
Recent research on competitiveness and clusters: what are the implications for regional policy?

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This paper reviews implications of recent research on competitiveness and clusters for regions and regional policy. A new framing of competitiveness clarifies the role of regions. Its empirical findings align well with the literature on drivers of regional performance, but there are opportunities for mutual learning. A step-change in the availability of data on clusters and cluster policies has enabled new research approaches. Clusters are shown to have a close association with regional economic performance and evolution. Cluster policies are largely focused on strengthening existing agglomerations, not creating new ones. The paper discussed several practical insights for regional policy makers.

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Introduction

Competitiveness and clusters have been controversial terms since they entered the public debate in a significant way in the 1990s (Porter, 1990; Krugman, 1994; Martin and Sunley, 2003). This controversy soon spilled over into the debate on regions and regional policy as regional competitiveness and cluster programmes gained popularity among policy practitioners (Kitson et al., 2004; Martin and Sunley, 2011).

This paper contributes to this debate by analysing the implications of three streams of recent research on competitiveness and clusters. In different ways all of these research efforts build on Porter's initial contribution and the impact it has had on regional policy practice:

- First, a paper that proposes a new definition of competitiveness and implements

this definition empirically using a dataset on national economies (Delgado et al. 2012). This paper builds on earlier efforts to measure competitiveness at the national (for example, Porter et al., 2008; Sala-i-Martin and Artadi, 2004) and regional level (for example, Dijkstra et al., 2011).

- Second, a set of papers that operationalize Porter's definition of clusters (Porter, 2008; Delgado et al., 2013) and then uses the dataset derived to test the relation between cluster presence and economic outcomes (Delgado et al. 2010, 2011).
- Third, a range of studies documenting the reality of cluster programmes and cluster initiatives that have developed over the last two decades (for example, Lindqvist et al., 2003; Ketels et al., 2006; Europe Innova, 2008; Meier zu Köcker, 2012).

The paper presents the key findings from these studies and discusses their relevance to the criticism of the competitiveness and cluster framework as well as to other related work on regional economies. It then discusses the relevance of these findings for regional policy. It looks in particular at the implications for regions pondering how to design their smart specialization strategies required by the European Commission (EC, 2010).

Throughout the paper, the term region is used pragmatically. Conceptually, it refers to geographic areas that constitute an integrated economic space in which companies have access to a common labour market and a common supplier base, and where they are subject to the same type of knowledge spillovers or other types of linkages. Empirically, it relates to geographic structures of the public administration that broadly meet these criteria, and where regional policies are applied or set and for which data are available.

For competitiveness, the new research sets out to clarify and operationalize the term in a way that focuses on its role as a comprehensive framework to capture all factors that drive the prosperity potential of a location, focusing on those amendable to policy action. Its empirical implementation reveals the different roles of institutions, macroeconomic policies and microeconomic factors alongside each other and helps to better understand the impact of historical legacies on these factors. Even though the empirical analysis is focused on nations, the definition and conceptual framework applies to locations more generally. It can help provide a broader framework for the analysis of regional economies. But it also could benefit from integrating more the richer insights into the different facets of institutional quality that the regional literature has provided.

For clusters, the new research defines the term through transparent empirical operationalization. This enables the systematic analysis of the relation between the presence of strong clusters and economic outcomes. For cluster policies, the new research documents the range

of efforts empirically referred to by policy makers and practitioners under this heading. The heterogeneity of these efforts makes general statements about cluster policy problematic and explains the different results found in the literature about the impact of cluster efforts. It does show, however, that most of these efforts are fundamentally different from the type of policies to create clusters that are criticized in the literature.

The recent work on competitiveness and clusters is found to generate interesting insights for regional policy. It helps to clarify the roles regions have in affecting competitiveness, both in terms of the policy areas and the role in the process of setting and integrating policies. It confronts the misperception that regional competitiveness is only based on clusters and instead provides a more comprehensive diagnostic for policy makers to analyse their region. And it provides a number of learnings for how to use cluster efforts as part of a regional economic strategy. These learnings are discussed in the context of the European smart specialisation strategy.

The remainder of this paper is organised in three parts. The following section discusses the recent work on competitiveness and its relation to the research on regional economies. The next section then looks at the recent work on clusters and cluster policies, again discussing the new findings in relation to the relevant existing research. The final section then draws together the implications of this recent work on some key debates in the areas of regional policy. At the end, it provides some concrete recommendations on how these insights can be used by policy practitioners going through the process of developing a smart specialisation strategy as required by the European Commission.

Competitiveness and Regions

Competitiveness is a frequently used but also widely controversial term in the economic policy debate. It gained prominence in the

early 1990s, when the rise of Japan challenged the economic dominance of the USA (Porter, 1990). It was then famously criticised as trivial when focused on productivity or dangerous if focused on gaining market share (Krugman, 1994). While the term had been introduced with a clear focus on nations, it was over time also applied to regions, where its use triggered new criticism (Dijkstra et al., 2011; Kitson et al., 2004). In the analysis of regions it competed with approaches like regional innovation systems, learning regions and the creative class (for example, Cooke, 2001; Asheim and Gertler, 2006; Florida, 2002) looking at the factors that enable regions to prosper over time as well as the literature on cities and the new economic geography (Glaeser, 2011; Jacobs, 1992; Fujita et al., 2001) looking at the impact of agglomeration on these dynamics.

Recently published research (Delgado et al., 2012), building on Porter's original contribution and its further development in Porter's work on the Global Competitiveness Report until 2008, takes a new look at this debate: It develops a new definition of competitiveness, operationalises this definition in a way that builds on the broader literature on economic growth and prosperity and tests the emerging framework empirically. While the empirical analysis stays at the national level, it suggests implications for the discussion about regional competitiveness as well.

Scope and findings of the new research

A definition of competitiveness is never right or wrong, it is only more or less appropriate to address a particular issue. For competitiveness, the challenge is to shed light on what policy makers can do to help their locations achieve a higher level of sustainable prosperity. The new work defines competitiveness as "the expected level of output per working-age individual that is supported by the overall quality of a country as a place to do business" (Delgado et al., 2012). This definition focuses on an outcome

that policy practitioners deeply care about, that is, a broad measure of national productivity that drives the level of prosperity.¹ It connects this outcome to an underlying set of fundamental causes that policy needs to address in order to achieve sustainable improvements in prosperity. And it differentiates these fundamental causes from other influences on prosperity that are given by nature.

This definition is then operationalised in a framework that specifies the quality of a location as a place to do business. The framework aims to be comprehensive in capturing the larger number of factors that have been shown in the literature to influence productivity. These factors are organised into three groups: social infrastructure and political institutions (SIPI), monetary and fiscal policy (MP) and microeconomic competitiveness (MICRO). This framework is then empirically tested using a combination of datasets covering more than 120 indicators in these three groups for a sample of more than 130 countries over the 2001–2008 period.

The results firmly establish the separate and distinct influence of each of the three broad dimensions of competitiveness on country-level differences in output per potential worker. Institutional factors are important as the prior literature suggests (Acemoglu and Robinson, 2012). But microeconomic factors are important in their own right, with an impact quantitatively comparable to that of institutional factors. Monetary and fiscal policies have an impact as well but matter less than institutional and microeconomic factors. When controlling for legacy, these 'deep roots' (Spolaore and Wacziarg, 2012) turn out to have significant explanatory power for the current quality of institutions and macroeconomic policies. Microeconomic circumstances, however, have a separate and positive effect on output per potential worker even after controlling for these historical factors. Current policies on areas such as physical infrastructure, skills, innovation and SMEs, then, matter and the

quality of these policies is not given by a location's institutional legacy.

The results are fully consistent with the view that many factors matter for a location's competitiveness and prosperity with none of them individually offering a set path to prosperity growth (Rodrik, 2008; Porter, 1990). Much of the empirical growth has focused on identifying those factors that have for the average of all locations the highest explanatory power for differences prosperity. This new research on competitiveness instead aims to capture to breadth of factors to enable each location to find those that matter most given its particular circumstances at a given point in time.

Relations to research on regional prosperity

This new research relates to the debate on regional competitiveness and, more broadly, the drivers of regional economic performance in a number of ways.

First, it provides a definition of competitiveness that suggests using the term as a comprehensive framework to capture all factors amendable to policy action that drive prosperity differences across regions. Used in this way, it has nothing to do with the interpretation of competitiveness as the ability to sell to other markets that has triggered a lot of criticism (Kitson, 2004). It also provides no basis for the assumption that regional competitiveness is a short hand for the presence of clusters (Martin and Sunley, 2011). Porter's own work has always put clusters into a broader framework of competitiveness, even if academic critics and many policy practitioners have often focused on this element alone (Ketels, 2011). The new definition is more consistent with the thinking about regional innovation systems and learning regions (for example, Cooke, 2001; Asheim and Gertler, 2006). It covers a broader range of factors, partly because this part of the regional literature has been very focused on

understanding innovation. But it is less focused on the role of linkages between different actors than on the conditions under which they operate. There is much less common ground with the arguments put forward on the role of the creative class (Florida, 2002). While the new competitiveness framework does capture the role of human capital, it sees it as one of many factors that together determine the prosperity potential of a region, not necessarily the dominant one.

Second, it can be related to the findings of the literature on prosperity differences across regions. The new findings on national competitiveness are at a high level complementary to the findings about drivers of prosperity differences across subnational regions, despite the focus on a different level of geography. However, there are also differences: The regional literature has largely abstracted from policies set at the national level, for example, macroeconomic policies or policies that affect the overall openness of an economy. Instead it has focused on the interplay of factor inputs, in particular human capital, location in terms of neighbours and different types of institutional qualities (social fabric, social capital, etc.) that are found to be critical for a region to benefit from factor inputs and positive spillovers from adjacent regions (for example, Dettori et al., 2012; Rodríguez-Pose and Crescenzi, 2008). Institutions as they are used in the study of national competitiveness are a concept that mixes many different aspects of institutions that are subject to very different types of policy actions. The new research on national competitiveness discussed here has taken some steps in disentangling a few of these dimensions by differentiating between political institutions, property rights and basic human infrastructure. But the research on regions has already drilled done significantly further, differentiating a range of institutional dimensions that matter separately (for example, Rodríguez-Pose and Storper, 2006).

Overall, the recent competitiveness work provides a broader perspective on the range of factors that matter for the prosperity potential of locations, while the existing literature aims to single out those that are on average most important. But the work on national competitiveness could also benefit from the deeper insights of the regional literature on the role of different types of institutions.

The Role of Clusters and Cluster-Based Policies

Clusters, that is, regional concentrations of co-located economic activities in related fields (Porter, 1990), have been known to exist since Alfred Marshall's times. While the empirical existence of such regional specialisation patterns is widely acknowledged, the conceptualisation of clusters by Porter was criticised as vague and 'chaotic' (Martin and Sunley, 2003). Others argued that economic geography was less driven by linkages between activities relatively narrow fields but instead by the broader types of economy-wide linkages giving rise to the emergence of urban areas (Glaeser, 2011; Jacobs, 1992; Fujita et al., 2001). As the number of policy programmes for clusters increased over time, researchers started to become concerned about the potential for distortive (or at best wasteful) interventions (Duranton, 2011; Brakman and van Marrewijk, 2012).

Much of the initial research on clusters was driven by case studies. Over the last decade, however, the development of comprehensive datasets on the presence of clusters through so-called 'cluster mapping' has opened the door to a new phase of research (Porter, 2003; Delgado et al., 2013). The resulting cluster mapping datasets for North America and Europe have made it possible to systematically test many of the hypotheses derived from case observations (Delgado et al., 2011, 2012).

The discussion of cluster policies was initially based mainly on conceptual arguments. Over the years the experience with these policies and

initiatives has generated much richer data to draw on. While the availability of comprehensive data remains a challenge, there have been more systematic efforts to collect data about cluster initiatives (Lindqvist et al., 2003; Ketels et al., 2006) and cluster programmes by government (Meier zu Köcker, 2012; Europe Innova, 2008). This data provide useful insights into the empirical profile of cluster efforts but so far less robust information about their economic impact. In terms of the effectiveness of these efforts, there has been an increasing number of studies using a heterogeneous set of datasets and methodological approaches (for example, Cooke et al., 2007; Falck et al., 2010; Kuhn, 2010; Martin et al., 2011).

Scope and findings of the new research

Porter's original definition of clusters highlighted three key dimensions: the role of geographic proximity, of linkages across economic activities and of the relatedness of a specific set of activities (Porter, 1990). The critics argued that these dimensions were insufficiently operationalised and thus enabled a wide, heterogeneous array of structures to be called clusters. There was also discussion as to whether a certain critical mass was necessary, and whether there needed to be active collaboration versus mere collocation to talk about a cluster (OECD, 2007).

Cluster mapping creates an empirical operationalisation of Porter's definition of clusters that does address many of these issues (Porter, 2003; Delgado et al., 2013). Based on an analysis of actual collocation patterns it groups industries into specific cluster categories. While the first generation of empirically operationalised cluster definitions still required significant amounts of expert choice (Porter, 2003), new methods are more algorithm driven and provide higher transparency on the way the cluster definitions are derived (Delgado et al., 2013). In this analysis, the relevant levels of proximity are externally determined through

the way the data are provided, that is, in the USA at the level of counties and then aggregated to economic areas and states. Linkages are captured through their revealed impact on locational choices, not just through measuring them directly. And the set of related industries is driven by actual colocation patterns across many locations. Using the definitions thus derived, the strength of a given cluster category in a specific location can then be measured; this allows empirical test as to what the critical mass is at which economic performance is affected. Actual collaboration is not measured (partly because there is no comprehensive data available) but is conceptually likely to improve the performance impact of colocation.

Cluster mapping identified three different types of industries by their geographic footprint (Porter, 2003): Local industries are present across all regions in similar intensity, traded industries have their activities heavily concentrated in some regions and natural resource-driven industries are where the deposits of natural resources are located. The difference between traded and a non-traded sectors has long been known in the international trade literature. Cluster mapping puts the focus on the region rather than the nation as the key geographic levels; hence, a much broader range of factors matter than just trade barriers and the exchange rate. It highlights the difference in competitive context across types of industries; in traded industries, there is an implicit competition between locations, not just the direct competition between firms that dominates local industries. And it documents the different but complementary roles of traded and local industries in generating regional prosperity.

Cluster mapping made it possible to create datasets that provided comprehensive and fully comparable data on the strength of clusters across different locations. The new cluster research then deployed this data to test for the relation between cluster strength and economic performance outcomes (Delgado et al., 2011, 2012). It finds the presence of strong clusters,

that is, regional clusters with employment specialisation across a location quotient cut-off, to be positively associated with a range of performance outcomes like regional average wage, cluster wage, employment growth, new business formation and growth and patenting.

The initial work on clusters described and analysed their occurrence as the national outcome of a market process. When evidence was presented about the positive impact of cluster presence on economic outcomes, however, policy makers started to think about public measures to foster clusters. The recent studies on cluster initiatives and cluster programmes have aimed to describe the nature of these measures in a more systematic way. Cluster policy is found to be predominantly oriented towards areas of existing strength, that is, areas where clusters already exist (Lindqvist et al., 2003; Ketels et al., 2006; Ketels, 2013; Meier zu Köcker, 2012; Europe Innova, 2008). In Europe, efforts in innovation-intensive areas like IT are most frequent, while in emerging economies there is a stronger focus on more traditional areas in manufacturing, food processing and tourism (Lindqvist et al., 2003; Ketels et al., 2006). Overall, the majority of cluster programmes and initiatives is about improving the competitiveness of existing clusters rather than the creation of new clusters. A closer look at the tools and organisation of these efforts reveals a large degree of heterogeneity. The label cluster policy is used in such a broad way, that they empirical analysis of specific programmes provides little insights into others.

Relations to existing research on regional clusters

The new studies join a large existing literature studying the effects of agglomeration on economic performance and discussing the arguments about policies oriented towards specific sectors.

The literature has largely focused on testing the strengths of specific types of linkages and spillovers between economic activities. There

are a few studies that then develop definitions of clusters of related industries based on shared knowledge/technologies or the use of similar types of human capital (Feser, 2003). A more recent research approach has grouped industries based on communalities in export patterns, where exports in a pair of industries is taken as an indication that these industries might be linked (Hausmann et al., 2012). Overall, however, there has been relatively limited attention on the systematic operationalisation of cluster definitions.

The literature on the impact of cluster presence on economic outcomes has produced a wide range results from finding very little if any positive impact (for example, Kerr et al., 2013; Martin and Sunley, 2011 and the sources quoted there) to meaningful positive effects (Greenstone et al., 2010). The lack of a commonly used empirical definition of clusters is an obvious candidate to explain the diverging results. The new research on clusters itself suggests how this could affect the results (Delgado et al., 2012): the positive effect of clusters on job creation is driven not by the narrow industries in which employment specialisation is already high; here convergence effects occur. It is driven by the related industries within the cluster that are still relatively less developed. Empirical studies that focus on the impact of specialisation in narrow industries are thus going to generate systemically biased results. There is also an issue with the focus on firm level economic indicators sometimes used in these studies. While firms should benefit from the presence of the cluster, some of the value thus created is then captured by workers through higher wages and land owners through higher real estate prices. These are mechanisms through which the broader region benefits from the cluster, not just the owners of the companies.

Other related research has found the evolutionary path of regional economic diversification to occur through growth in industries related to current areas of activity (Neffke

et al., 2011; Boschma et al., 2013). These findings confirm earlier observations from the case-based literature. The cluster mapping research identified linkages between cluster categories, not just within them, that fit well with these observations. This relatedness of clusters is also visible in economic outcomes: a strong cluster affects not only its core constituent industries but also industries in related cluster categories (Porter, 2003; Delgado et al. 2012).

Importantly, the cluster concept argues that what matters is the share of traded sector employment in strong clusters, not the employment in all industries that do agglomerate across locations. Studies that confuse this key indicator create results that are not meaningful (Florida et al., 2012).

Some related research argues that what matters is which specific clusters/sets of industries are present in a given location, not so much whether there is specialisation in any strong cluster (Hausmann et al., 2012, Lin, 2011): because rich locations—in these studies the focus is on countries—are active in certain industries, these are the industries less wealthy location should also aspire to enter. The cluster research found within the USA a different pattern: strengths in any cluster was more important for regional wage levels than which particular cluster this strength was in (Porter, 2003).

Finally, the urbanisation literature argues that general density of economic activity matters. Whether this density is based on specialisation into specific clusters is either considered immaterial or even negative for economies outcomes (Glaeser, 2011; Jacobs, 1992; Fujita et al., 2001, see also Brühlhart, 2009). Cluster research suggests that urbanisation and cluster economics can occur at the same time.

Turning to cluster policy, most of the conceptual critique is based on the assumption that cluster polices tries to create clusters (Duranton, 2011; Brakman and van Marrewijk, 2012). But it is conceptually equally justified to understand cluster policies as a tool to

internalise local externalities in existing clusters (Ketels, 2013; Rodriguez-Clare, 2005, 2007; Waits, 2000). Cluster policies are then ways to upgrade the underlying competitiveness of clusters, not to increase their size. The profiling of actual cluster programmes shows that the majority of them are indeed much better characterised as efforts to improve the competitiveness of existing clusters (Ketels, 2013; Meier zu Köcker, 2012; Waits, 2000).

Assessments of the impact of cluster programmes come again to very heterogeneous results. The data on the impact of cluster initiatives on economic outcomes are still fragmentary. The available evidence points to moderately positive effects (for example, for Germany: Dohse and Staehler, 2008; Falck et al., 2008, Falck et al., 2010). The reviews of individual programmes tend to find positive returns for the participants and an expanded capacity for joint action (for example, for the Swedish Vinnväxt Program: Cooke et al., 2007, for Canada: Cassidy et al., 2005). Studies in Denmark and Sweden have made peer group comparisons of companies active in cluster projects and those that are not (Kuhn, 2010). They find companies active in cluster projects to register better performance in subsequent years. Some studies in other countries have shown no such impact; instead, there is evidence that their funding decisions have been strongly influenced by the traditional industrial policy reflex to support failing activities (for example, Martin et al. 2011 on a programme in France). These firm level studies provide more robust evidence than what has been available before. But given their design they can only provide information about the effectiveness of individual cluster programmes, not about the impact or advisability of cluster programmes in general.

The research on drivers of cluster initiative success adds further texture to these findings (Lindqvist et al., 2003): Cluster initiatives are more effective when their underlying cluster is strong, when there is trust with regional government and when there is a solid organisation

to run the initiative. Again, the details of the programme as well as the quality of the cluster initiative matter: Cluster programmes can work but their success requires attention to detail and a training and knowledge infrastructure that can support high quality implementation.

Implications for Regional Policy

Based on this discussion of evidence, we can now analyse the implications of this recent research on competitiveness and clusters on some of the major debates on regional policy. These debates start with the general sense that regions are getting more important (OECD, 2007, Kitson et al., 2004) but also that the impact of regional policy is at least questionable, both conceptually and empirically (Glaeser and Gottlieb, 2008; Farole et al., 2011).

Selected challenges for regional policy

To start with, there is often a lack of clarity on whether regional policy is predominantly concerned with policies directed at regions or regions as the policy actors. Most academic contributions tend to focus on what policy interventions should be considered, not on which level of government should design and implement them. The policy advice-oriented literature, however, had to deal with the practical problems of 'multi-level governance' which is further complicated by the wide array of different institutional structures across countries (OECD, 2007, 2010). But are regions in this context just another actor alongside national government and supranational structures like the EU, or are they also a different actor with unique responsibilities? Garcilazo et al. (2010) suggest that regions are not particularly different from nations in terms of the policy imperative: "*In sum, good regional policy is, in essence, nothing more and nothing less than good economic policy without recourse to some macro-economic instruments (such as exchange rate or*

monetary policies)." The OECD (2011) takes a different view, noting that "regions are not countries and cannot simply replicate national policies at the regional level." While these two views are not fully contradictory, they do reveal significantly different views about the role of regions.

Another debate focuses on the question whether economic policy should be directed at regions or should instead focus on individuals (Gill, 2010; Garcilazo et al., 2010; Barca et al., 2012). If the impact of policies is significantly influenced by the regional context, there is a strong case for policies to be 'place-based' in order to reach individuals (and firms) in the most effective way. If this is not the case, policy makers should instead focus on the broader levers they have to affect economic geography, that is, market opening and connectivity and otherwise equip individuals to best succeed in this context.

A related debate concentrates on whether policy should try to influence the factors that drive economic geography or should instead be mindful of and leverage the existing economic geography conditions when designing policies (World Bank, 2008). In fact, much of the criticism of especially cluster policies is based on the notion that these policies are about creating agglomeration (Duranton, 2011; Ketels, 2013). Both the literature on regional innovation systems and on competitiveness and clusters is focused on upgrading the underlying factors, taking the patterns of economic geography as given. The new economic geography literature instead highlights the potential for policy intervention to affect which equilibrium outcome in terms of agglomeration patterns across regions will emerge.

Another key policy debate relates to the prime objective that regional policy should have. Traditionally, regional policies often focused on supporting lagging regions, trying to reduce the heterogeneity of economic outcomes across regions within a country. This approach was motivated by the presence of

significant differences in regional prosperity but then received especially in Europe a new push as a result of the New Economic Geography literature. This literature was perceived to predict a strong increase in regional differences across European regions as a result of the removal of barriers to trade, investment and relocation in the European Single Market. A beefed-up European regional policy was supposed to compensate for these effects. The literature on regional innovation systems as well as the work on competitiveness and clusters then had some influence on these transfer were used in lagging regions. Faced with a reality where there is neither strong evidence that European integration has led to massive concentration of economic activity in core regions nor much success of European regional policies in driving lagging regions to achieve higher growth, a new consensus has started to emerge: Regional policies should help all regions to grow, not just provide transfers to lagging regions (OECD, 2010, 2011). Even where this general principle is accepted, the policy advice often retains the notion that public investments should be made where the needs are most pressing, not necessarily where the economic returns are the highest (Barca, 2009; Walburn and Saublens, 2011). Whether the actual practice of regional policy then clearly follows either a focus on high returns or high needs is yet another matter (Crescenzi, 2009).

Finally, both at the national and the regional level there is a debate as to whether policy should be sector-specific or framework-condition oriented. The generally poor experience with industrial policy in the past had for a long term shifted the focus on framework conditions. But more recently there has been renewed interest in industrial policy (Rodrik, 2004) and some evidence that it can have positive effects (Criscuolo et al., 2012).

Relevance of recent competitiveness and cluster research for regional policy

Overall, the recent research on competitiveness and its drivers points towards an emerging new

role for regions: Regional policy should focus on microeconomic competitiveness and is in this sense different from the broader scope of economic policies to be set at the national level. The national level has an important influence on pretty much all dimensions of microeconomic competitiveness. These influences have different implications across regions, reflecting the heterogeneity in local circumstances. Regions have an important role in managing these influences and national policies given the specific context in their location. The relevant choices are best made in the context of an economic strategy that defines the strategic positioning of a region in the national and global economy. Public–private dialogue is critical to ensure that such a strategy is consistent with the views of companies and thus able to mobilise their actions.

While still only suggestive, the new work on national competitiveness also indicates that there is a qualitative difference in the policy making challenges faced at the national versus the regional level. For many policies set at the national level the challenge is to adopt and sustain policies that have been shown to be prosperity enhancing (for example, low inflation, effective property rights, open markets, etc.) irrespective of locational circumstances. At the level of subnational regions the challenge is much more how to prioritise among many policy actions that are in general prosperity enhancing on their own to create a policy mix that has the strongest positive effect given local circumstances. Current research that abstracts from interactions across different dimensions of competitiveness does not provide the necessary tools to support such choices.

The cluster mapping data are a critical diagnostic tool to understand the health and dynamics of any regional economy. It helps regional policy makers to understand what set of activities drives prosperity generation, how their competitive position is changed and whether there are new activities that are emerging. Cluster categories provide a useful level of aggregation to do

so, because they capture underlying economic linkages. Broader categories like manufacturing/services generalise across activities with very different competitive realities while more narrow categories like individual industries fail to capture the economic opportunities of linkages within a cluster. For a given cluster, the particular cluster profile—that is, strengths across industries within the cluster, presence of related clusters, existence of institutions for collaboration that can support joint action, etc.—can then provide critical additional insights to inform policy making.

The recent research on clusters as well as the related research on sectorial composition of an economy does suggest that competitiveness upgrading should have a cluster/sectorial dimension: One reading of this data is that location—which generally is meant to mean countries—should actively influence the sectorial composition of its economy (Hausmann et al., 2012; Lin, 2011). This view differs from earlier arguments about industrial targeting in the observation that such changes in composition should follow a sequential path, where economies gradually transition towards related activities that draw on related underlying comparative advantages. This literature tends to be less specific on the policy tools to use, which leaves the door open to distortive interventions. Another reading of the data suggests that competitiveness upgrading needs to consider the specific conditions relevant for the sectors/clusters in which a location—which generally is meant to mean regions—is specialised in (Porter, 2003). The change in composition is in this literature seen as market-driven response to upgrading the business environment, not as something that economic policy should directly target. Policy tools to consider in this context are all characterised by their positive impact on productivity and innovation. Traditional interventions that distort the market to create private profitability do not pass this test.

The data on cluster programmes and cluster initiatives suggest that policy makers need to pay significant attention to the specific tools and

programme structures that they deploy. While cluster programmes can be launched by different levels of government, clusters and thus cluster initiatives are always regional in nature. The data suggest that the dynamics go both ways: Strong regional government increases the likelihood that cluster initiatives succeed. Cluster initiatives can increase trust and capacity for regional collaboration.

The data on clusters indicate the potential of using cluster information as a critical diagnostic tool to support the emergence of new cluster. It can help regions to figure out in which directions they can diversify with the highest likelihood of success. And it can help national or supranational institutions to evaluate which regions are most likely to develop clusters in new areas, like renewable energy. A key challenge for policy is that interventions into new, emerging areas are much more risky than the work with existing clusters. Cluster programmes for emerging clusters thus need to be different from programmes for established clusters, something that is starting to be acknowledged by policy makers (Christensen et al., 2012).

Implications for policy practitioners and Smart specialisation

The European Commission has decided to make future funding through the structural funds programme conditional on regions' developing so-called smart specialisation strategies (EC, 2010). The smart specialisation idea has moved from conceptual idea to practical policy guide even faster than clusters (Foray, 2009; Foray et al., 2012), a process that has triggered not only many questions by practitioners but also critical comments by researchers (for example, McCann and Ortega-Argilés, 2013).

Smart specialisation strategies provide a good opportunity for a short review of the concrete implications of the recent work on competitiveness and cluster for policy practitioners. The discussion will follow the six step approach the smart specialisation guide proposes (Foray et al., 2012):

- *Step 1: Analysis of the regional context and potential for innovation*

The competitiveness research provides a comprehensive framework to organise the analysis of the regional business environment. It ensures that the analysis is not just limited on a narrowly defined regional innovation system. Often, and this is what the competitiveness research highlights, it is the interplay across the broader business environment that has a critical impact on firms ability and willingness to upgrade and compete in a more innovation-intensive way. Insufficient linkages between the regional innovation system and the broad number of companies that drive the regional economy is one of the key challenges that regional policy has struggled with in the past.

The cluster data and research provide a rich source of comparative information about a region's current pattern of specialisation, the dynamics of change and the opportunities that might exist for diversification into new areas. The assessment of the current cluster structure can at a high level help to suggest whether there are any barriers to dynamics of regional specialisation. It can then help focus policy attention on areas of the economy critical to current prosperity generation.

- *Step 2: Governance: Ensuring participation and ownership*

The competitiveness research suggests—even if the empirical analysis still does not capture this aspect sufficiently—that economic performance is based on the complex interaction across many areas of policy. It also suggests that for the microeconomic factors that are largely under the control of regions a range of actors from different parts of government as well as from different private sector institutions have either critical knowledge or influence on outcomes. This argues for the need to create public–private coordination platforms that provide a cross-cutting perspective beyond individual policy areas.

The research on cluster programmes and initiatives highlights the important role that cluster initiatives can play in building social capital and creating platforms for analysis and collective action. Cluster programmes have a role to play in supporting such structures for this reason of improving the policy process, not just because they might have a direct influence on the economic performance of a cluster. In turn, regions can benefit from using existing cluster structures both in the design and implementation of smart specialisation strategies.

- *Step 3: Elaboration of an overall vision for the future of the region*

How to get from an assessment of competitiveness and an analysis of the current cluster portfolio in a region to an overall vision remains one of the most difficult and idiosyncratic steps in the strategy process, for regions as well as for nations. There are some attempts to move this from an art of experts to a more structured process (Hausmann et al., 2004; Crescenzi and Rodríguez-Pose, 2011). But the reality remains in many regions that the lack of such a process tool drives regions to copy from successful peers, whether in cluster policies or overall regional innovation strategies (Hospers and Beugelsdijk, 2002). In Europe, the alignment of regional strategies with the Europe2020 objectives and especially the so-called ‘grand challenges’ threatens to repeat these old mistakes.

The new competitiveness and cluster research does not provide a simple solution to these problems. It does focus on the need to identify what the specific advantages are that a location offers to companies. But in the past especially the business environment data has also led to simple benchmarking of best practices elsewhere that by themselves do not constitute a vision or strategy.

- *Step 4: Identification of priorities*

A simple reading of the cluster research can lead to the misconception that setting priorities

is tantamount to picking a few clusters as they key ‘strategic’ areas regional policy should focus. The recent research on competitiveness and clusters should caution policy makers against this perception.

From a competitiveness perspective, policy priorities should be driven by the competitive advantages that a location wants to put at the core of its strategic positioning as it defines its role in national and global economy. Knowing these advantages, it can set policy priorities as areas in which the region wants to stick out, or in which it is currently too far behind its peers.

Clusters are one important dimension of how a location can decide to position itself. However, clusters only indicate where a location aims to compete, not how. So the understanding of which clusters a region is strong in (or perceives to have potential) only narrows the range of choices of what policies to pursue; it does not define specific policies itself. Often clusters in a location compete on a similar set of underlying advantages that are then deployed in different ways in their respective economic field.

- *Step 5: Definition of coherent policy mix, roadmaps and action plan*

The action plan translates the vision or strategic positioning of a location into specific policy efforts, taking into account the priorities that have been identified.

The competitiveness research—again more in its conceptual part than in the empirical implementation of measurement—highlights the need to consider interactions across policy areas. However, it still gives little specific guidance on what interactions exist. Clusters are helpful as a process response to this challenge, because it starts the policy debate from the perspective of related economic activities rather than policies. Organising policies around clusters makes these clusters are natural integration point to think about the interaction of these different policy efforts. So while there is no conceptual tool that captures the linkages across policy areas in any detail, the organisation of

the policy process through clusters provides an opportunity to drive towards more coherence.

The research on clusters and cluster programmes also provides an increasing amount of insights into the specific features that make cluster programmes and cluster initiatives more likely to succeed (Christensen et al., 2012; Lindqvist et al., 2003). How to structure a cluster policy is often at least if not more important than whether to start such a policy.

The research on cluster policy also indicates that policy makers need to be mindful not to focus too narrowly on existing arrears of strengths. It also indicates that launching activities in other fields, which the focus on entrepreneurial discovery in the smart specialisation framework strongly suggests, will require other types of cluster programmes than those traditional in place for well-established clusters. The competitiveness and cluster research suggests that opportunities in new fields can be systematically pursued in the following three areas:

1. Assets in the business environment that have not yet been exploited, for example, because their value has grown only recently due to changes in technology or market needs
2. Existing clusters that provide a source of relevant capabilities to move into related clusters so far less well developed
3. Existing clusters that offer opportunities to grow activities in industries within the cluster category that so far are less well developed

While none of these conditions guarantees that market success will materialise, the likelihood of success in these areas is higher than in other markets in which the locations brings no relevant assets or capabilities to bear.

• *Step 6: Integration of monitoring and evaluation mechanisms*

The increasing availability of data on regional competitiveness and regional clusters that has driven the latest round of research provides opportunities for monitoring and evaluation.

However, the discussion on the impact of cluster programmes does indicate the limitations of the available tools. They do provide useful insights into who specific programmes and initiative can be improved (see for example, the cluster initiative benchmarking effort in ECEI, 2012). But they do little to answer the broader questions of how cluster programmes contribute to regional prosperity more broadly and whether they should be pursued at all. On these issues the conceptual discussion has started to become more focused, identifying cluster policy more specifically as efforts to improve the performance and competitiveness of existing agglomerations in clusters through enhancing collaboration and organising collective action for upgrading company sophistication and business environment quality. But the tools available to measure these efforts and their impact are still limited.

Key challenges ahead

The recent work on competitiveness and clusters has provided important new insights that are relevant to understand the dynamics of regional economies and inform policy makers that aim to improve their performance. It is in many aspects much more consistent with other work on regional economies than the sometimes infected debate makes believe. Whether it is going to lead towards any more convergence of views in these discussions remains to be seen.

The discussion in this paper has identified a number of areas in which further conceptual progress is critically needed. One important issue is how to move from the current tracking of the many dimensions of competitiveness that are important for prosperity outcomes to an identification of those dimensions critical for a specific location to enable higher performance. The approaches currently used in the empirical analysis of competitiveness are not well adapted to this challenge. The attempts made to identify more structured algorithms to narrow down the choice are interesting but not yet sufficient (Hausmann et al., 2004; Crescenzi and

Rodríguez-Pose, 2011). More work will be necessary to arrive at tools that practitioners can use, and that can enable them to break free from the tendency to copy and follow generic strategies.

Another key issue is the need to become more specific about the different types of cluster programmes and cluster policy tools used. The research has indicated that there is a huge variety in outcomes that is likely to be the result of the huge variety of measures subsumed under the heading of cluster policy. There are some interesting attempts to develop a taxonomy of cluster policies (for example, OECD, 2007). But here, too, more needs to be done to generate categories that can support more insightful research and provide more actionable advice for practitioners. This is important not only for the debate about cluster policy but also about the broader emerging debate about a new industrial policy. The evidence presented here suggests that the question is no longer sufficiently framed around whether or not policy should be cluster or industry specific. It needs to be framed around that type of interventions and specific programmes that such policies would entail. To have that debate, we need better conceptual frameworks that can identify the key dimensions to consider in this context.

Endnote

¹ The definition captures both the productivity of workers and the productivity of the economic system to mobilize the working-age population to engage in economic activities.

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