

## Clusters and competitiveness: Porter’s contribution

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Clusters have been known to exist at least since the days of Marshall. But Michael Porter’s work, first in *The Competitive Advantage of Nations* (Porter, 1990) and then in *On Competition* (originally published in 1998; updated edition in Porter, 2008), has undoubtedly had a singular role in raising the profile of these ideas to a wider audience, especially many practitioners in business and government. Cluster initiatives, one of the ways in which practitioners have responded to Porter’s cluster ideas, have multiplied in numbers of the last few years. An internet search for cluster initiatives in 2005 identified 1,400 such initiatives. Since then, these initiatives have become much more numerous (Ketels, Lindqvist and Sölvell, 2006). Cluster policy programs, too, have been multiplying. A review for the European Commission in 2007 indicated that all EU member countries had some type of cluster policy program in place (Oxford Research 2008).

Critics have argued that such popularity itself is no proof of profoundness (Martin/Sunley, 2003; for a different perspective see Benneworth and Henry, 2004).<sup>1</sup> While this is true, so is the opposite: popularity is clearly not a sign of conceptual weakness. At the minimum, it is a strong signal of relevance. And given that the interest in these ideas has remained strong if not grown over the last two decades, popularity is an indication of the robustness of Porter’s ideas. He clearly struck a chord, most definitely with practitioners. Understanding why this has been the case is relevant not only for policy practice, but also for academic research that aims to be relevant.

The chapter first looks at the origins of Porter’s interest in clusters. Rather than representing a break relative to his earlier work on companies, clusters and the broader notion of competitiveness turn out to be natural extensions of his prior thinking. The chapter secondly identifies the key characteristics of Porter’s conceptual thinking on clusters. The discussion explores the particular perspective that Porter has taken, often as a result of his specific background and prior research interests. It contrasts these ideas to the work in related academic fields and finds differences but few if any fundamental incompatibilities. The chapter thirdly turns to extensions of these core concepts in Porter’s more recent work. A central focus of this work has been the creation of broad-based empirical datasets that allow the testing and further development of the original cluster framework. The fourth part then explores the policy implications to be drawn from Porter’s work on clusters. Porter develops recommendations on how to leverage clusters as a tool in economic development. While many current cluster programs are broadly consistent with these ideas, some policy practice and much of the academic criticism of policies inspired by Porter’s cluster work have taken a different direction,

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<sup>1</sup> See Motoyama, 2008 for a broader discussion of the critique.

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looking instead into ways of creating clusters. The fifth section discusses why Porter’s work in this field has had such a profound impact, especially on practitioners. A central reason is that Porter addresses very specific needs of different practitioner constituencies, providing a framework and actionable ideas they could easily relate to. The final section turns to a number of open issues that will determine whether Porter’s long-term impact on the practice and thinking in this field will reach its full potential.

## Origins

Porter’s interest in clusters developed almost accidentally. Having been called into President Ronald Reagan’s Commission on Industrial Competitiveness in 1985, he went out to use his perspective as an industrial economist and business strategy researcher to better understand the competition the United States was facing. Given his professional background, he wanted to understand the firm level reasons for why the US seemed to be falling behind some its international peers, at the time in particular Japan. Porter quickly noted each of these countries the US competed with seemed to have strengths in specific industries rather than across the board. He assembled an international team of researchers to take a closer look at the leading industries across these countries to understand the drivers of their success. This work -which as earlier chapters in this book illustrate - culminated in the *Competitive Advantage of Nations* (Porter, 1990), very quickly revealed that in many industries the most successful companies happen to be co-located in a relatively narrow number of locations.

This observation could not be easily explained by Porter’s existing research. His work on competitive advantages had focused on drivers internal to firms as the key explanation of their success. Unless one would be willing to believe that the executives making the right strategic choices to build such advantages were accidentally co-located in a few places, this approach did not solve the puzzle. His work on market attractiveness could explain how companies from a given industry could capture varying levels of economic returns depending on the market structures they faced locally. But the motivation for Reagan’s Commission had been that foreign companies started to out-compete their US rivals on their own markets, where everyone was exposed to the same market structure conditions.

Porter needed to develop a concept to systematically capture how the external environment at a company’s home based influenced its capacity for value creation and innovation. This would extend his previous work in two respects: It would add a second pillar to his work on value chains, which had provided the basis to understand how activities within the firm contribute to value creation. And it would add perspective to his work on market structures, which had identified five forces to understand how value was captured among suppliers, producers, and consumers.

The diamond of business environment qualities, the new framework Porter developed, provided an integrated perspective on the many different factors that influence how productive a company can be in a given location (Porter, 1990). Compared to the existing literature, this

new approach provided three critical innovations. First, it opened the view for the systemic interactions among different external conditions in affecting the value creation potential of a company. Access to better skilled employees or infrastructure, for example, becomes much more of an asset when market conditions create an incentive for companies to use these capabilities. This insight moved beyond much of the existing literature that had looked for individual factors to explain differences in country performance, neglecting the interactions between them. And it provided a new way of overcoming the sterile ideological debate about whether open markets (less government) or better factor inputs (more government) are the critical drives of a location’s prosperity.<sup>2</sup>

Second, it introduced demand conditions as a critical influence on the value generation capabilities within a location. Economists had thought about the impact of local demand basically in terms of its overall quantity, if at all. Porter, heavily influenced by his work with companies, provided a very different perspective. For companies, demand is clearly crucial; it is regularly the number one item manager’s worry about, much ahead of factor input conditions and often even ahead of rivals. Porter’s framework highlights the nature of demand, pushing companies to develop new and better products and services. Exposure to more sophisticated customers can enable companies to develop distinct advantages relative to their rivals, increasing the value that they are able to generate.

Third, it explicitly acknowledged the role of related and supporting industries and introduced the notion of clusters. Related and supporting industries contribute to the productive capability of a firm by giving it ready access to specialized inputs and services without having to face the different types of transaction costs associated with sourcing from other locations. Clusters extend this notion further, pointing out the role of competitors, specialized research and standard setting institutions, government agencies, and other public and private bodies that facilitate linkages and common action. Clusters enable and push companies to leverage the opportunities of a given business environment.

Overall, Porter’s work on clusters has logically emerged from his earlier work on company strategy. Competition is for him the unifying phenomena, and his work looks at how it affects companies, clusters, and locations, and what they can do to succeed in an environment where competition is a critical organizing principle.<sup>3</sup> Porter’s work on clusters is an important element of his broader analysis of how location affects prosperity and company performance. Clusters exist because they provide real economic benefits to the companies that co-locate. But clusters as agglomerations are not the sole driver of performance; they emerge because of specific business environment conditions and enable companies to leverage these conditions more effectively.<sup>4</sup> Clusters are not a substitute for weak business environment conditions. In fact, under such conditions they are very unlikely to emerge naturally in response to market signals.

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<sup>2</sup> On both accounts, there are interesting similarities between Porter’s thinking and some of the arguments made by Rodrik (2006) and Hausmann, Rodrik and Valesco (2005).

<sup>3</sup> See Porter’s new introduction to *On Competition*, revised edition, 2008

<sup>4</sup> See Porter et al. (2008) and Furman et al. (2002) on the integration of the cluster dimension into broader assessments of competitiveness and innovative capacity.

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Clusters have to be seen within the context of the overall competitiveness framework to fully understand their dynamics and avoid policy mistakes.

### **Key elements of Porter’s cluster concept**

Porter (2008, p. 215) defines clusters as ‘a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities’. His work is driven by his interest in their role in enabling companies to reach higher levels of productivity. While the general categories Porter uses to describe clusters are not fundamentally different from the broader related literature, his background in business and market analysis provides his work with a unique perspective. Two dimensions are particularly important:

First, geographic proximity within the cluster is the defining element that enables cluster dynamics to develop. Porter’s background in business strategy analysis gave his perspective on proximity a particular flavor. Deep interactions with local partners are sources of sustainable competitive advantages. While working with the best global research center located somewhere else might provide clear benefits, it is something that competitors from any location in the world in principle can copy. A close relationship with a local partner, however, is something that in its depth is only achievable for companies located there. Working with leading suppliers and research centers around the world is, conversely, a necessity to enter competition at the most advanced level. But it does not provide the type of sustainable competitive advantages engagement in a strong local cluster can deliver. Few other analytical approaches to clusters contain such a clear notion of the different and complementary role of local and global linkages (see also Barthelt et al., 2004; Wolfe and Gertler, 2004). For Porter, it was a natural complement to his work on global strategy (Porter, 1986).

Second, value creation proximity – i.e. the strengths of relations between different activities in creating value for customers - within a cluster is a necessary condition for co-location to be relevant. Only if activities affect each others’ value creation, geographic proximity between them matters. This perspective leads to a view of clusters as entities that cut across narrow industries and often also across broad economic sectors like manufacturing or services. Porter’s earlier work on value chains clearly indicates that such categories were of little use to understand the range of activities that had to be combined in order to produce a competitive product or service. This perspective also opens the view for including specialized government agencies, business associations, and other organizations into the cluster if their activities have a significant impact on the companies’ value creation. Porter argues that organized collaboration can significantly enhance the impact of co-location on performance. But he also notes that many of the cluster dynamics play out even in the absence of such organized joint efforts as an automatic consequence of proximity.

Overall, Porter’s approach to defining clusters is driven by revealed outcomes and behavior, i.e. the evidence that being close to one another matters for economic performance,

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not by generic definitions, for example the use of a common technology (a central consideration for the definition of industries in official statistics), or by a specific type of linkage (common labor market, common factor inputs, knowledge or other non-pecuniary spillovers). All of the above could underpin the presence of a cluster; what matters to Porter, is the revealed overall impact in terms of cluster dynamism, not the specific mechanism through which it is achieved. This approach has been criticized as ‘fuzzy’ (Martin and Sunley, 2003), making it impossible to truly test the cluster approach empirically. Section 3 below shows that this principles-based definition can be translated into testable empirical definitions, a process that was under way but had not been published when the criticism was voiced.

There is no fundamental conflict between the core elements of Porter’s work on clusters and other schools of thought in this area. They are all grounded in related prior work by Marshall, Jacobs, and others; Porter’s chapter on clusters in “*On Competition*” explicitly discusses these connections. But while there is a lot of common ground, there are not surprisingly also differences in the respective focus of the work, in the methods, and in the policy conclusions.<sup>5</sup>

The literature on Industrial Districts (e.g., Becattini, 1990) concentrates on the particular type of cluster present in Northern Italy, focused strongly on the social embeddedness of clusters.<sup>6</sup> The new economic geography literature (e.g. Fujita, Krugman and Venables, 2001) uses mathematical models to analyze the impact of differences in trade costs between regions on agglomeration patterns under conditions of forward and backward linkages and spillovers. These models abstract from business environment conditions that in Porter’s framework are the foundation of cluster emergence and economic performance. In the new economic geography as well as in the related urbanization literature (e.g., Glaeser, 2008; Jacobs, 1969; Scott, 2006) the focus tends to be on economy-wide linkages, not on linkages within more narrowly defined clusters. The literature on innovation systems (e.g. Cooke, 1998; Nelson, 1993) focuses on the dynamics of knowledge flows, localized learning, and innovation, often with a bias towards science-driven innovation. This is one of the central dynamics within clusters that Porter analyses in his work, but not the only one. As in the broader literature on regional studies, the focus in the innovation system literature is on public policy and the science system, not primarily on the role of companies in related industries. The literature on value chain analysis (e.g. Humphrey and Schmitz, 2000; Gereffi and Kaplinsky, 2001) concentrates on how the position of companies and clusters in developing economies within global value chains affects economic development. The focus of this work is often on the power relations within global value chains and how this might hinder or help economic development. There is also a large empirically driven literature on the geography of innovation, mostly focusing on advanced economies (e.g., Audretsch and Feldmann, 2003; Saxenian, 1996). The work on creative regions (Florida, 2003) concentrates on identifying factors that enable regions to attract and retain a ‘creative class’, seen as a necessary asset for economic development and especially regions’ ability to be hotbeds of new ideas.

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<sup>5</sup> See Cortright (2006) for a discussion of the different strands of literature.

<sup>6</sup> See Porter and Ketels (2009).

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Despite the many linkages and complementarities between these different strands of work, there is a sense that they have largely developed in parallel to each other and especially to Porter’s work. The use of different methods in particular seems to have been a barrier for the flow of ideas. The focus on different dynamics or issues leads to different or even opposing conclusions: the new economic geography literature points out how economic integration can increase the divergence between central and peripheral regions (World Bank, 2009a), while the cluster literature argues that economic integration creates opportunities for all regions to attract clusters. The literature on creative regions identifies characteristics that all regions should aspire to, while the cluster literature identifies the need to develop a unique profile of capabilities that is different for each region. A sense of competing for the attention of the same decision makers might have also added to an unwillingness to fully engage.

Whatever the reason, the lack of productive dialogue is problematic. There are no fundamental incompatibilities across the different approaches. Where deeper differences in perspective exist, they tend to reflect the focus on one particular dynamic rather than another. The opposing views of the new economic geography and cluster literature on the impact of integration on especially peripheral regions is a good example: In practice, both dynamics are at work and what is needed is a conceptual approach that identifies the conditions under which one or the other empirically dominates.<sup>7</sup> This is only one example of where the lack of an effective dialogue between the different approaches has limited progress in the field.

### **Empirical tests of Porter’s cluster concept: Cluster mapping**

In the first decade after the publication of *The Competitive Advantage of Nations*, Porter’s work was focused on case studies and further developments of the conceptual framework. He worked with a number of countries and regions that had taken an interest in his ideas, from the Basque Country in Spain to New Zealand, Portugal, Colombia, the countries of Central America, the state of Massachusetts in the US, and many others. Cluster mobilization was often a central part of these projects. The 1998 Harvard Business Review article ‘Clusters and the new economics of competition’ (Porter, 1998) summarized many of the key findings from this work, establishing the central role of clusters in Porter’s overall thinking on competitiveness.

Over time, the focus of Porter’s work then started to include large-scale quantitative efforts on data generation and analysis. Already *The Competitive Advantage of Nations* had used trade data to gain insights into the cluster specialization of countries, and into their competitive positions on global markets. But these first efforts were not sufficient to test the impact of cluster presence on economic outcomes, a core hypothesis of Porter’s conceptual thinking. In the late 1990s, Porter started an initiative to derive a quantitative mapping of clusters to conduct such tests. Porter sought to identify clusters from the revealed locational patterns of economic activity across the US. Based on the existing data structure in terms of regions (states and economic areas in the case of the US) and industries (4- and 5-level SIC-codes), he looked at

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<sup>7</sup> See Brühlhart (2009) as an interesting example of such a discussion.

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the locational patterns of employment within narrow industries and regions. In a first step, this led to a separation of industries where employment was significantly concentrated across regions (Porter calls them traded cluster industries) from industries where employment was evenly spread across space (Porter calls them local industries). For the first group of industries, the co-location of employment across industries was then a main determinant to identify 41 cluster categories, i.e. groups of industries that tended to co-locate (Porter, 2003 describes the approach in more detail).

This mapping of industries into clusters resulted in a dataset covering the entire US economy that indicated employment numbers per cluster for each region. The dataset also included average wages, job creation, establishments, and patenting by regional cluster.<sup>8</sup> In ‘The Economic Performance of Regions’ Porter uses this data to test key hypotheses derived from his conceptual framework (Porter, 2003). This analysis provides a more nuanced understanding of the role of clusters for regional prosperity: At the national level, the traded cluster sector accounts for about 1/3 of US employment and registers higher wages, higher productivity, and higher productivity growth than the economy overall. The traded cluster sector also accounts for the vast majority of patenting in the US. At the regional level, higher wages in a region’s clusters are highly correlated with wages in the local industries and with a region’s overall wage level. The dominant driver of average regional wages is the level of wages regions reach within individual traded clusters and the local industries, not the employment mix across clusters or the between clusters and local industries. Increasing employment specialization in clusters is associated with higher wage growth. And a higher share of employment in strong clusters, i.e. regional clusters with a location quotient above a cut-off point, is associated with a higher average regional wage and higher regional patenting intensity (Delgado et al., 2006).

At the cluster level, higher specialization within a regional cluster, measured by standard location quotients, is correlated to higher relative wages compared to the national wage in the cluster category. Higher specialization seemed to have a stronger impact, if it is not only driven by high employment in a narrow industry, but reflects strong employment positions across several industries within a cluster. While these findings on the positive relationship between cluster presence and economic performance are quite consistent the related literature, especially from economic geography studies, they are for the first time derived within a consistent cluster framework. More recent analysis distinguishes between simultaneous cluster (agglomeration) and catch-up (dispersion) effects: Higher initial employment within a narrow industry reduces future employment growth within that industry but increases job growth in related industries within a cluster (Delgado, Porter and Stern, 2007).

Porter’s initial results for the U.S. were found to hold also in Canadian (Institute for Competitiveness and Prosperity, 2002) and European data sets (Ketels et al., 2008; European Commission, 2007). Using the same cluster definitions as in the US study, these studies indicate that US regions receive meaningful economic benefits from their higher levels of specialization compared to their European peers. Medium-sized European regions in particular are much less

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<sup>8</sup> The data is accessible through <http://data.isc.hbs.edu/isc/>

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specialized in their employment portfolios around clusters than their US counterparts. Comparisons within the EU also highlight the importance of general business environment conditions alongside cluster specialization: Across all 27 EU member countries, a heterogeneous group of economies at different levels of economic development and overall competitiveness, there is no statistical relationship between cluster presence and regional performance. But as soon as subgroups of countries at similar overall levels of competitiveness are created, the relationship is significant in the subgroups of the old EU members in Western Europe (EU-15) as well as of the newer members in Central Europe (EU-8).

The empirical findings inspired new conceptual thinking on the role of cluster linkages. One dimension of these linkages is geographic: the data revealed that regions and regional clusters register higher performance if neighboring regions are specialized in the same fields. This is consistent with the misalignment of administrative regions used for statistics with the functional economic regions companies operate within. But it is also consistent with possible synergies between neighboring regions, an observation that influenced Porter’s work on collaboration between neighboring regions<sup>9</sup> and synergies between metropolitan and rural regions (Porter et al., 2004).

Another dimension of these linkages is related to the value creation process. The cluster mapping exercise revealed that cluster categories were not isolated islands, but often connected through industries that had significant ties to more than one cluster. Porter exploited this observation to systematically track which clusters were linked to one another through a significant number of ‘shared’ industries (Delgado, Porter and Stern, 2007). In the regional analysis, it turns out that regions that have strong clusters in related fields are doing better than regions that have strong clusters without such connections. This observation influenced Porter’s thinking on the evolution of regional economies and the diversification of a country’s export portfolio. For regions, growth is likely to occur in related fields, not completely new fields without any relation to existing activities.<sup>10</sup> Similarly for exports, growth is most likely to occur through strengthening positions within existing clusters<sup>11</sup> and through diversification into related clusters.<sup>12</sup>

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<sup>9</sup> Porter has worked extensively with Central America through CLADCS, a research center at INCAE Business School. See Ketels (2009b) for an application to the Baltic Sea Region.

<sup>10</sup> Neffke et al. (2009) provide evidence on the evolution of specialization patterns across Swedish regions that confirm this view.

<sup>11</sup> This is consistent with recent empirical findings (Newfarmer, 2009) that indicate significant export potential for developing economies in areas of existing export categories.

<sup>12</sup> Hausmann and Klinger (2007) independently proposed a related approach. They identify proximity between product groups based on the income level of countries that export them, not by underlying cluster linkages revealed through co-location of economic activity. They do not discuss the potential for improving exports in existing products and suggest the use of more traditional industrial policy tools to implement their approach.

## **Policy implications of Porter’s work**

Porter’s conceptual work and the supporting empirical tests indicate that strong clusters go hand in hand with strong economies. The lessons drawn by practitioners from this observation have, however, in some cases been quite different from Porter’s own reasoning and advice. This section first presents Porter’s own view about the policy implications of the cluster framework, and then contrasts these ideas with some of the applications seen in practice.

Clusters are the appropriate level for government and companies to engage in efforts to improve competitiveness; this is at the heart of many of Porter’s discussion of the policy implications from the cluster approach (Porter, 1998). He sees clusters as a powerful tool for policy diagnostics, design, and delivery, not as something that government policy ought to create. Based on this general view, Porter identifies five broad roles for public policy (Porter, 1998). First, include an analysis of the cluster portfolio and individual clusters in your assessment of the local economy. Second, ensure that overall economic policies strengthen the general business environment to support the natural emergence of clusters. Third, remove policies that actively work against the emergence of clusters, for example by opposing tendencies for regional specialization. Fourth, leverage clusters as a delivery channel and object of economic policies to upgrade the relevant business environment conditions and thus competitiveness. Fifth, encourage the emergence of cluster organizations that can strengthen the linkages and spillovers within clusters.

The two last roles are most visibly different from traditional approaches. On organizing policies around clusters, Porter sees, for example, cluster-based workforce development efforts or foreign direct investment attraction as being more effective than efforts organized by individual companies or broad sectors of the economy (see Porter in Mills/Reynolds/Reamer, 2008). Targeting individual companies has a strong impact on these particular firms but is highly distortive across the markets in which they operate. General programs for large swaths of the economy avoid much of the distortive effect but are also known to be not very effective in using public resources. Clusters provide a better trade-off between these two concerns: Distortions are reduced, because by definition the linkages transmitting such possible distortions are strong within the cluster but weak outside. Impact is increased, because the policy reaches a receptive group of companies and the cluster dynamics enhance the policies’ direct impact.

Porter suggests organizing policies towards clusters not only because that makes them more effective, but also because it allows these policies to be more informed. At a fundamental level, a cluster focus helps, especially regional government, to get a more nuanced sense of the economy.<sup>13</sup> But moving beyond this diagnostic phase, clusters also offer an effective platform to then engage the private sector in a dialogue about policy design. One of the key challenges for policy makers is to identify how scarce resource should be used in order to have the optimal impact on the competitiveness of companies and the overall economy. In making these trade-

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<sup>13</sup> See Porter’s presentation to the National Governors Association in the United States, based on Porter, Council on Competitiveness and Monitor Company, 2005

offs, say, spending on a new university instead of giving an R&D tax credit, governments need to understand how companies will react to these policies and whether they address any binding constraints they face. Many countries have established policy dialogues between the public and the private sector at the level of the entire economy. But these discussions have a tendency to focus on the few issues relevant for all companies, like taxes and general bureaucracy. A dialogue at the level of a cluster can go much deeper, addressing the many more technical issues that are together hugely important for competitiveness.

On mobilizing cluster initiatives, Porter is as much concerned with enhancing the level of positive spillovers within the cluster as with identifying specific efforts to improving the underlying business environment. In a static sense, cluster initiatives (Porter sees them as a particular type of what he calls ‘Institutions for Collaboration’) can enable higher levels of interactions between companies for a given level of business environment quality. Porter mentions his own work with the medical device cluster in Massachusetts, where prior to the creation of MassMEDIC many of the companies did not realize the breadth of related companies nearby (Porter, 1998). In a dynamic sense, cluster initiatives can be platforms for joint action between companies or between the private and the public sector to improve the underlying competitiveness of the cluster. Porter argues strongly for private-sector leadership in cluster initiatives. This might be influenced by his experiences in the US, where the private sector tends to be willing to take the initiative. In Europe, behavior is often different and governments play a more important role in launching cluster efforts. The emerging empirical literature finds such public sector leadership consistent with effective cluster mobilization, as long as the private sector assumes responsibility for the action agenda of the initiative (Lindqvist, Ketels and Sölvell, 2003).

The actual practice of cluster policies and cluster initiatives is highly heterogeneous, depending on the economic context but also the economic policy orientation of governments. In advanced economies, cluster policy has become a relatively widely used policy tool, especially in innovation policy but also in regional and SME policies. Cluster policy is in most of these cases designed as an additional pillar alongside existing programs, usually with a modest share of overall funding. In the US, the federal government has traditionally not had a cluster policy, but both the Economic Development Administration (EDA) and the Small Business Administration (SBA) are now funding cluster-based efforts. U.S. cluster activity has traditionally been driven by private-sector leaders, but some U.S. states have also active cluster program. There is some degree of ‘me-too’ cluster initiatives found across all states, for example in life sciences, but this is not typical. In Europe, as well as in Canada and Japan, government plays a significantly more important role as the initiator of cluster efforts. Many of the more recent cluster programs, e.g. in France, Germany, and Sweden, award funding based on open competitions. A few countries and regions have used the cluster framework as a more fundamental basis of their economic and innovation policy, e.g. Finland (Ylä-Anttila and Palmberg, 2007) and the Basque Country. Local and regional governments have found a new role in the mobilization of cluster efforts, often using co-financing available through the EU structural funds. National governments and the EU remain largely focused on financing, limiting the public-private dialogue on national/EU-level policies affecting clusters.

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In developing and emerging economies, cluster efforts are hampered by the generally weaker clusters and general business environment conditions. In Latin America, organizations like the Inter-American Development Bank and the Central American Federation (CAF) but also national entities like Fundacion Chile are engaged in cluster-programs, some with many years of experience. In Africa and developing economies in Asia, the World Bank, UNIDO, USAID, and others make use of cluster initiatives. While these efforts have had local success, in particular in upgrading the export abilities of some regional clusters, they still account for a relatively small fraction of overall economic development activities. In general, clusters have not become a tool in driving competitiveness upgrading at a broader level. In the emerging economies of Asia and the Middle East, governments are much more willing to actively engage in the creation of clusters. These programs target specific industries rather than clusters, often through dedicated investments or incentives. In many cases, this has led to a proliferation of virtually identical cluster efforts across neighboring regions with little relation to their existing capabilities and economic base. Some of these efforts have been successful, usually if the selected industries leverage existing strengths and the policies used imposed high levels of competition alongside government support. But the failures are numerous, with little positive impact on either the wider economy or overall competitiveness.

The notion of government ‘creating clusters’ finds no support in Porter’s own work<sup>14</sup> and characterizes only a segment of actual government cluster policies. The evolution of clusters is a complex, market-driven process that government influences but cannot effectively control.<sup>15</sup> Nevertheless, the suspicion that cluster creation is the essence of cluster policy underpins much of the academic criticism of Porter’s influence on government policies. Interestingly, the creation of clusters is a much more natural policy in other conceptual approaches than in Porter’s framework: In models of the new economic geography literature, for example, agglomeration is the key mechanism and cluster policy understood to mean the artificial creation of agglomeration (Duranton, 2009; Baldwin et al., 2004). Many of the authors from this field are rightly critical of such policies (Martin et al., 2008a) that rely on little if any empirical evidence to support their effectiveness. But these policies are also diametrically opposed to what Porter’s work suggests cluster policy should be.<sup>16</sup>

The issue that concerns policy makers significantly more is how to generate more impact from existing cluster programs and initiatives (High Level Advisory Group on Clusters, 2008). While there is significant data on how the presence of clusters relates to economic outcomes, there is no comparably systematic data on the impact of cluster initiatives or programs. The available case studies and individual program evaluations point towards a positive impact on the companies involved and on generally improved public-private cooperation at the regional level, but do not quantify the economic returns achieved.<sup>17</sup> The

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<sup>14</sup> See the interview with Michael Porter in Svenska Dagbladet, 28 January 2008. See also several of Porter’s presentations in the Middle East on this point; [www.isc.hbs.edu](http://www.isc.hbs.edu)

<sup>15</sup> See the case studies and discussions in Braunerhjelm and Feldmann (2008) and in Breshnahan and Gambardella (2003); see also Sölvell (2009) and Konakayama and Chen (2007).

<sup>16</sup> See Ketels (2009a) for a further discussion of these misperceptions.

<sup>17</sup> Ketels (2009a)

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benefits accruing to the wider regional or national economy are often small. These observations suggest that current cluster policy practice is concentrated on mobilizing existing clusters to achieve higher levels of performance. But there is little evidence of cluster policy being used to strengthen cluster portfolios or to upgrade general business environment quality.

### **Drivers of success: How did Porter’s cluster concept become so influential?**

Porter’s work on clusters and competitiveness has had an exceptional influence compared to alternative approaches in the literature. And its impact has proven to be remarkably robust over time: over the last few years a whole new wave of cluster efforts were launched, more than a decade after *The Competitive Advantage of Nations* was published (Davies, 2006).

Reviewing the discussion so far, the depth of this impact is somewhat surprising. Porter’s conceptual framework has many unique features. But it also shares key notions with most of the other work in this area. There is an emerging consensus on the empirical benefits of clusters. And there is widespread agreement that clusters are a useful analytical tool to inform policy making. But whether cluster programs and initiatives driven by government are sufficiently powerful or even a good investment from a societal point of view remains in dispute. From a conceptual perspective, the lack of consensus on what cluster policy is and how it should be implemented remains acute. Part of this is the result of an insufficient engagement with Porter’s work on this issue. But part of it may also reflect a lack of specificity in his writing on the specifics of cluster policy. From an empirical perspective, there are many practitioners who find Porter’s approach a very powerful inspiration for their work. But the experience with the first wave of cluster efforts in the 1990s also suggested a need to significantly systematize the advice on specific tools and structures (European Commission, 2003; European Commission, 2002; den Hertog, 2001).

Why has Porter’s work on clusters achieved such a significant, long-lasting impact on policy thinking, despite the skepticism of other academics and the heterogeneous ways in which policy makers have translated his thinking into practice?

Porter’s work has a number of features that distinguish it from alternative approaches. Maybe most importantly, he is willing to address the big policy questions that ultimately motivate practitioners. Where many other researchers focus on dealing with narrow questions within a given conceptual framework, Porter puts the key policy question first, and then draws elements from different research approaches and methods to identify an appropriate response. A key strength of his work is the ability to develop conceptual frameworks that integrate different, more narrow ideas into a coherent overall framework. A second key principle for Porter is an orientation towards action. He aims to create models that help practitioners to understand reality in ways that enable them to make better decisions in a specific context. He is less interested in description for its own sake or in the identification of general principles that work ‘on average’ but provide little help in making more informed decisions in a specific situation.

These general characteristics of Porter’s work on clusters (as of his work on business strategy and industry analysis) go some way towards explaining the impact he has been able to generate. An important additional aspect is the attractiveness of his work on clusters for three specific target groups: business executives, policy makers, and cluster practitioners.

Business executives are an audience that other schools of thought in this field have generally failed to excite with their ideas. Porter’s work has been unique in capturing their imagination. Partly this is a function of the reputation he built with this group through his previous work on strategy and industry analysis. But it is also driven by the fact that he connects his findings on clusters and competitiveness with key issues that business executives face. And it is helped by making his arguments in a language that relates to business executives’ need for practical solutions:

- Globalization and economic reforms have increased competitive pressure on many markets, often dramatically. Companies have responded by increasing efficiency, a process that can to some degree occur within firms. But it often also requires shifting the boundaries of the firm (outsourcing of non-core activities) and systemic changes across the industry value chain. For both, the cluster framework provides an essential tool to organize individual choices within companies and joint action across clusters (chapter 7 in Porter, 2008; Best, 2001; Ketels, 2007).
- Globalization has also changed the relevance of location for competition by exposing companies – directly or through the rivals they face – to a much broader set of different business environments. Companies have responded by reorganizing the geographic footprint of their value chains (Berger, 2005; Baldwin, 2006). The cluster framework provides them with a tool to think about these choices and evaluate potential locations. Porter’s work on global strategy (Porter, 1986) created a natural platform to explore clusters as the local sources of competitive advantages exploited on global markets (chapter 8 in Porter, 2008; Porter, 2000; Enright, 1998).
- Innovation has become an increasingly important driver of competition and seems ever harder to achieve within companies alone. The cluster framework provides a natural context in which to think about how to engage with open systems of innovation (Chesbrough, 2003). Locally, clusters are a structure in which collaboration with partners can be organized (Best, 2001). Globally, clusters are the concentrations of innovative activity that companies can analyze and, if appropriate, tap into to connect with emerging sources of new ideas. Clusters play an important role in the innovative capacity of locations (Furman et al., 2002).
- The pressure on companies to contribute to solving the broader challenges facing the communities in which they are operating is increasing. Companies cannot ignore this pressure for fear of the negative effects on their bottom line, particularly if NGOs brandish their failure to behave in socially responsible ways. But companies also face the interests of their shareholders that ask for returns on all of the company’s activities to the bottom line. The cluster framework provide a means to organize collaboration

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with the public sector to improve the external context in a modern way, and to structure companies’ efforts to address social issues in ways that are aligned with long-term competitiveness (Porter and Kramer, 2006).

Policy makers are the more traditional target group for the work of academic researchers. But even with them Porter is able to target a specific need that had not been addressed well previous work. Policy makers at the national and regional level, but also in international organizations like the OECD, UNIDO, and the World Bank, are looking for growth policy concepts that moved beyond the traditional mix of sound macroeconomic policies, market opening, and investments in long-term knowledge assets (Zeng, 2008; Pietrobelli and Rabelotti, 2004; OECD, 2003; den Hertog; 2001; OECD, 1999). The cluster framework, especially if seen in the context of the wider competitiveness approach it is part of, outlines a policy development method whereby government can play an active role without committing the costly mistakes of traditional industrial policy (chapter 7 in Porter). For a number of functional policy areas struggling with concerns about their impact, like regional policy, innovation policy, policies for small and medium-sized companies (SMEs), workforce development, investment attraction, and poverty alleviation, the cluster framework provides new tools and approaches (Porter et al. 2004; Porter, 1996; World Bank, 2009b, European Commission, 2008; Ketels, 2005; Nadvi and Barrientos, 2004; Landabaso, 2001; UNIDO, 2001). For sub-national regions, a level of government often ignored in the traditional macroeconomic policy discussions, the cluster framework defines an important role in economic policy (Porter et al., 2005; OECD, 2007; Rosenfeld, 2002) and provides conceptual guidance on how to effectively organize the decentralization of economic policy responsibilities.

For some policy makers, however, the motivation for using cluster policies might have been different. Some seemed to hope that clusters policies provide a way to achieve growth while avoiding the hard work of improving the business environment. It is often easier to find support for a program that encourages collaboration within a cluster, then taking on the power of entrenched interest groups that are holding back competitiveness upgrading. Others truly believed that cluster policies could ‘create’ clusters, bypassing the arduous path of economic development in which clusters gradually emerge in response to improving business environment conditions.

Economic development practitioners that are in day-to-day contact with businesses, either as consultants or as employees of public or public-private entities with an economic development mission, are a third important target group. For them, the cluster framework provided a clear job description in terms of their own role and of the tools and approaches they could use (Waits, 2000).<sup>18</sup> And it is much more accessible and implementation-oriented than the related academic literature.

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<sup>18</sup> The Competitiveness Institute ([www.tci-network.org](http://www.tci-network.org)) has been created by a number of these practitioners in 1998 to promote and develop the use of the cluster concept in regional economic development. TCI has grown to a network of 1700 members in close to 100 countries.

## Where to go from here

There is overwhelming evidence of the major impact that Porter’s work on clusters has had over the last two decades. But this success, especially the huge wave of government-initiated cluster policy programs launched in the last few years, also creates high expectations for the economic outcomes to be achieved. The jury is still out as to whether these expectations will be met, despite the success of many individual cluster efforts and policies. There are a number of factors that will be important for this to happen – and for Porter’s work in this area to reach its full potential impact.

For academic research, the future legacy of Porter’s work on clusters will depend on whether his ideas will be re-connected to the related approaches in the field. Despite the large number of citations, Porter’s work has not been fully incorporated into the traditional academic discourse. Younger scholars interested in studying clusters in Porter’s tradition find it hard to establish themselves in the available academic career paths. As discussed above, there are no fundamental incompatibilities between the more standard work in economic geography, regional studies, and other related fields and Porter’s conceptual framework. The differences that exist are in perspective and method, not more. Porter’s more recent analysis of cluster mapping data brings him closer to the mainstream discourse, especially in terms of methods. There is significant potential for using this data in more systematic evaluations of cluster policy interventions and their impact, an issue where disagreement currently remains high and little relevant data is available. Porter’s work has more insights to provide to other academic research, as much as his own thinking could integrate more comprehensively the work of others.

For practitioners, the future legacy of Porter’s work will depend on whether the activities being implemented in this spirit will be able to achieve impact. Despite the significant case-based indications that cluster programs can deliver positive results, there is no large-scale quantitative data about their effectiveness. And where impact has been visible, it has often tended to be localized within the cluster rather than achieving a meaningful impact on an entire regional or national economy. Both of these issues can be addressed: There needs to be an effort similar to the cluster mapping project, but this time tracking the many cluster policies and programs around the world to evaluate their impact.<sup>19</sup> The evaluations of individual cluster programs regularly conducted by public funding agencies do not deliver this type of comparable data. The evaluation of companies that participate in cluster-type programs is useful but does not capture the impact on business environment conditions (Martin et al., 2008b). In addition, there needs to be more conceptual work to provide policy makers with the tools to ensure that cluster policies deliver broader benefits to the economy than is typical today (Ketels, 2009a). Porter’s thinking provides the foundations for this work but in his writings these issues have not been dealt with explicitly.

Most importantly, perhaps, the confusion that still exists about the policy conclusions to be drawn from Porter’s work on clusters need to be addressed. Many policies are called cluster

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<sup>19</sup> Lindqvist et al. (2003) take a small step in this direction for the narrow field of cluster initiatives.

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policies but have little or no relation to the action recommendations that can be drawn from Porter’s work. And many cluster policies are launched to reach objectives that they are ill-equipped to achieve. Any of the failures occurring because of these mistakes will inevitably create a back-lash against cluster policies. And they fuel a discussion in the academic literature that has little to do with Porter’s original ideas, provides little practical guidance on the real implementation issues practitioners face, and fails to reflect the insights that these ideas can provide to future research. A stronger focus on the research, and conceptual thinking underlying Porter’s thinking on cluster policy, rather than on clusters as a diagnostic tool, may be part of the answer to overcoming the misperceptions among practitioners. A more explicit engagement of the research undertaken in the Porter tradition with the related academic literature might be another. But it will also require a greater willingness in the broader research community to fully engage with Porter’s ideas, despite the different language he uses. Almost twenty years after *The Competitive Advantage of Nations* and ten years after ‘Clusters and the New Economics of Competition’ Porter’s cluster framework continues to have significant potential as a rich source of new research and ideas.

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