. Martin (Eds.), *Clusters in Regional Development: Critical Reflections and Explorations*. London: Routledge.
- Gibbon, P. (2001). Upgrading primary production: A global commodity chain approach. *World Development*, 29(2), 345-363.
- Goldstein, A. (2005). *The Political Economy of Industrial Policy in China: The Case of Aircraft Manufacturing*. William Davidson Institute Working Paper, No. 779, July.
- Gordon, I. R. & McCann, P. (2000). Industrial Clusters: Complexes, Agglomeration, and/or Social Networks? *Urban Studies*, 3, 513-532.
- Guinet, J. (2003). Drivers of economic growth: The role of innovative clusters. In J. Brocker, D. Dohse & R. Soltwedel (Eds.), *Innovation Clusters and Interregional Competition* (150-160). Berlin: Springer-Verlag.
- Hassink, R. (2005). How to unlock regional economies from path dependency? From learning region to learning cluster. *European Planning Studies*, 13(4), 521-535.
- Hornidge, A. K. (2006). *Singapore: The Knowledge-Hub in the Straits of Malacca*. ZEF Working Paper Series, No. 14. University of Bonn. Retrieved June 28, 2008, from http://www.zef.de/fileadmin/webfiles/downloads/zef_wp/zef_wp14_hornidge.pdf
- Iammarino, S. & McCann, P. (2006). The structure and evolution of industrial clusters: Transactions, technology and knowledge spillovers. *Research Policy*, 35(7), 1018-1036.
- Jacobs, D. & De Man, A. P. (1996). Clusters, industrial policy and firm strategy: A menu approach. *Technology Analysis and Strategic Management*, 8(4), 425-437.
- Johansson, B., Karlsson, C. & Stough, R. R. (Eds.). (2001). *Theories of Endogenous Regional Growth: Lessons for Regional Policies*. Berlin: Springer.
- Karlsson, C. (2008). Introduction. In C. Karlsson (Ed.), *Handbook of Research on Cluster Theory* (1-19). Northampton, MA: Edward Elgar Publishing.
- Karlton, J. (2007). *On Stage: Acting for Development of Businesses and Ergonomics in Woodworking SMEs*. Doctoral thesis; Linköping University, Department of Management and Engineering. Retrieved June 28, 2008, from www.diva-portal.org/diva/getDocument?urn_nbn_se_liu_diva-9894-1_fulltext.pdf
- Koschatzky, K. (2005). Foresight as a governance concept at the interface between global challenges and regional innovation potentials. *European Planning Studies*, 13(4), 619-639.
- Krugman, P. (1991). Increasing returns and economic geography. *Journal of Political Economy*, 99(3), 483-499.
- LeVeen, J. (1998). *Industry Cluster Literature Review*. Retrieved October 9, 2006, from <http://www.planning.unc.edu/courses/261/leveen/litrev.htm#Introduction>
- Lytras, M. D., Russ, M., Maier, R. & Naeve, A. (2008). Preface. In M. D. Lytras, M. Russ, R. Maier & A. Naeve (Eds.), *Knowledge Management Strategies: A Handbook of Applied Technologies* (vii- xxxi). Hershey, PA: IGI Publishing.

- MacPherson, A. & Pritchard, D. (2007). Boeing's diffusion of commercial aircraft technology to Japan: Surrendering the U.S. industry for foreign financial support. *Journal of Labor Research*, 28, 552-566.
- Malerba, F. & Orsenigo, L. (1995). Schumpeterian pattern of innovation. *Cambridge Journal of Economics*, 19, 47-65.
- Marshall, A. (1890). *Principles of Economics*. London: Macmillan.
- Maskell, P. (2005). Towards a knowledge-based theory of the geographical cluster. In S. Breschi & F. Malerba (Eds.), *Clusters, Networks and Innovation* (411-432). Oxford: Oxford University Press.
- Menzel, M. P. & Fornahl, D. (2007). *Cluster Life Cycles – Dimensions and Rationales of Cluster Development*. Paper presented at DRUID Winter Conference. Retrieved March 6, 2009, from <http://www2.druid.dk/conferences/viewpaper.php?id=1056&cf=10>
- Midelfart, K. H. (2004). *Regional Policy Design: An Analysis of Relocation, Efficiency and Equity*. Working Paper 6/04; SIOS - Center for International Economics and Shipping, Institute for Research in Economics and Business Administration, Bergen Norway, February. Retrieved June 28, 2008, from http://www.forskningsradet.no/servlet/Satellite?blobcol=urlvedleggfil&blobheader=application%2Fpdf&blobkey=id&blobtable=Vedlegg&blobwhere=1141388108860&cachecontrol=5%3A0%3A0+*%2F*%2F*&ssbinary=true
- Mohannak, K. & Aylward, D. (2002). Regional innovation: Experience of small firms in non-metropolitan Australia. In T. Turpin, L. Xielin, S. Garrett-Jones & P. Burns (Eds.), *Innovation, Technology Policy and Regional Development: Evidence from China and Australia* (127-150). Cheltenham, UK: Edward Elgar.
- Niosi, J. & Zhegu, M. (2005). Aerospace clusters: Local or global knowledge spillovers? *Industry and Innovation*, 12(1), 1-25.
- OECD. (1999). *Boosting Innovation: The Cluster Approach*. OECD - Organization for Economic Co-operation and Development: Paris. Retrieved June 4, 2008, from http://www.clusterbg.net/content/library/EN/Boosting_Inovations_Cluster_Approach.pdf
- Ogburn, W. F. (Ed.). (1964). *On Culture and Social Change*. Chicago, IL: The University of Chicago Press.
- Ohno, K. (2011). Learning from Best Practices in East Asia: Policy Procedure and Organization for Executing Industrial Strategies. National Graduate Institute for Policy Studies (GRIPS), Tokyo, Retrieved September 16, 2011, from http://www.jica.go.jp/uk/english/office/topics/pdf/topics111028_02_02.pdf
- Pietrobelli, C. & Rabellotti, R. (2004). Upgrading in Clusters and Value Chains in Latin America: The Role of Policies. Washington DC: Inter-American Development Bank. Retrieved June 28, 2008, from http://www.soc.duke.edu/sloan_2004/Papers/UNIDO_Pietrobelli-Rabellotti.pdf
- Piketty, T. & Saez, E. (2006). The evolution of top incomes: A historical and international perspective. *AEA Papers and Proceedings*, 96(2), 200-205. Retrieved June 28, 2008, from <http://elsa.berkeley.edu/~saez/piketty-saezAEAPP06.pdf>
- Porter, M. E. (1990). *The competitive advantage of nations*. New York, NY: Basic Books.
- Porter, M. E. (1998). *On Competition*. Cambridge, MA: Harvard Business School Press.

- Prahalad, C. K. & Krishnan, M. S. (2008). *The New Age of Innovation: Driving Co-created Value Through Global Networks*. New York: McGraw Hill.
- Raspe, O. & van Oort, F. (2008). Firm growth and localized knowledge externalities. *Journal of Regional Analysis and Policy*, 38(2), 100-116.
- Roelandt T. J. A. & den Hertog, P. (Eds.). (1999). *Boosting Innovation: The Cluster Approach*. Paris: OECD.
- Rosenfeld, S. A. (2002). *Creating Smart Systems: A Guide to Cluster Strategies in Less Favoured Regions*. Regional Technology Strategies, Carrboro, NC, April. Retrieved June 28, 2008, from http://ec.europa.eu/regional_policy/innovation/pdf/guide_rosenfeld_final.pdf
- Rosengard, J. K. (2000). *Doing Well By Doing Good : The Future of Microfinance Via Regulated Financial Institutions*. Paper presented at the III Inter-American Forum on Microenterprise, October 17-20, 2000, Barcelona, Spain.
- Rothaermel, F. T. & Ku, D. (2008). Intercluster innovation differentials: The role of research universities. *IEEE Transactions on Engineering Management*, 55(1), 9-22.
- Russ, M. (2009). *International Virtual Industry Clusters and the International Virtual Mega-Region: A New Strategic Option for Incorporating the SMEs from the Peripheral Regions as a Mode of Entry into the International Business Arena*. Paper presented at the ISC2009 Conference, Beer Sheva, Israel, December 27-29, 2009.
- Russ, M. & Jones, J. K. (2006). *Regional Economic Indicators for a Knowledge Based Economy: A Proposal and Early Findings of a Framework for a Knowledge Deprived Region*. Paper presented at 53rd Annual North American Meeting of the Regional Science Association International, Toronto, Ontario, Canada, November 16-18, 2006.
- Russ, M. & Jones, J. K. (2008). Regional Economic Development Indicators for a Knowledge-Based Economy in a Knowledge Deprived Region. *Journal of Regional Analysis and Policy*, 38(2), 189-205.
- Russ, M. & Jones, J. K. (2011). International Virtual Industry Clusters and SMEs: Early content and process policy recommendations. In K. I. Westeren (Ed.), *Aspects of the Knowledge Economy – Innovation, Learning and Clusters*. Edward Elgar Publishing. (Forthcoming).
- Russ M. & Paterni R. (2007). International Virtual Industry Clusters and the International Virtual Mega-Region: A Proposal for a New Paradigm for the Economic Development in Knowledge Deprived Regions for the New-Knowledge Based Economy. In L. Uden,, E. Damiani and G. Passiante (Eds.), *New Trends in Knowledge Management* – KMO 2007 Conference Proceedings, 50-56.
- Rychen, F. & Zimmermann, J. B. (2006). *Clusters in the Global Knowledge Based Economy: Knowledge Gatekeepers and Temporary Proximity*. September. Retrieved June 6, 2008, from <http://www.strategie-aims.com/actesateliers/StratespTer06/rychenZimmermann.pdf>
- Saxenian, A. (2005). From brain drain to brain circulation: Traditional communities and regional upgrading in India and China. *Studies in Comparative International Development*, 40(2), 35-61.
- Schwartz, D. & Bar-El, R. (2007). Venture investments in Israel-A regional perspective. *European Planning Studies*, 15, 623-644.
- Statistics Canada. (2005). *Skills, Innovation and Growth: Key Issues for Rural and Territorial Development – A Survey of the Literature; 1980-2003*. Minister of Industry. Retrieved June 28, 2008, from <http://www.statcan.ca/english/research/21-601-MIE/21-601-MIE2005076.pdf>

- Steinle, C. & Schiele, H. (2002). When do industries cluster? A proposal on how to assess an industry's propensity to concentrate at a single region or nation. *Research Policy*, 31, 849-858.
- Stephens, R. T. (2008). Knowledge management strategies for Web 2.0 integration. In M. D. Lytras, M. Russ, R. Maier & A. Naeve (Eds.), *Knowledge Management Strategies: A Handbook of Applied Technologies* (170-193). Hershey, PA: IGI Publishing.
- Sternberg, R. (2003). New firms, regional development and the cluster approach – What can technology policies achieve? In J. Brocker, D. Dohse & R. Soltwedel (Eds.), *Innovation Clusters and Interregional Competition* (347-371). Berlin: Springer-Verlag.
- Stinchcombe, A. L. (1965). Social Structure and Organizations. In J. G. March (Ed.), *Handbook of Organizations*. Chicago, IL: Rand McNally & Co.
- Sverrisson, A. (2004). Local and global commodity chains. In C. Pitrobelli & A. Sverrisson (Eds.), *Linking Local and Global Economies: The Ties that Bind* (17-35). London, UK: Routledge.
- Teece, D. J. (1998). Capturing value from knowledge assets. *California Management Review*, 40(3), 55-76.
- The World Bank. (2008). *The Growth Report: Strategies for Sustained Growth and Inclusive Development*, Commission on Growth and Development, Washington DC: The International Bank for Reconstruction and Development.
- Todtling, F. & Tripli, M. (2005). One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy*, 34, 1203-1219.
- Tucker, C. (2008). Identifying formal and informal influence in technology adoption with network externalities. *Management Science*, 54(12), 2024-2038.
- Turpin, T. & Garrett-Jones, S. (2002). Conclusion: Intersecting systems of innovation. In T. Turpin, L. Xielin, S. Garrett-Jones & P. Burns (Eds.), *Innovation, Technology Policy and Regional Development: Evidence from China and Australia* (199-213). Cheltenham, UK: Edward Elgar.
- UNCTAD. (2007). *The Universe of the Largest Transnational Corporations*. UNCTAD Current Studies on FDI and Development. UN, December 30, 2007.
- Vaessen, P. & Keeble, D. (1995). Growth-oriented SMEs in unfavorable regional environments. *Regional Studies*, 29(6), 489-505.
- Waits, M. J. (1998). The industry cluster approach in the new economy. In the proceedings from *Innovations in Economic Development: The Evolving Direction of Economic Development in the New Economy*, 20-22. April 11-12, 1997. The Hubert H. Humphrey Institute of Public Affairs and Center for the New West.
- Xenos, M. & Foot, K. (2008). *Not your father's Internet: The generation gap in online politics. Civic Life Online: Learning How Digital Media Can Engage Youth*: 51-70. Cambridge, MA: The MIT Press. Retrieved March 22, 2009, from <http://www.mitpressjournals.org/doi/abs/10.1162/dmal.9780262524827.051>
- Zaheer, S. (1995). Overcoming the liability of foreignness. *Academy of Management Journal*, 38(2), 341-363.

Acknowledgments

Earlier versions of this manuscript were presented at the 5th International Conference on Small and Medium Sized Enterprises: Management - Marketing - Economic Aspects; 11-14 AUGUST 2008, ATHENS, GREECE and at the 40th MCRSA Annual Conference, Milwaukee, May 28-30, 2009. The first author wishes to acknowledge the Frederick E. Baer Professorship in Business for partial financial support. The authors wish to thank Kelly Anklam for her assistance in editing the paper and Dafna Schwartz for her comments. Finally, a special thank you goes to the two reviewers of this paper for their thorough feedback and insightful comments. As always, the authors take responsibility for any mistakes.

English Abstract

Industry Clusters, SMEs and Public policy

A Review and Recommendations for Peripheral Regions

Meir Russ^a and Jeannette K. Jones^b

^aAustin E. Cofrin School of Business, University of Wisconsin - Green Bay, Green Bay, WI
54311-7001, USA e-mail: russm@uwgb.edu

^bAmerican Intercontinental University Hoffman Estates, Illinois 60192, USA
e-mail: jeannette.jones@faculty.aiuonline.edu

Abstract

Research suggests that small and medium size enterprises (SMEs) are major contributors to job creation and are stabilizing factors for economic development since they are locally bound and less mobile. It is believed, however, that those economic development advantages are diminished if the SME is situated in a knowledge deprived region. Our own research suggests however, that in knowledge deprived regions, small, knowledge intensive companies can endure if they network out of the region and collaborate with suppliers and/or customers. Since psychological distance often overrides physical distance as the principal barrier for collaboration, creating channels of networking are critical. One question of interest is how SMEs in knowledge deprived regions can be supported by regional and/or national economic development entities so it can participate effectively in the global knowledge economy. This paper will propose a number of ideas and policy guidelines for such support, taking into consideration the unique aspects of policy making in regard to knowledge management of SMEs situated in a peripheral region. The central idea is the support and creation of an appropriate infrastructure; for example, telecommunication and transportation infrastructures (which are obvious), and less obvious, regulatory (e.g., regulating capital transfer) and administrative (e.g., regional sister relationships) supports. Among other policy guidelines are supports for meeting opportunities, (e.g., supporting international conferences), formal recognition of clusters such as university-industry collaboration, and regional and international activities. In this paper we will also address pitfalls such as, “don’t pick winners,” and “let the business community drive the process.”

Key words: Industry clusters, peripheral regions, public policy, SMEs

French Abstract*

Industry Clusters, SMEs and Public policy: A review and recommendations for peripheral regions

Les clusters industriels, PMEs et politique publique:

Une revue et des recommandations pour des régions périphériques

Meir Russ^a and Jeannette K. Jones^b

^aAustin E. Cofrin School of Business, University of Wisconsin - Green Bay, Green Bay, WI
54311-7001, USA e-mail: russm@uwgb.edu

^bAmerican Intercontinental University Hoffman Estates, Illinois 60192, USA
e-mail: jeannette.jones@faculty.aiuonline.edu

Résumé

La recherche suggère que les petites et moyennes entreprises (PME) sont les principaux contributeurs à la création d'emplois et, comme elles sont localement implantées et peu mobiles, représente ainsi des facteurs de stabilisation pour le développement économique. On pense que les avantages de développement économique s'amoindrissent lorsque la PME se situe dans une région privée de connaissances. Notre recherche suggère que dans de telles régions, les petites entreprises à forte intensité de connaissances peuvent cependant survivre si elles créent des réseaux à l'extérieur de leur région, par exemple en collaborant avec des fournisseurs et/ou des clients. Comme la principale barrière est la distance psychologique, il leur est nécessaire de collaborer et de créer des canaux en réseau. Une question importante consiste à savoir comment une PME, localisée dans une région privée de connaissances, peut être soutenue par les autorités régionales et/ou nationales pour participer efficacement à l'économie globale de la connaissance. Cet article proposera un certain nombre d'idées et recommandations politiques pour un tel soutien, prenant en compte les caractéristiques uniques d'une politique de gestion de la connaissance des PME lorsque celles-ci se situent dans des régions périphériques. L'idée centrale est le soutien et la création d'infrastructures appropriées, comme des infrastructures de télécommunications et de transport (ce qui semble évident) ou encore le soutien par la régulation politique (par exemple pour le transfert de capital) et administrative. Parmi les autres recommandations politiques, on cite la promotion des rencontres, des conférences internationales, la reconnaissance formelle des clusters, telle que la collaboration entre universités et entreprises, ainsi que diverses activités régionales et internationales. Enfin, cet article aborde également des pièges à éviter comme "ne pas sélectionner les gagnants" ou "laissez le milieu d'affaires diriger le processus".

Mots clés: cluster industriels; PME; politiques publiques; régions périphériques

* Translated by: Johannes Schaaper, Senior professor in International Management, BEM Bordeaux Management School

Spanish Abstract*
Industry Clusters, SMEs and Public policy:
A review and recommendations for peripheral regions

Segmentos Industrials, PyMES y la Política Pública

Revisión y Recomendaciones para las Regiones Periféricas

Meir Russ^a and Jeannette K. Jones^b

^aAustin E. Cofrin School of Business, University of Wisconsin - Green Bay, Green Bay, WI
54311-7001, USA e-mail: russm@uwgb.edu

^bAmerican Intercontinental University Hoffman Estates, Illinois 60192, USA
e-mail: jeannette.jones@faculty.aiuonline.edu

Resumen

Las investigaciones previas sugieren que las pequeñas y medianas empresas (PyMES) tienen un papel importante en la creación de empleo y que son agentes de estabilidad y desarrollo económico debido a su dependencia local y su escasa movilidad. Sin embargo, se cree que estos factores ventajosos para el desarrollo económico se reducen si la pequeña o mediana empresa se encuentra en una región carente de conocimiento. De esta forma, la presente investigación sugiere que en estas regiones, las pequeñas empresas que tienen un alto grado de conocimiento se mantienen si establecen relaciones fuera de la región y si colaboran con proveedores y/o clientes. Aunque la distancia física es la principal barrera para esta colaboración, la distancia psicológica juega un papel más importante y es un factor clave en la creación de canales y redes de contactos. Una cuestión interesante es entender cómo una pequeña o mediana empresa en una región carente de conocimiento puede ser apoyada por organismos de cooperación y ayuda al desarrollo nacionales o regionales; de forma que dicha empresa pueda participar activamente en la economía global del conocimiento. Este artículo propone algunas propuestas y directrices para otorgar dicho apoyo, considerando los aspectos únicos en el diseño de políticas en relación con la gestión del conocimiento de una pequeña o mediana empresa situada en una región periférica. La idea principal es la de apoyar y crear una infraestructura adecuada; algunas muy obvias, como las telecomunicaciones y el transporte y otras menos evidentes, como la creación de reformas y regulaciones (regulación a la transferencia de capital), y apoyos administrativos (relaciones con otras regiones semejantes). Otras directrices políticas permiten identificar oportunidades, mediante conferencias internacionales o el reconocimiento formal de segmentos como los convenios entre universidad e industria, así como las actividades regionales o internacionales relacionadas. En este artículo también se señalan algunos obstáculos encontrados, resumidos con frases como “no elijas a los ganadores” o “deja que el mundo de los negocios dirija el proceso”.

Palabras clave: Segmentos industriales; Pequeñas y Medianas Empresas; Política Pública; Regiones Periféricas.

* Translated by: Javier Flores. Ph. D. Universidad Complutense de Madrid. javierflores@ccee.ucm.es

German Abstract*
Industry Clusters, SMEs and Public policy:
A review and recommendations for peripheral regions

Industriecluster, Mittelstand und Staatsaktivität:

Rückblick und Empfehlungen für wirtschaftliche Randgebiete

Meir Russ^a and Jeannette K. Jones^b

^aAustin E. Cofrin School of Business, University of Wisconsin - Green Bay, Green Bay, WI
54311-7001, USA e-mail: russm@uwgb.edu

^bAmerican Intercontinental University Hoffman Estates, Illinois 60192, USA
e-mail: jeannette.jones@faculty.aiuonline.edu

Zusammenfassung

Die Forschung zeigt, dass kleine und mittlere Unternehmen (KMU) die zentralen Wirtschaftakteure sind, die Arbeitsplätze schaffen und die Wirtschaftliche Stabilität generieren, denn sie sind regional gebunden und weniger mobil als große Konzerne. Es wird unterstellt, dass wie auch immer diese positiven KMU-Eigenschaften und wirtschaftlichen Vorteile sich verringern, wenn ein KMU in einer Wissensarmen Region lokalisiert ist. Die Ansicht der Autoren jedoch ist, dass auch in Wissensarmen Regionen kleine und wissensintensive KMU überleben und sogar prosperieren können, wenn diese in stabilen Netzwerken z.B. mit Kunden oder Zulieferern außerhalb der Region verankert sind. Eine der Forschungsfragen lautet daher, wie ein solches KMU in einer Wissensarmen Region von Staatsseite unterstützt werden kann, um erfolgreich an seinem Standort in der globalen Wissenswelt verankert zu sein. Dieses Paper schlägt Ideen und Handlungsempfehlungen für die Wirtschaftspolitik vor, die solch eine Verankerung ermöglichen kann. Die zentrale Idee dabei ist, die dafür nötige Infrastruktur (wie Telekommunikation, Logistik, Kapitalzugang) für KMU aufzubauen, bzw. deren Aufbau im Unternehmen zu unterstützen.

* Translated by: Anja Schulz, PD Dr., TU Dortmund, Dortmund, Deutschland, Anja.Schulz@tu-dortmund.de

Italian Abstract*
Industry Clusters, SMEs and Public policy:
A review and recommendations for peripheral regions

I cluster industriali, Piccole Medie Imprese e politiche pubbliche

Panoramica sul tema e raccomndazioni per le aree periferiche

Meir Russ^a and Jeannette K. Jones^b

^aAustin E. Cofrin School of Business, University of Wisconsin - Green Bay, Green Bay, WI
54311-7001, USA e-mail: russm@uwgb.edu

^bAmerican Intercontinental University Hoffman Estates, Illinois 60192, USA
e-mail: jeannette.jones@faculty.aiuonline.edu

Abstract

La ricerca evidenza che le piccole e medie imprese sono le più importanti nella creazione di posti di lavoro e rappresentano un fattore di stabilizzazioine per l'economia poiché sono legate al territorio e meno mobili. Si crede comunque che questi vantaggi di sviluppo delle piccole e medie imprese sono ridotti se le stesse operano in un contesto povero di sapere. La nostra ricerca suggerisce che anche piccole aziende possono perdurare e svilupparsi in zone con bassa concentrazione di sapere se riescono a fare network con clienti e fornitori. Poiché è la distanza psicologica molto più che la distanza fisica a costituire barriere a questi sviluppi, il creare degli efficaci canali di comunicazione è un aspetto critico. Un aspetto da analizzare è come una piccola o media impresa in un contesto geografico con bassa incidenza di sapere possa sviluppare il suo network grazie all'intervento di entità di natura regionale o nazionale volto a far partecipare le imprese alle dinamiche dell'economia globale del sapere. Questo studio prone una serie di idee e linee guida proprio a questo scopo, prendendo in considerazione gli aspetti specifici e contestuali. L'idea centrale è quella della creazione e del supporto di una infrastruttura centrale; per esempio di comunicazione o trasporto (che sono ovvie) o a livello meno ovvio normativo (come ad esempio norme che regolano il trasferimento di capitali), a livello amministrativo (gemellaggi regionali). Fra le linee guida di politica di sviluppo ci sono quelle di supporto all'incontro di opportunità (ad esempio supportare conferenze internazionali), riconoscimenti formali di cluster come quelli fra aziende e università e attività regionali o internazionali. In questo studio approfondiremo anche 'trappole' di questi sistemi di sviluppo che riguardano temi come ad esempio "non facciamo scelte di parte" e "lasciamo che la comunità imprenditoriale gestisca autonomamente questi processi".

Parole chiave: cluster industriali; piccole e medie imprese, politiche pubbliche, regioni periferiche

Translated by: Riccardo Paterni founder of Professione Lavoro ® by Knowledge for Action & Action for Knowledge. riccardo@saperefare.it

Arabic Abstract*

Industry Clusters, SMEs and Public policy: A review, and recommendations for peripheral regions

الشركات الصغيرة ومتروضة الحجم التجمعات الصناعية، والسياسة العامة: مراجعة وتوصيات للمناطق الجانبيّة

Meir Russ^a and Jeannette K. Jones^b

^aProfessor, Austin E. Cofrin School of Business, University of Wisconsin - Green Bay, WH460;
2420 Nicolet Drive, Green Bay, WI 54311-7001, USA. Phone + 1 (920) 465-2757; E-mail:
russm@uwgb.edu

^bProfessor, American Intercontinental University – Main Campus, 5550 Prairie Stone Parkway --
Hoffman Estates, Illinois 60192, USA. E-mail: jeannette.jones@faculty.aiuonline.edu

خلاصة

تشير الأبحاث إلى أن الشركات الصغيرة ومتروضة الحجم من المساهمين الرئيسيين لخلق فرص العمل وهي من عوامل الاستقرار من أجل التنمية الاقتصادية كونها موجهة محلياً وأقل ميلاً للانتشار. يعتقد، مع ذلك، أن مزايا التنمية الاقتصادية ستتلاشى إذا وضعت الشركات الصغيرة ومتروضة الحجم في المناطق التي تفتقر للمعرفة. تشير أبحاثنا على الرغم من ذلك إلى أنه يمكن الشركات الصغيرة ذات المعرفة المكثفة الاستمرار في المناطق التي تفتقر للمعرفة إذا ما أقامت شبكة علاقات خارج المنطقة، وتعاونت مع الموردين و/أو الزبائن. بما أن المسافة السيكولوجية تقدم على المسافة المادية على أنها العائق الرئيسي أمام التعاون، يغدو خلق قنوات التعاون ضروريًا. السؤال المثير للاهتمام هو كيف يمكن دعم شركة صغيرة أو متروضة في المناطق التي تفتقر للمعرفة من قبل كيانات إقليمية و/أو وطنية للتنمية الاقتصادية حتى تتمكن من المشاركة بفعالية في إقتصاد المعرفة العالمي. سوف تطرح هذه الورقة عدداً من الأفكار والمبادئ التوجيهية للسياسات لمثل هذا النوع من الدعم، آخذين بعين الاعتبار الجوانب الفريدة في صنع السياسات فيما يتعلق بإدارة المعرفة للشركات الصغيرة والمتوسطة الحجم في المناطق الجانبيّة. الفكرة المركزية هي دعم وخلق البنية التحتية المناسبة؛ ومنها: البنية التحتية للإتصالات السلكية واللاسلكية والنقل (التي هي واضحة)، وتلك القل وضوها كالبنية التنظيمية (مثال: تنظيم انتقال رؤوس الأموال)، و الدعم الإداري (مثال: علاقات المؤاخاة الإقليمية). وضمن المبادئ التوجيهية الأخرى للسياسة الدعم لفرص اللقاء/الاجتماع (مثال: دعم المؤتمرات الدولية)، والإعتراف الرسمي بالكتلة مثل تعاون الجامعة- الصناعة، والأنشطة الإقليمية والدولية. سوف نتطرق في هذه الورقة إلى المفاهيم التي قد تسبب بعثرات ومنها "لا تختار الفائزين" ، و"دع مجتمع العمل يقود العملية". التجمعات الصناعية؛ الشركات الصغيرة ومتروضة الحجم؛ السياسات العامة؛ المناطق الجانبيّة: الكلمات الرئيسية

*Translated by: Zu'bi M. F. Al-Zu'bi, Ph.D., FHEA, Assistant Dean of the Faculty of Business, University of Jordan, Amman, Jordan, Email: zoz55jo@yahoo.com, z.alzubi@ju.edu.jo