The Globalization of Competition and the Localization of Competitive Advantage:
Policies toward Regional Clustering

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INTRODUCTION

Two seemingly competing tendencies, the globalization of economic activity and the localization of industries, have captured the interest of scholars, economic development professionals, and policymakers in recent years. While trends towards globalization of industries and companies appear to reduce the importance and distinctiveness of (subnational) regions, a tendency towards localization of certain industries and economic activities appears to do exactly the opposite. The simultaneous globalization and localization tendencies have created policy challenges for national and local governments. One response to these challenges has been a dramatic proliferation of regional development policies based on regional clusters of firms and industries.

This paper argues that the globalization of competition is completely consistent the localization of competitive advantage in some industries and activities. It goes on to describe the similarities and differences among the cluster-based strategies that have emerged in nations and regions around the world to deal with the globalization-localization nexus. It suggests that many such programmes lack a sufficiently rigorous process of cluster identification, characterization, and selection. As a result, there is a danger that instead of providing a basis for distinctive programmes tailored to the specific nature of the local economy and society, the focus on regional clustering will result in the same policies chasing the same industries in different places. On the other hand, when

properly formulated and implemented, such strategies hold promise precisely because they can address the challenges presented by a globalizing-localizing world.

The Globalization of Competition

One of the most important trends in the world economy in recent years has been the globalization of economic and business activity. International economic activity of all kinds has been on the increase. World trade has grown significantly faster than world output over the last few decades and foreign direct investment flows have grown faster than world trade. In 1996, the world-wide stock of foreign direct investment reached US$3.2 trillion and sales by foreign affiliates, roughly US$7 trillion a year, were some 30 per cent greater than world exports (UNCTAD 1997). Foreign portfolio investment has increased in importance as well. Private holdings of long term foreign securities by United States residents and entities alone reached an estimated US$1.1 trillion at the start of 1997 (International Monetary Fund 1997). And finally, international currency transactions, at US$1.5 trillion to US$1.8 trillion a day, dwarf all other forms of international economic activity.

Some of the major features of the globalization phenomenon have been the development of global finance and financial markets, the spread of knowledge facilitated by improved communication, the widespread availability and use of technology, the active expansion of multinational firms, the decoupling and decentralization of economic activities within and between firms, the blurring of nationality of multinationals, the development of global oligopolies, reductions in barriers to trade and investment, the increased importance and power of supranational organizations such as the European Union, and the emergence of regions and regional identities that transcend borders (See Amin and Thrift 1994c; Dicken 1992, 1994; Dunning 1998; Hagström 1990; and Reich 1991, for example). Added to this list today would be the rise of electronic communities over the Internet and the fact that nations comprising nearly one half of the world's population (including China, India, South Africa, the former Eastern bloc, and the formerly import substitution driven economies of Latin America) have either entered the world economy or have dramatically changed their relationship to it in the last two decades (Enright 1997).

The result has been an unprecedented globalization of business competition and competition for attracting economic activity. To some, (Cooke and Imrie 1989, Amin and Robins 1990, and Ettlinger 1994), globalization has broken down formerly strong local and regional economic identities. It is only a slight exaggeration to state that the process of globalization is one that is often portrayed as pitting large, powerful multinational firms and supranational organizations against virtually powerless and increasingly identityless regions and regional governments. In such a world, one role of government is to ensure that such regions are not bypassed by the globalization of economic activity.

The Localization of Competitive Advantage

As globalization has accelerated, interest in localized groups of firms in the same or related industries, or 'regional clusters', has accelerated as well. Porter (1990), Enright (1991, 1996, 1998), and Storper (1992) point out that in many industries, the leading firms are located in the same nation, region, or even city. Regional clustering is found in virtually every advanced economy and increasingly in developing nations as well (Humphrey and Schmitz 1996). It can be seen in the industrial districts of Northern Italy, the high technology agglomerations of Silicon Valley or Route 128, the company towns of Ludwigshafen or Toyota City, and the metropolitan business service centres of New York or London. It can even be seen in the emergence of 'anti-cluster clusters', clusters of firms in non-location sensitive activities which we would normally think as not subject to clustering at all. Omaha in telemarketing, South Dakota in credit card processing, Ireland in back office processing for financial services, Sydney in information processing, Bangalore in software services, and Manila in data entry are only a few examples of mobile activities that one generally thinks of being decentralized FROM places being decentralized TO places. The fact that even such 'placeless' activities have shown tendencies to cluster indicates the strength of the phenomenon.

Storper (1992) concludes that the clustering phenomenon places a fundamental limit on the process of globalization. In addition, even large multinationals, have their local characteristics. Despite the emergence of so-called 'transnational corporations' (Bartlett and Ghoshal 1989), most

multinational companies are ‘home-based multinationals’, with a distinct centre of gravity for their management and critical activities (Dicken 1994, Sölvell and Zander 1995). ABB, a firm that is often characterized as virtually stateless, has its business units headquartered in specific locations with specific identities. The motion picture industry is dominated by multinational firms, all headquartered in the Los Angeles area. The pharmaceutical industry has been consolidating on a worldwide basis, but more than half of the leading firms have headquarters and/or major research facilities between New York City and Philadelphia. The financial services industry is globalizing, but New York and London have maintained or increased their dominance.

Even the fact that some regional clusters decline in the face of competition from multinational firms does not diminish the importance of location. Some (though certainly not all) regional clusters have been displaced, not by randomly located multinationals, but by other regional clusters of either small firms or multinationals. Birmingham’s craft-based gun cluster was displaced by mass production and interchangeable parts, but the new firms were concentrated in the Connecticut Valley, still the leading production area for firearms in the United States today. The cutlery industry of Sheffield (UK) was displaced by a similar cluster in Solingen (Germany), which in turn has battled with another cluster in Seki (Japan). Producers of low and medium priced watches in the Swiss Jura came under great pressure first from Japanese companies and then from a cluster of Hong Kong companies. North American and European motorcycle companies were displaced largely by four Japanese firms, including three from the small city of Hammamatsu, which was also home to the top three Japanese multinational musical instrument companies that displaced craft-oriented firms in North America and Europe. This is not to say that the regional clustering phenomenon is present in all industries or even most industries (in fact the geographic profile of different industries varies widely, Enright 1993a), but that it is an important part of the economic landscape.

Globalization and Localization: Resolving the Paradox

The numerous examples of regional clustering provide evidence that even as competition and economic activity globalize, that competitive advantage can be localized. This is the economic

equivalent of what ten years ago I started calling ‘the Brussels paradox’. That is, if current trends toward increasing the power of European Union institutions and growing (subnational) regionalism within the EU continue, Brussels will be capital of one Europe, but two Belgiums.

Of course, the apparent economic paradox is really no paradox at all. Globalization can result in a geographic spread of economic activities over space, but it also can allow firms and locations with specific sources of competitive advantage to exploit their advantages over ever wider geographic areas, often, though not always, at the expense of other areas. Enright (1993b) claims that as long as globalizing forces move at a faster pace than forces that influence the geographic sources of competitive advantage (such as localized human capital, presence of key suppliers, tastes of local consumers, demand patterns of industrial customers, the nature and levels of local competition and co-operation, and local institutions), that economies will become in some ways more distinct, rather than less distinct. Thus, geographic sources of competitive advantage will become more, not less, important.

These tendencies can be reinforced by the location choices of multinational firms, which are slicing their activities more and more finely, and are more carefully arbitraging differences in locational sources of advantage, even having locations compete for product mandates in some cases (Birkinshaw 1998). In some industries, design, research and development, finance, and even business unit headquarters activities have been concentrating on a global basis. Nissan performs a substantial portion of its new design work in Southern California, a noted centre for automotive design. Samsung designs new semiconductors in Silicon Valley. Several European pharmaceutical and chemical companies do the bulk of their biotechnology research in biotechnology clusters in the United States. In a study of the geography of innovation in Europe, Tödtling (1994) found that globalization and moves to more flexible production systems tend to strengthen existing innovation centres. Financial and managerial centres, such as New York, London, and Tokyo, appear to be consolidating their power (OECD 1995). Most major Western financial institutions have their Asia-Pacific regional headquarters in Hong Kong or Singapore (Enright et al. 1997). German banks buy British merchant banks, but then move their merchant banking headquarters to London, while the world’s first major

pharmaceutical company, Hoechst, recently moved the headquarters of its pharmaceutical operations to the United States. In each case, the decisions of multinationals have reinforced pre-existing clusters.

Although the globalization of competition should raise, and arguably has raised, the average level of economic well being around the world, there are winners and losers in this process as well as shifts in the relative power of economic actors. Dicken (1994), Amin (1992), and Schoenberger (1991) point out that not every local economy can hope to participate in the localization process brought about by the globalizing activities of multinational firms. In particular, excluded regions are likely to become more excluded and the degree of differentiation across locations will increase with the globalization of economic activity, perhaps resulting in destructive competition among regions for a place in the productive networks of multinational companies.

Where one stands in terms of whether the globalization-localization nexus provides opportunity or threat seems to depend on where one sits. Those who study innovative high technology clusters, industrial districts that have succeeded in international competition, and dynamic metropolitan clusters tend to focus on the advantages of localization and the opportunities of globalization. Those who study regions that have declined, have lost branch plants, and have had difficulties in regenerating their economies focus on the loss of local industries, the difficulties in obtaining a position in the global economic hierarchy, and the loss of local economic power and autonomy. In either case, globalizing and localizing tendencies make ‘place’, in particular the attributes that determine whether a given place will benefit or suffer from the globalizing and localizing tendencies, more important, rather than less important, to a region’s economic well-being (Enright 1993b and Scott 1998).

CLUSTER-BASED DEVELOPMENT POLICIES IN THE GLOBAL-LOCAL NEXUS

The globalization-localization nexus described above has had an important impact on national and regional economic development policies. One response has been a growing interest in local development policies geared toward support for regional clusters-- localized agglomerations of firms in the same or related industries. In the last decade, dozens of regions, states, provinces, cities, and local communities have instituted development plans based on regional clusters. In addition, multilateral organizations, such as the World Bank, UNIDO, the OECD, the European Commission, and others have taken up cluster strategies as tools for regional and local development. The reasons have included the globalizing and localizing forces mentioned above, perceived difficulties with development through large firms, trends toward outsourcing and downsizing among larger firms, case studies on successful clusters, and the tendency to push economic policymaking from the national to the regional or local level in several nations. Perhaps the most important reason, however, is that other strategies have not worked to the satisfaction of policymakers and their constituents (see Doeringer and Terkla 1996; Scott 1992, 1998; OECD 1995; Gittell et al. 1996; and Enright 1996).

Governments with widely different ideologies and philosophies have instituted cluster promotion policies. In the United States, conservative states, liberal states, and states in between have adopted cluster-based strategies. In Canada, the most interventionist (the Atlantic Provinces and Quebec) and least interventionist (Alberta and British Columbia) provinces have done the same. Cluster-based strategies are being employed in Europe by governments across the spectrum from left to right and right to left. In the Asia-Pacific, national or local governments in such diverse places as Australia, New Zealand, Malaysia, and Singapore have adopted cluster development strategies. With such different governments all adopting cluster-based strategies, it is easy to conjecture that we have either stumbled across universal truths, mass delusions, or the same words used to describe very different programmes. In reality, it is probably a mixture of all three.

An exhaustive enumeration of cluster-based strategies is beyond the scope of this paper. However, it is useful to identify some of the similarities and differences found in cluster-based strategies.

Common Elements of Cluster Strategies

Cluster development strategies tend to have a number of elements in common. Though not necessarily linked specifically to clusters, efforts to *improve the generalized business environment*, by reviewing tax policy, examining regulations, reducing costs of services, streamlining administration, and maintaining a favourable business climate, often become parts of cluster development policies. So too do efforts to *provide information and data* on business and economic trends as well as information and data specific to individual clusters, such as market data, information on customers and competitors, information on technological trends, and so on. In many instances, governments have commissioned detailed consulting reports that identify and profile clusters, and make suggestions to cluster participants. Such activities are justified on the basis that it is often too difficult or expensive for firms to carry out such activities on their own.

Most jurisdictions, at least in advanced economies, provide basic *infrastructure, education, and training*. In cluster-based programmes, these investments tend to become far more focused on the specific infrastructure, skills, and capabilities required by specific clusters. This can include effluent treatment facilities for specific industries (Catalan leather), dedicated water (Malaysian electronics) or electricity (Venezuelan metals) lines, and specialized port (Singapore shipping) or airfreight (Dutch flowers) facilities. It can mean specific education and training programmes in software (Bangalore), motion pictures (Los Angeles), materials science (Sassuolo), winemaking (Napa Valley), and electronics (Taiwan), among others. The purpose is to provide specific infrastructure, skills, and capabilities that can be a source of localized competitive advantage.

Cluster development programmes have used a variety of means to foster *business networking and inter-firm collaboration*. Some programmes have relied on informal networking through introductions, referral lists, industry associations, and other mechanisms. More formal programmes, such as those in parts of Canada, parts of Australia, New Zealand, the United Kingdom, and Finland, have added a cluster dimension to the networking programmes pioneered in Denmark and Norway, in which small and medium sized enterprises can receive government support to create networks and

develop collaborative activities. These policies, some of which have run their course and have expired, have received mixed reviews, with some observers pointing to the number or networks that were formed under the programmes and with others pointing out the large number of networks that survived only as long as government funding was available (Korhonen 1996).

In several regions, governments have made investments to *provide business services* ranging from basic research, to market research, to materials testing, to business process consulting, to accounting and record keeping, to advice on business management. The idea is to provide scale and experience sensitive services that small and medium sized firms cannot perform or afford for themselves individually. The best known examples are Northern Italy's locally run 'real service centres', the many offices of Germany's Steinbeis Foundation scattered around the country, and the manufacturing and business extension services attached to several public universities in the United States. Such centres provide services such as contract research and development, transferring technology from universities to firms, applied technology research, materials testing, managerial training, and other services. While such institutes are often initiated with public investments, several have become partially or fully self-funding.

Finally, many groups interested in promoting cluster development engage in activities that can be best termed *community building*. As Scott (1998), Putnam (1993), Rosenfeld (1995), and Cooke and Morgan (1994) have observed, it is difficult or impossible to separate a region's economic development from its social and community development. These authors indicate that communities that can develop a shared sense of purpose, work toward the common good, and engender information sharing and inter-firm trust perform better economically than other communities. This knowledge has informed cluster development programmes in North America (in places like Arizona, Austin, Chihuahua, Florida, North Carolina, Silicon Valley, and Quebec) and Europe (in places like Germany, Italy, Spain, for example), where attempts have been made to develop institutions to foster community development. Such efforts are subject to the caveat that successful institutions a specific location can be very difficult to reproduce elsewhere (Amin and Thrift 1994c).

Differences in Cluster Development Strategies

Although there are elements common to many cluster development programmes, there are important differences among programmes that are rarely highlighted. Cluster development programmes, for example, differ in the origin of the industrial base and in the degree of government intervention, with different approaches that depend on different views of (or positions in) the globalization-localization nexus.

Origin of Industrial Base

Cluster development programmes can focus on the expansion and deepening of the indigenous economic base, on attracting activities of foreign firms, or on a combination of the two. *Organic cluster strategies* seek to broaden and deepen a region's existing economic base by identifying the region's clusters and then trying to promote development by improving information flows, increasing the interaction among local firms, removing infrastructure bottlenecks, developing human resources, and fostering inter-firm collaboration. Although some efforts might be made to attract firms from outside the region, the primary focus is on development based on firms already present in the region. Most of the programmes in the United States, Spain, Italy, Austria, and New Zealand, among others, are in this category.

Transplant cluster strategies attempt to build clusters by attracting facilities of outside companies and developing or attracting suppliers and related firms. Such strategies resemble the traditional transplant strategy that fell into disrepute in some places in the 1970s and 1980s, albeit with refinements. One refinement is the use of clustering to focus on particular targets or sets of targets that might fit particularly well with the local economic environment. Another is a realization that regional headquarters, research and development, and certain other high value-added activities are more desirable targets than manufacturing alone. Another is the use of the policies associated with cluster development to foster better linkages within the local economy. Ireland, Scotland, Wales, Northern England, Malaysia, and Singapore, among others, have used this type of strategy.

Hybrid strategies result when organic cluster development programmes start actively to recruit outside investment, or when transplant strategies become successful enough to create a critical mass of locally embedded facilities and firms that can be engaged in more organic programmes. In the United States, Massachusetts, Arizona, and others have added promotion of foreign investment into clusters to their programmes. Singapore and Ireland, on the other hand, have developed a sufficient mass of foreign owned firms to treat them as a base for cluster development.

Each strategy has its pluses and minuses. Organic strategies, since they build on unique features of the local environment, can foster distinct advantages that are difficult to copy. Organic strategies, however, are predicated on the presence of a solid economic base to build upon, which is not the case in many regions. Transplant strategies can help develop a regional economy rather quickly, but are limited to the investments available for attraction, are subject to imitation and destructive competition, and face the risk that poorly embedded facilities will eventually close. Hybrid strategies, while perhaps intrinsically attractive, can result in confusion and competition between policies directed at indigenous and foreign firms.

For the purposes of this paper, the point is that different strategies indicate different approaches to the globalization-localization nexus. Organic policies view economic development primarily coming through local firms and their ability to inject themselves into international markets, in other words to become vital multinational companies or to extend their international presence. Globalization and localization primarily provide opportunities and the role of government is to accelerate the development of latent or potential clusters already in the environment. Transplant strategies attempt development by attracting the globalizing activities of multinational firms and using these activities to provide a nucleus around which other activities will develop or can be attracted. The globalization of competition and the activities of multinational firms provide opportunities to attract some activities to locations that have either lost out in global competition in other industries or to locations that have not been developed previously. Implicitly, transplant strategies indicate a realization that indigenous development is unlikely to achieve the desired results

or the belief that globalization might bypass the location in question, the downside to the globalization-localization nexus.

Extent of Government Intervention

Cluster development strategies also differ in their level of government intervention, another fact rarely highlighted in the literature. *Catalytic strategies* limit government to an indirect, supporting role. In these strategies, governments attempt to facilitate the development of clusters by encouraging private sector efforts. In Arizona, for example, an important part of the state's activities involved identifying the heads firms in related industries and introducing them to each other. The firms were then largely left to their own devices (Waits et al. 1992). Today, government provides some support in the form of defraying the expense of an organizer for industry associations that are part of the cluster programme, but direction is clearly given by the private sector. In New Zealand, a government entity, TRADENZ, tries to educate individuals in specific industries to the potential benefits of clusters and provides a limited amount of support for networking, but again it is up to the private sector to form relationships and gain from the process (Ffowcs-Williams 1997).

Interventionist strategies, on the other hand, involve more active attempts to support cluster development. Several regions in Europe have active transplant cluster strategies that seek out potential investors and then offer tax breaks, direct subsidies, training grants, and other forms of direct aid to firms (Mytelka 1998). Malaysia is embarking on a similar strategy, targeting several high technology industries, and providing infrastructure, facilities, training, tax breaks, grants, and other subsidies (Malaysia 1996). Singapore has evolved its activist industrial attraction policies into policies intended to develop and expand the clusters that have been attracted in the past. Quebec, on the other hand, has taken a somewhat different approach, with significant government investments in research, education, training, infrastructure, and networking programmes, but more limited direct support to specific firms (Ferland et al. 1996).

Again, the differences in levels of government intervention imply different views of the globalization-localization nexus. Catalytic strategies assume that providing the means for clusters to

accelerate their own development will allow localized clusters to take advantage of the globalization of competition in the marketplace. Interventionist strategies assume that market forces will not be sufficient to foster the development of vibrant clusters in the region without more substantial government support and resources. The latter can reflect beliefs that global competition is too tough, other clusters are too well supported, or local firms are too weak to go it alone.

It appears that cluster-based strategies or at least strategies that claim to be based on a cluster logic can be adopted by, or sold to, governments of virtually any persuasion. Interventionist governments find that cluster-based strategies provide them with finer tools with which to pick and promote industries of choice. At the same time, even the most non-interventionist policymakers and economists realize that some market failures can be addressed through government action. Cluster-based strategies give them a means and a rationale for doing so. Despite the apparent similarities in cluster-based development programmes, it seems that part of the reason that cluster-based strategies can be adopted by different types of governments is that a fairly wide range of strategies, with varying tools and tactics, actually are being subsumed under the same rubric.

Cluster Selection

Another area in which cluster development programmes show both similarities and differences is in the process of cluster identification and selection. Some programmes use an involved process of identifying and selecting clusters for support (see Rosenfeld 1995, Massachusetts Technology Collaborative 1997, Gouvernment du Quebec 1997, Regional Planning Association 1996, and Cornejos et al. 1997 for examples). The Greater Tucson Strategic Economic Development Plan, for example, identifies 24 specific target industries (at the 4 digit SIC level), all within the categories of optics, environmental technologies, aerospace, bioindustries, teleservices, and software and information services. These clusters were identified using a detailed set of criteria, including industry growth rate, multiplier effect, job creation and income potential, match with local resources, environmental considerations, relationships with local suppliers, contribution to quality of life, and synergy with local institutions and businesses (Greater Tucson Economic Council 1996).

Other programmes are not so focused. According to one government, 'Priority sectors are characterized by a reliance on significant R&D investment, value-added production, a skilled workforce, intellectual property assets, and global exports. They enjoy high margins and high growth, but only if they identify and service new markets, develop and apply new technology, attract and develop human resources, and operate at a world class level of quality.' (British Columbia Ministry of Employment and Investment 1997). The literature from this government makes no mention of suitability to the local environment or economy, which presumably would have an important influence on the success of the programmes.

Some jurisdictions target so many industries and clusters that one wonders how many are really targeted at all. Malaysia's list of targeted industries is actually several pages long. Both Alberta and its largest city, Calgary, have identified long lists of industries for support. The Calgary Economic Development Authority helpfully adds that, 'If your company is not in one of these sectors that does not mean that we are not interested in providing assistance to you.' (Calgary Economic Development Authority 1997). Some 'clusters' such as 'tradable business services', 'engineering', and 'technology' (Northern Ireland Growth Challenge 1997), while useful perhaps in a broadbrush description of an economy, are too broad to be of much use for cluster development programmes. Other selections, such as 'tourism/ heritage/ lifestyle', 'agriculture/ aquaculture/ forestry', 'knowledge-based cluster', and 'government services cluster' (Cape Breton 1995), are hardly clusters at all.

Despite some of the differences cited above, perhaps the most striking feature of the lists of clusters identified for development programmes is their similarity. A random selection of such programmes shows that 'Business services' has been selected in Alberta, British Columbia, Chihuahua, Connecticut, Malaysia, Massachusetts, New York, New Jersey, Northern Ireland, Singapore, and Tennessee; 'Electronics' in Alberta, Chihuahua, Ireland, Malaysia, Massachusetts, Scotland, Singapore, Tennessee, and Wales; 'Information technology' in Alberta, Arizona, British Columbia, Cairns, Connecticut, Hunter, Ireland, Malaysia, Massachusetts, North Tyneside, Northern Ireland, Scotland, and Quebec. 'Telecommunications' in Alberta, Arizona, Connecticut, Finland,

Hunter, Massachusetts, Scotland, Singapore, and Wales; 'Medical and biomedical industries' in Alberta, British Columbia, Cairns, Connecticut, Massachusetts, New York, New Jersey, Northern Ireland, Scotland, Tennessee, and Wales; as distinct from 'Pharmaceuticals and biotechnology', selected in Arizona, British Columbia, Connecticut, Hunter, Ireland, Malaysia, Massachusetts, and Quebec.

Despite the different processes that have been employed to identify clusters for support programmes, there is a surprising similarity in those identified. Either economies around the world are far more similar than they initially appear, or some other force is influencing the selection process. Such conclusions, and the overly diffuse 'clusters' identified in some locations, lead one to wonder how many programmes are based on a real knowledge of what clusters are and how they can promote economic development.

SHARPENING CLUSTER ANALYSIS AND CLUSTER DEVELOPMENT STRATEGIES

Several issues arise from the above discussion of cluster development strategies. These include characterizing the variety of clusters, understanding the state of development of clusters, the importance of cluster identification and selection processes, the links between market failures and cluster-based strategies, and whether cluster-based strategies are appropriate in a particular context. The discussion indicates that we must sharpen our analysis of regional clusters and cluster development policies if clustering is to be used successfully as a basis for economic development.

Dimensions of Clusters

First for consideration is what a cluster is in the first place. One of the more confusing features of the recent literature and policymaking based on regional clusters is the fact that a variety of phenomena are grouped under the term. 'Regional clustering' has been used to describe industrial districts of small crafts firms, high technology centres, agglomerations of financial and business service firms in cities, company towns, and large branch plants and their supply chains. 'Cluster' terminology seems so embedded that one despairs of redefining or sharply defining the term. However, clusters at least

must be characterized along relevant dimensions if appropriate policies are to be devised. I have found thinking along the following dimensions to be particularly useful (see Table 13.1).

TABLE 13.1 GOES APPROXIMATELY HERE, IT CAN GO LATER, BUT NOT EARLIER

The *geographic scope* of a cluster refers to the territorial extent of the firms, customers, suppliers, support services, and institutions that are embedded in the ongoing relationships and interdependent activities that characterize the cluster. *Localized clusters* are tight groupings found in a small geographic area, often a single town, whereas *dispersed clusters* are spread across wider geographies.

The *density* of a cluster refers to the number and economic weight (in terms of market shares of relevant industries) of the firms in the cluster. *Dense clusters* can be populated by hundreds, thousands, or even tens of thousands of firms with total sales reaching hundreds of millions or billions of dollars, whereas *sparse clusters* do not have the same economic weight, either because they have fewer firms or fewer substantial firms.

The *breadth* of clusters refers to the range of horizontally related industries (industries related by common technologies, end users, distribution channels, and other non-vertical relationships) within the cluster. *Narrow clusters* consist of one of a few industries and their supply chains. *Broad clusters* provide a variety of products in closely related industries.

Cluster *depth* refers to range of vertically related industries within the cluster. *Deep clusters* are those in which a region does not just contain an industry or set of related industries, but complete or nearly complete supply chains, whereas *shallow clusters* are those that rely principally on inputs, components, equipment, technology, and support services from outside the region.

The *activity base* of a cluster involves the number and nature of the activities in the value-added chain performed with the region. In *activity-rich clusters,* most or at least many of the critical activities in the value-added chains of the relevant industries are performed locally. Firms in such clusters tend to carry out their core strategy-setting, product or service development, marketing

strategy, and corporate co-ordination activities within the region in question. *Activity-poor* clusters, on the other hand, involve one or only a few activities in a given industry or set of related industries.

The *growth potential* of an individual cluster depends not only on the growth in demand for the products and services supplied by the cluster, but also the competitive position of the cluster relative to outside competitors and the availability (or ability to create or attract) resources necessary to support growth. Thus one can specify *sunrise*, *noonday*, and *sunset* clusters, but it is far more useful to include the relative competitiveness of the firms in the cluster versus outside competition (*sunrise/ competitive*, *sunrise/ non-competitive*, etc.) and an assessment of the region's circumstances with respect to the resources required for growth.

The *innovative capacity* of the cluster refers to the ability of the cluster to generate the key innovations in products, processes, designs, marketing, logistics, and management that are relevant to competitive advantage in the industries in question. The distinction between *high innovation* and *low innovation* clusters is far more useful than that between 'high technology' and 'low technology' clusters. Some 'high technology' clusters are not at all innovative and some 'low technology' clusters are. A cluster's ability to sustain itself is related more to its innovative capacity than to the level of technology produced or used in the process.

A cluster's *industrial organization* refers to the governance structures and relationships among firms in the cluster, including the nature of relationships and distribution of power among firms. *Co-ordination mechanisms* involve the ways that inter-firm relations are organized, through hierarchies, markets, or other forms.

Characterizing clusters along these dimensions allows one to understand their potentials and problems in ways that can inform policy. Localized clusters, dense clusters, deep clusters, and activity-rich clusters have a greater chance of fostering close inter-firm communication and interaction that can be a source of competitive advantage. These clusters are, other things being equal, more likely to be high innovation clusters that benefit from the globalization of economic activity. Policy towards clusters with these attributes can be organic, focusing on enhancing the information, relationships, and skills necessary to project further into the international market place.

Dispersed, sparse, shallow, and activity-poor clusters are less embedded into the local economic and social systems and are less likely to be sources of self-sustaining growth. These clusters are, other things being equal, less likely to be high innovation clusters. In addition, while they might benefit in the short run from the globalization of economic activity, they might be more subject to competition over time, since the core competitive advantages of constituent companies are created somewhere else. This description fits many of the clusters created through transplant strategies. No matter their origin, development in clusters with the attributes listed above is likely to be far more difficult. Concentration on fostering the conditions under which suppliers or related firms can be attracted, developed, or spun off is likely to be a high priority.

Knowledge of industrial organization, governance structures, and co-ordination mechanisms can guide policy toward the most efficient use of scarce resources. Policies directed at SMEs, for example, will be ineffective if the cluster has lead firms or core firms that are not interested in the programmes. On the other hand, atomistic, decentralized, 'all-ring' structures with activities co-ordinated by spot markets might be very difficult to structures in which to foster inter-firm collaboration due to co-ordination difficulties.

In general, local policy should be designed to help localize, deepen, broaden, activity-enrich, and/ or improve the innovation capacity of clusters. In reality, it can be difficult or fruitless to move in all directions at once. Policy should benefit from characterizations and analyses that identify the key constraints and leverage points of relevant clusters along these dimensions. In addition, different clusters, even in the same location, might have very different characteristics and therefore a very different appropriate policy mix. 'One size' does not fit all, even for clusters in the same location. This is another fact that has been largely overlooked in cluster development programmes and the literature on regional clusters.

State of Development of Clusters

The state of development of a cluster also will have an important influence on its future and the appropriate policy mix to support the cluster. The state of development of a cluster refers not to the

age of the cluster, but rather whether the cluster is benefiting from the co-location of firms, is self-aware, and is self-reinforcing.

Working clusters are those in which a critical mass of local knowledge, expertise, personnel, and resources create agglomeration economies that are used by firms to their advantage in competing with those outside the cluster. Working clusters tend to have dense patterns of interactions among local firms that differ quantitatively and qualitatively from the interactions that the firms have with those not located in the cluster. Working clusters often have complex patterns of competition and co-operation and often are able to attract mobile resources and key personnel from other locations. Even if participants do not call themselves a 'cluster' there tends to be knowledge of the interdependence of local competitors, suppliers, customers, and institutions. Italy's industrial districts, Silicon Valley, and Hollywood would be prime examples.

Latent clusters have a critical mass of firms in related industries sufficient to reap the benefits of clustering, but have not developed the level of interaction and information flows necessary to truly benefit from co-location. This can be due to a lack of knowledge of other local firms, a lack of interaction among firms and individuals, a lack of a common enough vision of their future, or a lack of the requisite level of trust for firms to explore and exploit common interests. In any case, such groups of firms do not think of themselves as clusters and, as a result, do not think of exploring the potential benefits of closer relationships with other local organizations. Arizona's optics cluster, for example, consisted of a group of firms that operated without knowledge of each other until a cluster development initiative brought them together. Today, there is an active industry association, joint selling of bundled products, and numerous other industry activities. New Zealand's wine industry also went from a latent cluster, with limited interaction, to an industry that has been able to develop and jointly market New Zealand wines as high quality wines in major markets.

Potential clusters are those that have some of the elements necessary for the development of successful clusters, but where these elements must be deepened and broadened in order to benefit from the impact of agglomeration. Often there are important gaps in the inputs, services, or information flows that support cluster development. Like latent clusters, they lack the interaction and

self-awareness of working clusters. New York is showing signs of the emergence of a multimedia cluster, but is not as far along as the multimedia clusters in Los Angeles and San Francisco.

Wishful thinking clusters are those chosen by governments for support, but which lack a critical mass of firms or favourable conditions for organic development. Many of the electronics and biotechnology 'clusters' found in government programmes fall into this category. Other 'wishful thinking' clusters are those such as 'manufacturing' or 'high technology' that are far too broad to act meaningfully as clusters. Sometimes such entities are called 'policy driven clusters' because they rely on government rather than market forces for development.

Knowledge of the state of development of clusters is extremely useful in determining where to focus the details of cluster promotion policies. For working clusters, policy emphasis should be placed on helping them to further their penetration into export markets. For latent clusters, emphasis should be on helping them reach a level of self-realization that will allow for development of inter-firm linkages, institution building, and information generation. For potential clusters, emphasis should be on helping develop or attract a sufficient critical mass of economic activity to become a working cluster. For wishful thinking clusters, emphasis should be on either more creative approaches or exclusion from resource constrained programmes.

Selection Processes

The process of selecting clusters for inclusion in development programmes can be quite important. A critical question is the role that economic analysis and political forces play in the decisions. Rosenfeld (1995), describes a detailed process combining statistical analysis of a region's economy with other information to identify the key linkages and leverage points, but as shown by some of the 'clusters' identified above, the cluster selection process is not always so informed or scientific. In fact, such processes can be highly political, with 'wishful thinking clusters' suddenly discovered in places where no one had ever supposed they existed or could exist. While it is beneficial to include some 'potential clusters' in a cluster development programme, and it makes sense for a region to

'stretch', the trouble with politically motivated selections is that they often receive a disproportionate share of attention and resources and wind up undermining the entire effort.

Care should be taken that selection processes do not retard the self-realization of clusters that happen not to be chosen for the programmes. When the very definition of 'cluster' is based on some programme, there are unintended consequences. The president of a firm in what by all appearances should have been a dynamic cluster once told me, 'We thought we were a cluster. We wanted to be a cluster, but we were not approved', as if a cluster only exists if it is identified by some authority.

Market Failures and Cluster Strategies

Other issues are intrinsic to the cluster development strategies themselves. In theory, government action is justified by market failures, but in practice relatively few cluster programmes explicitly identify the market failures that they are designed to correct. The most obvious market failures that can be addressed by cluster strategies are impacted information, managerial myopia, underprovision of public goods, and co-ordination failures. Impacted information occurs when information that would be useful to the firms is not available to them or is only available at a cost that would be prohibitive. Managerial myopia occurs when information that is available is not used to optimum benefit due to lack of understanding, or to a failure to link knowledge with action. Public goods, such as education, training, infrastructure, and others tend to be undersupplied by markets. Co-ordination failures occur when information is available and is understood, but is not acted upon because disparate actors cannot organize themselves to act in concert.

Public entities can clearly play a vital role in providing information, education, and public goods, and in helping to provide co-ordination mechanisms for local firms. However, these activities often are applied as recipes rather than as attempts to overcome specific, identified market failures. Nor is the nature of the 'public goods' that are being provided fully scrutinized. The legitimacy of cluster promotion policies towards small and medium sized enterprises, for examples, is rarely questioned. If, however, international experience indicates that only ten per cent of the SMEs in a given jurisdiction will use government support programmes (as found in the EU by Thomas 1995),

then unless this ten per cent will have a decisive impact on a regional economy, programmes involving even small levels of direct government support (as in many network programmes) are providing private rather than public goods.

Finally, of course, market failures should be real, not imagined ('This specific set of firms is unable to co-ordinate to carry out this specific valuable activity by themselves,' as opposed to, 'We aren't the biotechnology capital of the world so there must be a market failure.').

Failure to explicitly identify the market failures that cluster development programmes are designed to address leaves the programmes open to rent seeking and political lock-in. If in Adam Smith's time competitors spoke of raising prices whenever they conversed, in our time they are just as likely to ask for government support and handouts. Cluster programmes are new potential sources of such support. Even in New Zealand, a nation that has largely withdrawn from state support of industry, one participant in a cluster development programme told me that firms participated, 'because that is the only way we can get money from government.' A related danger is that the same co-operation that allows a cluster to have a voice in shaping local economic policy, partner with local governments to identify infrastructure needs, and set up cluster-specific education and training programmes, also can be used to lobby for protection or support that goes well beyond the provision of public goods (Grabher 1993).

The Appropriateness and Sufficiency of Cluster Strategies

There is also a danger that cluster-based strategies will be used in situations in which they are not appropriate. In some countries, particularly developing nations, there is a danger that industry or cluster based strategies will be viewed as substitutes for developing the preconditions for development. Only when these preconditions, such as the existence of real markets, coherent macroeconomic policies, a certain level of proficiency among government agencies, etc. are in place will an industry based or cluster based strategy be helpful or appropriate (see Enright et al. 1994, 1996). Otherwise, 'cluster programmes' result in hopelessly piecemeal solutions to systemic problems, or, even worse, become tools to subsidize politically connected companies or industries.

In addition to appropriateness is the issue of sufficiency. Cluster-based policies are unlikely to be sufficient to generate sustained economic development in the absence of a generally business-friendly environment, a certain level of skills and capabilities in the region, and the institutions and attitudes that will support economic growth. This suggests that governments must look beyond cluster-based policies alone in their efforts to foster development. Locations must be developed, not just clusters. Cluster development is a means, not an end. The economic rebounds of Massachusetts and New Zealand in the early 1990s, for example, were due far more to deregulation, reductions in intervention, lower taxes, and the restoration of a business-friendly environment than to the existence of any cluster development policies. One reason that cluster development policies have the potential of being extremely useful is that, when properly assessed, planned, and implemented, they are directly targeted on the globalization-localization nexus described above and they point towards other policy areas that require attention.

CONCLUSIONS

Although distance might be less important for certain industries or activities today, geography in the sense of 'place' is not. In fact, the globalization-localization nexus described above makes the specific attributes of particular places more important to their economic development and prosperity rather than less important. This is true whether one is located in a dynamic region which is home to firms that can take advantage of globalization trends and the tendency of firms in some industries to be localized, or in a less dynamic region which might suffer. It also is true for multinational firms that choose the best locations for their activities, local firms that might lose out to global competitors, and firms that use the benefits they find within their clusters to succeed in world markets.

The opportunities and threats associated with the nexus have helped foster an interest in cluster-based development strategies, especially on the part of local and regional governments. For some, the goal is to enhance the development of existing clusters and their penetration into world markets. For others, the goal is to make sure that their regions are not left behind by the process of globalization. Although many of the elements of cluster development strategies have similarities with more traditional development policies, the strong emphasis on groups of firms in related industries (rather than individual industries or firms), the focus on inter-firm linkages, the potential for organic development programmes, and the orientation toward business and community organizations and institutions are each distinctive aspects of cluster-based strategies. In addition, cluster development policies, intentionally or not, tend to be aimed precisely at the globalization-localization nexus that has created such challenges for policymakers around the world.

Many cluster development programmes are remarkably similar, both in their main features and in the specific clusters that they tend to focus upon. Some observers have even concluded that there is enough convergence in policies or programmes to conclude that there is little doubt as to what to do, but only as to how to do it (OECD 1995). Such similarities often mask the differences of the origins of the target industrial base, the level of government intervention in clusters development, and even in the understanding of what a cluster is in the first place. The general failure to acknowledge such differences leads one to wonder if in becoming all things to all people, cluster development strategies will ultimately mean little to anyone. After all, it would be ironic if a concept that holds out the promise of development tailored to the specifics of local economies were to become the rationale for ‘one size fits all’ policies where all regions follow the same policies in pursuit of the same industries. It would be particularly ironic for a process predicated on the embeddedness of economic activity into local society results in the same set of disembodied policies regardless of the local context. This would nearly ensure that the ‘nightmare’ scenario of faceless, identityless regions fighting each other for a place in the production networks of multinational firms would ensue.

The best way to avoid this result is to ensure that cluster development programmes are tailored to the local economic and social reality. This implies careful identification and characterization of local clusters in all their dimensions, explicit recognition of their needs, and programmes that clearly target specific market failures. It implies an understanding of the motivations and needs of multinational corporations that are in tough competitive environments as well. It implies a growing differentiation of regions and a further geographic division of labour. When viewed in this way, cluster development programmes can be useful tools for policymakers as they seek to maximize the potential of their own economies to effectively deal with a globalizing-localizing world.

Table 13.1 The Dimensions of Regional Clusters

Dimension	*Types*	*Examples*
Geographic Scope [a]	Localized Dispersed	Sassuolo ceramic tiles Japan synthetic fabrics
Density	Dense Sparse	New York financial services New Hampshire instrumentation [b]
Breadth	Broad Narrow	Osaka electronics Dalton tufted carpets
Depth	Deep Shallow	Danish agroindustry Ireland pharmaceuticals
Activity Base	Activity-rich Activity-poor	Silicon Valley Chihuahua maquilas
Growth Potential Industry Growth / Competitive Position	Sunrise/ competitive Sunrise/ uncompetitive Noonday/ competitive Noonday/ uncompetitive Sunset/ competitive Sunset/ uncompetitive	Los Angeles multimedia Quebec transport equipment Boston minicomputers
Innovative Capacity	High Innovation Low Innovation	Boston biotechnology, Milan fashion Singapore electronics
Industrial Organization [c]	Core-Ring with coordinating firm Core-Ring with lead firm All Ring, No Core All Core, No Ring	Veneto garments Toulouse aircraft Carpi knitwear
Co-ordinating Mechanisms [d]	Spot markets Short-Term Coalitions Long-Term Relationships Hierarchies	Prato textiles Hollywood motion pictures Turin factory automation equipment Detroit autos

[a] Enright (1993b)
[b] Kaufman et al. (1994)
[c] Storper and Harrison (1991)
[d] Enright (1995)

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