

Clusters, Cluster Policy, and Swedish Competitiveness in the Global Economy

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Preface

Initially, globalisation and the technological and economic changes it encompasses were expected to reduce the importance of local economic factors and therefore also the role of clusters. In fact, the dynamics seems to suggest the opposite and economic geography is now recognized as a critical factor to understand differences in economic growth and prosperity across countries and regions.

The report *Clusters, Cluster Policy, and Swedish Competitiveness in the Global Economy* seek to answer the question how cluster-based economic policy can help Sweden to succeed in global competition. The author finds that Sweden makes good use of cluster policies that are generally quite well designed. The operational weaknesses that have been identified are not Sweden-specific and reflect the more general learning process about how to organize cluster efforts most effectively worldwide. Cluster policy can for example be a useful tool to improve cluster competitiveness. In particular, cluster policies may serve to alleviate defined weaknesses in Swedish economy, such as a low level of entrepreneurship. Taking that as a departure point, the author suggest a number of measures that should be undertaken in order to sharpen the competitive stand of Sweden in a globalized context.

Dr. Christian Ketels is a member of the Harvard Business School faculty at Professor Michael E. Porter's Institute for Strategy and Competitiveness. The author takes full responsibility for the results and the analyses presented in this report.

Stockholm, February 2009
Pontus Braunerhjelm
Principal Secretary, The Globalisation Council

Globalisation Council members

The Swedish Government has established a Globalisation Council to promote a deeper knowledge of globalisation issues, draw up economic policy strategies and broaden public dialogue about what needs to be done to ensure that Sweden can compete successfully in a world marked by continued rapid globalisation. The Council's work is expected to lead to proposed measures whose purpose, broadly defined, will be to boost Sweden's competitiveness and attractiveness on the international scene.

In addition to regular Council meetings, background reports will be written by independent researchers and other experts. These will be quality assessed by reference groups composed of representatives from academia and the Government Offices and by leading economists on the Council's Advisory Board. The work of the Council, which must be completed well before the 2010 general election, will be documented in a final report along with economic policy recommendations. Plans are also being drawn up for a number of external activities, such as conferences and seminars.

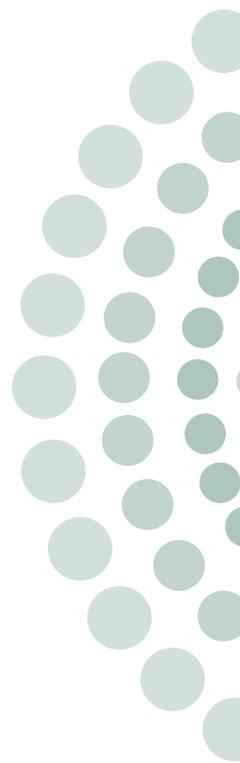
The Council comprises representatives from the business sector, the Government, social partners, the government administration, the media and the research community. It is chaired by the Minister for Education and Research, Lars Leijonborg. The Principal Secretary is Pontus Braunerhjelm.

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1. Introduction

How can cluster-based economic policy help Sweden to succeed in global competition? This is the central question this paper is trying to address. It draws widely on the literature and on-going research, but does not attempt to survey all the contributions in the field. The aim is to distill lessons that are relevant for policy makers.

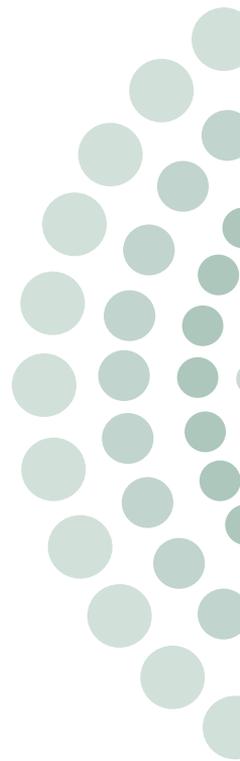
Clusters are in this report understood as regional agglomerations of companies, research institutions, government agencies, and others in a specific area of business activity related through various knowledge and economic linkages (Porter, 2008). This definition focuses on the role of geographic proximity and linkages across activities. Contrary to parts of the literature, it does not define clusters through a specific type of linkage or the presence of organized collaboration between co-located companies. Cluster-based economic policy, a term that is under significant debate and will thus be discussed in more detail in part two of this report, is then understood to cover all government measures leveraging the cluster concept to improve competitiveness.

Success in global competition is ultimately viewed as the ability of an economy to sustain a high and rising standard of living earned on global markets. A high standard of living can in an accounting sense be achieved through high labor productivity, high labor mobilization, or a combination of the two. In this report we are agnostic about the specific driver of high prosperity, we only set the end result as the benchmark for success. Other indicators such as export success are seen as an intermediate indicator often associated with higher prosperity, not as an ultimate objective of economic and more specifically cluster policy.

The paper approaches its central question through three different steps. First, what can be learnt from the academic research on clusters so far? The findings on how clusters impact economic performance, on how clusters develop, and on how their role is changing as globalization is affecting economic structures, provides the foundation for thinking about the role that cluster policy can play.

Second, what conclusions can be drawn from the debate about whether cluster policy is at all useful and how can it be structured accordingly to achieve the best possible impact? The positions on these questions remain hotly contested in the academic community as well as among policy makers. An increasing number of governments have over the last few years launched cluster programs but there is still little consensus on what cluster policy is, and even less on how the many practical implementation questions should be answered.

Third, what does this all mean for Sweden? There is a growing sense that for many policy challenges that individual countries face the power of generic recipes is limited and a more situation-specific analysis is needed to identify appropriate policies and instruments (Rodrik, 2007). For Sweden then, the paper analyzes what the current profile of clusters reveals about policy needs, whether cluster policy has an answer to any of the specific competitiveness challenges the country is facing, and how current Swedish cluster policy compares to what might be done. The section then concludes with a number of specific recommendations for policy.



2. Clusters as building blocks of a modern economy

2.1 Clusters and economic performance

Clusters are part of the economic reality, reflecting the balance of agglomeration and dispersion forces for specific economic activities. Marshall's (1890) original observation that firms can enjoy benefits from locating close to others engaged in related activities continues to hold true, in advanced as well as in developing countries. It is widely argued that the benefits have three main sources: First, there is the potential to attract more specialized suppliers and interact with them more efficiently (Amiti/Cameron, 2007). Second, there is a labor market that is deeper and provides more specialized skills. And third, there are knowledge spillovers through different channels that one can only tap into locally (Thompson, 2006). There is significant empirical evidence for each of these sources to matter (Ellison/Glaeser/Kerr, 2007) with their relative weights driven by cluster-specific factors. In biotechnology, for example, knowledge spillovers are found to be especially important (Aharonson et al., 2007) while in other areas the access to a specialized labor market is seen as crucial (Eriksson/Lindgren, 2008 for Swedish evidence). Differences also exist as to the level of proximity that is relevant and to the way different types of companies (size, foreign/domestic) react to cluster dynamics (Duranton/Overman, 2008).

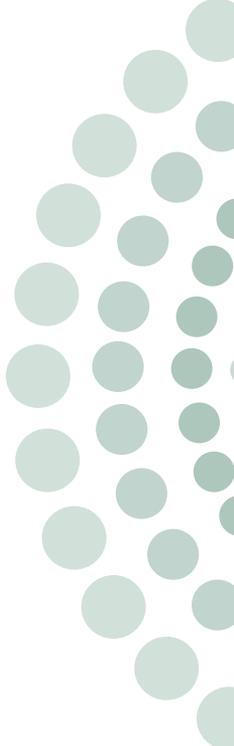
But there are countervailing effects that hold the unfettered push towards co-location in check. Companies are in business to serve customers and if the costs of serving customers from a distance are too high, it can be more beneficial to follow them instead of related companies in a cluster. And companies need to look at the cost side too: More companies close by leads to more competition for employees, dedicated infrastructure, and other input factors. Again, there is clear evidence that these factors matter as well, especially at the level of narrow industries (Braunerhjelm/Thulin, 2009; Delgado/Porter/Scott, 2008). The tendency of economic activities to co-locate depends on the specific balance between these opposing forces. On the level of national economies, between 30% and 40% of all employment tends to be in industries that co-locate across regions. The rest is largely in activities that serve local markets without any

effective competition from companies located elsewhere. A small share of employees is in activities that have to be where specific natural resource deposits can be found.

Sweden falls into this general pattern with 34% of employment accounted for by industries that strongly co-locate. In the European average the share of employees in the cluster sector, i.e. the part of the economy where the co-location effects are sufficiently strong to dominate locational decisions, is a few percentage points higher. This is largely driven by Germany, which has a large manufacturing sector where cluster effects tend to be strongest. The United States but also Norway and Denmark register a smaller 'cluster sector', which reflects their higher share of more locally oriented services.

Cluster strength is one of the important determinants of prosperity differences across geographies. While the size of the cluster sector is largely a reflection of broad trends in economic composition at the national level, the level of specialization within the cluster sector is an important driver of economic performance. This should come as no surprise: Being in an industry that is part of the cluster sector indicates that there are significant benefits from co-location. If a region has a lower level of specialization in an industry, productivity in this industry will be lower. If a region has much of its employment in the cluster sector spread out across many industries rather than being concentrated in a few industries where it can benefit from agglomeration, its overall level of productivity and ultimately its prosperity will suffer.

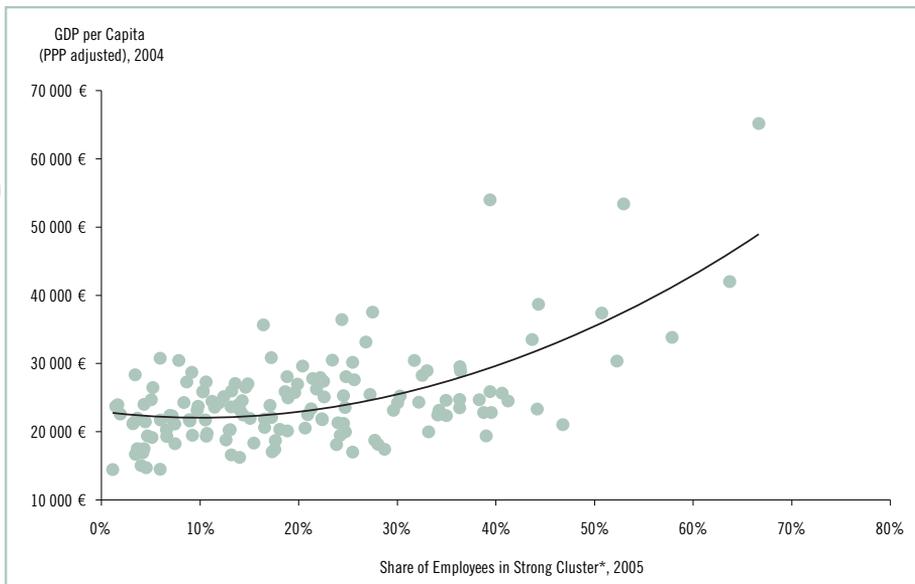
The evidence from quantitative studies across many countries and regions clearly bears out this positive relationship between employment in strong clusters and economic performance. Data from Europe and North America indicates that differences in the strength of cluster specialization explain on average around one third of the difference in GDP per capita levels across the two geographies (European Commission, 2007; Porter, 2003). The more detailed US data also shows that differences in specialization are associated with differences in relative wages across locations within each industry. This industry-level wage effect is on average twice as important as the composition of a regional economy across industries in explaining differences in average GDP per capita levels across US regions. US data also suggests that strong clusters receive more foreign direct investment (Bobonis/Shatz, 2007). While none of these studies prove causality, they are indicative of the close relationship between clusters and economic outcomes.



Specialization in clusters is clearly not the only driver of regional prosperity. In terms of locational factors, the pure size of economic activity is another candidate suggested in the literature. There are two varieties of this argument. One approach argues that cross-cluster spillovers are more important than within-cluster spillovers, so that absolute size instead of relative specialization matter most. Another approach goes further and argues that absolute size allows for heterogeneity, i.e. the absence of specialization, and that this heterogeneity is critical for 'creativity' (Florida, 2003; Jacobs, 1961). Both of these models suggest the emergence of a very unequal world, i.e. a few prosperous large regions (core) and many poor small regions (periphery). The cluster model instead is consistent with a world where all regions of similar fundamentals can reach similar levels of size and prosperity if they develop different specialization patterns.

In terms of other influences, the competitiveness framework points towards the more general economic fundamentals given in the quality of the business environment and the sophistication

Figure 2.1 Clusterportfolio Strength and Regional Prosperity
NUTS 2 Regions in European Countries



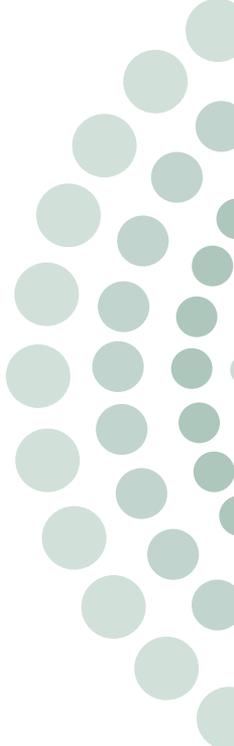
Note: Strong clusters defined by LQ>2: NUTS Regions in the EU-15 countries excluding Portugal and Greece.
Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070510.

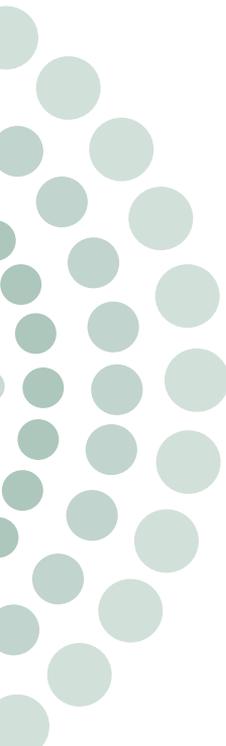
of companies (Porter, 1990). Clusters, this approach suggests, can amplify the strengths that the fundamentals provide but they are dependent on them and cannot substitute their weaknesses.

A number of empirical studies look at all three dimensions, i.e. cluster specialization, agglomeration/diversification, and the quality of the economic fundamentals (Lall/Mengistae, 2005; Brühlhart/Mathys, 2007; Carlino/Hunt, 2007; McDonland et al., 2007; Fritsch et al., 2008; DeGroot et al., 2008). There is no clear consensus across these studies but the overall evidence suggests that all three play an independent role. Looking at the two dimensions related to geography, there is some evidence that cross-cluster agglomeration remains the dominant force in developing economies, while it is losing power in advanced economies where cluster specialization has an increasing relative role (World Bank, 2009; Brühlhart, 2009; Krugman, 2008).

Sweden is a good example for the interplay of these three dimensions (Braunerhjelm/Borgman, 2004). Stockholm, the country's most prosperous region, leads the nation in a broad measure of cluster strengths that includes the relative specialization per cluster, the absolute employment size per cluster and the relative share of a cluster in the regional economy (European Cluster Observatory, 2008). But prosperity differences among the other Swedish regions are small, despite significant differences in cluster strength and overall size. Clearly other factors are important, too. The European data suggests the same: while cluster specialization explains a significant share of prosperity differences among the EU-15, a group of broadly similar competitiveness, it is much less powerful among the EU-25, where differences in competitiveness are much stronger.

Recent studies indicate that specialization and diversification are not necessarily in conflict: The advantage of large metropolitan areas seems to be that they can combine both, i.e. due to their size create sufficient critical mass in individual clusters while supporting an overall portfolio of clusters that provides a breadth of knowledge and capabilities. And the advantage of diversification seems to be strongest when it happens in 'related clusters', i.e. in activities that share common aspects of knowledge or capabilities. High specialization in a narrow industry supports high levels and growth of productivity. Employment growth, however, is likely to occur in related industries within the cluster, not in the already highly present industry itself (Delgado/Porter/Scott, 2008).





Clusters affect prosperity through their impact on productivity, innovation, and entrepreneurship. The positive impact of cluster strength on economic performance works through a number of distinct channels (Porter, 1998). This is important, because it suggests that locations facing challenges in these areas might be served particularly well by adopting a cluster perspective.

Companies within clusters achieve higher levels of productivity (Boasson/MacPherson, 2001). They can, because the presence of specialized suppliers and service providers reduces reaction times and the need to keep higher levels of working capital. They must, because the competition for inputs drives up costs and the competition on the end market enforces a constant focus on efficiency improvements and the adoption of best practices. The effect of higher competition is felt not only by companies but also by employees that are seen to work longer hours in strong clusters (Rosenthal/Strange, 2008).

Companies within clusters reach higher levels of innovation (Moreno et al., 2004). The cluster environment creates stronger pressure to innovate, a richer source of relevant ideas, and lower costs of turning ideas into new products and services. In a dynamic sense, this will also increase the incentives of companies to invest in innovative capacity, giving a further boost to innovation. Importantly, there is emerging evidence that the impact of clusters is particularly strong on the commercial use of knowledge, not just the creation of knowledge (Sölvell/Protsiv, 2008).

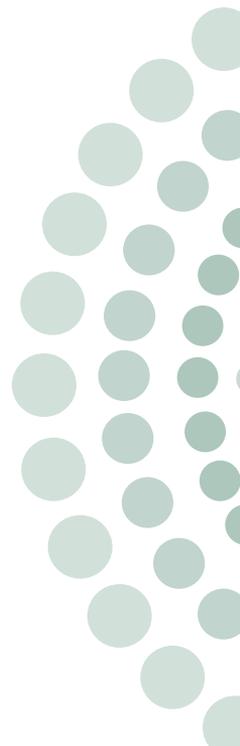
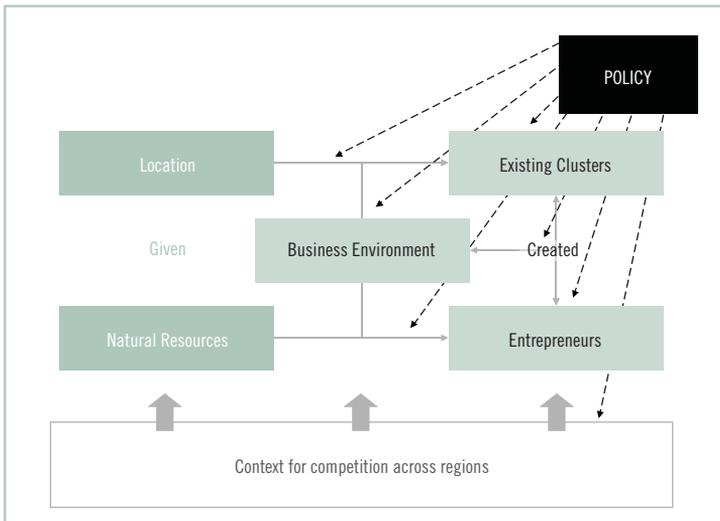
Clusters finally provide a beneficial environment for entrepreneurship. New companies are more reliant on external assets and capabilities than incumbents. This leads to higher levels of entry in cluster environments (Guiso/Schivardi, 2007; Freser et al.; 2008; Glaeser/Kerr, 2008). More importantly, new studies also indicate that survival rates (Wennberg/Lindqvist, 2008) and firm growth (Audretsch/Dohse, 2007) are higher in strong clusters as well. These findings suggest that cluster policies could be more effective than traditional entrepreneurship policies that have tended to create new companies but failed to trigger their growth into larger businesses.

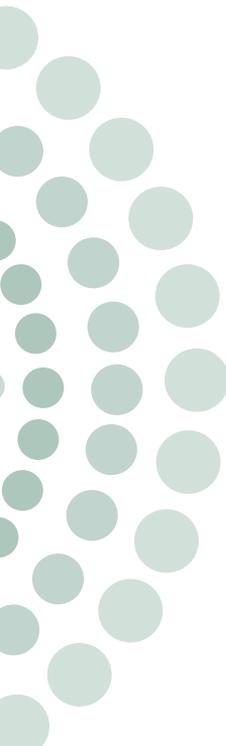
2.2 Cluster evolution

Strong clusters develop over often long periods of time; these evolutionary processes take many forms and are far from automatic. The evidence of a positive relationship between strong clusters and strong economic performance is of little policy relevance, if we do not understand and ultimately have the ability to influence the dynamics that lead to the emergence of strong clusters. The limitations of a cluster policy that argues for a narrow “strengthening the existing strengths”, i.e. working only with clusters that are already strong, is particularly clear for less advanced economies that need to create new capabilities (Ketels/Memedovic, 2008). But it is also problematic in advanced economies like Sweden where structural change within and across clusters is of strong importance as well.

The knowledge about the processes that lead to the emergence of strong clusters is still largely case-based. Clusters develop when economic transactions across locations are feasible *and* there are specific factors in a location that provide a nucleus for cluster dynamics to emerge. The first element is often neglected in policy discussions but crucial for cluster dynamics to become more relevant

Figure 2.2 Emergence of Clusters





(Forslid, 2008). It is clear, however, that, the historically integrated US market as well as the more recent (and less deep) integration of European markets have a profound impact on the different patterns of cluster emergence and overall economic geography in these two large regions. Where trade across locations is inhibited, the productivity benefits of clusters are irrelevant and the seeds of cluster evolution have no opportunity to come to fruition.

For the second element a number of different types of nuclei have been found to play a role. Endowments of natural resources or the geographic location close to trading routes often played an important role. Specific elements of the business environment, for example the presence of a strong university, are another trigger for the development of a cluster. The existence of unique local demand conditions, for example environmental regulations that support the use of renewable energy, is another variation of this theme. And then there can be individual companies, be it entrepreneurial start-ups or investments from elsewhere (Manning, 2008), that succeed in the market and over time become the anchor of spin-offs and other companies that turn into a cluster. Quite often, new clusters are also rooted into older clusters that have lost a market but found a new way to leverage their capabilities. Clusters can increase companies' ability to transfer capabilities to new markets, even if the traditional anchor company that initially gave rise to the cluster has vanished (Treado/Giarratani, 2008). In reality, all these different factors often interplay and change in importance over time as clusters evolve.

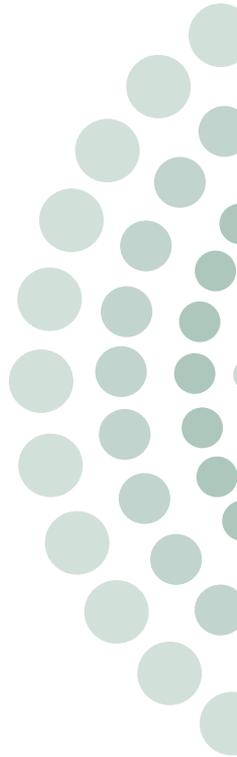
The case evidence also emphasizes the role of entrepreneurs in translating the opportunities from effective cross-regional competition and conducive business environments into actual cluster emergence (Braunerhjelm/Feldmann, 2006). This is particular true for the development of collaboration within a cluster that moves beyond the automatic benefits of pure co-location. A growing literature looks at the life cycle of clusters (Bergmann, 2006). Clusters often seem to follow an s-shaped development path. After an (often long) phase of slow gestation a cluster reaches a size where cluster effects set in and growth accelerates. This growth then becomes self-reinforcing; cluster effects reach their full scale and growth explodes. Eventually, growth moderates as the cluster reaches its market potential and congestion effects become more relevant. Some clusters then manage to reinvent themselves, finding a new market or technology to ignite a next phase of cluster dynamisms. Others, however, get locked into existing technology and eventually

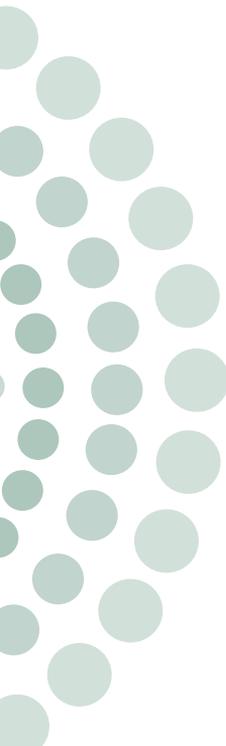
shrink, as their markets disappear or other locations develop more dynamism. This thinking finds its reflection in the work on regional economies (Audretsch et al., 2008). One hypothesis is that the rise and fall of regions basically follows the rise and fall of key clusters. Another hypothesis is that regions are of different types, and clusters 'move' across these types as they pass through their life cycle (Duranton/Puga, 2001).

The limitation of many of these studies is that they work well backwards, i.e. track the path of successful regions, but have only limited predictive power, i.e. are able to identify clusters that eventually blossom early in their life cycle. Many case studies suggest that the process of cluster development is complex and fragile (Feldman/Francis, 2004); the life cycle hypothesis is a helpful analytical tool but describes only a moderate part of the mix of self-organizing and externally induced processes that are under way when clusters form (Sölvell, 2008).

The likelihood of cluster emergence is significantly affected by government policies and the presence of existing economic capabilities. The discussion so far has not touched the role of government, and for good reasons: There is very little evidence that governments can create clusters and ample examples of where they failed in such efforts (Porter, 2008). But it is quite clear that government is an important factor in the different types of cluster evolution processes described above (Sölvell, 2008; Meier zu Köcker, 2008). Government policies are important for how the potential benefits of geographic location of natural resources can be exploited. They influence many aspects of the business environment, from decisions about the university system to infrastructure to consumer and environmental regulation. They can make market entry more or less attractive for entrepreneurs. And they can play a role in the diversification towards new clusters through targeted FDI attraction and facilitating collaboration in existing clusters.

Where efforts aim to facilitate the evolution of new clusters, they need to identify which new clusters have a reasonable probability of developing. Two new approaches have recently been suggested to support this selection, both based on identifying areas that are related to current strengths. These current strengths are seen partly as a source of existing company capabilities that can also be used in the new field, and partly as an indication of existing business environment strengths that are also relevant there. One approach looks at the types of products and services that countries at a given





level of economic development tend to export (Hausmann/Klinger, 2007). As countries develop, it turns out that they move sequentially into new exports of related goods and services, rather than 'jumping' into very distant areas of the product space. Another approach looks at the linkages between and within clusters revealed in employment, and takes that as a starting point to analyze the potential to develop an existing portfolio of exports (Porter/Ketels, 2007). Growth can be generated from increasing the value per unit of exports in existing clusters, growing exports in so far weaker industries within strong export clusters, developing related clusters, and turning exports positions in narrow niche industries into broader cluster strengths.

2.3 Clusters in the global economy

A company's locational footprint is becoming more important for economic success in the global economy, not less. Initially, technological and economic changes due to globalization were expected to reduce the importance of local economic factors and therefore also the role of clusters (Cairncross, 1997). In fact, the dynamics turned out to be exactly the opposite and economic geography is now recognized as a critical factor to understand differences in economic growth and prosperity across countries and regions (World Bank, 2009). Traditional access-to-market advantages that provided benefits to large economies have been reduced, giving more room for cluster dynamics to be decisive (Forslid, 2008).

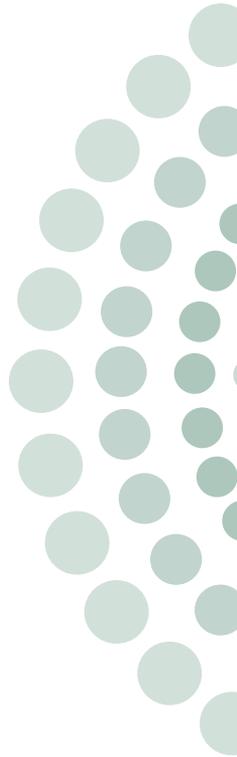
From a company perspective, lower trade costs, changes in technology, and changes in economic policy in many countries and in the framework for global trade have made competition more intense and more international. The higher intensity of competition has forced companies to focus even more on productivity, especially innovation and knowledge. Companies need to leverage the new opportunities of the global economy to become more efficient and more innovative to sustain their market position (Berger, 2005). The efficiency drive has resulted in outsourcing and core competence-thinking, increasing the need to find external partners for activities no longer provided internally. At least for some of these partners it has turned out that having them close-by is a significant advantage. The innovation drive has resulted in companies looking for more external

partners as sources of ideas, especially in sectors like pharmaceuticals where the productivity of increased R&D spending has come under intense scrutiny. Again at least some of these partnerships turn out to be most effective if they are based on geographic proximity. A stronger relevance of clusters is fully consistent with companies' growing interest in local outsourcing and open innovation.

Competition has also become more international, with relevant competitors coming from a growing number of locations and countries. And it is not only a change in numbers; the heterogeneity of the locations they come from has increased as well. Companies then compete not only with the internal capabilities of these rivals, but also with the respective business environment strengths and weaknesses that they can tap into, including the presence of local clusters (Marsh, 2008). Making sure that specific activities are placed in locations that are consistent with a company's overall market positioning has become a strategic challenge, not just an important but ultimately operational question.

The global landscape of clusters is fundamentally changing, with both the geographic locations and activity profiles of clusters adjusting to globalization. Globalization has meant different things for different clusters. While on average there has been a tendency for clusters to become more important in their impact on economic performance, individual clusters experienced everything from explosive growth to fast decline (Rabelotti, 2001). Incumbent clusters with strong inherent position grew as they could serve a larger market. Incumbent clusters that were the result of remaining trade barriers and had only a relative advantage in serving a limited geographic market, however, came under increasing pressure. And new clusters could grow where rising competitiveness and advantageous cost positions provide a platform to serve new markets. Quite tellingly, the outsourcing of economic activities to emerging economies has again taken place in clusters (Enright et al., 2005).

Globalization also has an impact on how individual clusters are structured. While large scale quantitative data is still missing, the emerging view sees clusters becoming more specialized on specific groups of activities within a larger value chain. This has also increased the level of linkages between clusters that provide complimentary services along such chains. At the bottom of this process are the growing opportunities to distribute activities not linked through local externalities across locations that individually provide the most attractive conditions (Baldwin, 2006). Clusters are



less self-contained units that compete with other clusters of similar scope. They become like pearls on a necklace (or global value chain) of competing and collaborating clusters, each looking to establish competitive advantages in a unique market or activity segment.

2.4 Implications

This discussion of current findings on clusters as a feature of modern economies, their evolution over time, and their reaction to globalization leads to an initial set of implications for the role cluster policy can play in strengthening a country's competitiveness.

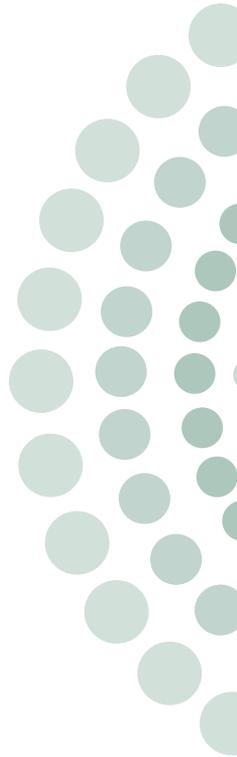
- Clusters are part of the reality of all economies and have a meaningful impact on economic outcomes. This makes them a candidate for policy but gives only limited guidance for how such policies should be structured (Venables, 2008).
- A cluster approach needs to be integrated into a broader competitiveness agenda, using it most in areas like entrepreneurship and innovation, where cluster dynamics play a strong role. Many other elements matter for economic performance and asking cluster policy to achieve too much is the best way to get disappointed.
- Cluster evolution has to be seen as a dynamic process where government policy is one of the factors that influence the general direction of change. Cluster policy thus should be more concerned with how the evolutionary process of cluster development can be changed from the current status-quo in a given location than with defining the 'end point' of such a process.
- Globalization provides many opportunities for cluster development, but also challenges. Cluster policy can support clusters succeeding in this changing environment through a focus on combining local buzz, i.e. unique strengths in specific interrelated activities, with global pipelines, i.e. established linkages with strong partner clusters in global value chains (Bathelt/Malmberg/Maskell, 2002; Pietrobelli/Rabelotti, 2006).

3. Cluster policy

Establishing the presence and importance of clusters is not sufficient to proof that cluster policies can and should be pursued. Cluster research over the last twenty years has to a large degree focused on establishing their role for the market success of companies and the performance of regions. Not surprisingly, the evidence that clusters are important for economic success has attracted the interest of policy makers. But while there is an emerging consensus on the usefulness of clusters as an analytical tool (if not on their relative importance as a driver of economic outcomes compared to other factors), at least the academic discussion on cluster policy remains far from reaching an agreement.

Practitioners, meanwhile, have over the last few years launched an impressive number of cluster policy programs. This revival, after a first wave of interest in the wake of Porter's "Competitive Advantage of Nations" had lost steam (See Aranguren et al., 2006 on the experience of the Basque country, one of the earliest adopters of cluster policy), was driven largely by a growing frustration of policy makers with traditional approaches at a time when pressure to increase competitiveness was growing (Davies, 2007). The new policies and programs could draw on the learnings from earlier efforts. But they could still not build on a consensus model of cluster policy that would have converted the skeptics. A significant wave of policy action without a widely accepted conceptual basis on how the cluster framework should be turned into specific policy programs and instruments is clearly problematic. At best, there is a danger that policies are less effective than they could be. At worst, they can become a significant disappointment that even creates economic distortions.

The remainder of this chapter aims to develop key elements of a conceptual foundation for cluster policy to mitigate these problems. Because of the significant disagreements about cluster policy, there is no general definition of cluster policy that could serve as the starting point of this discussion. For this analysis, we understand cluster policy to include *all efforts by governments, alone or in a collaborative*



effort with companies, universities, and others, that are directed at clusters to develop their competitiveness. This excludes efforts by other entities acting alone, for example pure private cluster initiatives and government policies that either are either not directed at clusters (but might affect them) or do not focus on raising the cluster's competitiveness (but might use them to create institutions that benefit the region in general). Cluster-based economic policy is used in a slightly wider sense, including also cross-cluster policies affecting the fundamental conditions for cluster emergence and the use of cluster structures as process tools to improve cross-cluster competitiveness.

Figure 3.1 Cluster-based Economic Policy

		Aims to improve cluster competitiveness	
		YES	NO
Targets policies at clusters	YES	Cluster Policies	Policies to strengthen cross-cluster competitiveness through cluster-based efforts
	NO	Policies to remove general barriers for cluster emergence	

3.1 The basic motivation for cluster policy

Cluster policy is motivated by traditional economic arguments on dealing with market failures. Economists consider policy interventions as justified when specific conditions exist that reduce the ability of the normal market process to lead to optimal outcomes from an overall welfare perspective. Such 'market failures' provide the traditional motivation for economic policy. The local externalities that give rise to clusters create a number of such market failures:

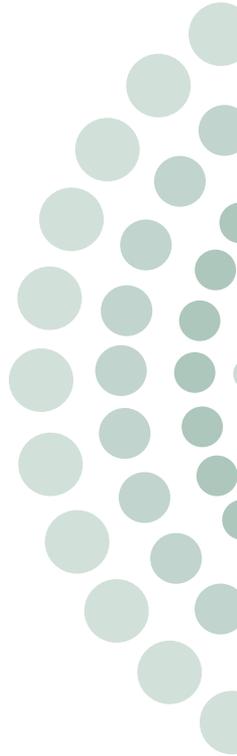
Coordination failures exist, because individual companies consider in their decisions, be it whether to locate in a cluster or what investments to undertake being there, only the impact on themselves, not on others.

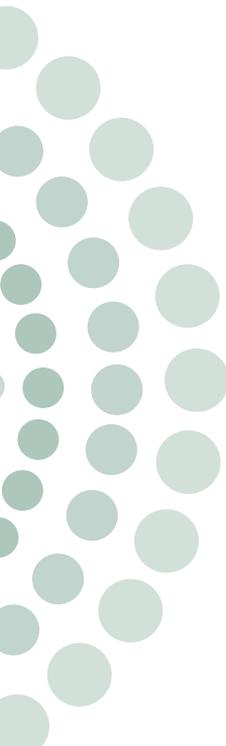
Information asymmetries exist, because even if the incentive problems of taking account of the impact of own actions on others could be managed, the knowledge necessary to make the right 'social' decision is dispersed among the many participants of the cluster.

Path dependency exists, because decisions not only influence the present, but also the possible evolutionary path of the cluster in the future. Both coordination failures and information asymmetries thus have a dynamic dimension as well. And social and private discount rates might differ, creating an additional source of market failure.

Where cluster policy addresses market failures, it does not reduce global welfare. Under some assumptions, the free competition between rational governments in supporting clusters even leads to the best possible outcome, not a race to the bottom (Norman/Venables, 2004). While these arguments do not prescribe specific policy interventions, they give some guidance on the direction that cluster policy should take. The best approach is always to target the market failure at the source. Policy can subsidize activities that are underprovided because of coordination failures or differences in discount factors. And policy can facilitate platforms for collective action to overcome coordination failures and informational asymmetries.

Cluster policy can provide a superior balance between impact and distortion, but this outcome depends on the specific nature of the instruments used. In practice, efforts to address market failure are never perfect. They suffer from government failure in implementation (lack of knowledge to target the intervention,





inability to provide incentive-neutral financing, political pressure by interest groups for beneficial treatment, etc.) and might have unintended side-effects, creating collateral costs that outweigh the benefits. Economic policies can be compared on both the impact that they generate, i.e. addressing the problem or market failure, and the costs they might impact, i.e. distortions or government failure. Policies that target individual companies are highly effective but also very distortionary. Policies that target the entire economy have little if any distortionary effect but are often also not very effective. Policies targeted at individual industries come somewhere in the middle on both accounts.

Cluster policy, however, offers a superior mix of benefits and costs. It is organized around a group of industries that by definition have strong linkages. Targeting policy at them will thus not only be effective but even trigger additional benefits from positive spillovers that are induced. And while the policy is neutral within the cluster where competition for factors of production is the strongest, it is distortionary only relative to activities outside the cluster where by definition other skills and assets are needed. Some distortion remains, of course, but overall this approach provides a potentially better balance of effects. Whether this potential is being realized, depends on the specifics of how the cluster policy is being organized; section 3.3 below will get back to this question.

3.2 Two opposing approaches to cluster policy

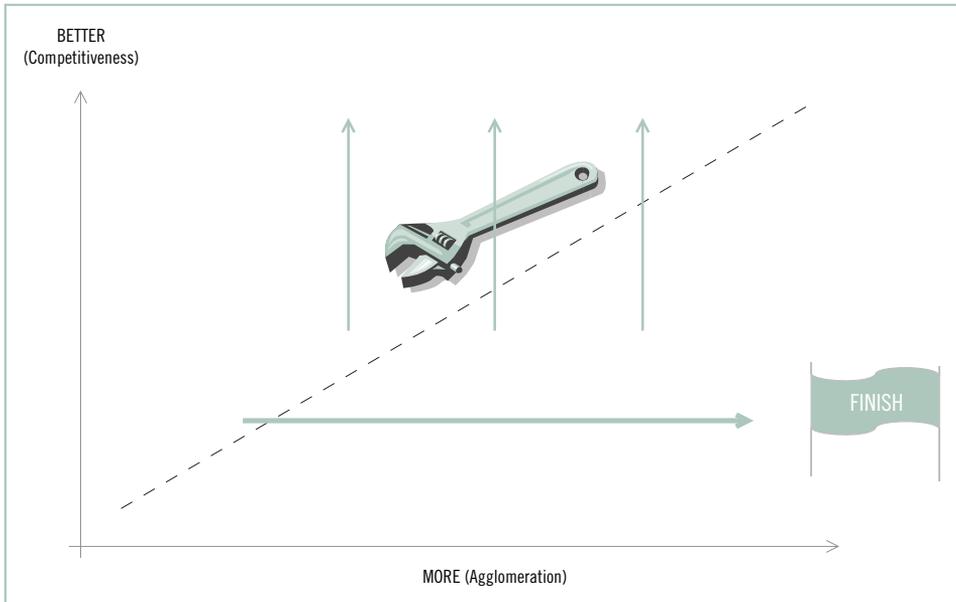
There are two fundamentally different ways to look at cluster policy, that lead to radically different views on whether cluster policy is desirable and how cluster policy should be structured. In the academic debate, the strongest criticism of cluster policy does not come from researchers that claim that locational factors are irrelevant, but from economic geographers and others that fully support the view that locational factors are important. Some criticize the way the cluster framework is translated from an academic idea into a practical policy concept (Martin/Sunley, 2003) but often fail to understand how this is a reaction to the needs of policy practitioners. Others provide a more fundamental criticism of the motivation for cluster policy (Duranton, 2008) that turns out to be highly revealing for how the

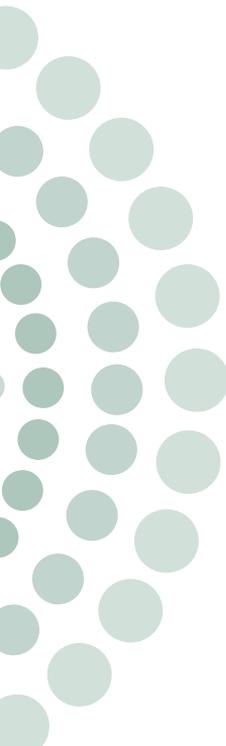
lack of a generally accepted definition of cluster policy continues to hamper the debate.

To understand the different views on cluster policy, it is useful to go back to a simple diagram that relates agglomeration to competitiveness. The evidence discussed in chapter 2 points towards a positive relationship between the two, a fact that is generally accepted by critics as well as supporters of cluster policy (as discussed previously there are differences in the view on how strong this relationship is relative to other factors). But how should cluster policy intervene to move a location from a place at the bottom left to the top right? This is where the fundamental difference sets in:

- One approach sees agglomeration as the central policy lever; as agglomeration rises, competitiveness will naturally follow as cluster effects set in. With agglomeration the ultimate goal, efforts to attract companies through incentives – from tax rebates to free infrastructure – naturally come to the forefront of the policy debate.

Figure 3.2 Two Perspectives on Cluster Development





Dynamic ‘new economic geography’ models provide guidance on when and how these instruments should be used (Brenner, 2008, 2003): the process of agglomeration in these models is characterized by important break-points at which economic geography patterns are determined. For economic policy, this implies that intervention has to be early, i.e. at a time when the locational patterns of where a dominant cluster will be located has not been determined yet. And it has to be massive, i.e. it has to give such a meaningful boost that the location gains sufficient critical mass to be far ahead of all potential rivals. And it implies a critical role for identifying a small number of clusters on which economic development then hinges.

If large-scale targeted subsidies in the early phase of cluster emergence are the policies under discussion, should they be used? Not only critics of cluster policy come to a negative answer: such policies are likely to fail because they require an abundance of information and ability in the hands of the policy maker. And they are not even necessary: current economic geography is already in line with the fundamentals including local externalities, so any policies to change the location of companies would lead away from an existing optimum (Martin/Mayer/Mayneris, 2008).

- Another approach sees competitiveness as the central policy lever; as competitiveness rises, agglomeration will naturally increase as the cluster becomes more attractive for new entrants (Roriguez-Clare, 2005a). With competitiveness the ultimate goal, clusters become a process tool to design and implement policies more effectively, not an ultimate objective. The instruments then targeted at existing clusters are well known from innovation policy, regional policy, and enterprise policy. They are supplemented by actions that specifically support collaboration in their use and that create platforms for collaboration within an agglomeration.

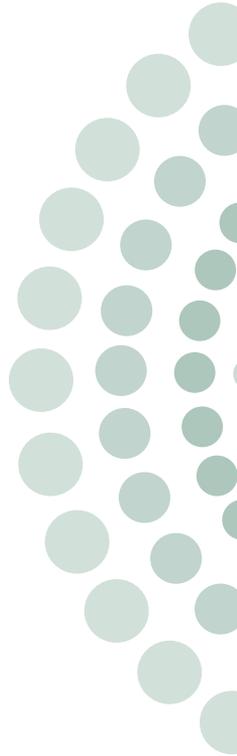
The competitiveness literature, including the insights on cluster evolution provide guidance on when and how to use these instruments that is radically different from the model cluster policy critics have in mind: The focus should be largely on agglomerations that have already passed the test of the early stages of development (Roriguez-Clare,2005b). This indicates that the fundamental conditions for economic success are in place and active collaboration can become a ‘turbo’ for the use of strengths already in place. The focus of policy interventions should be on

enabling collaboration and channeling existing resources in a different way, using moderate amounts of new funding. Large new funds are not necessary and could be harmful by increasing the potential for distorting incentives. And while a selection of clusters is necessary to be able to deploy sufficient resources and attention on any one initiative, economic development is the result of many clusters in all regions flourishing, not just a few per country.

If these are the policies under discussion, should they be used? Even the critics of cluster policy have a slightly favorable view: Improvements in the fundamentals of competitiveness are a sensible goal and the suggested approach limits the downside. But they remain skeptical about whether cluster efforts can have a sufficiently strong impact on improving underlying competitiveness. The quantitative evidence is still young but points to moderate positive effects (Engel/Henrik, 2004; Dohse, 2007; Christensen et al., 2007; Dohse/Stähler, 2008; Falk et al., 2008; Fromholt-Eisebith/Eisebith, 2008). Proponents of cluster policy see enough case-evidence that such efforts can in fact lead to a much more meaningful improvement in the way policies for higher competitiveness are being conducted (Waits, 2000; Cortright, 2006).

There remains a fair amount of disagreement in the debate about cluster policies. At least part of this disagreement is related to a lack of effective communication between theoretical research and policy practice. This communication failure leads to a fundamental disconnect on what cluster policy is and how it is related to competitiveness upgrading. For many researchers, improving competitiveness is fundamentally an automatic process, driven by the self-interest of all parties involved. For most practitioners, improving competitiveness is a complex challenge of identifying action priorities and mobilizing allies to implement them. Cluster policy, as understood by its proponents, is an answer to these real challenges that practitioners face, challenges that the critics assume will be taken care of automatically over time.

But there are also other concerns about cluster policy, unrelated to the disconnect on the definition of cluster policy. These concerns are related to the political economy dynamics that cluster policies are exposed to: Cluster policy can become a politically convenient cover for what then in reality is nothing else but traditional





distortive industrial policy. The political economy argument that some critics then make is the following: Even if cluster policy has its merits if applied as described in, for example, this report, it opens the political process for all kinds of sector-specific interventions. On balance, they argue, it is then better to forgo a useful instrument like cluster policy if it leads to opening the Pandora box of 'vertical' policies. This is an important consideration. But it has to be balanced against another political economy dynamic: Many governments are under intense political pressure to 'do more' rather than upgrading the general business environment. In such situations, the alternative to cluster policies is often not the absence of targeted policy action, but the use of exactly the type of old style industrial policy tools that should be avoided. And the risks of cluster policies being abused can be addressed by a focus on the specific tools used as well as ultimately the political institutions that deploy them.

3.3 Implementing cluster policy to improve competitiveness

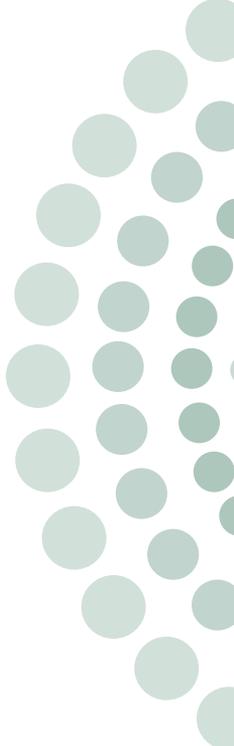
Cluster policy is a mix of activities that support platforms to plan and implement joint action with activities that support such joint actions directly. If cluster policy is about using clusters as a process tool to improve competitiveness more effectively, what are its central elements? First, government can support the creation of platforms for joint action to overcome coordination problems and tackle externalities. In a static perspective, such platforms allow cluster participants to better exploit potential linkages among existing capabilities, increasing the level of positive externalities in the cluster. In a dynamic perspective, they allow cluster participants to make better decisions about investing into new capabilities, taking into account the externalities of such actions across the cluster. Cluster initiatives (Sölvell/Lindqvist/Ketels, 2003) are among the most prominent forms of such platforms. They are part of a wider class of institutions for collaboration (IfCs) that also pursue competitiveness upgrading as their goal but can have a wider geographic and economic scope. Cluster initiatives can emerge without government intervention, but especially in Europe it is

quite common for government to play an important role at least in the initial stages of the effort. The evidence suggests that successful cluster initiatives become more and more private sector dominated over time.

Second, government can target specific policies, for example innovation support or FDI attraction, at regional clusters, whether or not an organized platform for collaboration exists. Such policies can overcome the collective action and informational problems by providing planning security and complimentary investments for private companies in the cluster. In the absence of a platform for collaboration, however, such targeting is made without the necessary knowledge to ensure that the government policies target the most relevant competitiveness barriers. More effective is therefore an approach where functional programs are made available for cluster initiatives that have decided that a specific program meets their unique needs.

Actual cluster policies tend to combine both elements, but differ in the relative weights. Most policies provide funding for a set of specific activities, but require the existence of an institutional platform that can administer them. The Swedish Vinnväxt program, the German Spitzenclusterwettbewerb, and the French Pole de Competitivite program support both, i.e. initiating cluster platforms and providing funds for a wide range of activities broadly related to improving innovative capacity under that roof. The US WIRED program is more narrowly focused on workforce development but has led to the creation of cluster platforms in response. The Austrian cluster initiatives received funding for establishing the institutional framework which then had to attract additional public or private funds for specific activities. The cluster focus of investment attraction agencies like ISA focuses on the specific action with a cluster initiative either as a potential partner or ultimate outcome of the efforts.

The design of cluster policy programs and their integration in a broader economic policy agenda are crucial for the impact cluster policy can achieve. Cluster policy provides a summary expression for a category of specific policies, just like innovation policy or monetary policy. It says nothing about the quality of efforts conducted under this heading. While there is little systematic evidence, the experience from many practitioners and individual cases indicates a number of key actions government can take to assure the impact of their cluster policies (High Level Group on Clusters, 2008).



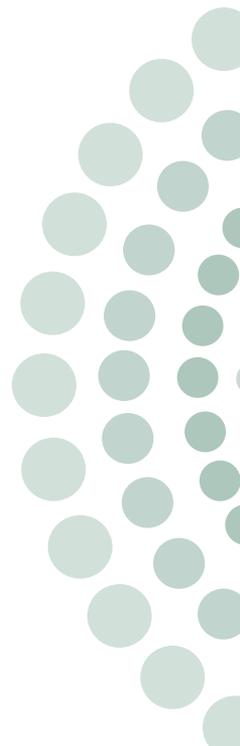
A first group of factors concerns the context and internal design of cluster programs. Many recent programs in Europe have implemented at least a good share of these ideas:

- Cluster programs work much better, if they are launched in a *context* that is conducive for the emergence of clusters and limits the likelihood of collateral costs: Openness for trade and investment is crucial for cluster effects to become relevant. Strong general business environments create the conditions in which companies are able to compete at a level of sophistication where they can take maximum benefits from clusters. Regional policies that support specialization and encourage regions to develop their own economic strategies are more helpful to cluster development than policies that eliminate differences and target only underperforming locations. Strong institutions and solid levels of trust enable collaboration within a cluster to function. And high exposure to external competition and robust competition policies limit the danger that collaboration leads to lower rather than more sophisticated rivalry.
- Cluster programs are more effective if their *formal structure* provides incentives that foster cluster dynamics: Competition models with the involvement of external jurors can de-politicize the selection process and induce a clear orientation to excellence. Process support in the application phase can lead to better applications and create collaboration platforms even in clusters that ultimately do not receive funding. Incentives for the involvement of additional new partners during the funding period can help to reduce the risk of creating closed-shops. Long-term funding with clear milestones set in negotiations at the beginning of the project provides the planning stability needed for cluster processes that inevitably take time. And the threat of losing funding in case cluster dynamics remain low avoids subsidizing many weak clusters rather than allowing stronger clusters to gain position.
- Cluster programs achieve better impact, if they define appropriate *roles* for different groups of participants, especially government. While there is no systematic evidence that a government role per se is negative, government cannot create clusters (Porter, 2008). And its involvement can be harmful if it restricts the participation

in cluster initiatives (for example by excluding large or foreign-owned companies that 'don't need the taxpayers' money') or imposes specific action priorities (for example by forcing the same focus on business-academia collaboration on every cluster). Government should, however, do more than just provide financing and become a true participant in cluster efforts. This is already often the case for local and regional governments but much less so when national governments are involved. Academia, too, plays an important role as part of the cluster but also as a potential initiator of collective action. Companies, finally, are the crucial core of the effort and need to set the overall action agenda for cluster initiatives to be effective.

A second group of factors concerns the integration of individual cluster programs into a wider economic policy approach (Pietrobelli/Rabelotti, 2004). Current cluster programs, including the best ones around, tend to be relatively weak in this regard. This is an issue, because even the most successful efforts affecting an individual cluster will have a limited impact on the overall economic health of a location. To justify politically as well as economically a more general use of cluster thinking in economic policy, the impact has to be higher.

- Locations should take a *portfolio perspective* on their cluster efforts, not pursue individual cluster efforts in isolation. In currently dominating clusters the economic impact from cluster efforts is likely to be highest. There needs to be a different approach that creates the opportunity for emerging clusters, drawing on existing strengths but accepting the potential for failure in some of them. And there is also a need for a more broad-based, i.e. not cluster-specific, policy to increase the likelihood of entrepreneurs starting businesses that eventually develop in clusters in new fields.
- Locations should leverage the experience of the cluster efforts for *economy-wide improvements*. At least part of the business environment weaknesses that create problems for specific clusters usually also affect companies more generally. Learning from the discussions in cluster efforts and making the improvements implemented for the cluster applicable more broadly will lead to broader economic impact. The institutional capital and trust



between public and private partners in cluster is another asset that can be leveraged more broadly. In many cases cluster efforts have become the central pillars in regional competitiveness efforts with a broader agenda.

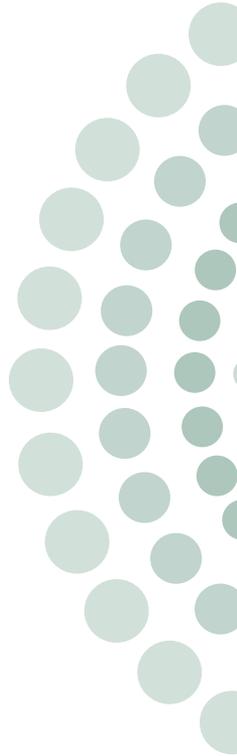
- Locations should integrate their cluster efforts into a *broader economic strategy* that identifies the specific value that it provides. Clusters often symbolize the unique advantages a location can offer. And they are in this way often an effective tool to market a location, much better able to communicate a specific positioning than general attributes like “open for business” or “entrepreneurial”.

3.4 Implications

The discussion of the fundamental motivation for cluster policy, the opposing ways in which cluster policy is being understood by critics and proponents, and the specific dimensions of effective cluster programs leads to an additional set of implications for the role cluster policy can play in strengthening a country's competitiveness:

- Traditional economic models provide a solid motivation for public policy action. Cluster policy meets the general welfare arguments for government intervention and is not based on a different set of economic assumptions.
- Clusters are a process tool to improve competitiveness; agglomeration is not a goal per se but a starting point for more effective policy action. Proponents and critics disagree mostly in which of approaches they understand to be cluster policy, not so much in how they assess them individually.
- The details of how cluster programs are deployed, structured, extended to mobilize groups of clusters, and leveraged to impact a location's wider economy are crucial. The most critical questions raised about cluster policy concern the scope of impact it can reach, not whether or not it is creating distortions.

- Cluster policy is a tool that inherently faces the danger of being abused as a shield for distortive industrial policy. To overcome this challenge, it requires strong governance and ultimately strong institutions, including a commitment to competition.
- Cluster policy is not about identifying a small number of clusters that will drive economic growth in the future; only the market process can make such a selection. Instead, cluster policy mobilizes competitiveness upgrading in many clusters and enables effective competition between them.



4. Cluster policy as a tool for improving Swedish competitiveness

Cluster policy is most relevant for Sweden, where it can address specific competitiveness challenges the country is facing. Whether or not cluster policy is an appropriate tool for Sweden depends not only on the general pros' and cons' of such type of policy. It is as much a question of the specific features of the Swedish economy and the competitiveness challenges it faces. This argument ties into a more general observation that for microeconomic competitiveness the challenge is much more the identification of country-specific action priorities while for macroeconomic competitiveness it is largely about the implementation of best practices that apply quite generally across countries (Rodrik, 2007; Porter et al., 2008).

This chapter looks first at the economic geography of Sweden from a cluster perspective. It then summarizes general findings on Swedish strengths and weaknesses in competitiveness. Finally, it provides a perspective on current Swedish cluster policies. Each section is followed by a discussion of the key implications for the use of cluster policy. A final section then brings together a number of key emerging policy priorities for Sweden.

4.1 The Swedish economy from a cluster perspective

The Swedish economy is dominated by a few moderately sized regions with density levels slightly below the European average. Geographic factors and the density of economic activity in particular provide an important context for the development of clusters. Sweden stretches across a geographic area that is large relative to its population of slightly more than 9m inhabitants. Most of the population and economic activity is, however, concentrated in the southern third of the country.

For the comparison with other European regions (EU members plus Iceland, Norway, Switzerland, and Turkey), data is available on the level of NUTS-2 regions, of which Sweden registers 8 out of a European total of 258. The comparison reveals that Sweden is dominated by four moderately sized regions that account for close to 75% of the country's labor force. The median and average size of Swedish regions is between 20% and 30% below the European average. This is largely the result of the absence of really large regions rather than a dominance of very small ones.

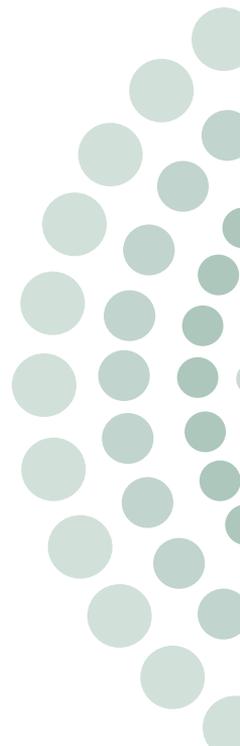
The Swedish cluster sector has traditional strengths in a few groups of related cluster categories but has fewer emerging clusters with the potential to take a leading position in the future. Transportation, Construction, and Metal Manufacturing are the three largest cluster groups in the Swedish economy in terms of total employment. All three are also large across Europe overall and Sweden's employment numbers are broadly in line with country's overall size. Information Technology, Forest Products, and Communication Products are cluster categories in which Sweden has between 66% and 105% more employees than expected given its size. The areas of Swedish strength are linked to each other in two or three main groups of related cluster categories (see appendix). This is in line with the experience of many other countries and regions, that have seen cluster develop naturally in related areas rather than randomly across the economy.

Overall, 65% of Swedish cluster sector employment is in regional clusters that are specialized (defined by a location quotient large than 1, i.e. a region has more employees in a cluster than expected given the region's overall employment size) relative to the European

Figure 4.1 Number of NUTS-2 Regions by Employment

Total cluster sector employment	EU-25	Sweden
2m+	9	0
1-2m	44	0
500K-1m	98	4
250K-500K	68	2
100K-250K	32	2
<100K	7	0
TOTAL	258	8

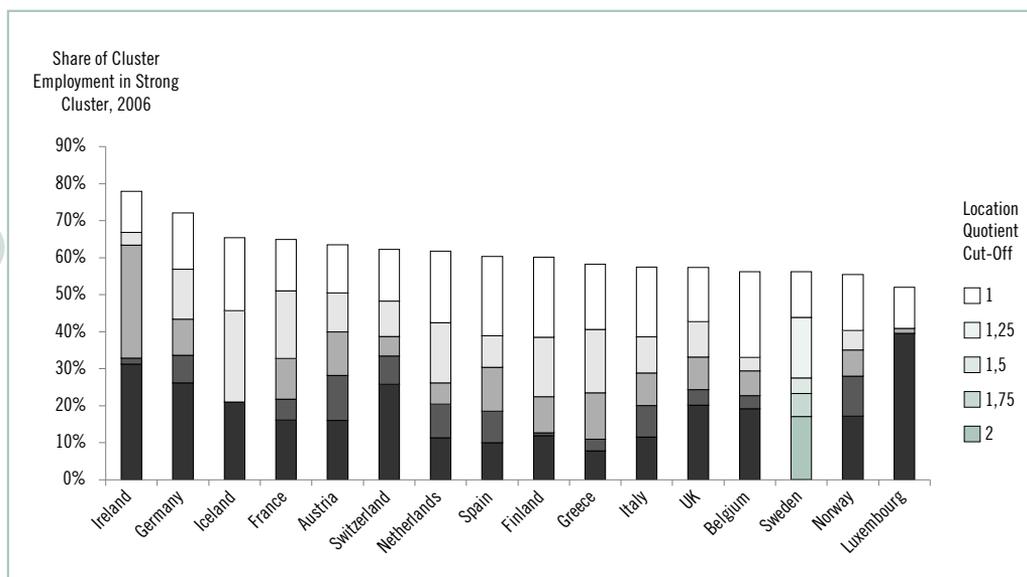
Source: European Cluster Observatory, 2008.



average. This is a low rate; among the EU-15 and EFTA countries only Norway and Luxembourg report a lower share. Looking only at employment in highly specialized clusters with a location quotient above 2 (i.e. a region has more than twice as many employees in a cluster than expected given the region's overall employment size), the picture is less dramatic. Here Sweden ranks close to the middle, leaving all the Southern European countries but also Austria, Finland, and the Netherlands behind. Sweden has a good position in highly concentrated clusters but is much weaker in the second tier where clusters have reached significant position but not full leadership yet.

The cluster sector itself is heterogeneous with significant difference in dynamics and wage levels. Over the last few years, Sweden's cluster mix has become slightly more specialized relative to the European average. But the average masks a high degree of diversity at the level of individual cluster categories. Among areas of traditional Swedish strengths, Pharmaceuticals, Business Services, Metal Manufacturing,

Figure 4.2 Strength of the National Cluster Portfolios

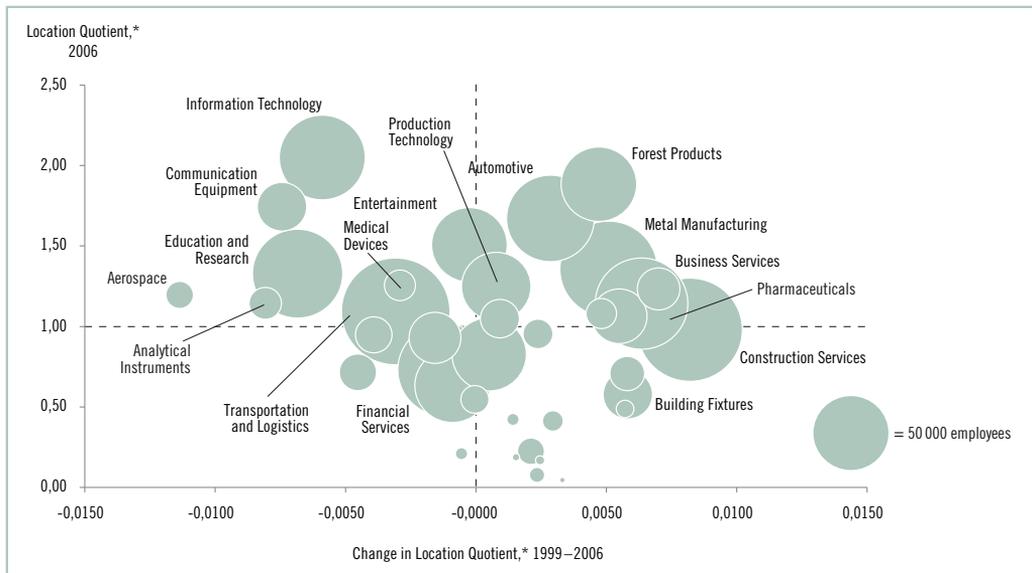


Source: European Cluster Observatory, 2008.

Forest Products, and Automotive have seen stronger job growth than the European average. Information Technology, Communication Equipment, Education and Research, Medical Devices, Aerospace, and Transportation and Logistics are areas of strength in which Sweden has lost employment position. Further data is needed to establish whether these changes reflect a loss of market position or a shift to productivity growth in already strong clusters. In cluster categories, in which Sweden has traditionally a weaker employment position, changes have tended to be smaller.

Wages in the Swedish cluster sector overall are close to 20% higher than wages in local industries, confirming findings from studies in other countries. Wages in core public services, a sector as large as the three largest cluster categories combined, are almost identical to the average cluster sector wage. Within the cluster sector, average wages differ widely across cluster categories, ranging from close to €80,000 in pharmaceuticals to slightly less than €40,000 in hospitality and tourism (data is for full-time employees only). Even within individual

Figure 4.3 National Cluster Employment Portfolio, Sweden



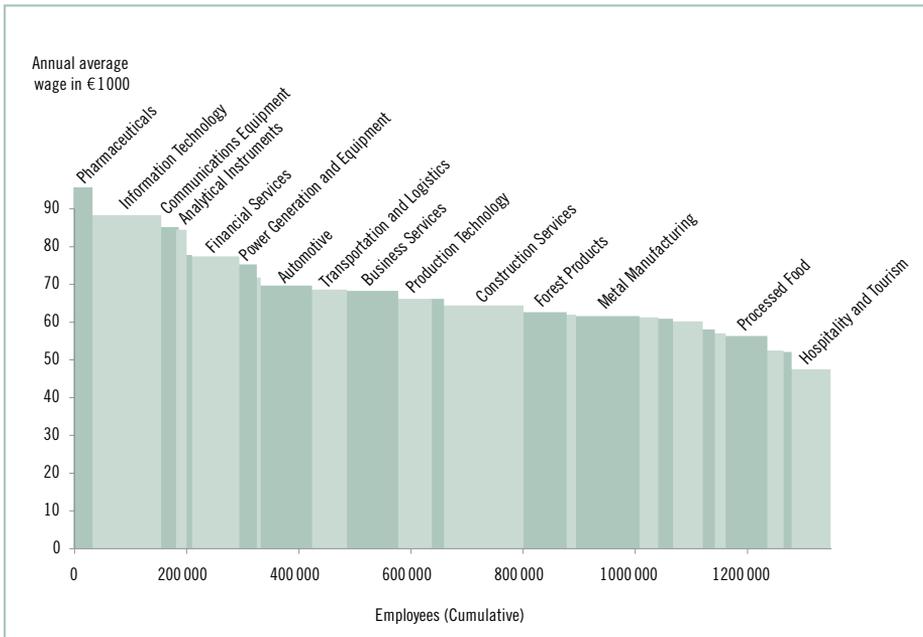
Note: Location quotient is calculated using all 27 EU countries plus Iceland, Norway, Switzerland, and Turkey. Change in European share is calculated for the countries with available data in 1999 and 2006: Austria, Belgium, Cyprus, Denmark, Iceland, Ireland, France, Germany, Latvia, Norway, Slovenia, Sweden, Switzerland, and the UK. Bubble size is proportional to total employment per cluster category. Source: European Cluster Observatory, 2008.



cluster categories, differences in wage across regional clusters are significant. In financial services and pharmaceuticals, two of the most extreme cases, the regional clusters with the highest average wages have more than double the wage of the regional clusters with the lowest average wages. Both region-specific effects and specialization play a role in explaining the wage differences. Being in Stockholm, a region with a higher cost level and potentially also general productivity benefits through its overall size, has a positive impact on wages across all clusters. Being more specialized, i.e. having a higher location quotient, also has a positive impact on relative wages in a specific cluster category.

Swedish regions have a number of significant clusters but the largest regions are less specialized than their European peers. Sweden has roughly 1000 regional clusters with significant specialization levels and minimum levels of absolute size (Lindqvist et al., 2003), based on an analysis of Swedish labor market areas (significantly smaller

Figure 4.4 Total Wage Bill of Swedish Clusters, 2006

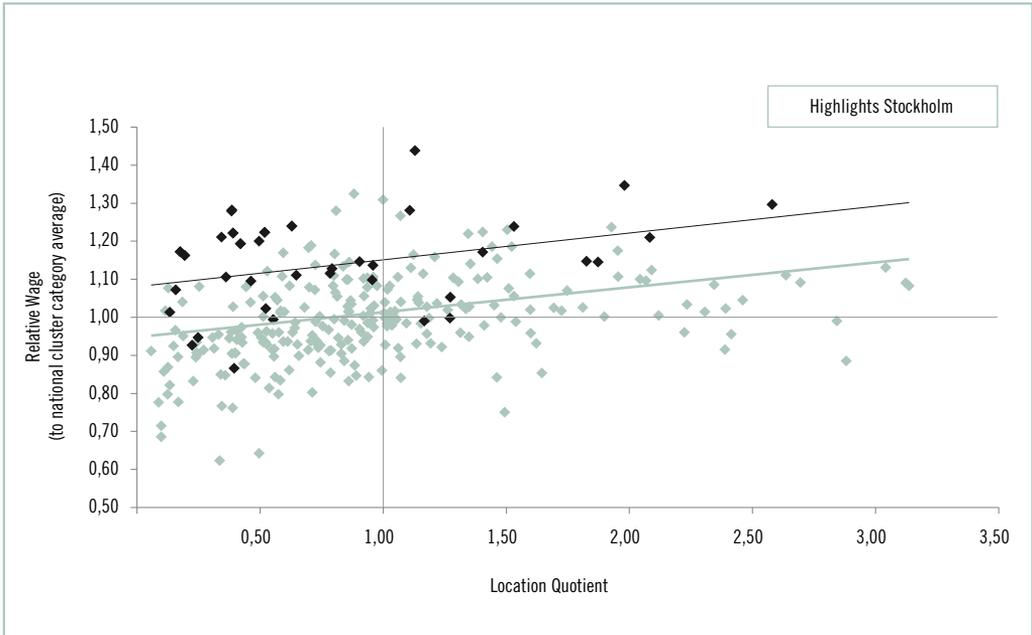


Source: BSR InnoNet, 2008; European Cluster Observatory, 2008; author's calculations.

than EU NUTS-2 regions) and with specialization levels calculated against the Swedish (not European) average. Looking at the much fewer NUTS-2 regions, 20 clusters meet the high specialization benchmark of $LQ > 2$. The European Cluster Observatory identifies two of them, Information Technology in Stockholm and Automotive in Western Sweden, as so-called “three star clusters” registering high specialization, high absolute size, and a high share of regional employment (European Cluster Observatory, 2008).

The four largest regions – Stockholm, Västsverige, Sydsverige, and Östra Mellansverige – with 75% of Swedish employment have less of their employment in highly specialized clusters than their European peers of similar size (14% vs. 21% in clusters with $LQ > 2$). The slightly smaller regions Småland and Norra Mellansverige have much higher specialization levels, both compared to the rest of Sweden and their European peers. The two smallest regions Mellersta Norrland and Övre Norrland register low specialization levels.

Figure 4.5 Wages and Specialization. Swedish Regional Clusters, 2006

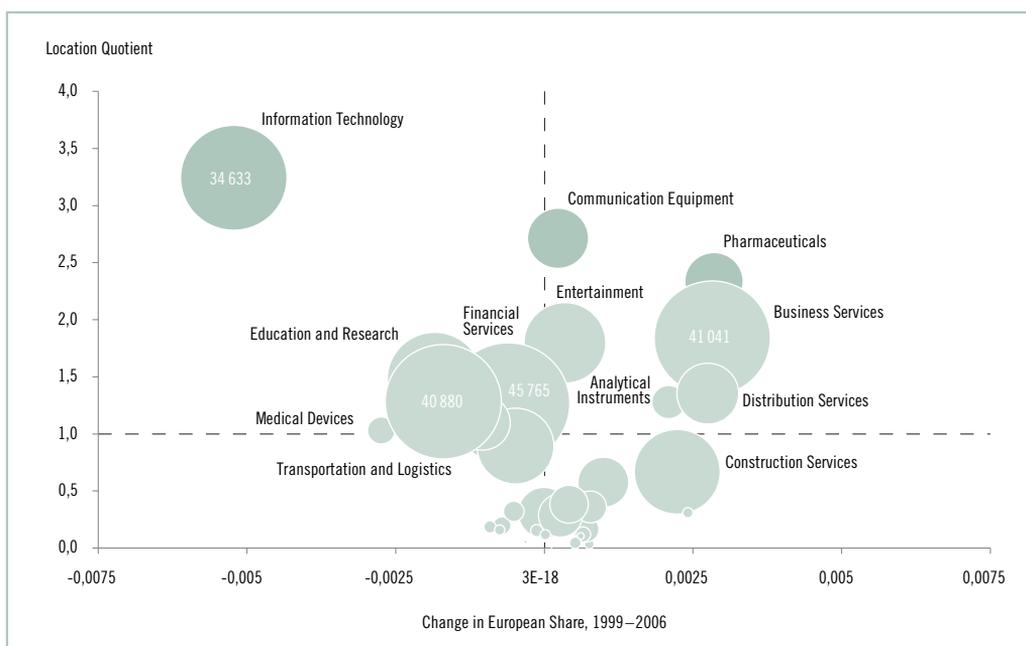


Note: Each data point refers to a cluster category in a Swedish NUTS-2 region. Location quotient is relative to European data, relative wage relative to Nordic data. Source: BSR InnoNet, 2008; European Cluster Observatory, 2008, author's calculations.



Cluster portfolios differ widely across Swedish regions. *Stockholm* has a strong cluster portfolio around related clusters in advanced services and knowledge-intensive clusters (OECD, 2006). Cluster initiatives like Kista Science City in IT provide platforms for joint action. In a number of its most employment-intensive clusters the region's specialization advantage is under pressure. But more detailed data will be needed to identify whether the relatively weak employment performance is the result of a loss in competitiveness or of a focus on high productivity growth instead of an increase in employment numbers. The figures below show the cluster portfolio for Stockholm and an indication of the overlap between the clusters in which the region is strong. Cluster portfolios for the other Swedish regions are available from the author and on the website of the Swedish Globalization Council.

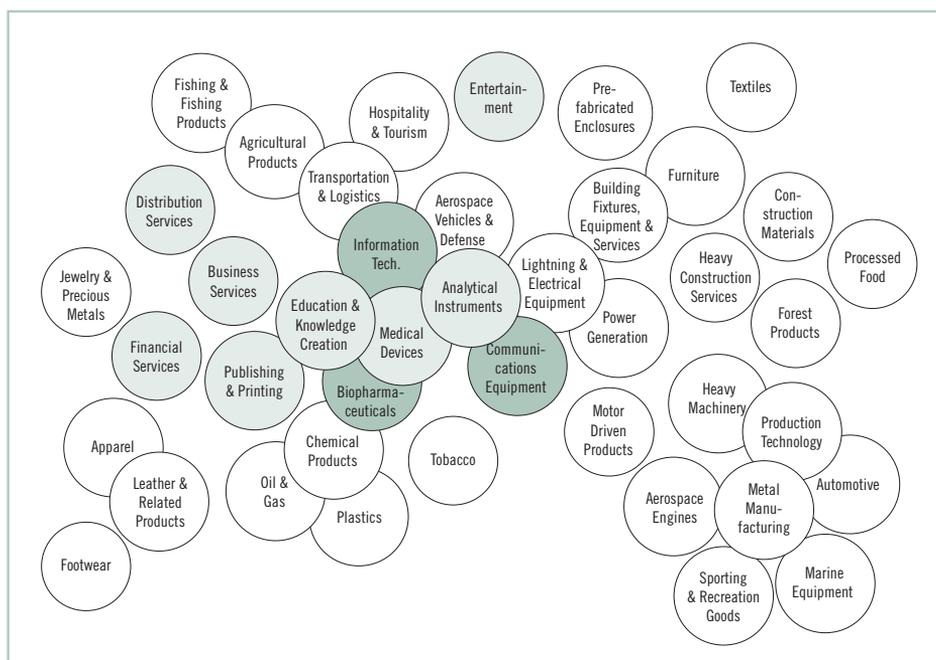
Figure 4.6 Regional Cluster Employment Portfolio, Stockholm, 1999–2006



Note: See detailed note for figure 4.3. Source: European Cluster Observatory, 2008.

Västsverige remains dominated by the automotive cluster, with registered solid growth before the dramatic crisis in late 2008. A number of other clusters in the region have also shown positive trends in the recent past, but are still at a much lower level of specialization. *Sydsverige* has a much less visible specialization pattern. It has some strength in medical devices, a cluster category of modest absolute employment size. Information Technology has been the most visible area in which the region has started to gain position. *Östra Mellansverige* has a strong but deteriorating position in the overall small aerospace cluster. The most visible strengths in areas with high employment numbers are in education and research and different industrial activities. *Småland* has a very high specialization level in a group of clusters related to wood and to traditional industrial activities. *Norra Mellansverige* has a similar profile but even higher specialization levels in a smaller number

Figure 4.7 Cluster Overlap Matrix: Stockholm

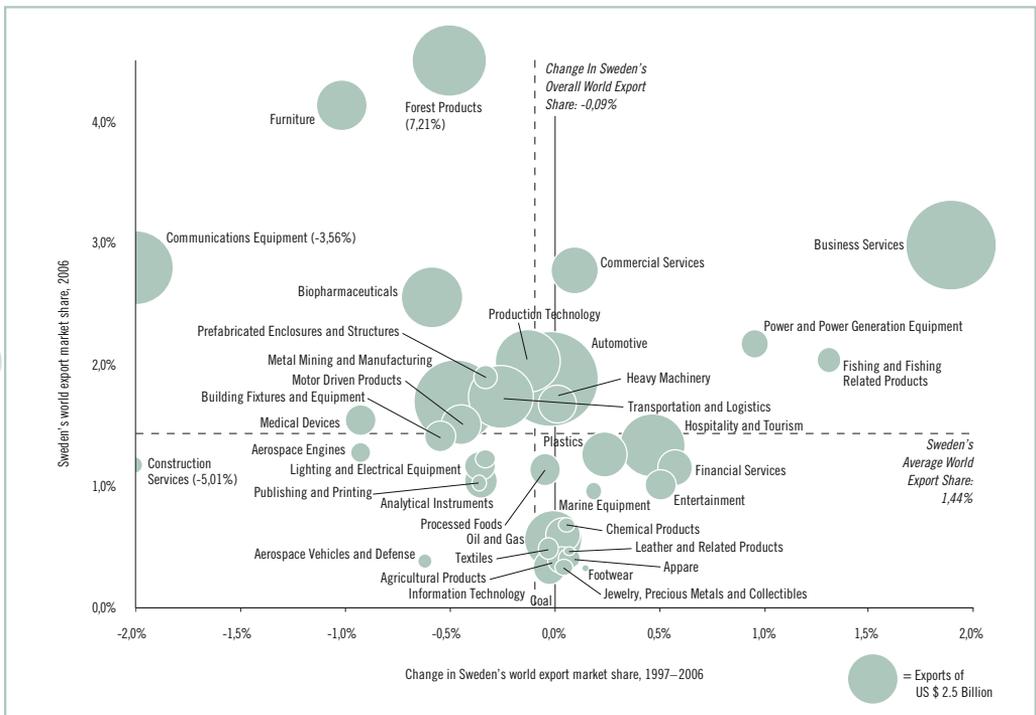


Note: Clusters with overlapping borders have at least 20% overlap (by number of industries) in both directions. Red shading indicates clusters with $LO > 1$, dark red with $LO > 2$.

of clusters, forest products and metal manufacturing in particular. With Paper Province and Triple Steelix the region has active initiatives in its leading clusters. *Mellersta Norrland* is dominated by the forest product cluster where it registers strong specialization. *Övre Norrland* is present in forest products as well but with a lower specialization level. It has significant employment in clusters in Education and Research and Automotive (Sölvell, 2006).

Swedish exports are driven by a broad base of positions across a significant number of clusters. Swedish exports are dominated by cluster categories in which the country has a revealed comparative advantage (RCA), i.e. its world export market share in the category is higher than the country's total share of world exports across all industries. Specific strengths are in activities related to the automotive

Figure 4.8 Sweden's National Cluster Export Portfolio 1997–2006



Source: Prof. Michael E. Porter, International Cluster Competitiveness Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director. Underlying data drawn from the UN Commodity Trade Statistics Database and the IMF BOP statistics.

cluster, clusters related to wood, clusters related to communication equipment and a wider range of skill-intensive activities, advanced service clusters, and cluster related to tourism and transport. Sweden's relative broad set of clusters with significant export positions is not untypical relative to peers of similar size and stage of development. In addition, the country's companies have also a number of strong niche positions outside of clusters in which Sweden already has a significant world market position. Such niche market positions can become the nucleus for new clusters to emerge.

Individual cluster categories have registered heterogeneous trends in export performance over recent years. The traditional strong market position in forest products and furniture has remained largely intact. Communications equipment and, to a much smaller

Figure 4.9 Sweden's Export Portfolio. Niche Positions Outside of Large Clusters

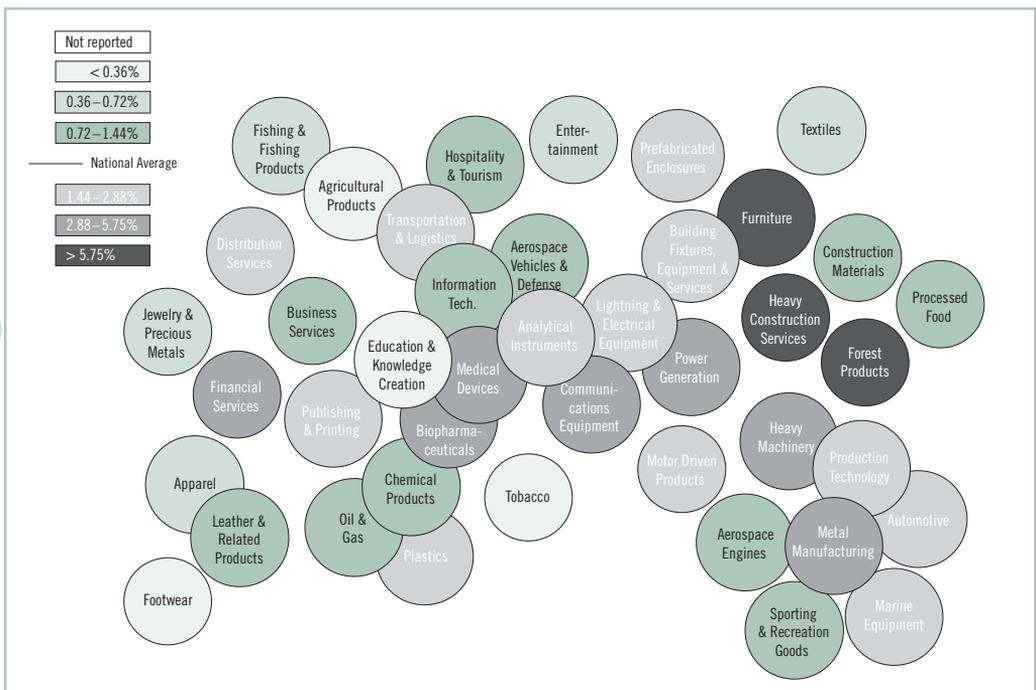
Cluster	Cluster World Export Share	Industry	Industry Share of World Exports	Change in Share (1997–2006)	Export Value (in \$ 1000)
Plastics	1.26%	Paints, varnishes	3.48%	0.78%	591,766
		Polymers of ethylene	2.14%	1.96%	913,730
Construction Materials	1.22%	Ceramic plumbing fixtures	2.71%	-1.76%	106,485
		Miscellaneous hard rubber; articles of hardened rubber	2.77%	-0.47%	399,852
		Packings, pallets and the like	2.76%	-0.37%	61,136
		Vulcanized rubber	2.33%	-0.95%	81,919
Lighting and Electrical Equipment	1.16%	Switching apparatus, 1000v+	4.13%	0.28%	274,938
Processed Food	1.13%	Aluminum casks, drums, cans, boxes and similar containers	3.20%	-3.18%	110,211
		Butter, other fat of milk	2.04%	0.16%	81,731
		Fatty acid, acid oils and residues from wax	3.21%	1.44%	75,284
		Machinery for heating food, drink Margarine and shortening	3.63% 4.96%	0.86% -2.66%	92,241 142,143
Analytical Instruments	1.03%	Instruments for analysis, measuring viscosity, expansion	2.50%	-0.46%	529,355
		Miscellaneous measuring, controlling and scientific instruments	4.71%	1.51%	292,655
		Parts of electric sound equipment	2.42%	1.30%	68,728
Entertainment and Reproduction Equipment	1.01%	Other recorded media	2.90%	1.67%	687,437
Marine Equipment	0.95%	Marine piston engines	6.56%	1.07%	438,943
Chemical Products	0.59%	Albuminoidal substances, modified starches and glues	2.03%	0.78%	258,825
		Detergents not for retail	2.11%	-0.69%	75,268
		Miscellaneous inorganic chemicals	3.16%	2.42%	80,285
		Organic detergents	2.36%	0.79%	137,328
Oil and Gas Products	0.55%	Wood-, resin-base chemical products	4.87%	1.64%	86,936
		Mineral tars and products Petroleum bitumen, coke, bituminous mixtures	2.47% 2.07%	1.32% -0.47%	273,699 158,718
Textiles	0.48%	Wadding, wicks, and textile fabrics for machine use	3.22%	-0.55%	173,780
Agricultural Products	0.39%	Spirits	3.70%	1.72%	630,141

Source: Prof. Michael E. Porter, International Cluster Competitiveness Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director. Underlying data drawn from the UN Commodity Trade Statistics Database.

degree, pharmaceuticals, have registered an erosion in global market share. Business services, conversely, have tripled their world market share over the last decade. This is consistent with the perception that Swedish companies move more of their production activities abroad while leadership functions and advanced headquarter and management services remain based in Sweden.

The falling number of clusters that are truly global leaders is a concern, even when Swedish overall global market shares are holding up quite well. The overall loss in Swedish world export market over the last decade is not dramatic – down slightly more than 6% in a period where China and other emerging economies have registered massive inroads on many global markets. But a more detailed look at the cluster-specific situation gives reason for concerns. In 1990, Sweden had a global world market share of more than 5.75% in three

Figure 4.10 Share of World Exports by ClusterSweden, 1990



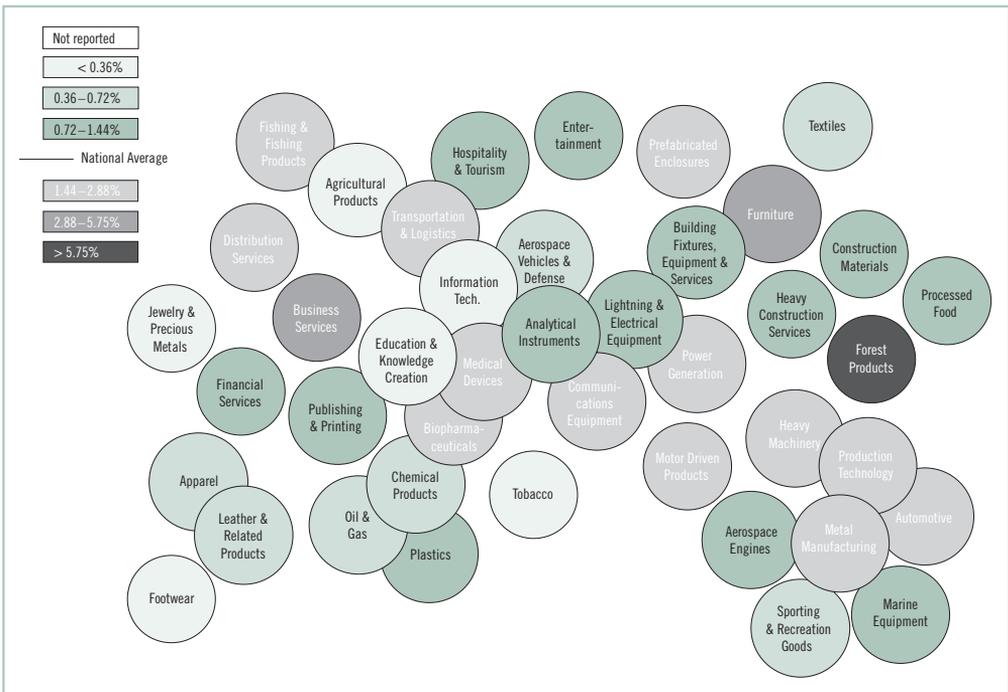
Note: Clusters with overlapping borders have at least 20% overlap (by number of industries) in both directions.

clusters and of more than 2.88% in an additional seven clusters. By the 1997, these numbers had changed to three (above 5.75%) and two clusters (between 2.88% and 5.75%). In 2006, the count was one above 5.75% and two between 2.88% and 5.75%. Sweden is strong in breadth but the very top of clusters with global leadership position seems to be thinning out.

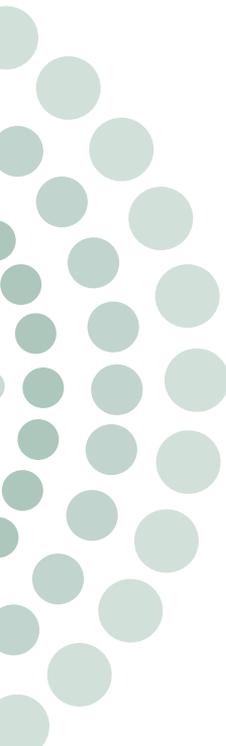
What do these facts about the current cluster profile of the Swedish economy imply for economic policy and in particular for the use and possible nature of cluster policy? A number of initial observations stick out:

- The Swedish data confirms the role of clusters as a driver of prosperity and a useful analytical tool to understand regional economies.

Figure 4.11 Share of World Exports by ClusterSweden, 2006



Note: Clusters with overlapping borders have at least 20% overlap (by number of industries) in both directions.

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- Swedish regions do not have the absolute size to support a wide range of significant cluster positions. They need to specialize, in a number of regions beyond the level currently achieved. Sweden needs an economic policy, including dedicated cluster policies, which support further specialization.
 - The significant differences across clusters indicate the need for a cluster-specific policy response; the same policies will not work equally well across the entire cluster sector. Sweden needs a cluster policy that allows for a high level of regional leadership within an overall national framework.
 - Sweden's export structure suggests that the country is moving from a manufacturing base to become a platform for advanced services within manufacturing-driven fields. Sweden needs an economic policy that supports this process while taking care that Sweden remains in a true global leadership position in a number of clusters.

4.2 Swedish competitiveness

The current cluster profile of the Swedish economy is only one way to identify what cluster policy can do for the country. At least as important is a more general view at the specific competitiveness challenges that the Swedish economy is facing. If cluster policy with its own set of capabilities can address these particular issues, it is a tool that should not be left unused.

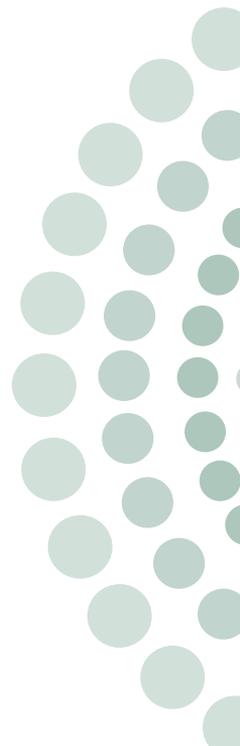
While a full scale analysis of Swedish competitiveness is beyond the scope of this report, the findings presented to the Swedish Globalization Council from an initial assessment in 2007 (Porter/Ketels, 2007) as well as other data that has become available since provides insights into key areas that Swedish policy makers need to address to sustain and improve the long-term foundations of Swedish prosperity. To identify potential weaknesses, the analysis can look at the three levels of indicators

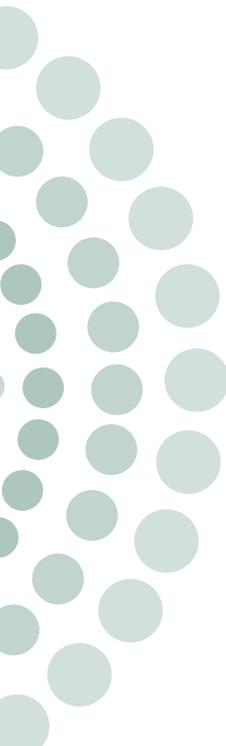
- *Prosperity decomposition*; labor productivity, labor mobilization, and local price levels determine in arithmetic sense the level of prosperity a location can enjoy.
- *Intermediate drivers and indicators of competitiveness*; indicators of trade, investment, knowledge, and entrepreneurship provide a market test for a location's competitive assets.
- *Competitiveness fundamentals*; a range of macroeconomic and microeconomic factors set the level of productivity that companies are ultimately able to reach at a location.

On the arithmetic *components of prosperity*, Sweden ranks well on labor productivity and labor mobilization. It is one of the few countries that combine solid positions on both, which is a key driver for the high level of overall Swedish prosperity. Domestic price levels remain a challenge, although more recently the entry of foreign food retail chains and other changes have led to an improvement relative to the other Nordic countries. One of the reasons for the still high level of domestic prices is the segmentation of the Nordic region into small national markets (Ketels, 2008). This lack of full market integration is also limiting the emergence of strong clusters.

On *intermediate drivers and indicators of competitiveness*, Sweden's position is mixed. World export market shares are generally stable, with significant changes between clusters and towards services. The level of foreign direct investment is high, but has been less dynamic in recent years. The total domestic investment rate remains relative low, despite the strong recent upswing before the crisis led to a dramatic drop. Patenting rates are high but over the last number of years the Swedish position has deteriorated while others, Asian countries in particular, have registered strong growth. Entrepreneurship rates are low, especially the growth of new businesses into companies of significant size. Cluster efforts can improve the conditions for new business formation. They can also increase the attractiveness of engaging in R&D and – more important for Sweden – reduce the barriers to turn research into valuable products and services.

On *macroeconomic competitiveness*, an area that includes both the strength of institutions and macroeconomic policy, Sweden gets generally high marks (GCR, 2008). This provides a solid foundation for companies to operate and is thus generally beneficial to cluster





emergence. The quality of institutions in particular, underpinned by a generally high level of trust in society (World Values Survey, 2008), makes Sweden an environment in which sophisticated approaches like cluster policy where abuses are possible, can be used. The one area where Sweden is ranked lower is the devolution of economic policy decision powers to the regional level. This could be a challenge for the execution of cluster programs but is more likely an opportunity for cluster programs to help regions play a more important role in setting their specific economic agenda.

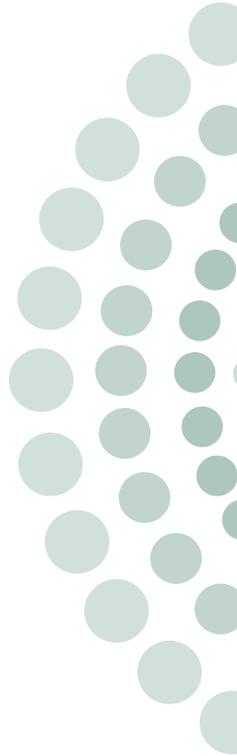
On *microeconomic competitiveness*, Sweden ranks overall among the leading countries in the world (GCR, 2008). Especially on company sophistication it registers high scores, reflecting its strong base of globally active large companies. The Swedish business environment has particular strengths in communication infrastructure, many aspects of the innovation infrastructure, and its capital markets.

But alongside the main assets Sweden has as a place to do business, there are also areas in which further improvements are necessary. Sweden boasts a strong skill base and traditionally a high share of graduates in natural sciences and engineering. But there are increasing concerns about the quality of education and the ability to provide a workforce with skills the match the needs of the Swedish economy in the years to come. In science education, Swedish students only rank average compared to the OECD, significantly below neighboring Finland and the pay-offs of higher education are behind many peer countries (OECD, 2007). Immigrants in Sweden rank lower on their educational attainments in science than students with a domestic background, like in many other OECD countries. And Sweden does not rank high on the attraction of foreign skill, an increasing necessity in the global economy where no country can achieve leadership relying on domestic talent alone (Ketels, 2008). The traditional logistical infrastructure has not kept pace with the economic growth in recent years. Business leaders are relatively most concerned about the country's airport infrastructure. At least part of the reason seems to be the allocation of public investment spending across regions and projects, as spending levels are among the highest in the OECD (Erlandsen/Lundsgaard, 2007). Government regulation and administrative practices are often perceived as bureaucratic and cumbersome, even if government gets high marks on being neutral and creating a level playing field (Conway et al., 2005). Sweden's labor market rules tend to be classified as rigid (World Bank, 2008), but the actual evidence on the labor market points to a higher level of flexibility than in many other European countries (Rae/Sollie, 2007).

Sweden also remains to have one of the highest levels of taxation in the world, especially on individuals (Holmes et al., 2008).

What do these facts about the profile of strengths and weaknesses in Swedish competitiveness imply for economic policy and in particular for the use and possible nature of cluster policy? A number of initial observations stick out:

- The Swedish economy has a number of qualities that make it a location conducive to the emergence and functioning of clusters. The high level of trust in society makes collaboration easier and more likely to emerge. The high quality of institutions is a safeguard against the abuse of cluster policies as a tool to introduce market distortions that limit competition. Finally, the overall high quality of microeconomic competitiveness provides ample opportunities for clusters to emerge and leverage existing qualities in the business environment.
- Despite its many advantages, the Swedish economy also features a number of factors that work against the emergence of strong clusters. The fragmentation of the Nordic countries into national markets leads to a cluster structure where clusters are too many and too weak. The traditional Swedish combination of a strong central government and strong local governments in the largest cities creates complexities for cluster development. And the tendency of regional policies to work against agglomeration instead of enabling the growth of all regions, too, can become a barrier for strong clusters (See the discussion of specific policies in Sweden with this effect in Forslid, 2008).
- The Swedish economy is facing a number of competitiveness challenges in which cluster policies can be part of the answer. This is not true for all of them, but cluster policies should not be neglected as part of an overall economic strategy. Areas in which cluster dynamics can enhance policy impact or where cluster initiatives provide an effective process tool to achieve better decisions are entrepreneurship, bridging the gap between research and marketable products and services, workforce skill development, and infrastructure investments.



4.3 Swedish cluster policy

Meaningful recommendations on the use of cluster policy in Sweden need to take into account what is already happening in this respect. While a detailed analysis of Swedish cluster policy is beyond the scope of this report, the following section provides some central observations on the use of cluster policy by the Swedish government.

Despite a business environment and academic tradition conducive to cluster development, Swedish economic policy has for a long time been skeptical about its use. Sweden has a long intellectual tradition of looking into the role of collaboration in a specific geographic context as a driver of economic performance and prosperity (Dahmen/Carlsson, 1991). The country was part of the initial Porter-study (Porter, 1990; Sölvell/Zander/Porter, 1991) and there has been a constant flow of academic publications on clusters ever since (Braunerhjelm et al, 1998; Söderström et al. 2001; Sölvell, 2004). In parallel, there has been strong interest in the related ideas of innovation systems and triple helix collaboration between companies, academia, and the public sector.

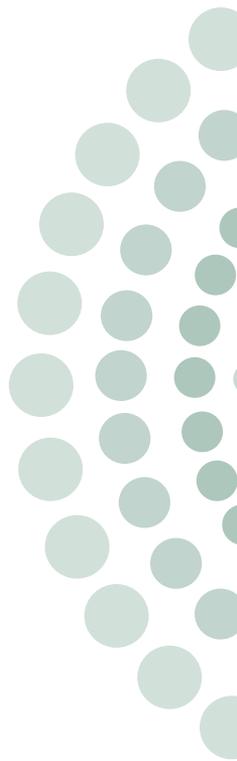
In the economic policy space, however, the reception of the cluster and competitiveness thinking has for a long time been relatively muted. Economic policy have been firmly grounded in a strong focus on fundamentals, i.e. a solid macroeconomic policy (at least after the harsh lessons of the Nordic banking crisis in the 1990s), open markets with equal rules for everyone, and general investment in infrastructure, education, and the science system. There have been strong reservations against sectoral policies that could lead to distortions, and this created a significant wariness about cluster policies.

Despite the remaining skepticism, cluster policy has become a more important factor in government policy and the programs initiated get generally good marks for their design and impact. The 2004 national strategy for innovation (Regeringskansliet, 2004) introduced the cluster terminology in the context of a major economic policy strategy. Among other things, the strategy led to six sector specific industrial strategies for the leading sectors of the Swedish economy, developed in public-private dialogue. Individual government agencies like NUTEK, VINNOVA, Knowledge Foundation (KK-Stiftelsen), and ISA and a number of Swedish regions have increasingly drawn

on cluster/innovation system-thinking (Brandt, 2001; Dinnetz, 2007; Sölvell, 2008). A global survey of cluster initiatives identified 102 Swedish cluster initiatives (Ketels et al., 2006) and the European Cluster Observatory (www.clusterobservatory.eu) lists 64 Swedish cluster initiatives with active contact information by December 2008. The vast majority of these efforts have some form of government involvement and often the public sector has been a key driver in their creation. Swedish agencies are also active internationally: A Northern Cluster Alliance with participation from a number of countries from the Baltic Sea Region was created in 2004 and since September 2006 Sweden is involved in BSR InnoNet, an EU-funded project on cluster development. In early 2008, Sweden hosted the EU Presidential conference on Innovation and Clusters in Stockholm. SIDA supports work on clusters in developing countries, especially Africa.

The flagship project for Swedish cluster policy is Vinnväxt, a program run by VINNOVA since 2001. In 2003, the first three regional clusters were selected in a competitive process for a ten-year program with up to 10 MSEK funding available per year, together with parallel process support. Five more clusters were selected in 2004 and in 2008 another four emerging clusters were accepted to the program. The program has many of the aspects listed above as crucial for good cluster programs and gets generally high marks from an independent international panel of researchers (Cook et al., 2007; Cook et al., 2008). Weaknesses are identified in two areas: First, there needs to be a stronger focus on internationalization. This is a problem in many government-funded cluster efforts (Meier zu Köcker, 2008) and has now become a key priority for cluster policy EU-wide. Second, the appropriate integration of national and regional agencies, i.e. the right balance of top down and bottom up-efforts, seems problematic. This is a challenge that countries with a traditionally centralized government structure often face. In a separate evaluation, the impact on the wider regions in which the Vinnväxt clusters were located was found to be moderate (Christensen et al., 2007). The strongest positive impact has been registered on institutional capital and the ability to collaborate, also beyond the boundaries of the specific cluster.

Despite these numerous efforts, cluster policy has limited visibility in Sweden. On the extent of cluster policy, Sweden ranks only 24th among more than 130 countries, far below its rankings on many other dimensions of competitiveness and significantly behind its Nordic neighbors (Global Competitiveness Report, 2008). While





this might be a misperception on the part of the Swedish executives surveyed, their subjective impressions matter. Cluster policy can only be fully effective, if it mobilizes the independent actions of many companies, even those that are not directly benefiting from financial contributions in public cluster programs.

What do these few key facts about the use of cluster policies by Swedish government agencies imply for their future use and possible nature of cluster policy? Two observations stick out:

- Sweden makes good use of cluster policies already. And where cluster policies are used, they are generally well designed. The operational weaknesses that have been identified are not Sweden-specific and reflect the more general learning process about how to organize cluster efforts most effectively worldwide. Sweden is part of the efforts to develop new answers for these challenges and is in many aspects at the forefront of these developments. A more strategic approach to internationalization and a more consistent approach to measuring the impact of cluster policies are two priorities for further policy improvements.
 - Funding for internationalization efforts should be conditional on a consistent strategy for creating such partnerships, i.e. the identification of partners that can help a cluster to specific needs like accessing complementary skills and knowledge or entering new markets. Current programs in many countries provide general funding for internationalization but provide little direction on how these efforts should be integrated in an overall cluster strategy.
 - Measuring the impact of cluster initiatives needs to be designed in a way that allows the comparison of cluster-based with cross-cluster policies. Current evaluations are focused on improving existing programs which is useful but not sufficient to support policy makers in making choices about whether to shift more resources to cluster-based programs.
- However, the cluster approach is largely used as an innovative design feature of specific programs by a few government agencies, not as a strategic tool to organize integrated policies across different dimensions of Swedish competitiveness. This limits the overall impact that cluster efforts can have. At the regional

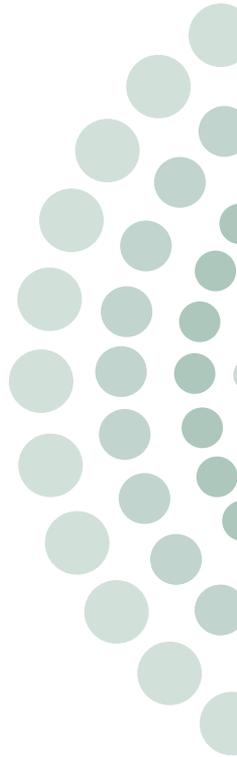
level, this leaves cluster efforts operating as individual islands that do not exploit the full potential of a cluster portfolio approach to regional competitiveness. At the national level, it misses the opportunity to make the discussion of cluster policy a trigger for the development of a more broad-based national competitiveness strategy that would integrate cluster policies with cross-cluster policy initiatives. And in the dialogue between the private and the public sector, cluster policy does not provide the visible orientation that would be needed to extend its impact beyond the moderate number of companies actively participating in cluster efforts.

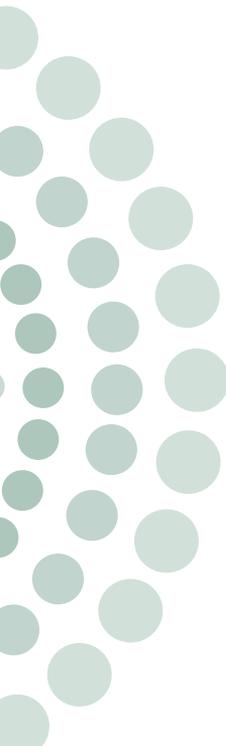
4.4 Recommendations for Sweden

This chapter has provided three types of information about the Swedish situation critical for identifying ways for cluster-based economic policy to help Sweden succeed in global competition. Information on the cluster structure of the Swedish economy, at the national as well as the regional level, provides a basis to understand the effect of the current forces for agglomeration and dispersion. Information on Swedish competitiveness identifies areas in which cluster efforts might be helpful and gives a sense on whether cluster policies can be implemented successfully. Information on Swedish cluster policy provides a benchmark for what is already been done and thus the starting point for any recommendations.

The specific policy recommendations from this analysis are organized into three groups:

1. How can clusters be leveraged to improve the efficiency of current economic policies?
2. What efforts can be taken to enable the emergence of strong clusters in Sweden?
3. How can cluster efforts be integrated in broader efforts to improve competitiveness across the entire economy, not just individual clusters?





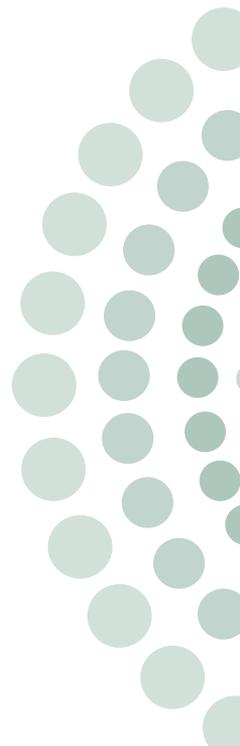
Cluster policy as a tool to improve cluster competitiveness. The ideas in this section draw on the narrow definition of cluster policy as efforts that use cluster structures and are designed to improve their competitiveness.

- Sweden's low levels of *entrepreneurship* are driven by a large number of factors, from cultural factors to many aspects of the business environment. Cluster policy can not address all of these factors. However, cluster policy can be part of an overall policy change to move from a policy that is focused on making it easier to become an entrepreneur, for example by educational programs, to a policy that also creates higher incentives for being an entrepreneur. Programs that explicitly link current entrepreneurship programs to clusters and cluster initiatives could be a first step in this direction. Cluster initiatives could be encouraged to set up efforts to foster spin-outs from existing anchor companies and identify areas in which existing companies could benefit from the presence of new suppliers and service providers.
- Sweden's *innovative capacity* is one of the country's most valuable assets. Both the receding patenting rates and the long-standing discussion about the relatively low returns to additional investments in innovation are therefore a key concern. Cluster environments are particularly strong in creating higher incentives for R&D and turning these investments into marketable goods and services. They also provide good environments for linking up to foreign research hubs and attracting advanced foreign skills. While many good examples already exist, further opportunities for integrating innovation and cluster policies should be reviewed.
- Sweden's skill base is a crucial element of its competitiveness and many studies indicate that globalization is increasing the returns to skill dramatically. Cluster-based approaches have shown their value in aligning the *workforce skills* provided by the educational system with the needs of companies in many locations. Programs could be launched that provided targeted funding to joint educational programs of clusters and related educational institutions.

- Sweden needs to further develop its *physical infrastructure* in line with the needs of its economy. The available data suggest that this is largely a matter of prioritization rather than overall spending levels. Cluster and regional competitiveness efforts can be an important tool to make more informed decisions about investments based on the joint knowledge of companies, academia, and the public sector.

General economic policies as a tool to enable the emergence of strong clusters in Sweden. These ideas discuss policies that do not use clusters directly as a delivery mechanism but have a strong impact on the underlying drivers of cluster emergence. For a knowledge-driven economy like Sweden, strengths in human capital quality and innovative capacity are particularly important facilitators of cluster emergence (Forslid, 2008). But there are also a number of other policy areas that Sweden should address in order to enable the emergence of stronger clusters.

- A key barrier for the development of strong clusters in Sweden is the combination of a relatively small national economy with a significant level of market segmentation across national borders in the Nordic/Baltic Sea Region. Membership in the European Union/ European Economic Area has removed a large number of barriers to trade and investment. But companies continue to face enough natural (language, legacy, culture) and political (regulations, administrative procedures) barriers that work against efficiency-driven agglomeration of activities (Ketels, 2007). Further *market integration*, driven by a more sector-specific approach that allows common Nordic/Baltic solutions within the EU framework, could remove some of these barriers.
- The ability of regions to set policies that support specialization and a unique economic profile is critical for the emergence of dynamic clusters. Sweden's strategy for regional development (Regeringskansliet, 2007) emphasizes the need for specialization and cluster mobilization to achieve growth in all regions. Like other countries with a tradition of centralized government (France, UK), Sweden has over the last few years experimented with the creation of integrated regions in Southern Sweden and Western Sweden. The question of how *regional policy structures* need to be structured in the Swedish context to effectively



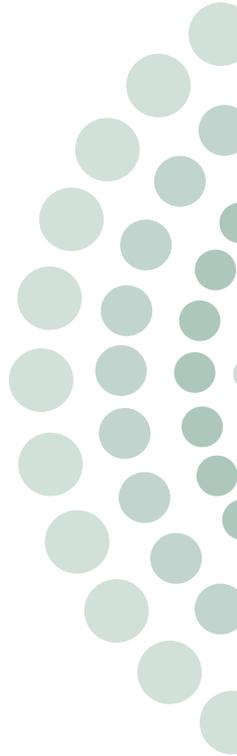
support cluster emergence is a critical issue for further analysis. The evidence suggests that the simple enlargement of regions or devolution of decision making powers to the regional level is not enough (Gadd et al., 2008). But inaction is clearly not a good alternative either.

- Universities are an important element of many clusters and cluster initiatives, especially in a knowledge-driven economy as Sweden. Over the last two decades, Sweden has pursued an active policy to spread institutions of higher learning and research throughout the regions, a policy that already has registered some impact on regional productivity growth (Andersson et al., 2004). These *universities* could become a strong element in facilitating regional cluster efforts, putting such initiatives on a more balanced foundation between the public and private sector. Such a role would be highly consistent with Swedish universities' so-called third mission in achieving societal impact and could build on programs like the Knowledge Foundation's program 'KK-miljö'. But it might require a review of existing capabilities and incentive structures to enable them to play this role effectively.

Cluster policy as a tool to strengthen overall competitiveness. This section discusses the use of clusters as a process tool to achieve goals that go beyond the competitiveness of any individual cluster.

- At the regional level, clusters could become a more important element of *regional growth strategies*. Regions would need to move beyond looking at individual clusters and isolation, and actively pursue the potential of linkages and cluster emergence at the boundaries of existing clusters. Regions would also create more explicit feed-back mechanisms to make sure that the learnings and improvements achieved in cluster efforts become beneficial for the entire region, not just the individual cluster. This would require a closer integration of efforts directed at individual regional clusters – like Vinnova's Vinnväxt program – with the programs directed at regional economies under the responsibility of NUTEK and other government agencies. The way linkages between individual clusters and entire regional economies are nurtured could become an additional factor to evaluate submissions in funding calls for proposals.

- At the national level, Sweden has for some time now had a strong macroeconomic policy-orientation that provides the country with valuable ammunition in the current economic crisis. It has also strong policies in many individual areas important for microeconomic competitiveness. But there are doubts as to whether good performance in individual policy areas remains to be enough, or whether Sweden also needs an *integrated competitiveness strategy* that lays out how the country aims to position itself as a place to do business in the global economy. Such a strategy would set clear priorities on business environment qualities that are crucial for Sweden versus those in which matching the performance of peers is sufficient. And it would explicitly link strengths in business environment quality to particular clusters in which Sweden has strong potential to exploit these assets.



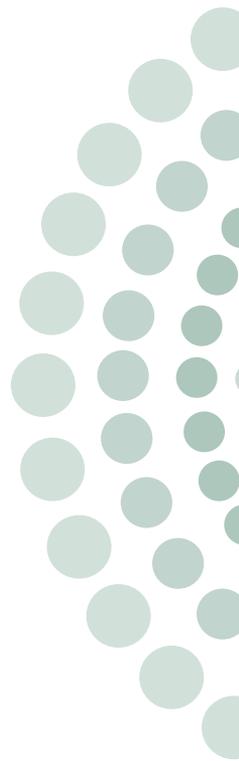
5. Conclusions

Cluster policy is a field under dynamic development where the clarity of the conceptual discussion has not always kept pace with the efforts of practitioners. While there is an emerging consensus of the role of clusters in the modern economy, the discussion on a workable theory of cluster policy is still very much ongoing. Over the last few years, the focus of the policy debate in this area has shifted to a concern about impact rather than distortion. The discussion of the current thinking and experience in this report comes to the conclusion that despite the absence of a full consensus on cluster policy, it is already a tool that has a lot of potential and is more effective than many of the real-world alternatives deployed by policy practitioners. However, the report also makes clear that as a tool cluster policy should not be used to artificially change the nature of economic geography. Instead, its main role is to use existing agglomerations as platforms for collaboration to enhance cluster dynamics and as more effective channels to deliver economic policies.

For Sweden, the report then evaluates whether cluster policy is a tool that not only has general appeal but also particular value given the Swedish situation. The data presented suggest that Sweden's economic geography, institutional capital, and business environment provide a good environment for successful cluster policy. Specific recommendations are made on how cluster policy can improve cluster dynamics, on how fundamentals can be changed to make the emergence of strong clusters more likely, and on how cluster processes can be channel back into overall competitiveness policies at the regional and national level. Cluster policy is only one of the tools that Swedish policymakers need to consider when preparing the country's economy for the challenges that the global economy holds in stock. But it is a tool that is too promising to ignore, despite the need to continue its further development.

In the current economic climate, it is also important to review the contribution that cluster policy might be able to make in dealing with the imminent crisis. Cluster policy is focused on the long-term supply-side foundations for economic growth and prosperity. The current economic challenges, largely issues of a demand slump originating in U.S. financial market conditions and now spreading out through countries and different sectors of the economy, require largely a demand-focused response. Cluster policy

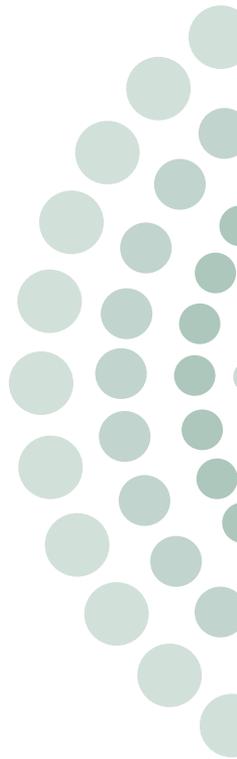
cannot provide the demand push but it can be an important tool to design and then implement the spending that has been put into the policy pipeline. This way, the spending is more likely to address long-term competitiveness issues beyond the short-term need to prop up demand. And it is standing a higher chance to change the expectations of business and consumers that worry about short-term government spending to be paid for by future taxation and might further reduce their own consumption. Cluster policies can thus make a contribution to ensuring that the public spending now under way has a positive impact, in the short- as well as in the long-term.



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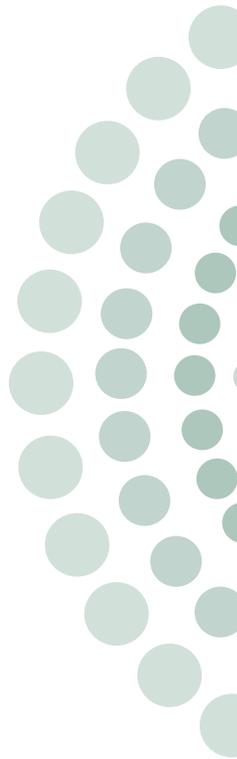
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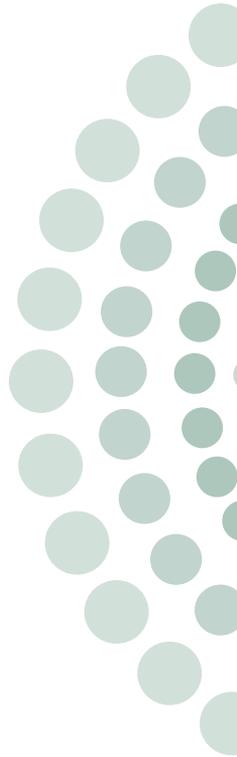
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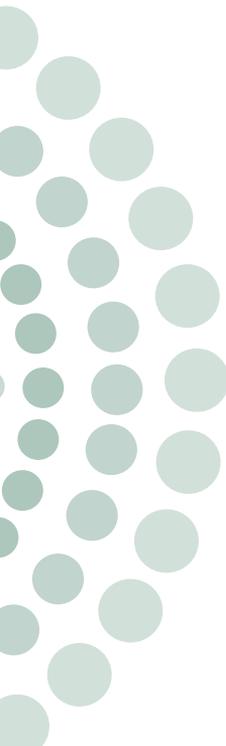
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