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Cluster Policy: A Guide to the State of Debate

Christian Ketels, Harvard Business School

1. Introduction

There is an increasing interest in the role of economic geography in explaining differences in prosperity levels across locations (World Bank, 2009; Spence et al., 2009). Different strands of the academic literature have contributed to this debate. The New Economic Geography approach applies models with increasing returns and mobile factors to explain the emergence of regions with different density of economic activity (Royal Swedish Academy of Science, 2008). The work on clusters (Porter, 2008) breaks this analysis down to the level of regional agglomerations of companies, research institutions, government agencies, and others in a specific area of business activity related through various knowledge and economic linkages. Other related approaches have looked at regional innovation systems (Cooke et al., 1997), industrial districts (Becattini, 1990; Porter/Ketels, 2009), and locations home to a 'creative class' (Florida, 2003).

But while there is widespread agreement that 'geography matters', there is little consensus on whether there is a case for policy. Arguments are made for (Porter, 2008) and against (Duranton, 2007); some authors acknowledge the theoretical case for intervention (Norman/Venables, 2004) but point out the complex implementation issues that render success unlikely (Venables, 2008). In the meantime, practitioners have made their choice and especially cluster-based economic policies have become widely used (Borras/Tsagdis, 2008; Oxford Research, 2008; Yusuf et al., 2008; Zeng, 2008; Davies, 2006; Pietrobelli/Rabelotti, 2006; Freser, 2005).

This article discusses the current state of the academic debate on cluster policy. It first reviews the findings on the relationship between the presence of clusters and economic outcomes, putting clusters into the context of other geographic and non-geographic factors affecting prosperity differences across locations. It then reviews the work on the emergence and evolution of clusters, a topic particularly important for policy that ultimately aims to change the trajectory of such paths'. The second part of the article addresses the issue of cluster policy. It sets out by presenting the basic theoretical argument for cluster policy. It then discusses two opposing understandings of how cluster policy should be conducted. Their different underlying definitions of what cluster policy is, it is then argued, are at the core of the different opinions about the use of cluster policy. A final section then discusses issues of implementation that have a crucial influence on whether and when cluster policy is beneficial and how large these benefits might become.

2. Clusters as building blocks of a modern economy

2.1 Clusters and economic performance

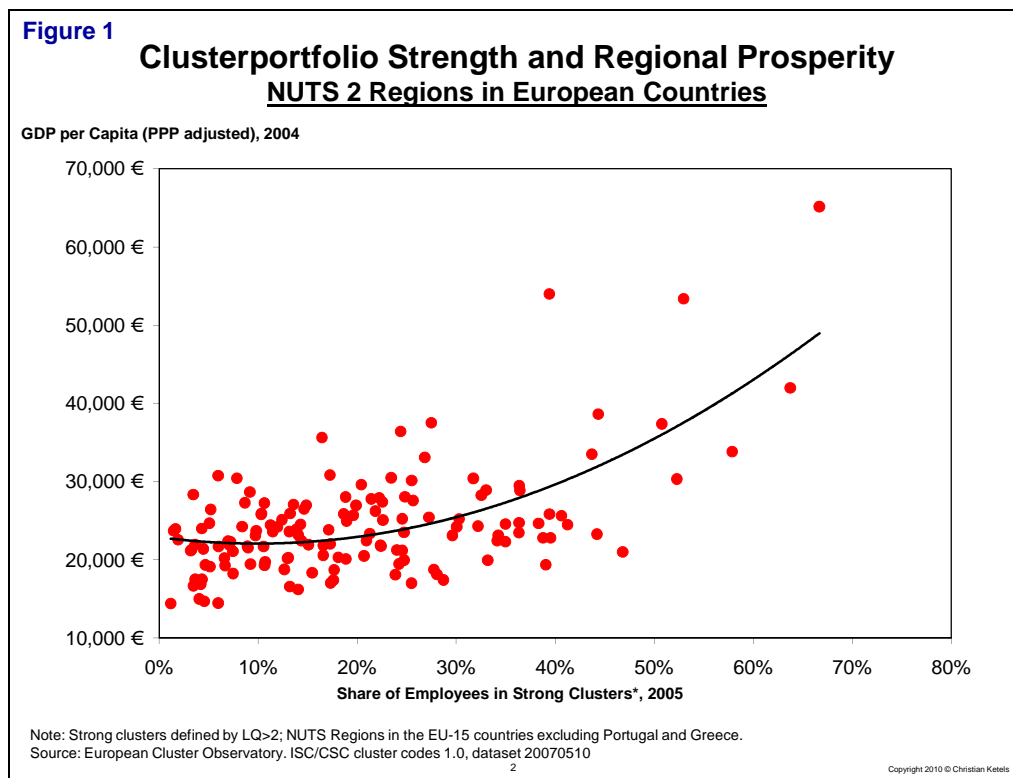
Marshall's (1890) original observation that firms can enjoy benefits from locating close to others engaged in related activities continues to find empirical support, in advanced as well as in developing countries. It is widely argued that the benefits have three main sources: First, there is the potential 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).

But there are countervailing effects that hold the unfettered push towards co-location in check. Companies are in business to make a profit when serving customers and if the costs of serving customers from a distance are too high, it can be more beneficial to follow them instead of staying with 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 (U.S. Cluster Mapping Project, 2008; European Cluster Observatory, 2008). 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.

While the size of the cluster sector is largely a reflection of broad patterns in economic composition at the national level, especially the degree of service-orientation the economy has reached, the level of specialization within the cluster sector turns out to be 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 such 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 cluster composition of a regional economy in explaining differences in average GDP per capita. 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 and density instead of relative specialization matter most (Bruelhart/Sbergami, 2008). 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 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 plays an increasing role (Word Bank, 2009; Brühlhart, 2009; Krugman, 2008). The European data suggests that 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 where competition for input factors drives up costs (Delgado/Porter/Scott, 2008).

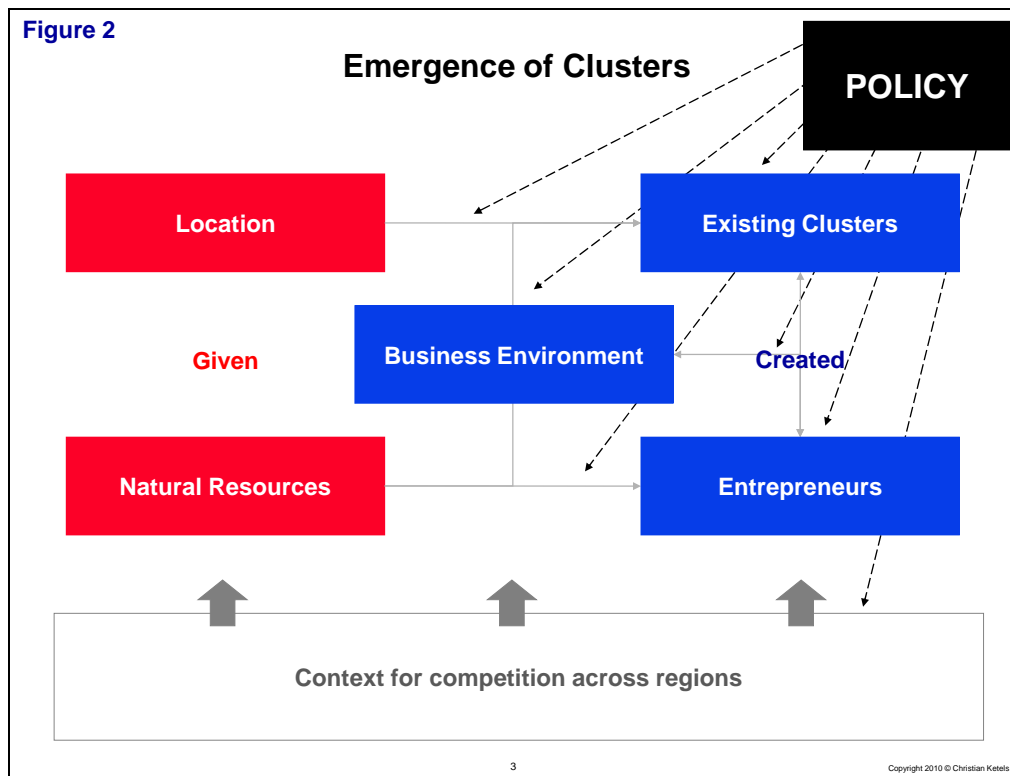
The positive impact of cluster strength on economic performance works through a number of distinct channels (Porter, 1998). Companies within clusters achieve higher levels of productivity (Boasson/MacPherson, 2001). They can, because the presence of specialized suppliers and

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.

2.2 Cluster evolution

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 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 emerge where economic transactions across locations are feasible *and* there are specific factors in a location that provide a nucleus for cluster dynamics to develop. The first condition is often neglected in policy discussions but crucial for cluster dynamics to become more relevant. It is clear, however, that the much longer history of deep market integration in the US compared to Europe has 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 condition, 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 in older clusters that have lost their traditional market but found new ways to leverage their capabilities. Changing patterns of regional specialization therefore tend to follow a pattern of “related diversification” (Neffke et al., 2009). Clusters can increase companies’ ability to transfer capabilities to such new uses, even if the traditional anchor company that initially gave rise to the cluster has vanished (Treado/Giarratani, 2008). 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 already 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 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 or 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. These findings are relevant not only for exports but also more generally for economies' changing patterns of specialization.

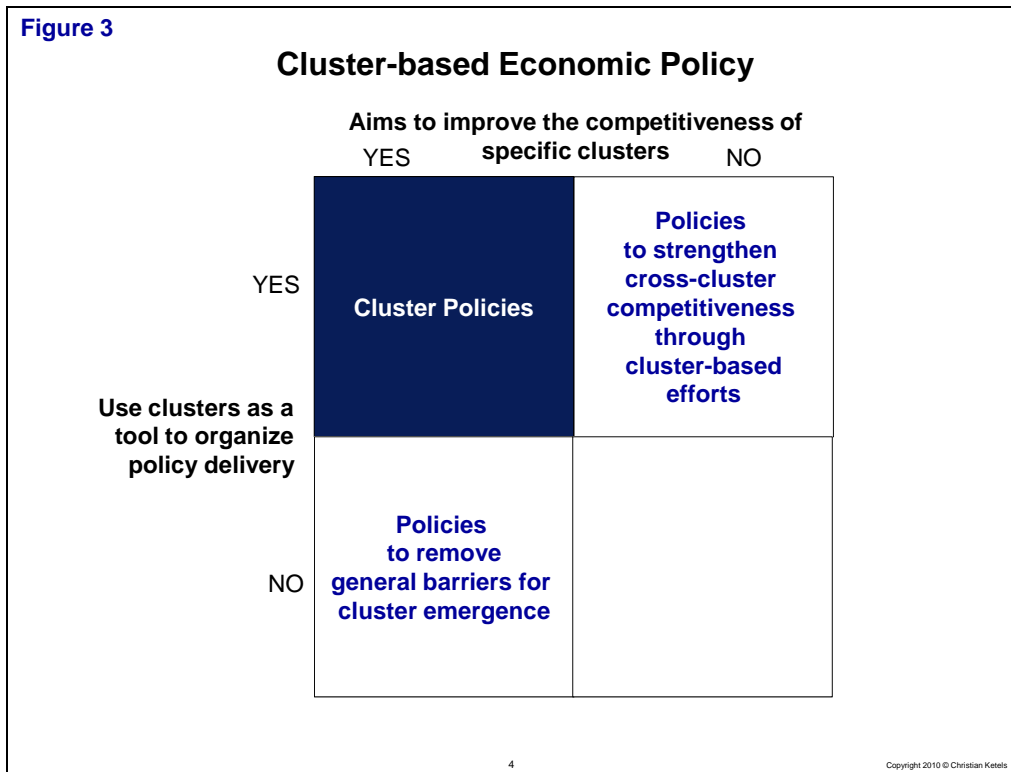
3. Cluster policy

Cluster research over the last twenty years has to a large degree focused on establishing clusters' 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, at least the academic discussion on cluster policy remains far from agreement.

Practitioners, meanwhile, have over the last few years launched an impressive number of cluster policy programs. Catalonia was among the first economies globally that launched cluster efforts around the time when Porter's "Competitive Advantage of Nations" was published (other "early adopters" were the Basque country (Aranguren et al., 2006), Denmark, Finland, and the Netherlands). The experience with this first wave of cluster policies was mixed, and there was a period of less activity that lasted up until the early 2000s. Catalonia was among the few regions that continued its cluster programs over time. Since then, there has been a marked revival of cluster efforts, especially since 2005. This revival 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; Freser, 2005). 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.

The lack of a generally accepted definition of cluster policy was a significant source of the disagreements in the policy debate. For this analysis, we define cluster policy to focus on *efforts by governments, alone or in a collaborative effort with companies, universities, and others, that aim to increase the competitiveness of specific clusters by organizing government policies around them*. This excludes efforts by other entities acting alone, for example pure private cluster initiatives, and government policies that 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 economy in general). The term cluster-based economic policy is used in a slightly wider sense, including also cross-cluster policies affecting the fundamental conditions for cluster emergence as well as the use of cluster structures as public private dialogue tools to improve cross-cluster competitiveness.



3.1 The basic motivation for cluster policy

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. In practice, efforts to address market failure are never perfect (Rodrik, 2008). 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 create, 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. While some distortion remains, the approach promises a potentially better balance of effects.

3.2 Two opposing approaches to cluster policy

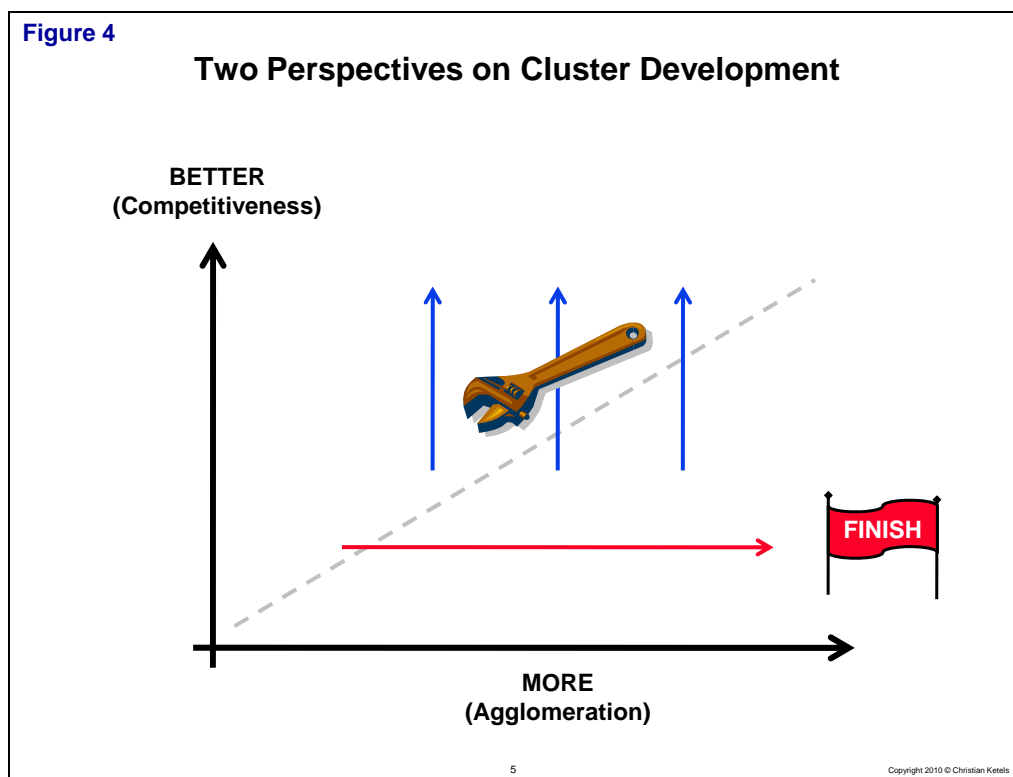
In the academic debate, the strongest criticism of cluster policy does not come from researchers that claim that locational factors are irrelevant, but from economic geographers and others that fully support the view that locational factors are important. Some criticize the “fuzzy” way the cluster framework is translated from an academic idea into a practical policy concept (Martin/Sunley, 2003). But while the issues raised in these discussions reflect important operational challenges of implementing cluster policy, they also tend to reveal a limited sense of the needs of policy practitioners: Cluster policy is a complex process and requires a framework that enables context-dependent on-the-ground choices, but that does not provide a conceptual argument against its use. 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. Economic geography-based approaches, too, look at the effects of traditional tax, trade, and regional policies on agglomeration patterns (Baldwin et al., 2003). Dynamic ‘new economic geography’ models provide guidance on when and how these instruments should be used to have a maximum impact (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 limited 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; Mills et al., 2008).

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.

3.3 Implementing cluster policy to improve competitiveness

The discussion so far has established a solid conceptual argument for cluster policy as a tool to leverage cluster agglomerations as a tool to achieve higher impact on upgrading underlying competitiveness. Whether these possible benefits of such policies materialize in a meaningful fashion, is a question of how and where they are implemented, not just of their conceptual solidity. Three issues are of particular important. First, does cluster policy open the door to distortive interventions that have little to do with the original objective but easily follow once

cluster programs are launched? Second, are the effects of cluster policy strong enough to warrant more fundamental policy interest? Third, which locations should use cluster policy?

Cluster policy uses industry-specific policy instruments and activities. As such, it 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, it opens the political process for all kinds of sector-specific interventions that undo its theoretical benefits (Rodrik, 2008). 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 (EBRD, 2008). 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 specific steps and conditions can reduce the likelihood of cluster policies being high-jacked by narrow interest groups: High exposure to external competition and robust competition policies domestically reduces the danger that collaboration leads to lower rather than more sophisticated rivalry. Competition models with the involvement of external jurors can depoliticize the selection process and induce a clear orientation to excellence. 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. Overall, especially the role of government needs to be carefully designed. While there is no systematic evidence that a government role per se is negative (Sölvell/Lindqvist/Ketels, 2003), government cannot create clusters (Porter, 2008) and can easily impose conditions that hurt competitiveness.

Cluster policy has in the past often been applied at the level of individual clusters. But simple arithmetic suggests that working with one cluster in a region, even if it is a large one, is unlikely to generate economic outcomes that are meaningful for an overall regional economy. The average regional cluster accounts for about 1% of total employment in a region (European Cluster Observatory, 2008); larger cluster categories like financial services or transportation can in individual cases reach much higher levels but are for most regions not above 5% of total regional employment. High-tech clusters like biotech range at a fraction of such numbers. Purely growing one such cluster by improving its competitiveness can thus have high impact on a few individuals and companies but will tend to have only a moderate impact on the regional economy at large. A number of recent analyses have identified how cluster policy can be designed to affect the wider regional economy and thus become a quantitatively important tool for economic development efforts (Pietrobelli/Rabelotti, 2004; High Level Advisory Group on Clusters, 2008; Ketels, 2009). Locations should take a portfolio perspective on their cluster efforts, addressing the different needs of clusters at different stages of development and

leveraging the linkages across clusters. Effective cluster policy mobilizes all clusters, not just one that is supposed to drive future economic growth. 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. And locations should integrate their cluster efforts into a broader economic strategy that identifies the specific value that the location provides relative to its peers. Clusters can effectively communicate the unique advantages a location offers, much better than general attributes like “open for business” or “entrepreneurial”.

Cluster policy has advantages that apply to pretty much all locations. But as is the case for many other policies with general benefits, their particular value depends on the specific context in which they are applied (Rodrik, 2007). Cluster policies are most powerful, if cluster dynamics address some core challenges an economy is facing. In Sweden, for example, low levels of entrepreneurship and insufficient commercialization of research activity are two important concerns that cluster policy is well placed to address (Ketels, 2009). Cluster policies can be ineffective or even backfire, if the economic context in terms of government institutions and effective competition is weak; the discussion above has pointed out how cluster policies can otherwise turn into costly interventions. In Russia, for example, some basic conditions are missing for the national cluster program to be very effective (Porter/Ketels, 2007). This also indicates that cluster policies are not a substitute for sound general economic policies. In the Central European countries that joined the EU, there was little evidence that countries with stronger cluster policies did better overall or even had stronger clusters; it was the general competitiveness of the economy that mattered most (Ketels/Sölvell, 2006). If the general context is not suitable for ambitious cluster policy programs, cluster efforts can still play an important role. In developing countries, cluster efforts can play an important role in creating the local and regional social capital that is a foundation for future competitiveness upgrading (Ketels, 2006). This makes them an important effort, even when the direct economic impact of the cluster policy is moderate or low.

4. 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.

The absence of a consensus on the usefulness of cluster policy is to a large degree the consequence of confusion about what cluster policy actually is. If cluster policy is understood as

a tool to artificially change the nature of economic geography, there are many conceptual and practical arguments against its use. If, however, cluster policy is seen as a way to leverage existing agglomerations as platforms for collaboration to enhance cluster dynamics and as more effective channels to deliver economic policies, it has much potential.

Whether or not cluster policy can fulfill this potential, is not only a matter of achieving more clarity in a conceptual debate that is too often conducted in the parallel worlds of different research traditions that fail to communicate. It also depends on the way cluster policy is implemented in practice. Every policy approach that includes industry-specific measures and is focused on enhancing collaboration within an industry is exposed to the danger of becoming a cover for interventions that reduce competition rather than enabling competition at a higher level of productivity. To avoid this fate, cluster policies need to be accompanied by robust institutions and market environments with intense and open competition. Every policy approach that claims a more prominent role in the policy debate also needs to be able to demonstrate a meaningful quantitative impact on economic outcomes. For cluster policy to pass this test, it needs to pursue a wider agenda, including portfolios of clusters and using clusters as a tool for economy-wide competitiveness upgrading, then is the current practice in many regions. And every policy approach has to show its relevance in the context of a specific location. For cluster policy, this creates demands both on the economic environment that should exist and on the economic challenges that a location needs to tackle. Cluster policy is not always the most important answer, but it is often part of what governments should consider.

Further progress in the cluster policy debate will have to be driven by more data. For clusters, there is now an increasing amount of quantitative data across many regions that has enabled a new wave of interesting empirical research. For cluster policy, there is nothing comparable. The impact assessment that exists looks at individual cases on-by-one and tends to be focused on improving the specific policy program in place, not on fundamental tests of cluster policy as a concept. This is a start, but more has to follow.

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