Methodology Background Paper 1

Benchmarking Regional Competitiveness in the European Cluster Observatory

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1. Introduction

Phase I of the European Cluster Observatory (ECO) undertook the first systematic mapping of European clusters. This work has contributed to a better understanding of the positive impact of geographic specialisation, in particular on broad economic outcomes like GDP per capita. Related research in this field, both in Europe and elsewhere, comes to similar conclusions of a positive relationship between cluster presence and economic performance.¹ Two key new questions emerge at this juncture:

- How is geographic specialisation related to other factors that might have an impact on economic outcomes?
- What are appropriate regional policy responses to affect the existing geographic specialisation patterns and these other factors in ways that enable better economic outcomes?

Work package 2 (WP2) of the second phase of the European Cluster Observatory project (ECO-2) will provide data and analysis that aims to address these two questions. The data from ECO-1 have been most relevant to policy makers at the EU and national levels, highlighting the need to increase the awareness of specialisation in economic diagnosis and policy design. An overall aim of ECO-2 is to provide additional data more relevant to decision-makers at the regional and cluster levels. At its heart it contains the collection of data on regional framework conditions across Europe to match the data on specialisation already available and to be further updated under ECO-2. We will provide ECO users with core secondary data on the competitive environment of European regions, corresponding largely to the NUTS-2 classification. We will also collect and analyse more detailed primary data for a selected sub-group of regions.

The data on regional framework conditions that we collect in WP2 will firstly enable us to separate the relative roles of regional framework conditions and specialisation with regards different types of economic outcomes. Past research indicates that specialisation is an important aspect, but not the only factor explaining outcomes. The strong positive relationship between specialisation (cluster presence) and economic outcomes was found to hold for countries at broadly similar stages of economic development, i.e. the old EU-15 member countries or the new EU-10 countries. Yet it did not hold across the much more heterogeneous group of all EU member and candidate countries. The new data set will help us distinguish the relative forces more clearly. For policy interventions, this data will provide crucial information to evaluate a location’s relative position in the range of factors that determine economic outcomes. Such information enables better choices on where to focus policy attention.

Secondly, our analysis of the data will help us to better understand the interactions between regional framework conditions and specialisation. Past research has treated specialisation as a given, subject to significant path dependency processes within and across clusters. But there is an implicit understanding that regional framework conditions, too, have a significant impact on how clusters emerge and develop over time. For policy interventions this is crucial – depending on the strength of these forces, it will suggest a focus on elements in the competitiveness environment, rather than on direct efforts to change specialisation patterns. The new data will help to provide a more robust understanding of these relationships and will inform the related policy choices.

In terms of the framework itself, a key challenge is to organise and present the data to maximise policy relevance and facilitate ease of interpretation for policy-makers. The data will be organised in the Observatory so as to provide an innovative and valuable benchmarking tool for regional policy-makers and other stakeholders. Alongside accessing analysis papers, policy-makers will be able to flexibly access a series of important variables and composite indices that capture the framework conditions and performance of their regions in comparison with others.

This is the first in a series of four background papers that have been written to inform the methodological development of a regional competitiveness framework and data collection process. Here we propose an overall conceptual framework for organising and analysing data on regional competitiveness within the ECO. Specific aspects
relating to the development and practical use of this framework are then the subject of the remaining three papers: paper two focuses on the data requirements of the proposed framework; paper three on the specific relationship between regional framework conditions and clusters; and paper four on the use of the framework for benchmarking, in particular the question of identifying reference regions.

This paper is structured as follows. In Section 2 we provide some context on the analysis of territorial competitiveness, reviewing current comparative frameworks. We do this first at the national level, which until now has been the dominant geographical scale of analysis, and then at the regional level, where the state-of-the-art is at a much earlier stage. We conclude Section 2 by highlighting key differentiating elements that should characterise the new diagnostic framework to be integrated into the ECO. In Section 3 we then present a detailed proposal for this framework, focussing specifically on how we plan to address the core issues of ensuring policy relevance and responding to the regional dimension. Section 4 concludes and makes links to issues to be explored in the other three background papers.

2. Comparative Analysis of Territorial Competitiveness

Competitiveness remains a controversial term that is both widely debated and used differently by different researchers and practitioners.\(^2\) However there is widespread agreement that there is a pressing need to better understand the fundamental drivers of innovation, productivity and prosperity across locations. Assessing what drives competitiveness framed in these terms is challenging, however, because of the sheer number and variety of influences at firm-level and at territorial level.

There is broad consensus that economic outcomes are explained by a combination of certain fundamental characteristics of a territory (geography, resources, historical and cultural legacy), alongside a series of microeconomic, macroeconomic and institutional

\(^2\) See, for example: Krugman (1996); Lall (2001a, 2001b); Camagni (2002); Malecki (2004); Bristow (2005); Aiginger (2006); Wilson (2008).
factors that facilitate or inhibit the competitiveness of the territory’s firms. However, the high degree of correlation among many of the indicators capturing these factors makes disentangling the impact of individual factors econometrically complex. It is precisely because of these difficulties, as well as the tendency of many studies to highlight a subset of influences rather than being inclusive, that the academic literature is nowhere near achieving consensus on a broad model. Different datasets and different choices about econometric approaches have also led to different and often conflicting claims about the specific drivers of competitiveness.

**National Competitiveness**

Over the last few years, a significant body of work has assessed competitiveness drivers at national level. This comparative work has tended to focus on a range of elements in the business environment (and to some degree also the associated behaviour of firms). On the one hand are studies that seek a fairly comprehensive analysis of the national competitiveness environment, and on the other hand are studies that target specific elements in greater detail. In the first group the *Global Competitiveness Report* (World Economic Forum, 2009a) and the competing *World Competitiveness Yearbook* (International Institute for Management Development, 2009) are the best known. The second group includes the influential World Bank reports on Doing Business (World Bank, 2009), Governance (Kaufmann et al., 2009), Logistical Performance (Arvis et al., 2007), and the Knowledge Economy, for example. The World Economic Forum has also launched a series of dedicated reports on specific themes such as travel and tourism, trade, financial markets and gender issues (Blanke and Chiesa, 2009; Lawrence et al., 2009; World Economic Forum, 2009b; Hausmann et al., 2006), and economic freedom is evaluated in two often-cited reports by Freedom House and The Heritage Foundation.

Our focus here is particularly on the more comprehensive attempts to comparatively analyse national competitiveness. Arguably the most widely recognised of these is the

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3 For the knowledge economy index see: [http://go.worldbank.org/JGAO5XE940](http://go.worldbank.org/JGAO5XE940).

World Economic Forum’s Global Competitiveness Index, which was introduced into the long-standing Global Competitiveness Report in 2004. It is founded on a definition of competitiveness as “the set of institutions, policies, and factors that determine the level of productivity of a country” (World Economic Forum, 2009a: 4), and covered 133 countries in 2009. The index is constructed from 110 distinct indicators, around 30% of which are derived from secondary sources, with the remaining 70% constructed from a survey capturing the perceptions of business executives. These variables are grouped into twelve pillars of competitiveness (see table 1). Results are reported in indices for each pillar individually and in an overall aggregated index that weights the pillars according to the stage of development of the country (World Economic Forum, 2009a).

Table 1: Global Competitiveness Index Structure

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Number of Indicators*</th>
<th>Secondary / Primary Data Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Institutions</td>
<td>15</td>
<td>0% / 100%</td>
</tr>
<tr>
<td>2. Infrastructure</td>
<td>8</td>
<td>20% / 80%</td>
</tr>
<tr>
<td>3. Macroeconomic Stability</td>
<td>5</td>
<td>100% / 0%</td>
</tr>
<tr>
<td>4. Health &amp; Primary Education</td>
<td>11</td>
<td>64% / 36%</td>
</tr>
<tr>
<td>5. Higher Education and Training</td>
<td>9</td>
<td>33% / 67%</td>
</tr>
<tr>
<td>6. Goods Market Efficiency</td>
<td>16</td>
<td>31% / 69%</td>
</tr>
<tr>
<td>7. Labour Market Efficiency</td>
<td>11</td>
<td>36% / 64%</td>
</tr>
<tr>
<td>8. Financial Market Sophistication</td>
<td>9</td>
<td>22% / 78%</td>
</tr>
<tr>
<td>9. Technological Readiness</td>
<td>8</td>
<td>50% / 50%</td>
</tr>
<tr>
<td>10. Market Size</td>
<td>2</td>
<td>100% / 0%</td>
</tr>
<tr>
<td>11. Business Sophistication</td>
<td>10</td>
<td>0% / 100%</td>
</tr>
<tr>
<td>12. Innovation</td>
<td>8</td>
<td>13% / 87%</td>
</tr>
</tbody>
</table>

*The total does not sum to 110 as some indicators are employed in more than one pillar.

The pillars themselves are divided into three groups, according to Porter’s (1990) ‘stages of development’, and the index applies different weights to countries depending on their allocated stage of development. Pillars 1-4 are ‘basic requirements’, key for factor-driven economies. Pillars 5-10 are ‘efficiency enhancers’, key for efficiency-driven economies. Finally, pillars 11-12 are ‘innovation and sophistication factors’, key for innovation-driven economies.

At global level, though not as wide in scope as the Global Competitiveness Index, is the World Competitiveness Yearbook, a report and index produced annually (since 1989) by the International Institute of Management Development. It aims to rank countries by their ability to create and maintain an environment that sustains the competitiveness of enterprise. The index covers 55, mainly ‘developed’ countries and is
calculated from 246 variables, around half of which come from an executive opinion survey and half from secondary data sources. The variables are organised into 4 ‘factors of competitiveness’, each of which has a number of sub-factors, which cover broadly the same types of framework conditions as the Global Competitiveness Index (see Table 2).

Table 2: World Competitiveness Yearbook Structure

<table>
<thead>
<tr>
<th>Factor of Competitiveness</th>
<th>Sub-Factors</th>
<th>Number of Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Economic Performance</strong></td>
<td>Domestic Economy</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>International Trade</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>International Investment</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Employment</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Prices</td>
<td>4</td>
</tr>
<tr>
<td><strong>2. Government Efficiency</strong></td>
<td>Public Finance</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Fiscal Policy</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Institutional Framework</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Business Legislation</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Societal Framework</td>
<td>11</td>
</tr>
<tr>
<td><strong>3. Business Efficiency</strong></td>
<td>Productivity and Efficiency</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Labour Market</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Finance</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Management Practices</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Attitudes and Values</td>
<td>7</td>
</tr>
<tr>
<td><strong>4. Infrastructure</strong></td>
<td>Basic Infrastructure</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Technological Infrastructure</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Scientific Infrastructure</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Health and Environment</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>25</td>
</tr>
</tbody>
</table>

The key strength of these two widely-cited reports is the wealth of country specific information they provide on a large number of individual indicators, something that they are able to do because of their extensive executive opinion surveys. Unfortunately, the way in which these studies organise their large range of indicators into ‘pillars’ or ‘factors’ is not especially conducive to providing policy advice. Also much less convincing are the underlying conceptual models used to aggregate the performance of these individual indicators into an overall index that has strong predictive power (see Porter et al., 2008). One-off studies such as those by Furman et al. (2002), Fagerberg et al. (2007) and Fagerberg and Srholec (2008), for example, have made significantly more headway in this direction. The first of these studies introduces a novel framework to analyse national innovative capacity, defined as “the ability of a country to produce and commercialize a flow of innovative technology over the long term” (Furman et al.,
2002: 899). The framework is based on the linkages between factors that contribute to innovativeness in the economy in general and factors that affect innovation in industrial clusters. Fagerberg et al. (2007) meanwhile assume that growth is the outcome of innovation and diffusion of new technological knowledge that depends in turn on a certain absorptive capacity in the society. Finally, Fagerberg and Srholec (2008) carry out an empirical investigation to identify the types of capabilities necessary to improve economic development. Four groups of capabilities (some of which had not been contemplated before) were identified: the development of the “innovation system”, the quality of “governance”, the character of the “political system” and the degree of “openness” of the economy.

While the WEF and IMD’s reports are the two main analyses of national competitiveness with global coverage, there are a host of other reports and indices targeted at specific macro-regions or groupings of countries. These reports tend to rely on secondary data, which seriously limits the range of framework conditions that can be represented, but also avoids some of the criticisms that have been levelled at the representativeness and robustness of the executive opinion surveys employed by the two global reports. A good example is the European Competitiveness Index (Huggins and Davies, 2006), which “selects those indicators currently available that enable a quantitative comparison of Europe’s regional and national economies”. These indicators are grouped into four dimensions: ‘the creative economy’; ‘the knowledge economy’; ‘economic performance’; and ‘infrastructure and accessibility’. Similar criticisms can be made, however, with regards the policy-usefulness of this index given the fairly arbitrary nature in which variables are selected and grouped.

Such criticisms are less relevant for the more narrowly focused European Innovation Scoreboard (European Commission, 2010b), which is published annually to provide a comparative assessment of the innovation performance of EU countries. This assessment is based on 29 innovation indicators organised in three dimensions that are clearer from a policy perspective: ‘enablers’; ‘firm activities’; and ‘outputs’. Analysis of comparative performance results in a classification of countries into four categories: ‘innovation leaders’; ‘innovation followers’; ‘moderate innovators’ and ‘catching-up countries’.

Finally, there are a range of institutional and government studies that are less concerned with developing an index of competitiveness, opting to focus each year on a
more sophisticated analysis of specific issues. The OECD, for example, launched their annual *Going for Growth* report in 2005, providing a comparative overview of national performance based on a broad set of indicators of structural policy and performance (OECD, 2010). The theme of this report changes each year, but a consistent set of internationally comparable indicators facilitates comparative assessment of a range of core framework conditions for national competitiveness. At the European level, an annual *European Competitiveness Report* was established in 1999, and each year analyses the comparative performance of EU countries in a range of core competitiveness indicators. The central focus is the analysis of productivity growth as a key long-run driver of competitiveness. In addition, each report tackles a series of other issues, the focus in 2009 being on: ‘the relationship between the EU and the BRICs’; ‘migration, skills and productivity’; ‘training, education and productivity’; and ‘ICT, regulation and productivity’ (European Commission, 2010a).

**Regional Competitiveness**

The attractiveness of extending this type of comparative analysis to the level of sub-national regions is apparent in the context of today’s global economy, where regions are increasingly seen as natural units of economic analysis. Globalisation has reduced many of the barriers that previously favoured nations as a key channel through which economic interaction took place, and has opened the way for networked interaction between smaller territorial units (regions, cities, and smaller ‘localities’ such as municipalities). Of these smaller units, it is regions (including city-regions) that are the most appropriate for analysis of competitiveness because they are increasingly significant units for policy-making in many (though not all) countries. Indeed, it can be argued that an analysis of competitiveness at regional level is particularly appropriate because, more even than nations, regions are in direct competition with one another for mobile factors of production (capital, labour) (Camagni, 2002; Malecki, 2004).

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5 Early and influential analyses of this process include those by Ohmae (1995), Storper (1997) and Scott (1998).
Recognition of the importance of analysis at regional level is reflected in various attempts to apply methodologies for measuring and comparing regional competitiveness, although as an emerging field the state-of-the-art is less developed than national competitiveness analysis. Focusing on the European studies, some have contemplated a fairly comprehensive range of European regions while others have focused on particular countries. While the former are usually based on methodological frameworks developed to compare the competitiveness levels of nations, adapting them to the regional dimension, among the latter we find a mixture of cases that are either based on more general studies or have developed their own frameworks.

A very recent example of the pan-European studies is the *EU Regional Competitiveness Index 2010 (RCI)*, a joint project of the Joint Research Council (JRC) and the DG for Regional Policy (Annoni and Kozovska, 2010). This is based on the World Economic Forum’s *Global Competitiveness Index (GCI)*, although two of the 12 original pillars (Goods market efficiency and Financial market sophistication) have been excluded due to little expected variation and lack of hard data at regional level. However, the decision to only use hard data has led either to the exclusion of many individual indicators that were based on survey data or to their substitution by alternative indicators for which hard data exists. It is worth mentioning as well that for some of the indicators regional disaggregated data does not exist. This is the case of indicators related to institutions, macroeconomic stability, quality of education, technological readiness of enterprises and venture capital. In these cases the authors have opted for applying national values to each or the regions. While little variation of some of these indicators within the countries would validate the use of national averages, we suspect that a high degree of variation may occur among some of these indicators. Therefore, the use of national averages might be introducing considerable distortion in the composite index. A further, if minor, difference between the *RCI* and the *GCI* are the actual weights assigned to the sub-indices according to the regional stage of development, adjusted to take into account that European regions would not be included among the lowest stage of development defined in the *GCI*.

The *Regional Innovation Scoreboard 2009* has adapted the methodology of the *European Innovation Scoreboard (EIS)* to assess the innovation levels of NUTS2 European regions. Contrary to the approach followed in the *RCI*, the indicators for which data was only available at national level were eliminated from the analysis and
the weights in the composite index were adjusted so the final weights were consistent with the original EIS (Hollanders et al, 2009).

The European Competitiveness Index (Huggins and Davies, 2006) described above also considers the regional level (at NUTS1, rather than NUTS2 as is the aim of the European Cluster Observatory), and the Atlas of Regional Competitiveness published by Eurochambers (2008) makes a partial analysis based on a selective ranking of regions (one from each country) on a narrow set of indicators. While there is no composite indicator, this report provides separate information for indicators grouped in six categories: Economic background and GDP, Employment and labour market, Education, Innovation, Transport and Energy, and Internationalisation.

Among the country specific studies we start by mentioning the Regional Competitiveness Index Croatia 2007 (UNDP, 2008), which follows both the World Economic Forum’s Business Competitiveness Index and the International Institute for Management and Development’s World Competitiveness Index methodologies. The former uses survey data to assess the perception of the business environment (divided into four sub-groups of indicators: demographics, health and culture; education; basic infrastructure and public sector; and business infrastructure) and the quality of the business sector (also divided into four sub-groups: investments and entrepreneurial trends; level of entrepreneurship development; economic results (in levels); and economic results (in trends)). The same two categories (business environment and business sector) are assessed using secondary data and basing the analysis on the latter methodology. Therefore, each region received four scores: two from the survey data and two from statistical secondary sources. The two sub-indices from each source of data were combined, giving a greater weight to business environment factors and finally the resulting indices were again combined in a single indicator of regional competitiveness. This indicator can be highlighted for the substantial effort to collect information not just at NUTS2 level but even at NUTS3 level to inform the competitiveness situation of the regions of the country.

The measurement of Lithuanian regional competitiveness, also at NUTS3 level, has been carried out by Snieška and Bruneckienė (2009) and is based on a model that divides factors of regional competitiveness in four groups: factors of conditions of production, demand conditions, factors increasing competitiveness of regional firms and factors conditioning the development of regional clusters. The theoretical
framework seems to coincide to a great extent with the drivers for competitiveness that we have included under the business environment box. However, it does not coincide in the choice of indicators to populate some of these groups (see background paper 2).

At an even at a more detailed geographical level (NUTS4), we find the regional competitive index that has been applied to Finish data by Huovari et al (2001). They consider 16 indicators grouped in four categories (human capital, innovativeness, agglomeration and accessibility) that are aggregated in a single indicator. Finally, the UK Competitiveness Index (Huggins and Thompson, 2010) constructs its own three-pronged model based on a linear framework that builds on the interaction of input factors on output factors and finally on outcome factors. Each of these dimensions is given an equal weight in the resulting composite index, which is calculated at NUTS1 level in the UK.

**Challenges for an ECO Framework**

This review of current analyses of national and regional competitiveness has highlighted a broad range of studies providing valuable data on framework conditions for competitiveness. There are, however, some important weaknesses. The general frameworks tend to either take a very broad, comprehensive focus with acknowledged weaknesses in data quality or are limited to fairly arbitrary selections of data in line with available comparable secondary sources. In both cases a key weakness is the way in which variables are organised within the established frameworks, which in mixing various aspects together tends to be non-conducive to offering clear policy guidance. Studies that have made significant advances either in conceptual models or in more detailed, sophisticated analysis of available data tend to be one-off, hindering comparative analysis over time.

The framework that we propose in the next Section to be integrated into the European Cluster Observatory attempts to respond to these weaknesses, adding three new dimensions that seek to maximise the policy-relevance of the analysis. Firstly, an organisation of indicators in clear layers and groups that highlight where policy influence is possible. Within this the focus will be on three distinct yet inter-related groups of competitiveness drivers as the layer where policy has most potential impact: ‘firm behaviour’; ‘business environment quality’; and ‘specialisation/clusters’. This will, secondly, facilitate analysis of their relative roles in explaining different outcomes; and, thirdly, enable analysis of the interactions between the three.
3. A Proposed Competitiveness Framework for ECO-2

The aim of the framework presented here is to provide a robust basis to assess and benchmark the drivers of competitiveness of regional economies. More specifically, in incorporating regional competitiveness analysis in the ECO we are primarily concerned with two key issues. Firstly, we seek to understand the relative importance of specialisation (clusters) and other regional framework conditions in determining economic outcomes, and the relationships between them. Secondly, we aim to organise the analysis in a way that is most useful for regional policy-makers in terms of benchmarking and identifying key areas to work on in their specific contexts.

To respond to these objectives we propose organising the many factors that measure and influence economic activity in a number of layers, differentiated by their relation to the ultimate objective of economic policy, and by the degree to which they can be affected directly by economic policy. This framework is outlined in figure 1 and explained in the following paragraphs.

*Figure 1: ECO Regional Competitiveness Analysis Conceptual Framework*
**Outcome indicators** sit at the top of the framework. The ultimate goal of economic policy is the standard of living that citizens in a particular territory can enjoy, most often measured by GDP per capita. The limits of GDP per capita in reflecting standards of living are widely recognised, as reflected for example in the recent report by the *Commission on the Measurement of Economic Performance and Social Progress* (Stiglitz *et al.*, 2009). However it remains a commonly understood, easily measured, and easily comparable gauge of the general level of economic activity in a region. As such it is highly relevant for policy-makers, yet not directly controlled by policy: sustainable welfare is created in companies and not through policy. By outcome indicators we therefore refer to indicators of ultimate performance; primarily to GDP per capita, but also potentially to complementary variables that capture broader aspects of standard of living that can also provide important information on the strengths and weaknesses of a location (for example, measures of subjective well-being).

Below the standard of living outcomes is a set of **intermediate performance indicators**. These include variables such as patents, productivity, employment rates, FDI, exports, and growth in numbers of firms. Much past work has looked at these either as ultimate goals or as policy targets to achieve ultimate goals. However, while they reflect performance in a range of areas that have been shown to support final outcomes in GDP per capita, there are significant dangers in designing policy to directly target these indicators. High levels of patenting or FDI, for example, can be ‘bought’ by spending huge sums on science activities or subsidies to firms, but the sustainable impact on prosperity will only arise if the root causes of innovative activity or attractiveness of the region to foreign firms are improved. These intermediate indicators are in effect ‘outputs’ of the underlying interaction between the firms in a region and their business environment. We therefore propose an approach that emphasises their importance as diagnostic instruments to better understand the process of transforming fundamental drivers of competitiveness into a high standard of living. They thus serve an important role as an analytical tool, not as direct policy target. As such their positioning in the framework opens the way for analysing the impacts of specific framework conditions on distinct intermediate indicators and developing lessons from the differences in performance across regions in terms of the transmission into final outcomes.

The third level represents the core of our proposed framework, capturing a set of **competitiveness drivers**. They are organised in three groups of indicators
corresponding to **specialisation** (clusters), **firms** (behaviour), and the **business environment** (quality). These three sets of inter-related characteristics of regions determine intermediate and ultimate measures of economic performance in a more direct way and are controllable to different degrees by policy. Collecting them in one level and distinguishing them from intermediate indicators (often mixed together in other frameworks) is a significant step in terms of enhancing policy relevance, as there is a clear differentiation of where and how policy can have an impact.

**Specialisation** is related to the industrial structure of the territory, an element that ECO-1 has explored in some detail with regards the impacts of regional specialisation and cluster presence. This characteristic of regions exhibits significant degrees of path dependency and changes only slowly over time, but policy plays a role in affecting actual impacts of these geographic factors as well as the speed and direction of development.

The split between **firms** and the **business environment** is influenced by Porter et al. (2008) and the business competitiveness index published in the past as part of the Global Competitiveness Report. The rationale for splitting the microeconomic determinants of competitiveness into ‘company operations and strategy’ and the ‘national business environment’ is that while certain factors characterise the environment in which firms must operate, other factors are directly related to choices that firms make in determining their own behaviour. In the first case we can think of the environmental factors typically comprising the factors, demand, and context for strategy and rivalry points of Porter’s (1990) diamond. In the second case we can think of things such as firm behaviour related to R&D and training, for example. Within these two groups, we plan to follow Porter et al. (2008) in a pyramid approach of aggregating individual indicators into groups and higher level measures, although the extent to which this is possible will depend on the final selection and availability of indicators.6

6 A detailed secondary data audit is the subject of Background Paper 2.
Figure 2: A Pyramid Approach to Aggregating Indicators (Porter et al, 2008)

Schematic Organization of Indicators

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Areas</td>
<td>Broad Categories</td>
<td>Subcategories</td>
<td>Narrow Subcategories</td>
<td>Indicators</td>
</tr>
</tbody>
</table>

Microeconomic Competitiveness

Quality of the National Business Environment

Sophistication of Company Operations and Strategy

- Factor Conditions
- Context for Strategy and Rivalry
- Demand Conditions
- Supporting and Related Industries
- Logistical infrastructure
- Communication infrastructure
- Administrative infrastructure
- Capital market infrastructure
- Innovation infrastructure

- Quality of roads
- Quality of railroad
- Quality of ports
- Quality of airports
- Quality of electricity supply
- Quality of domestic business transport network

Nested sequence of PCI analyses to determine weights

Finally, the fourth level of the framework identifies a group of **fundamentals** that can be taken as a ‘given’ for each region, at least in the medium term. These fundamentals include the geographic profile and location, the endowment with natural resources, and the size of the economy, for example. They provide underlying opportunities and challenges for prosperity generation for each region, and while policy can influence the impacts that they have, it cannot easily influence their presence *per se*. These factors play an important role in the empirical growth literature that examines exogenous factors explaining differences in prosperity and growth over extended periods of time. They are also an important consideration in making benchmarking analysis, where for certain purposes it is desirable for regions to compare themselves with peers that exhibit similar fundamental conditions (an issue addressed in background paper 4).

Having introduced this general framework, we now turn to examine how we propose to make it as relevant as possible for regional policy-makers. We first reflect on the relationship between diagnostics and policy levers in the framework, and then turn to discuss specific issues related to the regional dimension.
Diagnostics and Policy Levers

The ECO will provide diagnostics corresponding to each of the ‘boxes’ in the proposed framework, as illustrated in Figure 3. This will facilitate both an exploration of relationships and a nuanced profiling of the specific strengths and weaknesses of each region, based on comparison with peers. To maximise the relevance of the framework for regional policy-makers, however, particular concern should be given to understanding how policy levers relate to the different indicators.

Figure 3: Diagnostics and Policy Levers

As explained above, a key strength of this framework is that it groups those factors where policy can directly impact in one layer: the ‘competitiveness drivers’. At this level, policy levers can seek to improve various aspects of business environment quality, alter certain behavioural traits of firms, and (over the longer term) play a role in the evolution of specialisation patterns. Policy levers can also impact on the relationships between these three groups of drivers and on the relationships downstream and
upstream in the framework. For example, while geographic location is a fundamental that cannot be altered, policy can improve certain aspects of infrastructure to enhance connectivity, altering the relationship between this fundamental and the business environment. Similarly policy can seek to improve the efficiency of the transmission from improvements in the business environment to attraction of FDI, for example.

The Regional Dimension

Assessing competitiveness at the level of sub-national regions adds a further layer of complexity, especially if done for the entire EU. In many ways, sub-national regions are the most appropriate level to study drivers of competitiveness, because it is at this level of geography that the influence of all drivers comes together to affect economic activity. Indeed, there are microeconomic determinants of competitiveness that can be diluted when measured at national level. ‘Soft’ elements of the competitive environment such as social capital and governance relationships, for example, are increasingly recognised as significant in facilitating firm-level productivity and innovation, and are arguably easier to capture in a regional rather than national setting. However, looking deeper at the policy levels, we encounter the complex issue of the relevance of different business environment indicators for different scales of policy-making. While some indicators exhibit considerable variation across regions in Europe, for other variables the main variation is between countries. Similarly in terms of policy control, some variables are controllable by regional policy-makers (or even at the level of cities), others by national and European policy-makers. Thus we can distinguish three groups of competitiveness drivers that have to be treated differently for analytical as well as policy-advice purposes:

- Drivers that do not differ across regions and are set at the national or EU level; i.e. tariff rates, most tax rates, and competition law;
- Drivers that differ across regions but are set at the national or EU level i.e. most public R&D policy and national infrastructure projects;
- Drivers that differ across regions and are set at the regional level; i.e. land planning and the efficiency of local administrative services.

A specific challenge is to present and analyse this complexity effectively. ECO II focuses particularly on data collection in those dimensions of the business environment where regional differences are large even within a country. These differences could be the result of different regional policies or of national policies that have a highly differential impact across regions. Outcome indicators, intermediate performance
indicators, and indicators of fundamentals are collected at the regional level. Competitiveness drivers, too, are collected at this level, but could also be coded into three groups depending on their variation across regions and the policy control regions exert over them. This is illustrated in Figure 4.

**Figure 4: Three Categories of Competitiveness Indicator**

### Types of Competitiveness Indicators

<table>
<thead>
<tr>
<th>Type of Indicator</th>
<th>Control Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universities</td>
<td>Controlled nationally or by EU</td>
</tr>
<tr>
<td>Competition Policy</td>
<td>Controlled regionally</td>
</tr>
<tr>
<td>Physical infrastructure</td>
<td>Same across regions</td>
</tr>
<tr>
<td>Not relevant</td>
<td>Different across regions</td>
</tr>
</tbody>
</table>

The group of indicators in the top right corner are controlled either at national or European level and exhibit no variation across regions within a given country (or within Europe in some cases). For regional policy-makers they are therefore external factors, but nevertheless important control variables within the framework given their impacts on competitiveness at regional level. Examples include the competition policy or IPR environment faced by firms. Moreover, while the framework proposed in Section 2 is focussed on microeconomic competitiveness, there is a case for considering the introduction of some key macroeconomic and institutional variables controlled at national/European level.

The left hand side of the diagram contains indicators that exhibit considerable variation across regions. The top left corner refers to those where the corresponding policies tend to be national (or in some cases European); for example, infrastructure spending...
or labour market policies. The bottom left corner contains the most interesting set of indicators from a regional policy perspective because not only do they vary across regions, but are in the control of regional policy-makers. For example, indicators related to innovation policies or to certain types of investment or human resources. The split on the left hand side is by no means straightforward, however, given the vastly different policy competencies at regional level in different countries.

4. Summary and Conclusions

This paper has put forward an overall framework for organising and analysing data on regional competitiveness within the European Cluster Observatory. Specifically, this framework responds to the need to better understand the relative importance of clusters/specialisation and regional framework conditions in determining competitiveness outcomes, and to do so in a way that maximises the relevance of data and analysis for regional policy makers. These are features that are variously missing or weak in the range of national and regional competitiveness frameworks reviewed. In particular, our proposed framework adds three new dimensions in a comprehensive analysis of European regional competitiveness:

1. The organisation of indicators in clear layers that highlight the competitiveness drivers where policy can impact.
2. The grouping of competitiveness drivers into ‘firm behaviour’, ‘business environment quality’, and ‘specialisation/clusters’ so as to facilitate analysis of their relative roles in explaining different outcomes.
3. The grouping of competitiveness drivers into the three sub-groups also facilitates analysis of the interactions between the three.

Alongside accessing analysis papers, policy-makers will be able to flexibly explore a series of important variables and composite indices that capture the framework conditions and performance of their regions in comparison with others. There of course remain important limitations to this analysis, in particular related to the availability of data on the most appropriate indicators and the complexity of Europe in terms of which policy competencies lie at European, national, regional and even sub-regional (e.g. city) levels. We aim to confront these limitations in a transparent fashion, for example
categorising where possible indicators as proposed in Figure 4 to reflect their variation and policy relevance at regional level.

The framework proposed in this background paper is complemented by more detailed analysis of specific elements of the framework in three parallel papers. Background paper two deals with issues concerning the data that will enable us to populate the boxes of the framework with indicators. Specifically it undertakes an audit of available, relevant secondary data, building a preliminary series of tables of potential indicators. The paper also reflects on the need to complement the comprehensive analysis of secondary data with a collection of more detailed primary data among a sub-group of European regions. This is an important part of the work package that will enable a more sophisticated analysis incorporating the many important variables that are simply not currently available for all regions and/or that require the development of a dedicated regional opinion survey in line with those conducted at national level by the WEF or IMD.

Background paper three deepens analysis of the specific relationship between the competitiveness drivers in the proposed ECO framework (the red arrows in Figure 1), with a particular emphasis on the interactions between business environment quality and clusters. It focuses on two key areas for understanding the relationship between clusters and regional business environments. Firstly, those factors in the business environment that are important in general for the development of clusters. Secondly, those competitiveness factors that are specifically important for the development of particular clusters. While a detailed analysis of cluster-specific competitiveness drivers goes beyond the scope of the project, these are important reflections for policy interpretation of the general analysis. Moreover, in seeking to provide policy support across many regions and clusters, we also aim to provide more cluster-relevant business environment data as far as possible. The primary data collection phase of the project provides a specific opportunity to deepen this analysis among a sub-group of regions. A survey approach will facilitate the development of indicators that can capture ‘softer’ aspects of the business environment that are particularly relevant for the development of certain types of cluster; for example elements of trust and social capital. Working with partner institutions in this sub-group of regions may also facilitate the inclusion of more specific secondary data, for example on specific types of university qualifications.
Finally, background paper four explores in detail the issue of regional benchmarking, and in particular who to benchmark against. As such it aims to develop a sample methodology to support benchmarking analysis of European regions. In particular, while the ECO-II will provide the data to benchmark competitiveness drivers and performance against all other NUTS-2 regions, it could also provide a complementary tool that would help policy-makers identify ‘structurally similar’ regions for comparison.

The selection of regions with which to benchmark could respond to different criteria: neighbouring regions; regions with strong performance; regions with similar fundamental characteristics; competitor regions; etc.. In this background paper a focus on regions that are similar in terms of fundamental characteristics, and therefore underlying competitiveness challenges, is proposed as an example of what is possible.

This series of background papers in their whole will guide the development of a specific methodology and implementation plan for the remaining lifespan of the project, ultimately resulting in the integration of a framework, data, and analysis of regional competitiveness into the European Cluster Observatory.
4. References


