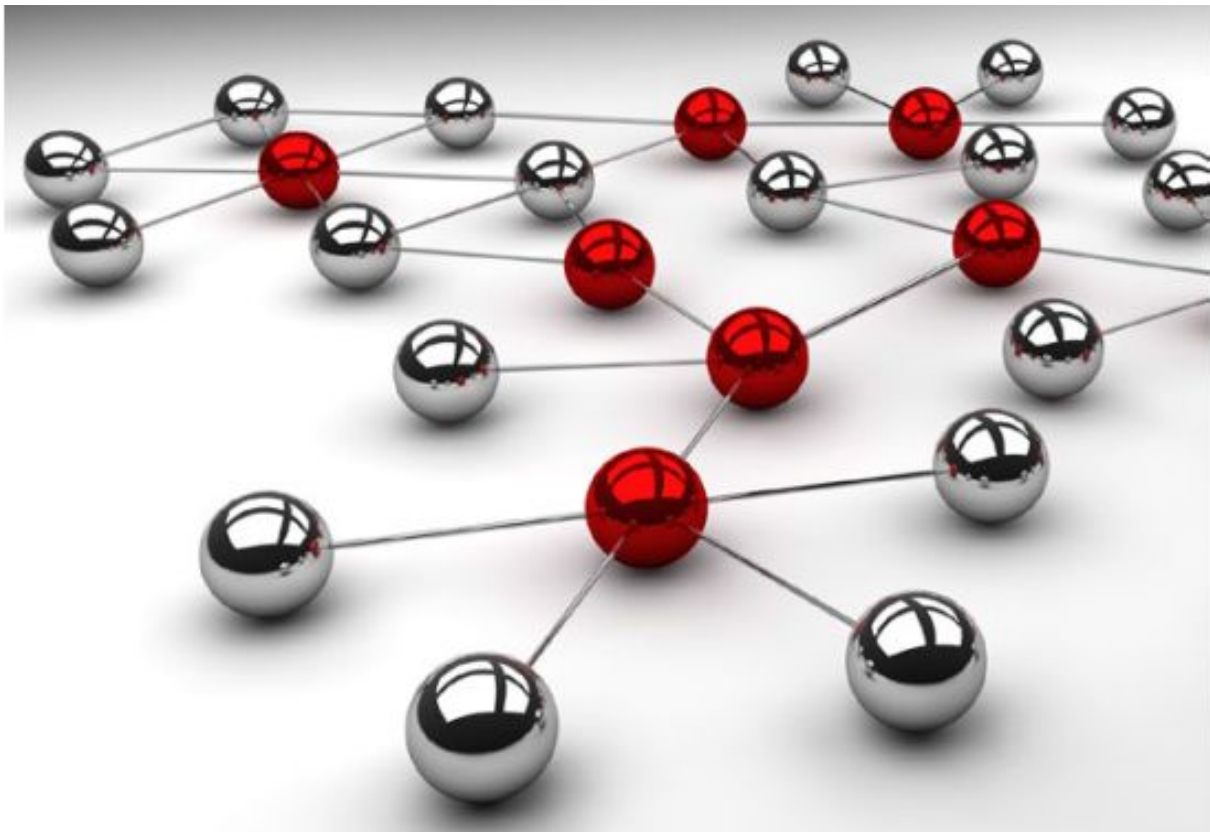


White Paper on Extended and Dynamic Clustering

Governance, Policies and Legal Conditions for Access to Market through
Extended and Dynamic Clustering of SMEs



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Short Description:

This document is the “White Paper” of the EFFORT project. Its purpose is to present the key policy and research recommendations that emerge out of the different streams of research undertaken in the project and the stakeholder engagement strategy. The White Paper identifies the domains for policy intervention in terms of research, regulation, legal measures, technology, and governance at EU, national and regional levels for the facilitation of *extended and dynamic clustering*.

Author: European Institute of Interdisciplinary Research (EIRR)

Contributing partners: All

List of participants, with co-ordinator first:

Participant no.	Participant organisation name	Participant org. short name	Country
1.	Umbria Innovazione s.c. a r.l.	UMBRIA	Italy
2.	T6	T6	Italy
3.	NetSmart S.A.	NetSmart	Greece
4.	European Institute of Interdisciplinary Research	EIRR	France
5.	Institute of Communication and Computer Systems	ICCS	Greece
6.	Corvinus University of Technology	Corvinus	Hungary
7.	Kaunas University of Technology	Kaunas	Lithuania
8.	Katholic University of Leuven	Leuven	Belgium
9.	Fomento del Trabajo Nacional	FOMENT	Spain
10.	TECHIN	TECHIN	Poland
11.	IESE Business School of the University of Navarra	IESE	Spain
12.	Lithuanian Development Agency Small and Medium Sized Enterprises / Lietuvos Smulkaus ir Vidutinio Verslo Pletrs Agentura	SMEDA	Lithuania

EXECUTIVE SUMMARY

This document constitutes Deliverable 6.3 “White Paper” of the EFFORT project. Its purpose is to present the key policy and research recommendations that emerge out of the different streams of research and stakeholder engagement of the project. The White Paper identifies the domains for intervention in terms of policy, law and regulation, technology, and governance at EU, national and regional levels for the facilitation of *extended and dynamic clustering*. It offers ‘parametric’ reflections and recommendations on each of these domains at the level of the unit of analysis of the EFFORT project, namely, cluster and cross-regional *extended and dynamic clustering*.

The document is structured around the thematic areas that have been elaborated in WP1 “Conceptual Framework and Methodology” which provided the focal points of the different research activities of the project and its stakeholder engagement strategy. It is organized in the following sections:

- *Section 1 Extended and dynamic clustering: background and key concepts.* This section provides a reprise of the conceptual apparatus and methodological approach of EFFORT and highlights the key concepts of *extended and dynamic clustering*;
- *Section 2 Toward extended and dynamic cluster-based regional economic policy.* This section lays out the rationale for cluster-based economic policy with emphasis on policy frameworks and approaches supportive of *extended and dynamic clustering*;
- *Section 3 Institutions, strategy and policy.* This section lays out the key lessons learned with respect to institutional and policy frameworks and their impact on the mobilization, organization and sustainability of *extended and dynamic clustering* practices;
- *Section 4 Organizational structure and process.* In this section the document outlines the key highlights of the organizational features of *extended and dynamic clusters*;
- *Section 5 Law and regulation.* This section lays out the key elements of the ‘legal environment’ that affect the mobilization, organization, and sustainable operation of *extended and dynamic clustering* practices;
- *Section 6 ICT infrastructure, uses, and policy.* This section looks at key issues regarding the impact and uses of ICT in clustered economic environments and ICT policy on *extended and dynamic clustering*;
- *Section 7 Governance.* In this section the document provides key insights on the comparative governance structures and processes that impact *extended and dynamic clustering*;
- *Section 8 Future policy and research directions and priorities.* In this closing section the document spells out the implications of the above findings for future policy and research on *extended and dynamic cluster-based regional economic policy*.



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Introduction

This document constitutes Deliverable 6.3 “White Paper” of the EFFORT project. The purpose of the White Paper is to present the key policy and research recommendations that emerge out of the different streams of research and stakeholder engagement of the project. It identifies the domains for intervention in terms of policy, regulation, law, technology, and governance and identifies emerging policy and research priorities at EU, national and regional levels for the facilitation of *extended and dynamic clustering* practices. As such, the White Paper offers ‘parametric’ reflections and recommendations on the level of the unit of analysis of the project, namely, cluster and cross-regional *extended and dynamic clustering*, addressing key issues concerning policy, organizational, legal and regulatory, technological, and governance structures and processes that enable, or impede, *extended and dynamic clustering* practices.

The document is structured around the thematic areas that have been elaborated in WP1 “Conceptual Framework and Methodology” which provided the focal points of the different research activities of the project and its stakeholder engagement strategy. It is organized in the following sections:

- *Section 1 Extended and dynamic clustering: background and key features*, revisits the conceptual apparatus and methodology of EFFORT and highlights the key concepts of *extended and dynamic clustering* on the basis of the empirical research conducted in the project;
- *Section 2 Toward extended and dynamic cluster-based regional economic policy*, lays out the rationale for cluster-based economic policy with emphasis on policy frameworks and approaches supportive of *extended and dynamic clustering*;
- *Section 3 Institutions, strategy and policy* lays out the central lessons learned with respect to institutional and policy frameworks and their impact on the mobilization, organization, and sustainability of *extended and dynamic clustering* practices;
- *Section 4 Organizational structure and process* outlines the key highlights of the organizational features and requirements of *extended and dynamic clusters*;
- *Section 5 Law and regulation* lays out the main elements of the ‘legal environment’ that affect the mobilization, organization, and sustainable operation of *extended and dynamic clustering* practices;
- *Section 6 ICT infrastructure, uses, and policy* looks at key issues regarding the impact and uses of ICT in clustered economic environments and ICT policy on *extended and dynamic clustering*;
- *Section 7 Governance* provides insights on the comparative governance structures and processes that impact *extended and dynamic clustering*;
- *Section 8 Future policy and research directions and priorities* spells out the implications of the above findings for future policy and research on *extended and dynamic cluster-based regional economic policy*.

Placing the White Paper in its appropriate historical context, it is worth noting that the research of EFFORT was initiated in a policy and economic environment much different from the one that is prevailing today. The context allowed the development and adoption of assumptions that were scientifically defensible within a more or less stable economic and policy environment. Recent events and emerging indications associated with the unfolding world economic crisis call for caution as they significantly reduce the field of vision in both policy and research terms. This is not a call for exclusive emphasis on ‘the logic of the conjuncture’. It is, however, a call for a rigorous critical and context-dependent perspective that places reflections and recommendations squarely within the ‘realm of the



possible'. This is the methodological canon that underpins the reflections and recommendations offered here. For the world economic crisis is likely to affect not only the financial and banking structures of economic development but also the way national and regional authorities define and pursue development strategies in ways that cannot be reliably predicted.

Section 1 Extended and dynamic clustering: *background and key features*

Clusters and the broader patterns of economic specialization across geographical regions have become an important concern for EU policy makers. One driver of this is related to the challenges involved in meeting the set of objectives on productivity growth, innovation, and competitiveness that the EU has adopted in the Lisbon-Agenda. In international perspective the EU is rated relatively high in terms of the quality of its institutions and the general conditions that underpin innovation. The opposite is true when it comes to its relative ability to mobilize them through entrepreneurship, new firm formation and corporate renewal. The EU is also rated comparatively high on R&D spending and scientific capacity. Yet, the opposite holds true on its ability to convert them into processes of economic valorization through innovation in ways that could enhance its global competitiveness. As a consequence, progress on the Lisbon-Agenda lags behind schedule and is unlikely to meet the 2010 goals.

In this context, clusters have been singled out as one element that can address the challenges along both these dimensions. They are reckoned to provide a network of skills and structural capabilities, that is, a micro-economic business and innovation-supporting environment, that increases the capacities of firms, especially SMEs and entrepreneurs, to accelerate the process of valorization by converting ideas into business activity, on the one hand, while facilitating the emergence of a meso- and macro-economic environments that help convert scientific advances or new business concepts to market validation and commercialization, on the other.

Another driver for the growing emphasis on clusters is the impact of globalization on the nature and intensity of competition across regions. Declining transport and communication costs, coupled to continuing liberalization measures, are exposing large segments of EU regional economies to heightened global competition. Liberalization and global competitive pressures on business environments and company practices have strengthened pressures for adjustment not only in regional micro-economic foundations but also in the wider social and political fabrics in which regional economies are embedded. With an increasing number of regions in the EU and globally, notably in the economies of Eastern Europe and Asia that provide attractive conditions for investment, regions in the EU are under intense pressure to define their differentiating value in a system of value flows and investment that is increasingly defined on a global basis.

Against this background, clusters for both national and regional levels of government and associated agglomerations of business communities have come to be seen as having the potential to be a key element of a region's value proposition in a global economy as they provide key matrices that concentrate regional economic capabilities and competence. In particular, clusters are thought to provide higher value for companies that are active in the economic fields in which they operate, thus increasing considerably the locational comparative advantage of regions (Ketels and Sölvell, 2006, OECD, 2007a, OECD, 2007b). As a result cluster-based economic development has become an increasingly compelling proposition in research and policy-making circles (The European Cluster Memorandum, 2007).

Theoretical and practical work on clusters has generated a wealth of knowledge on the micro-economic foundations of growth, innovation, and competitiveness. Clusters across the EU are today held as an example to the rest of the world. Their flexibility is usually contrasted with slow-moving manufacturers that depend on mass production who suffered in the recessions of the closing decades of the 20th century. In mainstream political formations and among some prominent academics clusters have been presented as examples to imitate and transplant across the EU. Reformers on the left have presented them as an example of how SMEs employing highly skilled craft workers can compete effectively with old-fashioned big business.

Yet research undertaken in EFFORT indicates that *the strengths of yesterday might be becoming the liabilities of tomorrow*. Several EU clusters, especially those usually associated with innovation in product, service and process, are facing a crisis related to the high, and more recently unstable, euro, increasing difficulties to access finance, and competition from low-wage emerging economies that are increasingly signaling a structural shift in the global economic context in which the EU regions are operating. Companies and the regional clusters in which they operate, in sectors ranging from automobiles, textiles, footwear, leather goods, and software development, among others, are under increasing pressure to compete against regional production centers in Eastern Europe, China and India.

The problem goes deeper than the effects of the current valuation or unpredictability of the euro and comparative labor costs. Several EU regions have grown increasingly conservative and inward-looking, focused more on finding outlets for the goods or services they have traditionally produced on a regional basis than designing and marketing innovative products or services on a global basis. One of the major problems that EU regional clusters face is that of being rooted largely in craft industries rather than value-added services such as design and marketing. In the days of lower competition and trade protection measures that preceded the current phase of globalization it sufficed to outsource such services to established specialized agencies. But today such clusters must compete with rivals that focus on services instead of manufacturing. Research indicates that EU regional clusters are falling behind in innovation. So though the traditional strengths of EU regions continue to hold they are also becoming liabilities. *The challenge is how to move their business to less tangible things like consumer research, cutting-edge design, expert marketing and skill in global sourcing.*

Structural changes affecting clusters are also fueled by the global strategies of multinational enterprises (MNEs). In contrast to earlier approaches that followed the logic of the 'product cycle' today MNEs are increasingly organizing not only their production but their R&D activities on a global basis. Success for a MNE in this respect has come to depend on correctly spotting which locations best suit which kinds of the firm's activities. Picking the right location to invest in activities ranging from production, logistics through to R&D is a critical matter (OECD, 2007a, Pro Inno Europe, 2007). On the other hand, SMEs that mainly interact with their counterparts in a regional cluster often lack the expertise to manage a global supply network, which normally functions as a comparative advantage for MNEs. The implication is that the geographical embeddedness of the firm can become a constraint when the supply chain is increasingly complex and defined on a global basis.

To confront these structural changes it is necessary to change the optic on the very concept of 'clusters' in a way *clusters are no longer seen as regional constellations nurtured by the economic base of a region but rather as 'hubs' within a global system of flows of economic activity*. This involves the elaboration of an approach to the development of SMEs that is based on institutional organs dedicated to building regional economic capacity in terms of skills and network development and the

construction of international connections to enable regional SMEs to confront the challenges of being 'hubs' operating between a global economy and a regional business ecosystem. Indeed, the historic challenge is how to enable SMEs to free themselves from being creatures of their regional clusters and how to reconfigure their functional relationship to them. *Instead of being one among many members of a regional cluster, the challenge is to become the central point – a 'hub' - of a global network of suppliers and retail outlets.*

In this context, we need novel approaches to both theory and practice that, though building on advanced theoretical approaches to the analysis and regulation of clusters, encapsulate the key dimensions of this new phase and enable cluster stakeholders address the challenges confronted by regional economies.

The concept of *extended and dynamic clustering* is designed to address this need through constructive dialogue with existing approaches to regional clusters. The concept involves a *spatial dimension* ('extended') and a *functional or temporal dimension* ('dynamic'). Its core can be described as follows:

- *Extended clustering* involves selecting and aggregating capabilities of clustered SMEs at regional, national, or international level in ways that help overcome the regional geographical boundaries and functional limitations of traditional clusters;
- *Dynamic clustering* involves flexibility and organizational adaptability in the configuration of 'virtual' clusters' that can aggregate and scale-up competencies of particular SMEs within the value chain.

In terms of its application to specific empirical contexts, the concept refers to cluster arrangements that have the following characteristics:

- Though embedded in, they transcend geographical location, in that they focus on global markets and circuits of value flows;
- They operate as both systematic, that is stable and long-term organisms, but have also the ability to operate as *ad-hoc* business networks able to reconfigure business practices and re-aggregate capabilities according to emerging market shifts and opportunities, and production needs;
- They are ICT-enabled and networked across geographical and functional or operational boundaries; and
- They are based on dynamic aggregations of capabilities of economic units of diverse origins and functions, which though they stem largely from the operations of MNEs, they often involve SMEs.

Research undertaken in EFFORT indicates that the presence and dynamic interdependency across these elements in a cluster, especially a cluster that is functionally and operationally networked beyond the natural boundaries of a region, can help SMEs improve their capacities for innovation, global market access, and general business performance.

Section 2 Toward extended and dynamic cluster-based regional economic policy

Today there is growing evidence and agreement among researchers that clusters exist and that they have a number of positive economic effects. However, there is less evidence and agreement on what

exactly the role of policy is and should be and whether it can generate value by accelerating the process of cluster development or increasing the effectiveness of existing clusters through *extended and dynamic clustering* practices.

In this context there is a need for a model for economic policy supportive of *extended and dynamic clustering*. This model should be based on our knowledge about existing clusters to identify a set of procedures and activities to be applied when conducting economic policies involving clusters. From a policy-making standpoint the evidence on the economic benefits of clusters suggests that policy makers should focus on policies that create or support clusters and *extended and dynamic clustering*. However, for many liberal economists, this continues to raise concerns about the distorting effects of policy interference with the operation of markets.

Nonetheless, there is an underlying economic rationale for *extended and dynamic cluster-based* regional economic policy that is consistent with economic models which are broadly supportive of the efficient operation of markets. This rationale has the following lines of reasoning:

- The externalities that give rise to clusters and *extended and dynamic clustering* indicate the presence of multiple equilibria with different levels of prosperity, not only in different locations but also for the sum of all locations; policy has a role in facilitating the transition of such locations to more favorable equilibria;
- These externalities do not occur automatically but can be generate, supported and strengthened through purposeful and targeted policy action;
- The time it takes for a region to reach its 'equilibrium' state is not a given and can be significantly influenced by policy (Ketels and Sólvell, 2006).

In terms of their economic and political contexts, national and EU level programs to support clusters and regional specialization originate from one of three main policy families: regional policy, science and technology (S&T) policy or industrial/enterprise policy. These three policy areas have undergone changes in policy orientation away from a top-down and single-sector approach towards policies that favor co-operative, multi-actor and often place-based approaches (see Table 1). These trends have supported increased policy interest in programs to develop or strengthen regional specialization and cluster development with an ultimate goal of improving competitiveness and innovation capacity.

Table 1. Policy trends supporting clusters and regional innovation systems

Policy stream	Old approach	New approach	Cluster programme focus
Regional policy	Redistribution from leading to lagging regions.	Building competitive regions by bringing local actors and assets together.	<ul style="list-style-type: none"> • Target or often include lagging regions. • Focus on smaller firms as opposed to larger firms, if not explicitly then <i>de facto</i>. • Broad approach to sector and innovation targets. • Emphasis on engagement of actors.
Science and technology policy	Financing of individual, single-sector projects in basic research.	Financing of collaborative research involving networks with industry and links with commercialisation.	<ul style="list-style-type: none"> • Usually high-technology focus. • Both take advantage of and reinforce the spatial impacts of R&D investment. • Promote collaborative R&D instruments to support commercialisation. • Include both large and small firms (often spin-off and start-up firms).
Industrial and enterprise policy	Subsidies to firms; national champions.	Supporting common needs of firm groups and technology absorption (especially SMEs).	<p>Programmes often adopt one of the following approaches:</p> <ul style="list-style-type: none"> • Target the drivers of national growth. • Support industries undergoing transition and thus shedding jobs. • Help small firms overcome obstacles to technology absorption and growth. • Create competitive advantages to attract inward investment and brand for exports.

Source: OECD, 2007b.

Cluster policies linked to regional policy often focus on “lagging” regions, including regions undergoing industrial restructuring and geographically peripheral regions. In addition, several initiatives originating in other policy families have incorporated a clear regional dimension, reflecting the recent emphasis in science and technology and enterprise policy on the importance of regions.

Several of the more recent cluster/regional specialization programs were born from science and technology (S&T) policy. They promote collaborative R&D to support growth of the most promising technology sectors in regions where these sectors are concentrated. Even though in theory spatially neutral, in practice such policies often focus on specific geographic areas where key institutions, researchers and firms are clustered.

Industrial policies with cluster programs tend to focus either on the drivers of national and regional growth or focus on the needs of SMEs. The cluster approach provides a more transparent, inclusive and potentially less trade-distorting framework for efforts to strengthen strategic sectors than the prior policies of supporting large and often state-owned firms. Programs to support clusters of SMEs started as early as the 1980s and tend to focus on building critical mass for export, access to information and technology absorption. Programs that focus on disadvantaged regions also tend to be closely linked with SME policy.

Most national programs in EU countries link more than one policy stream, either explicitly or implicitly. A notable trend is the emergence of innovation as an objective in policies other than those directly related to S&T policy. A few programs integrate all three policy streams – regional, S&T and industry/enterprise – and some involve considerable resources and register high on the country’s public policy agenda. A key question is whether one program can address all those objectives simultaneously. Over time, these policies have generally transitioned from a focus on SMEs only to a broader competitiveness clusters approach and increasingly emphasize technology and innovation.

The economic rationale for government intervention serves to define the different choices regarding program targets. Those targets may be places (leading regions, lagging regions, hub areas), sectors (dynamic, exposed, strategic, social significance) or specific actors or groups of actors (universities, SMEs, MNEs, etc.). They could also be a combination of these different target categories (see Figure 1). The targets then need to be clearly identified to ensure that the resources available for the program are adequate and that the goals are achievable. There are clear tradeoffs to be made when selecting these different targets.

These policy choices are not always evident. Focusing on leading regions that drive national growth is arguably an efficient means to boost national economic performance. However, lagging regions detract from social cohesion and can be a drag on national growth. Supporting dynamic sectors may give them a competitive edge with important technological spillovers for the wider economy. Refocusing exposed sectors to new opportunities can preserve employment and promote restructuring of regional economies. Improving opportunities for certain priority sectors helps to target resources but often involves predicting the evolution of fast-moving product markets. On the other hand, providing a blanket cluster program for all sectors or regions can dilute available resources and focus.

Figure 2. Types of Policy Targets



Source: OECD, 2007b.

Identification of clusters can be top-down, bottom-up or a combination of the two approaches. Countries identify potential program recipients using two very different approaches: either 1) a statistical method, such as a mapping study, or 2) a process of self-selection, such as a call for proposals. The former is particularly used when the goal is to support national economic drivers. In some instances, national programs provide only a general framework and rely on regions to identify target clusters within their jurisdictions.

The selection mechanisms used include both competitive and non-competitive procedures. Competitive selection has the benefit of identifying programs with the best potential impact given the level of public investment and sends a “label” signal to the market. Another benefit to this selection



mechanism is that groups that come together in a competitive process may build useful relationships even if not selected.

Among the top-down selection procedures, there is a trade-off between statistical versus negotiated approaches. Policy makers can use statistical mapping or other quantitative measures as strict selection criteria. However, because of methodological issues and definitional problems, these often give results that are contestable politically. There are also more flexible, even negotiated approaches which take into account a wider range of selection factors but such processes are then subject to other political influences. Several programs have used a hybrid approach.

In general, the instruments used in these programs are of three distinct types: 1) engagement of actors, 2) collective services and 3) larger-scale collaborative R&D. In terms of engaging actors, key issues include: the role of facilitators and cluster initiatives, the level and nature of interaction desired, and the spatial considerations of the cluster. For the programs that emphasize collective services, like business advice, skill development or joint marketing, a key consideration is how to target services in a way that does not substitute for private provision. Finally, collaborative R&D projects through cluster programs tend to involve more than one research institution or university in co-operation with several firms and often tap into external R&D funding sources and programs.

In general, the funding patterns of these programs can be broken down into three basic categories. The first category of programs for instruments to engage actors tend to spend less than 100 000 EUR per cluster per year for three years or less. A second category of spending includes programs that emphasize service delivery and support for collaborative projects, including “light” R&D, with spending from between 100 000 to approximately 1 million EUR per cluster annually over several years. A third category for “heavy” R&D projects includes projects that spend approximately 1 million EUR or more per cluster annually for periods up to ten years. However, overall it does appear that the level of funding for the majority of these programs is relatively limited, especially relative to their goals (OECD, 2007b).

However, *cluster creation and targeting is a risky guide for policy* as it can lead policy makers to concentrate on the same type of cluster categories viewed as ‘strategic’. In such a field many locations without relevant competitive advantages will tend to compete for the same number of limited spots sustainable in the industry. And they will tend to compete on the amount of financial incentives provided by policy, not on their inherent attractiveness for these activities. This type of ‘locational competition’ can lead to a government-centric approach to regional economic development that can be less than economically optimal for regions and costly for public budgets. It often also relies on limiting or distorting the effects of competition, and because high levels of local rivalry are critical in creating competitive clusters, these policies can undermine the very competitiveness they are designed to create (Ketels and Sölvell, 2006).

A more productive way to approach *extended and dynamic cluster-based* policy is to think through the concept of ‘enabling framework’. Such a framework is focused *on removing bottlenecks for cross-border and cross-regional clustering practices in ways that enhance market access and the innovation capacities of cluster participants*. This approach is driven by an underlying model of economic development that views clusters as ‘living systems’ evolving over time depending on the profile of their business environments, the composition of the economic base in which they exist, and other factors embedded in location and history. *Policy in this context is not the result of blueprint but rather a*

function of a non-deterministic assessment of the development trajectory of a given cluster with the objective to optimize its positioning as a 'hub' in a global value chain.

This approach amounts to *a new model for regional economic development policy*. In the context of *extended and dynamic clustering* existing clusters have a significantly higher potential than just being the expression for well-intentioned cluster initiatives that are innovative but often isolated and with little sustainable impact. *To improve a location's competitiveness, all elements affecting the context for productivity and innovation in individual firms and clusters have to be taken into account.*

EFFORT's findings in this respect are consistent with and supportive of existing research which points to four dimensions that are critical elements of such a strategy. These are as follows:

1. Regions need to adopt a global 'hub' approach to the regulation of their clusters;
2. Address cross-cutting weaknesses in their general business environments;
3. Create an institutional and governance structure to focus on competitiveness beyond the life cycle of specific administrations; and
4. Define an overall understanding of the differentiating value they intend to provide relative to other locations.

This approach to regional economic policy, *focused on the overall business ecosystem as well as specific clusters*, stresses the importance of a key challenge policy-makers face: *prioritization*. Prioritization and implementation of regional policy can no longer rely exclusively on government. In earlier approaches, government was seen as responsible for a stable macroeconomic and legal context and a functioning infrastructure while companies were to compete in the market place. Competition under globalization alters the structural conditions of policy intervention. Government is an important factor in shaping the business environment but so are companies, universities and public and private research bodies, and many other institutions of government and civil society. Government itself is not the unitary entity it appeared to be when macroeconomic policies were the focus. At the microeconomic level *many different types of government agencies at all levels of geography have an impact. And this is fundamentally a question not of government intervention but one of governance among different stakeholding organizations within a spatially dispersed system of competencies geared to market access and innovation.*

Effective *extended and dynamic cluster-based* development needs to be based on an assessment of the most critical barriers that hold back productivity improvements and innovation. To act upon this set of factors, a broad group of institutions have to work together. Depending on the unique circumstances, all entities related to the cluster – from the government to individual companies to trade associations and universities with relevant research or educational programs – have to be involved. A generally accepted policy framework which explicitly seeks inclusion and 'buy in' on the part of all stakeholders is a critical condition for the mobilization of actions and resources in clusters. At the same time public funding on the part of national or regional authorities for the support and development of clusters is also important as it demonstrates commitment and credibility. However, these conditions in themselves are not sufficient for *extended and dynamic clustering*. *What is critical is a governance framework that encourages transactional relationships among the actors within the cluster and their counterparts in other complementary clusters* (OECD, 2007a).



Section 3 Institutions, strategy and policy

The challenges EU clusters confront are increasingly defined on a global basis. However, the regional responses and strategies they have engendered vary considerably across regions. The role of regional and national institutional structures is of critical importance in shaping the conditions under which different regions organize their strategies. Institutions provide the structures of incentives and disincentives for business and economic decisions and policy responses of the key stakeholders within different regional clusters. They can be enabling mechanisms supporting innovation and growth or obstructive structures contributing to stagnation and decline. However, institutions in some ways are historical givens; they cannot be easily or rapidly reconfigured according to emerging needs. Indeed, as the EFFORT research demonstrates, *institutions provide the strategic frameworks of action (or inaction) for different regions and regional clusters*. Furthermore, institutional development and reform can lag behind economic transformations since these are conditioned by the wider national historical, contexts in which they exist.

The institutional structure of regional and national contexts is a key antecedent to the design, organization and implementation of policy frameworks and approaches to clusters, and more specifically *extended and dynamic clustering*. The research undertaken in EFFORT supports the claim that public policy plays a crucial supporting role in the innovation process. Such support includes the provision of funding in the earliest stages, the facilitation of direct and indirect dissemination of information and the fostering of an entrepreneurial culture in academia, and the society at large. This finding is consistent with both the Aho Report and the *Gate2Growth* manual as one of the key components in creating an innovative Europe (Aho Report, 2006, European Commission, 2007).

Often national and regional cluster policies target certain sectors or product areas (e.g. automotive, pharmaceuticals, energy, etc.), technologies (e.g. wireless technologies) or materials (e.g. composites, wood, etc.). There are solid reasons behind such sectoral approaches. They are often reckoned to be the most effective way to facilitate innovation as they can identify the barriers and drivers of innovation. Coupled to this, feedback from the cluster stakeholders engaged in EFFORT indicates that the amount of funding that goes towards innovation (i.e. the application of new knowledge) is quite small when compared with the amount of funding that is put into R&D (i.e. the creation of new knowledge). Generally speaking, it is clear that *there is both a lack of capital and a lack of financial resources directed towards innovation and their follow-up activities such as further training and networking events in which entrepreneurs meet with industrial players*.

However, even though sectoral approaches to cluster policy tend to predominate it does not necessarily mean that they are the most effective approach to cluster regulation, especially in the context of *extended and dynamic clustering*. A sectoral policy focus by prioritizing certain areas and objectives can exclude others that can make a significant contribution to a given region. Policy approaches that are based on a view of clusters as 'platforms' that can enhance synergies across sectors still hold significant advantages that cannot easily be foreseen from a sector-centric perspective (OECD, 2007a). In some cases 'platform' orientations to cluster development seem to happen despite of policy intent. An example of this is food and health-care, an area where medicine meets agriculture. Here developments are driven by advances in biotechnology but primarily by the increasing attention that nutrition-related health problems have received in recent years. However, it is quite rare that cluster policies actively and systematically strive to support the interaction of different competence areas or clusters.

The impact of cluster policies on the development of clusters in general and *extended and dynamic clustering* specifically is difficult to assess, taking into account that regional clusters are the result of many factors that work together over time. Some clusters emerge spontaneously without governmental support, while some cluster initiatives do not or have not yet resulted in statistically significant clusters, as measured for example by the European Cluster Observatory.

Despite the high levels of activity in cluster development there is a sense that cluster-specific policies have yet to show their full impact. This might be just an issue of time, as cluster development takes many years and many of the initiatives are still relatively young. But the research undertaken in EFFORT also indicates a number of more widespread challenges that may limit the potential impact of these policies. These are as follows:

- In several cases, cluster initiatives have emerged out of SME policies and thus tend to focus on smaller companies and start-ups. However, *a low presence of larger companies may limit the economic impact of clusters*. While such efforts have benefits, there is evidence that *full cluster effects can only develop if all types of companies are actively engaged, independent of size or sector*. Similarly, the participation of companies is often limited to companies that have a direct need for available government support. While this is natural, successful cluster initiatives require ‘opportunity-based’ participation where successful companies see additional benefits;
- In many of the cluster initiatives the role of the government is limited to the provision of financial incentives. This support is useful and often crucial to initiate joint activities. However, it does not necessarily engage the public sector in addressing the barriers to higher competitiveness and innovation that clusters face.
- In some cluster initiatives there is lack of integration of cluster initiatives in an overall regional economic strategy. Without integration in such a strategy, cluster initiatives are less effective. *Regional strategies should anticipate the international strategies of key actors and stimulate cluster initiatives to position themselves in a European and global context*. In the absence of such international alignment, cluster initiatives and the cluster policies that support them tend to be less effective because of unnecessary duplication and sub-critical mass.
- Some of the initiatives focus on emerging clusters where only a few companies and maybe one research institution are present. While such efforts can be part of an overall cluster strategy, they should be only one element in a portfolio of activities and are likely to have limited impact. The cooperation of regional clusters is often limited to a general exchange of operational practices. However, *a key issue concerns the exploration of opportunities of creating networks of regional clusters that play complementary roles along the value chain of their economic sectors*.
- There is insufficient integration of cluster initiatives at the regional level. Regional policies often do not exploit existing or potential linkages between clusters within a strong portfolio of clusters at different stages of development. And there is not enough dialogue between cross-cutting policies to strengthen regions and cluster-specific efforts.

In the clusters examined by EFFORT and the wider research of the domain *there is a clear need for the assessment of policy and regulation impact on the performance of clusters and the ability to develop extended and dynamic clustering practices*.

A cluster policy's long-term goal must be to enhance the prosperity of a region by strengthening the competitiveness of a certain industry or set of companies. It is in the nature of this goal that cluster policies must achieve sustainable frameworks for cluster development. Two types of sustainability can be distinguished:

1. *Sustainability of policy and policy measures*: In order to achieve industrial commitment to cluster programs some framework conditions should remain stable for some time. Instability in the creation of a program and changes in program content may make companies think it is less meaningful for them to invest in relationships with rapidly changing bodies and learn about the possibilities and restrictions of support schemes, which could become obsolete overnight.
2. *Sustainability of the clusters or cluster initiatives*: Cluster development is a long-term process that can be disturbed and even destroyed quite easily if the framework conditions are unfavorable. Crucial elements of cluster development include the delimitation of the cluster (sector, technology, etc.), the regional cluster "climate", e.g. tradition of collaboration, and the skills and tools of the cluster manager.

Against this background, *policy and regulation should be predictable, flexible, and modular. Regulations that focus on the policy goal, rather than on the technical solution through which it is achieved, leave space for innovative solutions.*

The analysis of cluster policies undertaken in EFFORT shows that the trans-border dimension of such policies is in its infancy. Cluster policies are still seen as an instrument to increase competitiveness of specific regions. Yet, governance systems for innovation policy do not lead easily to the recognition of trans-border character of clusters. Other forms of timid cross-border aspects of clusters policies lie in the possibility of most regional and national programs, to accommodate foreign firms in the supported clusters, but usually this possibility is only marginally exploited. *Competition between regions and countries is one strong deterrent to the development of truly cross-border programs.*

Although promoting clusters across administrative borders might appear somewhat counter-intuitive for public authorities whose areas of action are often confined to their boundaries, this is the direction to follow. *There is no necessary contradiction between geographical concentration and functional specialization.* In this regard, *the policy definition of clusters as 'hubs' in global networks is an area of growing significance and interest for future cluster policy-making.* Thus, introducing a European dimension appears as a necessary step to take for cluster policies.

Indeed, the real challenge for EU clusters concerns the management of innovation in global value chains. In particular *the issue of how public support measures can facilitate innovation processes in clusters active in global value chains is of utmost importance for policy makers.* Research and experience show that a dominant part of development and innovation takes place in clusters of companies which are based on production value chains, i.e. supplier-customer relations. With globalization these systems become increasingly transnational. Large clusters have a transnational structure with connections to several countries and with different specialties. *Today very few cluster supporting programs have strategies for how to form cross-border clusters.*

In order to increase the likelihood that cluster policy action will be effective, analysis of the determinants of success is of utmost importance. Regional policy-makers need to have a good understanding of how the region's economy as well as the wider social system is affected by more

general economic trends. Yet, the cost of data-collection remains a challenge, especially as far as sample-based statistics at the sub-national level are concerned. This has resulted in a situation where, *in spite of the general consensus about the vital importance of clusters for successful policy-making, typically there is a general scarcity of comparative data about cluster policy in regions in official statistics agencies*. Better regional indicators of this kind are of paramount importance for the ability of regions to devise and run effective policies for the knowledge-based economy and society.

While it may be valuable to have certain cluster-related indicators in a single region, being able to compare these data with those from other regions can make them all the more powerful as input for policy-making. Often, only comparisons of statistics across regions can render them intelligible, as individual figures do not provide any point of reference. This raises a number of challenges. The selection of indicators should be guided by the longer-term as well as current objectives of policy-making within the region. Such policy frameworks differ across regions, which implies that the indicators, which are of most use for informing policy-making will not be the same in all regions. *There is, therefore, a need for regions to coordinate their benchmarking activities in order to agree on a common approach*. The answer to this need should enable a high degree of comparability across regions, but still enable all participating regions to collect the data which are of most relevance for their specific purposes.

Benchmarking should not be used to demonstrate which region is the “best” on a set of indicators – although we must be realistic enough to see that this will always be taken as one of the results of such an exercise. Rather than simply ranking regions according to “performance”, *benchmarking, if rooted in a proper understanding of the relevance of clusters for wider socio-political objectives, can be a valuable source of information for supporting policy-making in finding effective answers to the challenges of the knowledge-based economy and society*. It can do so by helping to:

- Identify areas which may require policy intervention because developments overtime or in comparison to other regions are running counter to major policy objectives, or because new policy challenges have arisen which are not yet taken into account for policy-making;
- Point towards “good practice” in other regions (that perform well on an indicator), which may be used to find ways how own performance can be improved;
- Provide a framework in which the success or failure of different policy or management approaches can be tracked over time (IANIS+, 2007).

Policy design recommendations

A common feature in some of the policies analyzed in EFFORT is the goal to establish a “community of interest”, where groups of companies belonging to various sectors have worked together and shared information in order to define new business models, among SMEs, able to work together and communicate and to spread new working practices to other players along the value chain, in the same industry or not. Innovativeness in policies targeting SMEs can be looked at from different perspectives, for example in terms of the adopted approach, the targets, the promoted technologies, and the processes. The sectoral focus brings about a general shift of policy goals from the strengthening of individual participants to the *improvement of the competitive positioning* at a higher community level. This approach inevitably determines the raising of issues related to competitiveness among players. Linked to this is the practice of *leveraging the driving force of leading companies*. The rationale is that leading players in a sector or a district may act as a catalyst in their value chain, thus facilitating the



inclusion of other actors. Moreover, large players can more easily contribute to the technological developments and to the definition of standards that are of general interest for the industry.

Another approach involves the *combination of a top-down with a bottom-up approach*, that is to say central management and control and regional/local deployment. This practice is pertinent whenever measures are to be applied in various areas or districts belonging to the same sector industry but with local features. Central coordination increases the efficiency of the action, avoids duplication of efforts, and facilitates the collaboration with international stakeholders. The bottom-up approach of regional implementation assures a close link with the target beneficiaries that allows the provision of services actually tailored to customers' needs.

The possibility to gain from networking is a common condition for many of the policies analyzed in EFFORT. A *sectoral focus* is a *facilitator* in this respect, as it drives the involvement of sector-specific stakeholders and experts with sectoral background and reputation. It also makes it easier to involve industry associations and chambers of commerce in the dissemination phase, and to involve industry associations and chambers of commerce in the promotion and dissemination phase. These organizations often play an important role as intermediaries, for example in smoothing conflicts of interest or removing concerns about competition.

Communication is essential both for managing cluster initiatives (internal communication) and for involving relevant stakeholders and beneficiaries (external communication). *Internal communication* and the strong *relationship* between central management and the people and organization in charge of (local) implementation are relevant factors allowing efficient management of initiatives. This holds true in particular when numerous and various players are involved and when policy is implemented at two levels, typically a central coordination level and a local implementation level. Towards direct beneficiaries, the implemented communication activities not only increase awareness of the initiative among members of the business community, they also serve as examples of reference introducing novel practices, tactics, and ways of doing things to SMEs which can later adopt to their own business. The most important elements highlighted by EFFORT's analysis are: the *involvement of other sectoral stakeholders* and, related to this, the management of *various communication channels*.

Evidence has also been found regarding measures to increase resources for research and innovations in order to improve the productivity of industrial and scientific research. However, it should also be clear that *increasing R&D budgets is not making a region more innovative*. Technology development and innovation should be complemented by a greater focus on market-related issues. Inventions and R&D activity will only create sustainable wealth and development in a region when they are transformed into marketable products/services. The consequences should not be underestimated: *transforming Europe into the most innovative economy in the world also implies that innovation policies are aligned with the industrial policies and vice versa*.

Section 4 Organizational structure and process

The research undertaken in EFFORT confirms that the *organizational and network structure of clusters is dependent on the industry in which they operate and the knowledge-intensity of the activities they engage*. For instance, the organizational and network topology of automotive clusters varies considerably as one moves from wood or furniture to ICT or aviation clusters. Even within the automotive value chain the organizational topology of clusters varies according to the technology- and

knowledge-intensity of specific production processes. Clusters operating in lower parts of an industry's value chain, such as automotive component supply chains, tend to be vertically integrated, while clusters involved in more technology- and knowledge-intensive activities such as advanced engineering and design tend to be geographically dispersed and horizontally integrated in order to leverage knowledge and expertise networks and generate complementarities which exist on a global basis.

In this context, the generic use of the term 'cluster' has limited value. Instead, *clusters must be mapped on the basis of the industrial sectors in which they operate, the knowledge-intensity, and value-added elements of the processes they undertake*. Though some clusters are embedded in geographical locations (requiring more traditional forms of intervention and support) others operate as 'hubs' in geographically dispersed but technologically, organizational and institutionally integrated networks.

Consequently, *policy directed to the formation and regulation of clusters must be calibrated according to the organizational and functional topology of different clusters and their precise location in the production process and value-chain*. Clusters specializing in auto motive component production for instance might require regional coordination and integration mechanisms among key stakeholders. Clusters that operate in high value-added activities such as design and advanced engineering tend to operate as 'hubs' within a global network of knowledge flows. For the latter, policy should be targeted to developing approaches and support mechanisms that insert the competences and requirements of the regional cluster into geographically dispersed circuits of knowledge and expertise.

Currently in the EU there is a trend towards larger and longer-term initiatives, often with a duration of more than five years. The scope of cluster policy initiatives has arguably increased compared to awareness-raising programs and grant schemes of earlier years. This is necessary, considering the increased complexity of the objectives and activities, often involving numerous organizations and stakeholders. It can require substantial resources (and some patience) to *create momentum and critical mass* with such programs. *An important success factor for supply-chain oriented initiatives is the participation of large enterprises*, as they are normally key nodes within supply chains. Ideally, policy initiatives will therefore leverage the role of large firms.

The initiatives confirm that cluster performance is not only a problem of hardware, software and standards (i.e. upgrading ICT infrastructures in numerous companies). Instead, improved performance requires *organizational innovation*. The biggest challenge in this respect is often convincing firms that they have to introduce organizational changes. Another success factor is that the *project manager* be representational, legitimate and recognized by all stakeholders represented in the cluster. *As conflicts of interest* cannot be avoided in projects where many stakeholders have to agree on common processes and standards, it is important that working groups and other joint activities within the cluster be coordinated by experienced neutral *third-party moderators*.

The EFFORT research and stakeholder engagement indicate that a critical factor in the effective operation of clusters and *extended and dynamic clustering* concerns *the relationship of organization and trust among stakeholders*. Trust here involves two dimensions: trust among the companies involved in the cluster, and trust between the companies and public authorities (both regional and international), and research organizations. Both of these dimensions have to do with transparency and complementarity of interest across the stakeholders.



Another critical issue in the organization of clusters and *extended and dynamic clustering* concerns the identification of areas of business complementarity across the business activities of member companies – both on a regional and cross-regional basis. This depends on *the development of criteria of cluster member selection on the basis of a strategic vision of the cluster's long-term objectives*. In other words, cluster initiatives should not appeal to generic notions of the benefits of clusters but rather to the self-interest of stakeholder organizations.

Complementarity of business interests must be a key criterion of cluster member company selection. This must also be supported by analysis of compatibilities in the cultures of the organizations selected. The organizations involved in collaborative projects must be able to communicate with each other, sharing a common “language” and vision. They must have a working style that is complementary, in the way they go about reaching decisions, their problem-solving style and so forth. Above all, their behavioral styles must be compatible.

Another element concerning organization is the importance of *clearly establishing the ground rules for collaboration, such as ensuring that there are clearly defined goals, objectives, and responsibilities for collaboration that are fully understood by all parties involved*. This underlines the necessity of preparing detailed and binding initial collaboration agreements in order that future ambiguity is avoided. It also needs to be recognized that circumstances change and this alone suggests that there may be need for, first, frequent appraisal of collaboration and, second, the scope for adaptability. The importance of establishing the limits to collaboration has also been noted to avoid the transfer of general knowledge and experience during the process of joint product development.

However, there needs to be a balance between protecting the proprietary interest of a cluster member organization while establishing trust and openness with its partners, these being regarded by many as critical ingredients in the continuation and effectiveness of inter-organizational relationships. The task for those involved in the management of collaborative product development is to balance these potentially conflicting issues as different cluster projects evolve.

Related to the establishment of clear ground rules for collaboration is the corresponding need for the monitoring progress through the establishment of “milestones”. However, it is obvious that at the outset it is difficult to plan for all the possibilities that might emerge as product development proceeds and this again highlights the need for frequent reappraisal and for a degree of flexibility.

The presence of one or more “collaboration champions”, or “mentors,” with a wholehearted commitment to making collaboration work and a determination to overcome any difficulties has also been noted. Such individuals, it is suggested, will be most effective if they have sufficient seniority or the support of top management. They are likely to play a role akin to the “product champions” identified as important to the success of new product development. Indeed. Some of the most important factors in cluster organization and extended and dynamic clustering are: top management commitment, trust among companies, partner selection ability, personnel involvement, collaboration set-up. The overall message is that organizational and inter-organizational factors are considered to be more important for successful inter-organizational collaboration than contextual factors such as public policy, legal frameworks, and shared ICT platforms.

Section 5 Law and regulation

The operation of clusters is significantly affected by the prevailing legal environment within national jurisdictions, and in the case of *extended and dynamic clustering* that prevailing across them. This section highlights key issues in the legal environment affecting practices of *extended and dynamic clustering*. The term ‘legal environment’ constitutes a large, amorphous field that contains many heterogeneous elements of legal nature. Clusters and clustering are new concepts for legal experts and jurisdictions that are, in principle, still used to base their reasoning and approaches on the level of company or group. Business law literature and practice has long familiarity with the concepts of ‘strategic alliance’ or ‘constellation’. However, such concepts are more relevant to the practices of MNEs, not those of SMEs.

Law and regulation in the context of clusters has often contradictory implications. For instance, it is difficult, in many cases, to draw a definitive and absolute distinction between barriers to and enablers of *extended and dynamic clustering*. The same elements, for instance, IPR protection, can be seen as barriers or as enablers at the same time, according to the concrete circumstances that the companies and clusters confront. In what follows we outline some key highlights of law and regulation that affect clustering and more specifically *extended and dynamic clustering*.

Contract law: Contract law affects the life of every company and, as a consequence, of every cluster. Any business relation, be it written or oral, is regulated by contract law. Companies that are willing to collaborate in a networked or clustered environment can do so informally or through a variety (depending on national legal specificities of contracts law) of legal forms such as Joint Ventures and Strategic Alliances or through Consortium Agreements. Each of these options involves optimized options regarding the required level and intensity of integration that the contracted parties want to achieve and their goals. The legal form that has been selected, in fact, will influence the extended and dynamic character of the collaboration so that, for instance, if it is not likely that an informal cluster will become *extended and dynamic*, this is the case in point for a highly-integrated Joint Venture. With this context, it is not straightforward to assess whether the laws that regulate the creation of a separate entity (assuming that the cluster is ‘incorporated’ in such a separate entity) acts as a barrier or an enabler. In other words, it is up to the firms that are willing to collaborate to choose the best legal business form and make the applicable regulation an enabler.

For instance a national framework law on public companies, in particular as regards minimum capital requirements, is a barrier to clustering if the undertakings that want to collaborate are very small and do not have the financial capability to set up. On the other hand, the regulation of a consortium agreement can be an enabler for the very fact that it allows such firms to collaborate and set up a cluster without requiring big capital investments and the respect of cumbersome and costly proceedings. For these reasons the analysis should be carried out on a case-by case basis, and it is possible to generalize only to a certain, limited, extent.

Nevertheless, lawmakers can enact instruments that create the conditions for setting up of clusters. Probably the best example in Europe is represented by the Groupement d’intérêt économique (GIE), introduced in France. Pursuant to Article 1 of this Law “two or more legal or natural persons can constitute an Economic Interest Grouping for a limited period of time. The aim of the grouping is to facilitate or develop the economic activity of its members, to improve or increase the results of this activity. It is not that of realizing benefits for itself. Its activity must be linked to the economic activity of its members and can have only an auxiliary nature with respect to the latter.”

In light of the above considerations, national lawmakers should take into account the possibility to enact instruments, like the French GIE, that allow the clustering of SMEs. Policymakers, at national and European level, should also carefully consider the need for flexibility of the members of the grouping, and allow the parties to contractually modify the regime of unlimited and common liability set forth by the existing applicable laws. By doing so, the traditional draft between companies and simpler legal business forms (with no capital which is separated from that of its members) will be (at least potentially) altered, but, from a general point of view, there are no reasons for not introducing reforms in the area of company law. In other words, it could be useful for business actors to have legal forms that allow them to pursue common objectives without incurring in a cumbersome liability regime and with no heavy financial investments.

Intellectual property rights (IPRs) protection and clustering: IPRs represent a very sensitive issue for every company that aspires to be competitive and innovative. The same consideration applies to clustering, and the fact that the inter-company cooperation is extended and dynamic can render the issue more acute. A plurality of parties from different countries is involved in a cluster that is extended and dynamic. Different cultures and interests have to merge and coexist without overlapping each other. It is up to cluster managers to make the cooperation profitable and safe for all parties involved, taking into account, between the many possible legal elements, the importance of effective confidentiality agreements and provisions (see above) and the fact that many jurisdictions, i.e. applicable laws and competent courts, can be involved in case of disputes.

A critical issue in this context is *the management of IPRs*. Cluster members have to deal with the following questions: what to do with the copyrights, patents, licenses etc. that each firm owns? Is it suitable to transfer such rights to the cluster itself (if it is a juridical person) or to keep them at the level of every participant? This issue has to be carefully assessed in order to avoid litigation and, ultimately, the end of the cluster itself. Litigation, in fact, provided its costs and its potential consequences, is one of the biggest barriers to cooperation and especially to the continuation and further extension of established clusters. In order to provide the above questions with a solution it is necessary to divide pre-existing rights and rights that are established during the existence of the cluster. As regards the former, in fact, it is recommended that the members do not transfer them to the cluster and, instead, allow it to use them as far as necessary.

We highlight, therefore, the significance of the contracts that are entered into by cluster members. In the case of transfer of technology, cross-licensing, confidentiality agreement, etc. the parties should be aware to draft clauses that are simple and intelligible but that are aimed to regulate their relations and their potential conflict in a (as far as possible) complete and consistent way. The same considerations apply in case of contracts between the cluster legal entity (or its members) and third parties, for instance software providers, even if in this case the use of standard agreements, drafted unilaterally by the supplier, is common practice.

Cluster associates should also set up a homogeneous IPR policy, taking into account potential costs and benefits. In the area of inventions, for instance, applying for and, if granted, keeping a patent is very expensive, and in many circumstances SMEs are not able to deal with these costs. Clustering can be a good remedy for this structural barrier, especially if the collaboration between members is deep and effective. There are, in fact, no legal barriers to the sharing of the costs of a patent application and of the consequential benefits, and actually clustering can show his potential particularly in this field.

Based on the research undertaken in EFFORT the following recommendations on enhancing SMEs' value obtained from intellectual assets and intellectual property can be made:

- Promoting enhanced intellectual asset-based management by SMEs and developing a system to value intellectual assets adequately, for instance by facilitating SME marketing of their intellectual assets, when appropriate, in order to maximize their investments in them;
- Raising awareness about the nature of IP rights and how they benefit SMEs;
- Creating and promoting online IP marketplaces where SMEs can showcase their IP offering easily and inexpensively;
- Facilitating the filing of patents by SMEs;
- Providing guidance, financial and legal instruments for SMEs to acquire or adopt intellectual assets and IP rights developed in universities and research centers;
- Preparing guidelines to encourage fair transactions and fair treatment by MNEs of IP developed by SMEs, for example through business codes of practice, including in the OECD Guidelines for MNEs;
- Providing SMEs with the legal means to appropriately protect their IP rights in international markets;
- Encouraging SMEs participation in negotiations for IPRs in the establishment of treaties or international agreements.

European patent law and extended and dynamic clustering: Patent law is another important issue affecting *extended and dynamic clustering*. It is noteworthy that the European Patent Office (EPO) does not grant a true European patent that is valid across European jurisdictions. At the end of the procedure, in fact, the inventor will obtain a bunch of national patents, whose effects are regulated by the national provisions concerned. Such a lack of harmonization can be perceived as a barrier to *extended and dynamic clustering* because transnational clusters have to deal with many regimes as regards validity and enforcement of their patents. At the same time, the unification of the granting proceedings before the EPO is an enabler, although the costs (to a certain extent progressive with the number of countries for which protection is sought) and the time required to get a patent granted by the European authority can be reported in the list of potential barriers

Administrative law: licenses and public procurement: The relations with administrative authorities are traditionally one of the most sensitive (and often problematic) aspects of the life of businesses, especially SMEs. Dealing with such offices can be cumbersome, costly and time-consuming and, for these reasons, it can be perceived as a barrier to clustering. On the other hand, a fast and efficient administration is an enabler for firms that are willing to cooperate and pursue common activities.

Taxation regime: With respect to taxation it is also difficult to assess whether or not a lower tax rate is an enabler to clustering. Indeed, available data show contradictory evidence. Ireland, for instance, is one of the most corporate-friendly jurisdictions in Europe, with a very low tax rate, but at the same time is one of the countries with less cooperation between SMEs. If we take into account formal collaboration, we see that Denmark, Finland, Iceland and Norway are also the only countries where more than 40% of the firms participate in formal cooperation. In the Netherlands, Luxembourg and Italy between 30 and 40% of the firms report that they have a formal cooperation agreement". It would be possible, thus, to reach a preliminary conclusion that a moderate tax rate and the implementation of corporate-oriented policies are potential enablers to formal clustering.

On the other hand, *extended and dynamic clusters* are in a position to take advantage of the existence of different (often competing) fiscal jurisdictions as to a certain extent, they have to adopt strategies similar to those of MNEs. From the standpoint of regional public policy makers this issue concerns the creation of a ‘business friendly’ and more specifically ‘fiscally-friendly’ environment. In this respect, extended clustering allows SMEs to do what they could not traditionally do: delocalize their business where it is more convenient. The similarities between clustering and multinational groups go further. More than that, a cluster may become a group if the integration between partners is so strong, extended and dynamic that the clustered companies decide to incorporate, instead of a JV as in the previous example, a holding company. In this case the firms involved keep their formal independence (unlike in a merger) but accept to be part of a group with common strategies and shared objectives. In summary, a moderate tax rate and the implementation of corporate-oriented policies are potential enablers to formal clustering and that the effect of income taxation (namely corporate tax) on clustering is basically only indirect as it affects in the first instance individual companies.

Employment law: Issues related to employing and dismissing employees are of crucial importance for any business, and they can act as potential barriers or enablers to clustering. More than this, clustering can be an important way to increase employment rate in Europe for the very fact that cooperation can, and should, imply job creation. *Extended and dynamic clustering* is a useful tool for the growth of SMEs, and it is expected that such a growth increases employment. On the other hand, the major changes that can arise within the members of the cluster (e.g. specialization of the production) have effects for workers (secondments or, in the worse cases, dismissals).

From a policy making point of view employment law issues are very sensitive for their social, economical and political implications. Labor is a matter of business, but also of human and civil rights. The European approach is slightly changing from a wide protection of employees to company oriented flexibility. Flexible labor regulations might boost job creation. But flexibility does not mean removing protection for workers. In this context, it is important to refer to ‘flexicurity’ which is the theme in vogue across European employers’ and employees’ associations. The term echoes the reflection that “the key question Europe has to address today when it comes to economic competitiveness and social cohesion is how to make the best use of its most important asset: its work force. The availability and quality of human capital determines the dynamism of Europe’s markets and the effectiveness of its investment in research and development. Human capital is the bedrock of Europe’s emerging knowledge economy”. In conclusion, “the broader debate on ‘social Europe’ and what it means in the age of globalization and rapid technological change also reflects this perceived dilemma created by the assumption that there must be a big ‘trade-off’ between economic efficiency and social justice. Such a trade-off should result in a victory for both, considering that without economic efficiency it is impossible to create social justice and vice-versa.

Section 6 ICT infrastructure, uses, and policy

ICT uses in extended and dynamic clustering: Companies use ICT in clustering practices mainly for the following purposes: to reduce costs, to better serve the customer, to support growth (e.g. by increasing their market reach), to increase organizational visibility, search for required skills, knowledge sharing and online collaboration. Very few use ICT for supply chain management, value chain management, virtual consortia and e-tendering.



In essence, companies explicitly or implicitly address one or several of these objectives. In almost every case, ICT use can be regarded as an ICT-enabled process innovation. Understanding one's *business processes*, and improving them is therefore the key underlying issue in most cluster projects. Cluster policy initiatives, then, support companies in achieving related goals, either by directly providing support to individual firms, or by addressing framework conditions.

A challenge in this context is that the empirical evidence on the impact of cluster implementation projects is normally quite poor. Many initiatives that provide grants to companies pay little or no attention to the evaluation and documentation of the projects' outcomes and the challenges experienced. Yet such information is essential for better understanding success factors and, thus, for optimizing the design (and effectiveness) of similar initiatives. Furthermore, it is increasingly recognized that investments in ICT-enabled process improvement must be justified by demonstrable payback within acceptable timeframes. A good practice element in initiatives is therefore to assess or even measure the *return-on-investment* and to *document project results*. These can be used as showcases. Several initiatives report that showcasing effects are even more pronounced if delivered in a *peer-to-peer* context.

It is broadly recognized that cluster initiatives require a differentiated approach depending on the target group's motivation and preparedness. While many of the earlier initiatives focused on "starters" with little or no experience, particularly in technologically less advanced economies, more recent policies exhibit a trend towards *focusing on more advanced and motivated SMEs*. These companies typically have a more positive attitude towards ICT and 'know what they want', i.e. they have clear business objectives. Focusing support measures on those firms constitutes a strategic shift from addressing weaknesses to reinforcing existing strengths. This increases in particular the efficiency of activities, as less effort is needed for convincing companies about the usefulness of clustering.

The need to address standards and interoperability: The initiatives examined in EFFORT confirm that addressing *standards and interoperability* issues is of paramount importance to get SMEs digitally connected to global supply chains. Work on standards, awareness raising and the provision of information on this topic to companies (e.g. guidelines for the selection of standards) constitute central elements in many of the initiatives. While fully recognizing the importance of standards in clustering initiatives is probably no longer just good practice but a necessity, there is an important learning point related to this aspect: information campaigns should adequately *address cluster managers*.

Another learning point is that it can be more effective to focus on the deployment of *specific processes* or ICT applications rather than aiming at promoting e-business in the broadest sense. This enables initiatives to go into more detail and address challenges – including technical, organizational and legal ones – more specifically, this possibly achieving a deeper impact.

Section 7 Governance

Being part of a cluster is an important competitive strength for business. Clusters help close the gap between business, research and resources, thereby bringing knowledge faster to the market. Successful clusters promote intense competition along with co-operation. They enhance productivity, attract investment, promote research, strengthen the industrial base, and develop specific products or services and become a focus for developing skills. That is why "cluster policy" has become an



important element of Member States' innovation policies as reflected in the National Reform Programs, and why cluster policies are supported by Community instruments. The new generation of European regional policy programs for 2007-2013 promotes an approach based on regional innovative clusters, not just in developed urban centers but also in poorer or rural regions.

At the same time, for Europe to tap the full potential of its clusters, they must also achieve a critical mass and strategic orientation through *more and better transnational European cooperation*, across national borders. This raises the prospect of generating world-class European clusters. To support this process, it is necessary to map the strengths of national and cross-border clusters and stimulate practical cooperation between regional authorities and relevant economic actors or associations, supporting co-operation between cluster initiatives.

The knowledge economy relies on the transfer of knowledge from those who generate it to those who use it and can build on it. The transfer of knowledge between public research organizations and third parties (including industry and civil society organizations) needs to improve. Public research organizations, which account for about one third of the total R&D activity in Europe, have a particularly important role to play in this. All of the many forms of knowledge transfer - contract research, collaborative and co-operative research, licensing, publications and exchanges of skilled researchers between the public and private sectors - need to be further developed and better managed.

The research undertaken in EFFORT confirms the need of strengthening collaboration across universities and industry to enable European universities to improve their performance, including by contributing more and more efficiently to the innovation process. Key to this is granting universities sufficient autonomy to develop their own strategies. Structured and strategic partnerships between business and universities need to be strengthened. This requires more possibilities of exchange of staff, teaching and encouragement of entrepreneurship in university and the establishment of science parks around universities, with adequate finance available to support research spin-offs. This will help bridge the cultural gap that so often separates university research from business needs. Development of links between universities and local civil society would also be conducive to a better uptake of innovation at local and regional levels.

Research also indicates *the importance of synchronization and alignment between administrative structures of government and economic transformations*. This point is not to be confused with institutions as they were discussed above. Institutions refer to strategic frameworks of action and policy development. Synchronization of administrative and economic spheres refers to the *quality* of institutional and policy intervention. The conceptualization, formulation and implementation of successful regional economic strategies depend on the ability of regional stakeholders to 'read' the transformations that affect a regional economy. *If it is true that regional economic success depends on the learning abilities of social and economic systems, it is also true that such success depends in a fundamental sense on 'learning' government systems at regional and national levels.*

Such synchronization is crucial in the positioning of a region as a 'hub' through the development of business environments geared to innovation. Leading government practice in this respect focuses on a wide range of support elements which include infrastructure support, advanced business services, fiscal incentives, world-class educational and research facilities, and quality of life, which are intended not only to attract but also keep investment by embedding it in the regional economy. It also particularly relevant in two core elements that play a major role in the competitiveness of regional clusters: the degree of alignment of education and research institutions with the development



requirements of the clustered ecosystem, and the degree of correspondence between technological development and economic contribution. Though there is considerable variation along these issues in the regions considered here they all illustrate the importance of a synchronized ‘enabling framework’ for cluster competitiveness.

The process of matching providers and users of finance in a pan-European context could be made more efficient using online automated services that also include a wide range of learning materials and structured information gathering. Efficiency and effectiveness are greatly improved through automation at the early stage of the investment process where otherwise a large number of people would have to scan the vast number of initial proposals. However, it also became clear that personal interaction in one way or the other was seen as an essential need that still existed among entrepreneurs and venture capital funds. One reason for the necessary personal interaction is that cross-border investments usually take place in later phases of the investment process, hence requiring more substantial levels of negotiations.

Specific lessons learnt from observing entrepreneurial behavior cover the level of investor readiness, support seeking and coaching. Regarding the investor readiness of entrepreneurs, it became clear that most entrepreneurs are not ready to access investors since they do not have an adequate business plan, they do not understand the needs of specific investors, they target the wrong investors, they forget to mention key elements and they overestimate their company. Regarding entrepreneurs seeking support, one of the key elements of an investor-ready project is the management team. An experienced and capable management team combined with a promising project almost always finds the appropriate level of funding. However, such projects generally will not make use of services like Gate2Growth business matching since these services are more oriented towards the less experienced, less capable or less mature management teams. Regarding the coaching, referring entrepreneurs to a service professional in their region proved to be very successful. This method of signposting enables entrepreneurs to find local support, local funding sources and access to international networks.

Section 8 Future policy and research directions and priorities

The trends described above give an idea about how regional economies are changing and some of the evolutions in economic activity that lie behind these changes. Regions have to decide what is a sound basis for policy-making on investment and strategy given these trends. At a regional level, the performance of firms can be affected by a number of external shocks or changes that are beyond the control of firms but that affect dramatically their competitiveness. Three such influences include: 1) changes in market demand; 2) disruptive technologies; and 3) uncertainties relating to globalization process more generally.

Changes in market demand will alter the production location equation in the coming decades, with implications for firms and clusters across the EU. The rise of developing countries in world trade and investment will be increasingly related to changes in demand rather than simply participation in production. This, combined with demographic trends, suggests that the major growth in the medium term will come not in EU economies but in certain emerging markets. Forecast market growth in the automotive industry, for example, for the period 2001 to 2020 shows the stark difference between market demand in different regions of the world. The region-level implications of this are not clear, other than that world-wide employment in car manufacturing is likely to increase, assuming no

disruptive technologies or unforeseen market changes. The challenges involved in meeting demand in the car industry are likely to be mirrored across the range of other commodity and consumer goods for which demand has been stable but is now expanding rapidly.

Regions, like firms, have to address the issue of disruptive technologies and the impact they can have on regional economies. Industrial locations generate economies of agglomeration. The collocation of related activities results in a dense network of suppliers, a workforce with the many and varied skills required, and the diverse milieu of supportive activities and businesses from machine tool suppliers to training consultancies. However, disruptive technologies can change this paradigm. New technologies can be either a huge windfall for a regional economy. But new technologies can also be a significant threat, undermining the competitive advantage of established firms and regions. These innovations are sometimes driven purely by invention, meaning the creation of a new process or product. But they are also often a response to an external push such as new regulations, standard setting, environmental concern, etc. At the same time, nobody knows which technologies will emerge victorious in the long term. There are uncertainties over whether the technologies will work in a satisfactory manner, over whether they will meet the demands of government regulators, and whether consumers will accept them, among other issues.

More generally, whether economic change will continue at the same rate or direction in the future as in the past is an open question. Two of the main engines that drive globalization – liberalization and progress in transport – may run out of steam. Further liberalization is increasingly difficult to achieve because the issues to be addressed are more controversial and more actors are involved in the decision-making process. Further expansion of transport – notably the two fastest increasing components of the transport sector (road and air transport) often appear to be largely unsustainable. Other factors such as geopolitics or security, energy and environmental concerns such as climate change, or demographic change could slow or undermine the process in different ways. Growing emissions of greenhouse gases, for example, is raising concerns about environmental costs of current consumption patterns, leading to the implementation of measures that could influence the globalization process in the future. On the one hand, globalization of production could be adversely affected, for instance if the measures put in place contribute to curb traffic directly or raise the cost of transport. On the other hand, given the global nature of the problem, there will be increasing pressures from state and non-state actors to implement global solutions, such as the creation of markets for emission trading rights and international co-operation for the development of clean energy sources. While these issues are not currently changing the way that the reorganization of production is taking place, in the future they could have a strong influence on the economic logics that are driving the location of production at the moment (OECD, 2007a).

Based on the foregoing observations and the wider streams of research and engagement EFFORT the following research directions and priorities emerge:

Globalization and its impact on the spatial location of economic activities: This process leads both to a *widening of the extent and form of international transactions*, and to a *deepening of the interdependence between the actions of economic actors located in one country or region and those located in others*. These exchanges have increased in intensity and complexity over the past decade and are linking places that were hitherto remote from each other.

The impact of MNE consolidation on regional economic systems: MNEs have had a mixed impact on clusters and regional economies. The search for more efficient business models has in some cases

redefined long-established local ties. Downsizing, M&A, break-up of large firms and market-motivated relocations of HQs all appear to have loosened the bonds between anchor firms and the region. These reconfigurations result not only in job losses in many cases but also alter the relationship between MNEs and SMEs and other local actors.

The reorganization of production by MNEs has had some positive side effects, despite the socio-economic upheavals involved. For example, *outsourcing of increasingly important segments of production by MNEs is broadening the structure of regional economies by changing the relationships within regional supply chains, making them more open and outward looking.* Despite the global reach of MNEs, *new business models in some cases put more emphasis on region-level collaboration among firms, particularly in the field of innovation.* This process seems to be at least tacitly encouraged by the MNEs as part of a general strategy to monitor innovation within regional systems and identify partners, even SMEs, with whom they can share the risks involved in technology or product development. For these reasons, *regional systems of innovation are becoming increasingly complex in terms of both the types of actors involved and the range of industries or technologies that are present.*

The 'push' and 'pull' drivers of outsourcing and offshoring and their impact on the structure of regional economies and their implications for MNE and SME relations and national and regional policy: The impact that ICT-enabled offshoring is likely to have on EU labor markets has been the subject of intense discussion. What is clear is that *the emergence of this form of offshoring has shifted the globalization debate away from its limited focus on certain manufacturing sectors or manufacturing processes that concerned specific regions or region-types towards a more general concern about economy-wide impacts.* The reconfiguration of the production system is based on firms making a range of decisions about how they break up production to make it more efficient and responsive. These decisions – on which activities to source outside the firm (and potentially across borders) and which ones to keep inside the firm (but possibly in a foreign affiliate) – are of crucial interest for both national and regional policy makers. The place of an investment decision within the wider sourcing/location strategy of a firm helps to determine the extent to which linkages and externalities develop with local firms, the employment generation potential and the skills upgrading that can be expected to accrue.

Comparative national and regional models of policy frameworks and institutional capacity: Looking forward, *the concern of policy makers is to understand how resilient regional economies are.* The response of the regions to these evolutions takes a variety of forms, some more explicit than others. In most cases, there is some form of regional economic strategy that includes within it a business development and innovation plan elaborated at either the regional or municipal level, often coordinated with a national level strategy that includes specific programs, instruments and funding. The strategy may be codified in a formal document or represented by particular institutions.

The tools available at the regional level vary considerably according to institutional frameworks and the focus varies according to the industry(ies) targeted. However, a number of policy relevant findings emerge. *A clear and systematic analysis of the region's economy and assets in the context of global trends is the basis for any potential regional action. There is relatively little data available at the regional level to help policy makers, especially given the complexity in defining a region, and even national level information is limited. Quantitative and qualitative data is useful for development of a clear SWOT analysis to appreciate what strengths are durable and where there may be new opportunities.* This analysis also requires *a clear understanding of the changing roles of different categories of firms (start-ups, SMEs, MNEs, etc.) and their role in global supply chains.* However, *the data are often at too large a scale and do not capture the very localized dimension of the knowledge*



spillovers that policy should be targeting (evidence from the US points to a rapid decline in the positive spillover effect with distance).

Getting the most out of the presence of MNEs: Many regions are closely associated both with specific firms and with groups of firms working in particular sectors. The strong specialization is an expression of the competitive advantage of those firms. The competitiveness of the region is recognized as being tied to the fortunes of the firms and the sectors. This can be a clear advantage in cases where the firms are market leaders or where the sectors are expanding. In many cases, the regional economies have grown alongside the expansion of key firms, becoming specialised in the core business of the firm and building an enterprise base around supplying the key firm(s). Over the past few decades, the regions have benefited significantly, in terms of both employment and wealth creation, from the ability of key firms to globalise their activities.

Focusing on (cross-over) technology rather than industry sector: The assumption that there are separate sectors with their own technologies and methods has changed considerably. There is, for example, strong interdependence between ICT and biopharmaceuticals and between ICT and automotive. *Regions are emphasising the opportunities for regional firms to move beyond sectoral boundaries, thereby broadening the technological and skill base of the region as a whole.* The fact that technologies cross over from one sector to another is clearly important for regions looking to diversify and valorise innovation, but there exist significant challenges. These opportunities raise the *question of the right strategic focus of investment in the regions: whether to reinvest in existing competitive sectors or to gamble on developing new technology fields.*

Promoting joint R&D and commercialization: While specialized regions tend to have higher education institutions that work with local firms, the existence of an academia-business gap is a compromising factor. One of the components of this gap is the mismatch between the education provided and the current needs of local firms. Furthermore, the timeframes for academic programs often do not match the needs of firms, either in terms of overall curriculum or specific doctoral projects with industry.

Promoting open innovation: In order to promote the open innovation concept which is currently developing and make the EU regional R&D systems more private-sector driven, regions have to support privately managed R&D facilities. These tend to be led by or based around the existing facilities of large firms.

Other measures of regional attractiveness: A first consideration for regions is the actions that they can support the regional environment generally, in terms of physical, human capital and other innovation assets. Many of the overall regional strategies focus generally on the attractiveness of the region for residents and the business community. The common denominator in current thinking about regional policy – including in relation to knowledge and innovation – is an emphasis on place-specific externalities based on exploiting unused potential. The issue for policy makers is to identify the possible sources of externalities in regions where economic activity is, for one reason or another, constrained.

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