

# The Paradox of Global Markets and Local Clusters

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The importance of innovation and trust for competitiveness  
and its implications on policymaking in the European Union

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# Abstract

This thesis examines cluster and innovation system theory's answer to why some firms, and not others, based in particular nations achieve international success in distinct segments, and the European Union's recent policy efforts based on such theories. On this background a discussion on the changes needed in national economic policymaking among EU Member States when the EU starts taking a cluster and innovation approach towards strengthening the Union's competitiveness is presented. The main result is that taking a cluster and innovation approach towards competitiveness alters many of the traditional roles of economic policymaking, historically governed in a state-centric manner. Instead, a perspective where economic policy crosses traditional policy families and which link supranational, national, regional and local policies in a Multi-Level Governance framework, with a strong focus on growth and innovation, is advocated. Furthermore, given the importance of trust in the innovation process, a tool is developed aimed at quantifying the degree of trust within clusters. The Trust Model developed by the Great Place to Work Institute to measure trust *within* organizations acts as a model for developing a tool measuring trust *between* organizations in clusters. The tool is finally piloted on Copenhagen Finance and IT Region (CFIR) in order to safeguard from any unexpected problems before a full-scale study is to be launched.

**Key words:** European Union, Clusters, Innovation Systems, Trust, Policymaking  
**Words:** 20207

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# 1 Introduction

In 2005, Thomas Friedman published his book '*The World Is Flat: A Brief History of the Twenty-First Century*', in which he argues that globalization has decreased the importance of geographic location as a competitive advantage for economic growth. New technology has removed geographic, political and other barriers to the flow of information, international trade and collaboration, i.e. *making the world flat*. In Friedman's view, this would mean that the identified trend of particular segments of industries locating in specific geographical places, as discovered by Marshall (1890) already in the beginning of the last century, gradually would have diminished as an effect of globalization. However, a growing number of researchers representing different fields assert that the effects of globalization are quite the opposite, i.e. that location matters despite the fact that changes in technology and competition have altered many of its traditional roles (e.g. Porter, 1990; Florida, 2002). In their view, globalization has exposed regions to intense competition where the ones with competitive advantage have experienced rapid growth while others have grown weaker, making the world everything but flat. This process has sustained, and even substantiated, the geographic concentrations of particular related industries, so called "clusters", especially in advanced economies (Porter, 1990).

Even though clusters have been around for hundreds of years, it is only since the beginning of the 1990's that policymakers and governments have started to act on the issue and trying to figure out what role policymakers can, and should, have in supporting them. This has huge implications for regions that in the era of globalization are struggling to remain competitive and adapt to the new economic reality (OECD, 2007). Furthermore, the concentration of specific industries in clusters has in the last decades increasingly come to be regarded as an important driver of innovation. According to the European Union (EU) it is innovation that will shape the European vision of growth and prosperity and reach the goals set forth in the Lisbon Strategy. In this process, clusters will play an important role and act as a catalyst for greater innovation that will improve the Union's international competitiveness (European Commission, 1995; 2008a). However, the important question arises regarding what implications the EU's newly found interest in clusters and innovation will, and should, have on policymaking at the regional, national and supranational level?

Research has up until recently shifted from being strongly focused on empirical evidence of how and why industries' cluster to instead focus on the effects of clusters and, especially relevant for policymakers, how to facilitate the development of clusters. A central theme in this research, as in economics,

sociology and political science, has been the role played by trust, here regarded as a pre-requisite for knowledge-sharing and learning and hence innovation. If policymakers at regional, national or EU-level are to launch new cluster policies and initiatives, of which we have seen a dramatic increase in recent years, the issue of trust within clusters not only has to be thoroughly studied but it also has to be made useful to policymakers and practitioners. One way of doing this is to develop a tool that measures the degree of trust within clusters. This thesis believes that this can be done by deploying those tools developed for measuring trust *within* organizations to measure instead the degree of trust *between* organizations within a cluster. First then can we suggest specific actions and implementation of programs aimed at increasing the level of trust and hence competitiveness of a cluster and the region in which it is located.

## 1.1 Aim and research question

Political economy, as understood in this thesis, is not a dichotomy of *market* and *politics* always pulling in opposite directions but instead as interdependent, creating an inter-discipline field of study where economy and political science meet (Krätke & Underhill, 2006). Classical political economy has always been highly concerned with the contrast between the wealth of some nations and the poverty of others referring to theories of absolute (Smith) and comparative advantage (Ricardo; Heckscher & Ohlin). Irrespective if advantage originates from an absolute or relative cost advantage of producing an item, or from factors of productions such as land, labour, natural resources etc., governments have traditionally implemented policies aimed at lowering the relative costs of its nation's firms in order for them to stay competitive (Porter, 1990: 12).

The number one factor for competitive advantage today is innovation (Cooke et al, 2004: xiv). Furthermore, trust, an essential part of social capital, i.e. *the instantiated norm that promotes cooperation between two or more individuals* (Fukuyama, 1999) is often viewed as an important factor in the innovation process and said to be strengthened when actors operate in spatial proximity, for example in clusters. On this background, the European Union has launched a series of policies and programmes aimed at the creation and upgrading of European *clusters* in order to strengthen its innovative and hence competitive performance vis-à-vis other economies.

The **purpose** of this thesis is to discuss the effects on the national level in terms of initiating, implementing and evaluating policies aimed at strengthening its innovative performance through clusters. This leads to the following **research question**:

*“What changes in national policymaking must follow if EU initiatives aimed at strengthening the Union’s competitiveness through clusters and innovation are to be successful, and how can trust among the actors within a cluster, crucial for the innovative output of a region and nation, be measured in a quantitative way?”*

**The first part** of this thesis, where the theoretical framework is presented, relates to the first part of my research question and constitutes the main focus of the thesis. It seeks to present the ideas behind what governs the differences in innovative output among nations and regions as well as discussing the effects on national science and technology-, industry- and regional policy following from taking an innovation and cluster approach towards European competitiveness. The theories deployed belong to different academic fields such as sociology, political science, economic geography and management theory in order to fully grasp the topic of study and its policy implications at different level of government.

**The theoretical framework sets out to discuss the following questions:**

- What governs the innovative output of nations and regions in advanced economies?
- What are the effects of EU’s innovation and cluster policies on traditional national economic policy in terms of policy objectives, policy implementation, and influence vis-à-vis the regional- and supranational level?
- What policy advises follows from taking an innovation system as well as cluster approach towards strengthening the EU’s competitiveness?

Given the importance of trust for determining cluster growth, it still has proven to be a difficult area to define and measure (Sölvell, 2009: 98). With reference to the renewed policy interest in supporting clusters, the tools used to measure whether or not such policies are successful merit stronger analytical frameworks (OECD, 2007). The risk otherwise is that these policies are not living up to its full potential and hence wasting public support (European Commission, 2008b). **The second part** of this thesis builds on what is presented in the theoretical chapters on the role of trust in fostering innovation and set out to develop a questionnaire that measures trust within clusters, which then are tried in a pilot study on a selected cluster. *The aim is to develop a solid methodological tool from which policymakers and cluster practitioners can evaluate and direct concrete measures in order to increase the degree of trust within a given cluster.* It is important to realize that the aim is *not* to test the questionnaire and analyze the results, but to develop and pilot a questionnaire in order to avoid any methodological or costly problems when the questionnaire is later launched in a full-scale study in the autumn of 2010 by the company that this thesis is partly written for, but which lay outside the scope of this thesis.

**The second part sets out to answer the following questions:**

- How can the degree of trust among different relevant actors operating within clusters be measured?
- What problems may follow from using such a tool to measure trust within cluster and how can they be avoided?

The overarching aim of the thesis is to discover the reasons behind why a change in traditional economic policy must follow when the EU starts viewing clusters and innovation as crucial for improving the Union's competitiveness. A tool is then developed for measuring trust within cluster and tried in a pilot study on a chosen cluster.

# 2 Background

## 2.1 Clusters

The aim of this section is not to provide a *detailed* picture on what lies behind the clustering of certain industries, different types of clusters, how clusters evolve etc. as this is described in lengths elsewhere (see e.g. Porter 1990, 1998; Krugman, 1991; Malmberg et al, 1996; Ketels, 2003; Asheim et al, 2006). Instead, the purpose is to provide the reader with a broad overview of the ideas behind the concept of clusters, as it constitutes a central theme in this thesis.

A crucial question for economists and policymakers is why some firms, and not others, based in particular nations achieve international success in distinct segments and industries (Porter, 1990: 18)? The classic theories of specialization and absolute advantage (Adam Smith) and latter theories of comparative advantage based on labour productivity (David Ricardo) or factors of production such as land, labour, natural resources etc. (Heckscher & Ohlin) focused on the macroeconomic characteristics of nations in determining patterns of trade (Porter, 1990: 11). Porter underlines that while the overall macroeconomic, legal, social and political context of a nation is important, it is not enough in determining national competitiveness (Ketels & Sölvell, 2006). The answer lies also, according to Porter, in the drivers that determine value creation and innovation at the *company level*. The microeconomic business environment in which local firms compete is in turn determined by four broad but mutually reinforcing attributes often referred to as the “diamond” of competitiveness. Porter identified the following attributes as determinants of national competitive advantage:

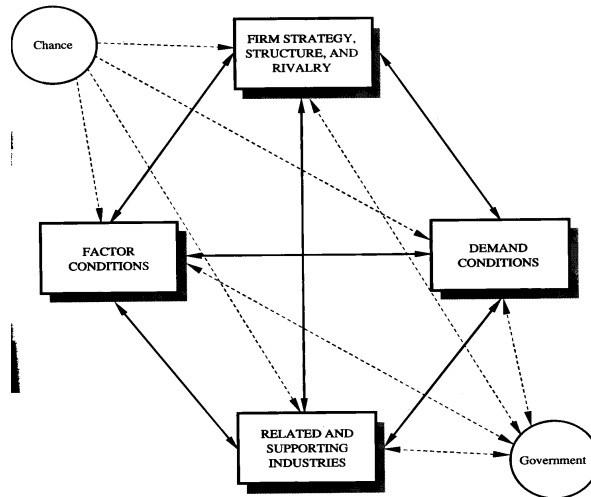
- 1) *Factor conditions* (the nation’s position in factors of production, such as skilled labour or infrastructure, necessary to compete in a given industry)
- 2) *Demand conditions* (the nature of home demand for the industry’s product or service)
- 3) *Relating and supporting industries* (the presence or absence in the nation of supplier industries and related industries, i.e. clusters that are internationally competitive)
- 4) *Firm strategy, structure and rivalry* (the conditions in the nation governing how companies are created, organized, and managed, and the nature of domestic rivalry) (Porter, 1990: 71).

In addition to the four attributes presented above, *chance* (i.e. developments outside the control of firms) and *government* (i.e. antitrust policies, regulation,



investment in education, etc) can influence the national system. Nations are most likely to succeed in industries where the national “diamond” is the most favorable.

**Figure 2.1: The determinants of National Advantage** (Porter, 1990: 127)



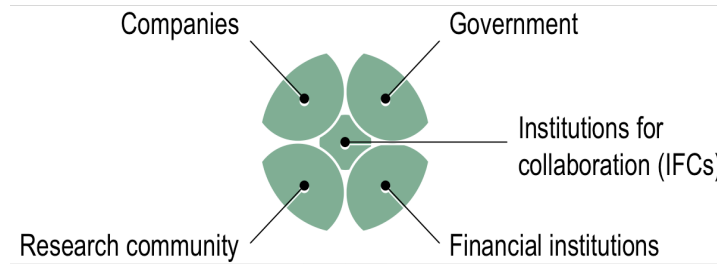
However, a nation’s competitive industries are seldom evenly developed across the whole economy as the systematic nature of the “diamond” promotes the *clustering* of its competitive industries, which is a phenomenon that seems to occur in all nations (Porter, 1990: 148). The United State’s highly competitive industry of movie entertainment, for example, is not dispersed across the entire nation but geographically concentrated in Hollywood, California.

Historically, terms such as “agglomeration” (Marshall, 1890) and “industrial district” (Becattini, 1979) have been used to describe the concept behind the grouping of industries. Today, however, the term “cluster” is most common. Clusters are “*geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate*” (Porter, 1998). Even though several definition exists<sup>1</sup>, they usually focus on the role of geographic proximity and the *linkages* between actors meaning that clusters consists not only of physical flows of inputs and outputs, but also include intense exchange of knowledge and information (Ketels, 2009; Krugman, 1991; Sölvell, 2009: 15). In other words, clusters are defined primarily by relationships at the same time as their geographic boundaries may not correspond with existing political borders (e.g. Medicon Valley in the Öresund-Region) but influenced by factors such as travel conditions, cultural identity, and personal preferences (European Commission, 2008b).

According to the cluster literature, the effect of globalization is *not* as Friedman (2005) suggests a “flat” world but instead the opposite, i.e. a “spiky” world where location matters considerably. One reason behind this paradox is that companies

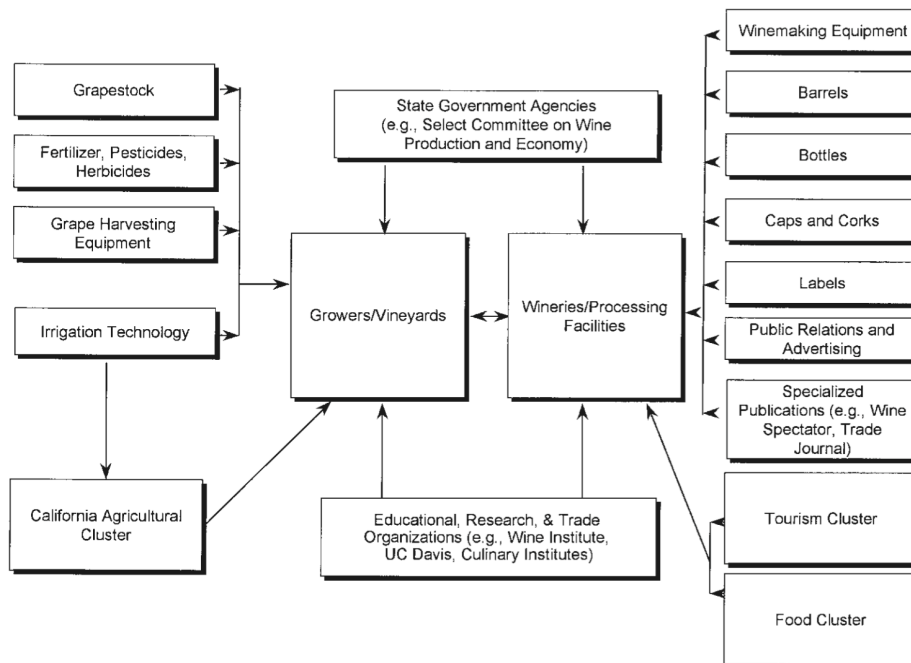
operating on globalized markets have an array of choices regarding where to locate their activities. Consequently, companies choose that location that offers the best business environment for their specific needs. In other words, *“the more markets globalize, the more likely resources will flow to the more attractive regions, reinforcing the role of clusters and driving regional specialization”* (Ketels et al, 2008: 5).

**Figure 2.2: Five actors composing a cluster** (Sölvell et al, 2003: 18)



Cluster compose, among other, of firms which in addition to engage in intense rivalry also cooperates and interacts with other actors in the cluster such as universities, venture capitalists local governments etc. in both formal ways in IFCs (e.g. chambers of commerce) and informal ways by sharing knowledge and expertise. To provide a more comprehensible picture of what a cluster may look like in reality, the California wine cluster makes a good example in identifying the different types of actors composing a cluster.

**Figure 2.3: The California Wine Cluster** (Porter, 2000: 17)



Why, then, do clusters matter? Once a cluster forms, all firms in that cluster becomes mutually supporting resulting in benefits and information flowing in all directions preventing inertia and creating knowledge spillovers. New entrants to the cluster leads to a diversification of R&D, at the same time as new ideas are combined and innovations are brought to the market rapidly while intense rivalry puts pressure on firms to stay ahead of its competitors (Porter, 1990: 151). Firms cluster due to advantages vis-à-vis firms that operate in isolation in terms of *efficiency* (lowered costs), *flexibility* (high mobility of labor and other resources) and *innovation* (knowledge spillovers and cooperation, firms perceive new buyer needs more rapidly) (Sölvell 2009: 33; Porter 1990). In Europe, for example, research has shown that the economic prosperity of its regions is related ( $R^2 = 0,394$ ) to the degree of cluster strength (Sölvell, 2009).

## 2.2 EU cluster and innovation policies

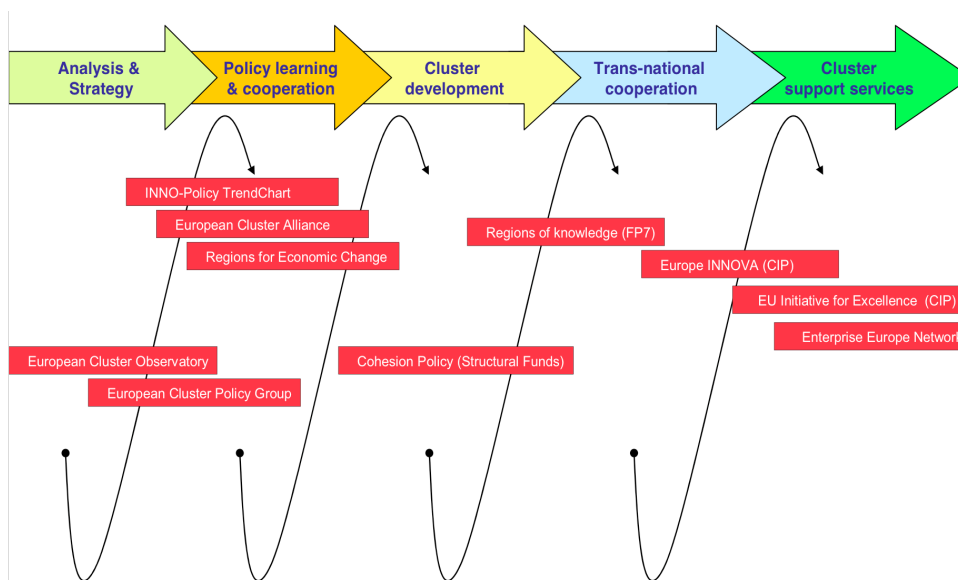
In addition to the “global market – local cluster paradox” explained above, there is also what has been phrased as the “European paradox” which refers to the fact that while scientific performance in the EU is excellent comparative to other economies, its commercial performance in high-technology sectors such as electronics and information technologies has deteriorated.<sup>2</sup> Simply put, the scientific advances made in Europe are not transformed into products, processes or services that meets market demand in the same fashion as in Japan or the United States (Cooke et al, 2000: 15).<sup>3</sup> On this background the Green Paper on Innovation (European Commission, 1995: 5) stated that “*one of Europe’s major weaknesses lies in its inferiority in terms of transforming the results of technological research and skills into innovation and competitive advantages*”. Since this weakness was identified, there has been a growing activity on EU-level to cope with this innovation deficit hampering European competitiveness.

In 2005, the Council at the Hampton Court Summit decided to give higher priority to the key issues on which Europe needs to act in times of growing globalization, primarily research and innovation. A high-level expert group was established by the Commission to asses the situation and their report, also known as the Aho-Report, concluded that Europe needs to improve its innovation performance in order to sustain a high and rising standard of living (European Commission, 2006a). The Competitiveness Council of 4 December 2006 (Council, 2006a) stated that support for innovation is an essential part of the Lisbon Strategy for Growth and Jobs. Furthermore, innovation policy typically addresses horizontal issues, consisting of various policies, thus requiring effective governance. All relevant bodies at all levels (EU, national, regional and local) is to cooperate under the Open Method of Co-ordination (OMC) to further strengthen the

coherence and synergy of its different policies, stakeholder involvement as well as monitoring systems that contribute to fostering innovation.

The Competitiveness Council identified clusters as one of nine strategic priorities at EU level for supporting innovation. The potential of existing and emerging clusters in Europe are seen as crucial if the European Union is ‘to become the most competitive and dynamic knowledge based economy in the world’ as set forth in the Lisbon Strategy. The EU institutions, most notably the European Commission, has therefore started to play an active role in supporting clusters by launching initiatives aimed at strengthening the knowledge base in Europe on this emerging policy field (e.g. the European Cluster Observatory) and supporting cluster cooperation throughout Europe (e.g. the European Cluster Alliance). Furthermore, the Structural Funds, the 7<sup>th</sup> Framework Programme for Research and Development, and the Competitiveness and Innovation Framework Programme (CIP) are three funding mechanisms that all includes a number of activities in support of clusters. In 2009, the Commission established a European Cluster Policy Group (ECPG) with a mandate to advice the Commission and Member States on how to develop internationally competitive clusters in the EU. Hence, clusters are an important part of Europe’s economic reality and cluster policies are a growing and essential policy area for the EU which have started to play more of a supranational role in promoting national cluster initiative programs (Mills, Reynolds & Reamer, 2008).

**Figure 2.4: Overview of current and planned EU initiatives in support of clusters** (European Commission, 2008b)



In 2006 a ‘High-Level Advisory Group on Clusters’ was established by the Commission to develop a cluster agenda of common actions for the Member States in their cluster policies in order to foster trans-national cooperation. A ‘European Cluster Memorandum’ on how to promote European innovation through Clusters was prepared by the group and launched in 2008 at the European Presidency Conference on Innovation and Clusters in Stockholm. The findings of ‘The European Cluster Memorandum’ were the following:

- The strategic importance of clusters for European innovation and global competitiveness is only now becoming fully recognized
- Cluster policy in Europe needs a step-change in ambition and effectiveness to reach its potential as a real driver of European prosperity
- Success depends on concerted changes in policies, programs, initiatives, and thinking at many different levels and in many different places across Europe
- This Memorandum – supported by national and regional agencies for innovation and economic development and addressed to policymakers at the national and European levels – lays out a path forward; it commits its signatories to concrete action and identifies the changes necessary in regional, national and European policies

In a Communication from the Commission in 2008 regarding EU’s role in facilitating clusters it was stated that such policies should be *“designed and implemented at local, regional and national level, depending on their scope and ambition. It is the role of the Community to facilitate and add such efforts, notably by improving the framework conditions, promoting research and education excellence and entrepreneurship, fostering better linkages between industry (especially SMEs) and research, and encouraging mutual policy learning and cluster cooperation across the EU”* (Commission, 2008a). In this aspect one must understand that such innovation strategy entails everything from completion of the internal market, investments in education and research, and promoting cooperation between academia, government and industry across Europe. The European Council also stressed this notion in 2008 when it emphasized that *“efforts towards improving the framework conditions for innovation should be better coordinated, including through improved science-industry linkages and world-class innovation clusters and development of regional clusters and networks”* (European Council, 2008).

The Community Strategic Guidelines on Cohesion adopted by the Council on 6 October 2006 for the period 2007-2013 sets explicit guidelines for fostering innovation by *“developing and creating regional clusters around large companies”* and promote actions that target improvements in competitiveness through clustering (Council, 2006b). Furthermore, the EU’s regional policy programmes for 2007-2013 also promotes an approach based on innovative clusters not just in developed urban centers but also in poorer or rural regions (European Commission, 2006b).

Looking at the benefits of clusters on innovation it is no surprise that in 2008, almost all Member States had at least one cluster programme in place, either at the national or regional level (Sölvell, 2009). However, there are some differences between the EU-15 and the Member States that later joined the EU when looking at the potential success of cluster initiatives. Many of these transition economies share some important common traits. First, they are in the process of shifting to a market economy, which means that they have less experience in competition. Second, they have fewer institutions for collaboration, such as industry organizations or chambers of commerce. Third, they typically have less trust in government initiatives and in other related industries, which is key in the success of cluster initiatives and the innovative process they are supposed to set off. To bring these countries up to speed with their EU-15 counterparts, strategic cluster policies, as proven to be a success in Slovenia, must be initiated in a way to overcome a lacking innovative performance (Sölvell, Lindqvist & Ketels, 2003). Furthermore, based on the fact that regional concentration of particular industries are weaker in Europe than in the USA (see Krugman, 1991) made some believe that the creation of the Single Market would lead to a situation in Europe where the industries would concentrate in the more advanced economies to the detriment of the less developed ones, resulting in a strong core and unbalanced development. However, the increased geographic concentration seems not to have taken place in Europe during the 1990's, i.e. in the post-Single Market period, but rather the opposite (Aiginger & Pfaffermayr, 2004). This signals that the European strategy of increasing its cluster's strength through regional specialization does not counteract the aims of the single market and the economic development of newer and less developed Member States.

### 3 Theoretical discussion

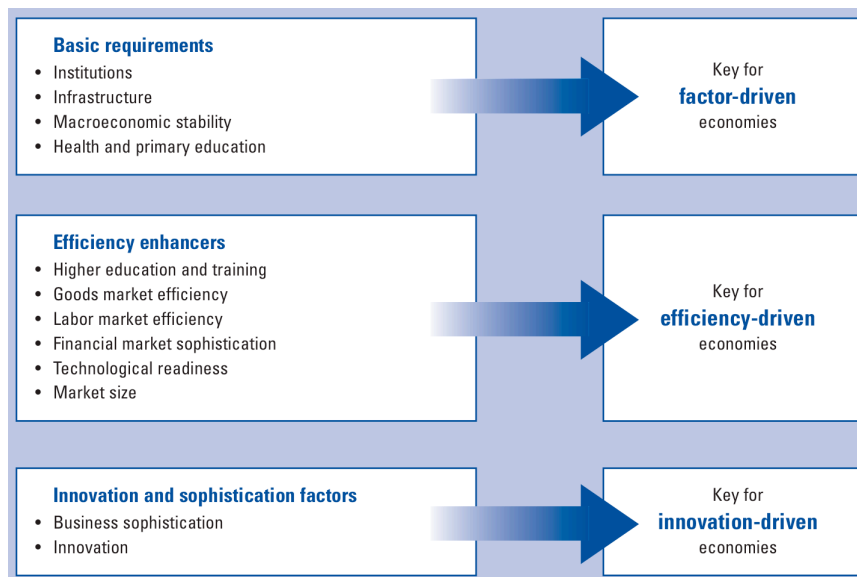
Innovation is believed to account for some 80 per cent of productivity growth in advanced countries, and productivity growth in turn accounts for 80 per cent of Gross Domestic Product (GDP) growth overall and is therefore understood to be key to improved competitiveness, growth and hence employment (Freeman, 1994 in Cooke et al, 2000). In that sense, productivity and innovation – not low wages, low taxes, or a devalued currency – is the definition of competitiveness (Porter, 2000: 30). This in turn share great resemblance to the definition used in the World Economic Forum’s Global Competitiveness Report (2009: 4) where competitiveness is regarded as “*the set of institutions, policies and factors that determine the level of productivity in a country*”. Although competitiveness in this report is determined by twelve different but interrelated pillars<sup>1</sup>, these pillars affect countries differently based on the country’s stage of development, i.e. that the best way to improve Bulgaria’s competitiveness will differ from Sweden’s.

In the first stage of development the economy is, in general, *factor-driven* (unskilled labour, natural resources, low wages), in the second stage when wages rise, the economy compete on the *efficiency-driven* stage of development (more efficient production processes) before moving towards the *innovation-driven* stage of development where the ability to sustain high wages and a high standard of living is determined by the ability of the national economy to produce new and different goods using the most sophisticated production processes. Consequently, in the long run, standards of living can be expanded only with innovation (World Economic Forum, 2009: 7). In figure 3.1 below, the 12 pillars of competitiveness and their relative importance for countries in each stage of its development are presented.

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<sup>1</sup> The twelve pillars are Institutions, Infrastructure, Macroeconomic stability, Health and primary education, Higher education and training, Good market efficiency, Labour market efficiency, Financial market sophistication, Technological readiness, Market size, Business sophistication, Innovation.

**Figure 3.1: The 12 pillars of competitiveness** (World Economic Forum, 2009: 8)



In the EU, a large majority of the Member states are either positioned in stage three, i.e. innovation-driven economies or in the transition between stage two and stage three (World Economic Forum, 2009: 12). This combined with the EU’s policy interest in this area is the reason why this thesis have chosen to put emphasis on innovation as a mean to strengthen the Union’s competitiveness and its affect on policymaking.

Innovation, broadly defined, includes both improvements in technology and better methods or ways of doing things (Porter, 1990: 45) and refers to “*the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organizations or external relations*” (OECD, 2005). As seen in the case of the EU described above, the promotion of innovation and of competition in general has become a political priority at the national and supranational level. However, to develop a better understanding of innovation we have to move away from focusing solely on the individual firm to instead focus on the environment in which firms interact, which from a policy perspective is much more interesting (Cooke & Morgan, 1998: 33). Consequently, the main question for policymakers as put forward by Porter (1990: 20) is why some firms, based in some nations, innovate more than others?

Traditionally the focus on the drivers of innovation has been exclusively on *internal* factors, i.e. within companies. Today, however, there is evidence that the *external* environment, such as strong university-industry-consumer linkages and access to a large pool of highly trained engineers and scientist, is at least as



important for innovation (Porter, 2001: 28). Innovation in that sense is influenced by many different actors and factors both within and external to the firm pointing to a more social aspect of innovation (Cooke et al, 2000). According to Chesbrough (2003) the days when firms generated their own ideas, developed them, distributed them etc. *on their own*, are soon to be over. In “knowledge-based economies” – economies that are directly based on the production, distribution and use of knowledge and information - the capability to produce and use knowledge is key to success for countries as well as firms and individuals (OECD, 1996; Lundvall, 1994). Furthermore, innovation is primarily seen as an interactive learning process governed by the flow of knowledge and technology among firms (users and producers), universities and government where learning and innovation is closely connected (Lundvall, 1988, 2007; Cooke, et al 2004; Porter, 1990; Etzkowitz & Leydesdorff, 2000).

However, despite the fact that globalization has made information globally accessible, knowledge is still surprisingly local (Cooke et al, 2000). This relationship is based on the notion that “*if all knowledge were readily transformed into information to which everyone has easy access, there would be little incentive for firms, regions and nations to invest in R&D and technology gaps between regions and countries would be minor and temporary*” (European Commission 1998: 33). As we empirically can see that this is not the case, the logical conclusion is that knowledge capital by large is not *codified* (explicit knowledge codified in publications, patents or other sources and easy to share) but *tacit* (implicit knowledge and know-how that is difficult to explain/codify) and hence geographically fixed (Cooke et al 2000; Polanyi, 1966).

At the same time a debate has emerged regarding what explains differences in national innovative output focusing on the concept of *innovation systems*. An innovation system, in turn, can be seen as a theoretical concept and model aimed at explaining how knowledge becomes an economic gain through the development of the innovativeness and competitiveness of a society as a whole, conceptualizing innovation as an evolutionary and social process based on a collective learning process (Christensen & Kempinsky, 2004; Doloreux & Parto, 2004). In other words, the system of innovation approach acknowledges that innovations are carried out through a systematic networking of various actors, such as government, industry and university (also known as Triple Helix when referring to formalized relations) but underpinned by an institutional framework containing routines, established practices, rules or law which regulate the relations and interactions among these actors and which acts in mutual beneficial ways (Edquist, 1997 cited in Coenen & Asheim, 2005: 2). Innovation in that sense has an important territorial dimension where the innovation process is based on resources that are place-specific that cannot be copied elsewhere but are tied to particular places (Asheim & Isaksen, 1997). Innovation systems should therefore be understood as policy instruments aimed at the promotion of localized learning processes in order to uphold an economy’s innovativeness and competitive advantage (Freeman, 1985).

This chapter will start off by presenting the key thoughts behind the National Innovation System (NIS) approach and its contributions to the concept of innovation before shifting the focus towards the Regional Innovation System (RIS) approach. The theories presented are then applied in a more specific discussion on innovation at the cluster level and the importance of trust in fostering innovation. Finally the implications on national economic policymaking in the innovation-driven economies in the EU are discussed on the background of the EU's recent efforts in this area.

### 3.1 National Innovation Systems

In a similar way as agglomeration and cluster theory grew out of empirically observed geographical specialization at the regional or local level, the national systems of innovation approach observed that globalization, despite its argued convergence effects between countries, diversity in national economic behaviour continue to be it highly persistent and stubborn (Wade, 1996).

The NIS approach developed its ideas on this background when trying to explain the variation in overall economic performance between different economies pointing to national elements of R&D (public and private), education institutions (e.g. universities), financial system, user-producer relationships, and social capital. What followed was *'a strong belief that the technological capabilities of a nation's firms are a key source of their competitive prowess, with a belief that these capabilities are in a sense national, and can be built by national action'* (Nelson & Rosenberg, 1993: 3).

Traditionally, researchers and policymakers focused on the relationship between inputs (such as research expenditure) and outputs (such as patent levels) when studying a country's innovative and economic performance (OECD, 1997). The concept of NIS, on the other hand, moved away from such a linear approach and regarded the interaction among different actors (e.g. firms – users and producers, universities and government agencies) as important as investments in R&D and emphasized the flow of knowledge and technology between them, hence realizing that innovation can come from many different sources and organizations at different stages (ibid; Lundvall, 1988). Innovation, in turn, was seen as a socially embedded process of interactive learning that cannot be explained with a purely economic analysis (Lundvall, 2007). This interaction occurs within a specific national context of shared norms, habits and rules that together plays the major role in influencing a nation's innovative performance and forms a sort of 'national' community, hence making it reasonable to name it *national* innovation systems (Nelson, 1993; Isaksen, 2003). Freeman (1987) defined NIS as *"the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies"*.

Understanding the linkages between these actors and how they relate to each other is key to improving a nation's innovation and technology performance (OECD, 1997). The term 'system' in national innovation systems relates to the set of institutions "soft" or "hard" whose interaction determines the innovative performance of national firms (Nelson, 1993: 4). According to Lundvall, different set of "soft" institutions such as norms, habits and rules define 'how things are done' and how learning takes place, while the "hard" institutions, i.e. organizations (e.g. firms, banks, state departments) can be regarded as embedded in the "soft" institutions (Cooke & Morgan, 1998).

The innovative capability of a nation's firms is determined to a considerably degree by government policies and national institutions (Nelson, 1993: 512). A nation's education system, for example, very seldom change in its basics and leaving out the relatively few top level scientists and engineers that acquire training abroad, countries will almost exclusively be made up of nationals trained at home. The nations system of university research and public laboratories that provides "public goods" is also to a large extent national. Furthermore, public infrastructure, laws, financial institutions, private investments, fiscal and monetary policies has great impact on innovation and will continue, in general, to remain domestic (Nelson, 1993: 519). This, in turn, makes it reasonable to talk about *national* innovation systems.

The NIS approach acknowledges that most markets are not "pure", i.e. "characterized by arm's length and anonymous relationships between the innovating producer and the potential user" (Lundvall, 1988: 350) but are "organized" and include a mixture of trust, loyalty and power relationships necessitating investments in codes and channels of information as well as in social capital (Lundvall, 2007: 108; Nelson, 1996). This entails that the effective use and production of human capital is fundamentally dependent on social capital and that both are important elements in what is called the learning economy (Lundvall, 2007: 115).

The concept of NIS criticizes trade theory's standard assumption that knowledge is assumed to float freely (Lundvall, 1998: 407). It takes a more interdisciplinary approach to economic growth theory than standard economics, incorporating a set of non-economic "soft" institutions such as norms and rules commonly found in political science and sociology and emphasize that knowledge is the most important resource in the current economy while learning is the most important process (Lundvall, 2007).

## 3.2 Regional Innovation Systems

The proponents of regional innovation systems (RIS) argue that research on NIS focus on the wrong spatial level, at the same time they do not neglect the national level's importance in affecting the innovative output of a nation (Cooke & Morgan, 1998: 203). The concept of RIS emphasize the importance of networks of interrelated firms, primarily at the regional level, as key factors in fostering innovative products and processes for global markets (Wolfe, 2008). Based on Lundvall's (1988) notion that interactive learning is key to innovation, the RIS approach believes that these exchanges of knowledge are facilitated when actors operate in spatial proximity (Cooke et al, 2000). In other words, RIS lies in the conjunction of the systems of innovation approach and the cluster concept (Coenen & Asheim, 2005). Regions, in turn, are to be understood as "*meso-level entities operating, in political and administrative terms, between local and national governments*" (Cooke et al, 2000: 2).<sup>4</sup> Coenen and Asheim (2005: 3) defines RIS as:

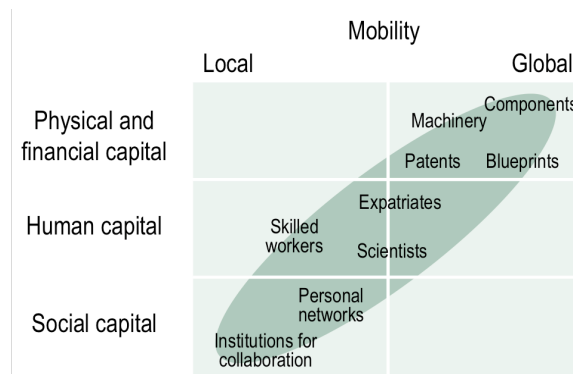
*"the systemic interaction between (1) the regional production structure or knowledge exploitation system which consists mainly of firms, especially where these display clustering tendencies and (2) the regional supportive infrastructure or knowledge generation subsystem which consists of public and private research laboratories, universities and colleges, technology transfer agencies, vocational training organizations, etc"*.

RIS, as any innovation system, basically concerns how the regional knowledge environment (universities and research institutes) integrates with the region's industry and how public institutions support this integration (Christensen & Kempinsky, 2004). The term 'Triple helix' (Etzkowitz & Leyersdorff, 2000) is often used to describe a RIS because it is a visualization of a dynamic system comprising of three different parts: society (politics), academia and industry but where in a RIS it is not always a question of formalized and functional relations (Christensen & Kempinsky, 2004).

But why, one might ask, does geographic proximity at the regional level matter for innovation in times of globalization? Howells (1996: 18) state that "*geographical distance, accessibility, agglomeration and the presence of externalities provide a powerful influence on knowledge flows, learning and innovation and this interaction is often played out within a regional arena*". At the regional level, much more so than in a national or international context, the flow of tacit knowledge and social capital are frequently nurtured due to continuing face-to-face contacts, interaction and exchange of information (Maskell & Malmberg, 1999a). Face-to-face interaction by itself implies transactions of tacit knowledge, which in contrast to explicit knowledge cannot be substituted by advanced communication or transportation, hence making

geographical distance an issue that still matters (Storper & Scott, 1995). Consequently, because it is implicit in nature it is non-replicable by competitors (Jürriado, 2008). Hence, despite globalization, polarization of innovative activities in specific geographical areas is persistent (Pilon & DeBresson, 2003). In other words, social capital, in contrast to physical and financial capital and to some extent human capital, is not as mobile but is overwhelmingly local.

**Figure 3.2: Three types of capital and their mobility** (Sölvell et al, 2003: 21)



The distinction between RIS and NIS are not merely a shift of focus from the national to the regional level but lies more in the notion of embeddedness which relates to personal relations, culture and networks for economic action build upon norms and trust at the region level (Wolfe, 2008). These embedded learning processes are difficult to study on a national scale, which is resolved by focusing on innovative sectors at the regional level, while at the same time recognizing the importance of the national level when empirically studying the role of embeddedness (Coenen & Asheim, 2005: 8). The emphasis on the role played by codified and tacit knowledge respectively in the innovation process are thereby the key difference between different innovation systems (Lundvall, 2007: 107). The different levels, however, should be seen as complementary rather than alternatives as they have “*important contributions to make to the general understanding of innovation in their own right*” (Lundvall, 2007: 100). In other words, firms may be part of several innovation systems at the same time and a nation’s innovative capacity originates from several factors on several different levels (Isaksen, 2003; Porter & Stern, 2001).

### 3.3 Innovation in clusters

The spatial micro-variant of regions, i.e. clusters, plays an important part in a RIS. A region may consist of several clusters whose firms are embedded within a wider RIS which in turn are connected to global, national and other RIS’s within a multilevel framework (Cooke, 2005: 82; Coenen & Asheim, 2005). When

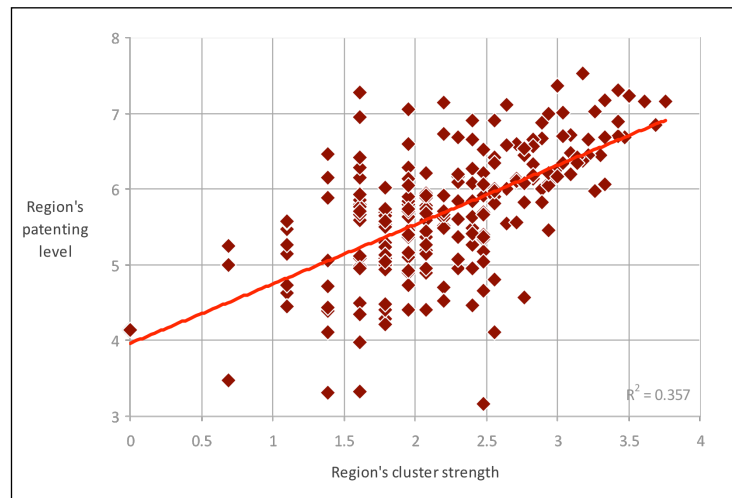
discussing RIS it is important not to merely refer to the *physical* space but to the socially constructed *relational* space from where it derives its features through different patterns of communication, learning, knowledge-sharing and innovation. For this, the scope of the *clusters* in the RIS determines its enhanced knowledge creation and circulation (Coenen & Asheim, 2005: 8). The important question however is *why* firms located in clusters are said to be more innovative than isolated firms and *how* the most innovative environment is constructed (Breschi & Malerba, 2005).

Knowledge spillovers between interrelated firms and institutions are a key factor in the ability to produce new innovative products for global markets (Porter, 2001: 30; Wolfe, 2008). In clusters, the geographical proximity enhances the ability of firms to exchange ideas and discuss problems through intense formal and informal meetings that may lead to technological spillovers (Audretsch & Keilbach, 2005; European Commission, 2008b).<sup>5</sup> More importantly, while proximity of firms in a cluster increases the information flow and the rate in which innovations diffuse, the spread of this information outside the cluster is limited as communications in the form of face-to-face contacts (tacit knowledge) leak out only slowly (Porter, 1990: 157). Cooperation, a central theme in this thesis, should *not* however be overemphasized at the expense of rivalry, which is central to the “diamond” model (Sölvell, 2009). However, even though competition and cooperation may appear as two separate entities they can coexist because “*cooperation at some levels is part of winning the competition at other levels*” (Porter, 2000: 25).

As innovation normally occurs from “*collaboration between different knowledge bearers who succeeds in matching their respective expertise to a new scheme which is able to serve a new economic function*” (Kern, 1998: 205), formal and informal modes of interaction and exchange of information between different actors within a cluster are crucial (Malmberg, Sölvell & Zander, 1996). The result from the 2004 and 2006 Innobarometer survey showed that innovative firms operating within clusters are more than twice as likely to source out research to other firms, universities or public labs than the average European innovative firms (European Commission, 2008b). The flow of information relies upon the willingness of the different actors in the cluster to inform others about their knowledge, which in turn will depend upon the trust established between them (Commission, 2008b).

The rationale behind taking a cluster approach when discussing regional competitiveness is demonstrated by looking at a comparison of European region’s patenting levels, a good proxy for measuring innovation, and cluster strength (see figure 3.3 below).<sup>6</sup> This reveals a positive relationship between cluster strength and patenting performance of a region and vice versa (Sölvell, 2009: 35; European Commission, 2008b).

**Figure 3.3: Cluster strength and patenting level in European regions**  
(European Cluster Observatory, 2007 – dataset 20070613)



Following the rationale in the system of innovation literature, firms operating in clusters are more likely to innovate if the actors are embedded in soft institutions (norms, culture) that facilitate trust and the exchange of knowledge. When discussing NIS, RIS or more specifically clusters, trust for many reasons deserves special attention (Bachmann, 2003: 59). Consequently, this is what we turn to the next.

### 3.4 Innovation and regional development - the role of trust

When trying to understand why some geographic territories such as Baden-Württemberg in Germany or the Emilia Romagna in Italy are relatively successful, many have underlined the long-term relations among firms in these regions and point to trust as an effective lubricant in business relationships that fosters regional development (Bachmann, 2003). The concepts described earlier clearly put emphasis on knowledge sharing and interactive learning as a prerequisite for firm's ability to innovate and hence stay competitive. For reasons stated below, a main factor deciding to what degree such sharing and learning takes place is trust.

As products have become more knowledge-intensive with a more information-based mode of production, these exchanges increasingly involve sensitive information making trust a highly desirable qualification (Lane, 1998; Sölvell, 2009: 37). The rationale is that trust unlike most other economic assets cannot be bought: rather it has to be earned and is therefore one of those rare assets which have a value but not a price (Cooke & Morgan, 1998: 30). Trust, in that sense, is not available on the market (Storper, 1995) but have to be obtained through trust-based relationships. According to Maskell and Malmberg (1999b) it is the sharing of

partly tacit and not yet codified knowledge that are the most valuable as such knowledge are not easily transferrable to outside competitors and hence creates a competitive advantage for the firms who obtain it. When trust-based relationships grow to become networks through which each participant might access knowledge (e.g. in a cluster) any infringement of trust will be severely penalized. When all actors in the network are aware of this conduct it is possible to exchange knowledge and ideas even between competitors, out of reach for outsiders (Maskell & Malmberg, 1999b: 17). As learning and innovation are critical in order to stay competitive (Lundvall, 1988; Cooke, 2005) the benefits of such trust-based relationships becomes evident.

Based on these assumptions Cooke and Morgan (1998: 30) drawing inspiration from the rich trust literature puts forward three major benefits for actors who have developed a trust-based relationship:

*(1) they are able to economize on time and effort because it is extremely efficient to be able to rely on the word of one's partner; (2) they are better placed to cope with uncertainty because, while it does not eliminate risk, trust reduces risk and discloses possibilities for action which would have been unattractive otherwise; and (3) they have greater capacity for learning because they are party to thicker and richer information flows.*

The keyword for building effective trust-based relationships is reputation, which in turn empowers the actors to monitor all interactions that are occurring (Sabel, 1993).<sup>7</sup> This implies that trust begins where knowledge ends hence that trust always implies confidence in face of risk (Sydow, 2003). Trusting, therefore, is:

*"the inclination of a person "A" to believe that other persons "B" who are involved with a certain action will cooperate for A's benefit and will not take advantage of A if an opportunity so arises" [while trustworthiness is] "the willingness of person B to act favorably towards a person A, when A has placed an implicit or explicit demand or expectation for action on B" (Ben-Ner & Halldorsson, 2010: 65).*

Consequently, *"trust implies a three-part relationship involving at least two actors and one act"* (Guinnane, 2005: 5). On a more general level, Fukuyama (1995: 7) proclaims that *"a nations ability to compete is conditioned by a single, pervasive cultural characteristic: the level of trust inherent in a society"* which is similar to the weight Putnam places on the importance of "social capital".<sup>8</sup> In a study by Zak & Knack (2001: 307-9) it was demonstrated that country level trust has a significant impact on economic activity. Despite the critique put forward by some scholars, e.g. Williamson (1993) and Guinane (2005), that trust as defined here has no role to play at all in business performance, many scholars, although not to the same degree, agrees that trust has highly positive effects (e.g. Lane, 1998; Arrow, 1974) or that the level of trust are helpful in explaining variations in economic performance on a national or organizational level (Fukuyama, 1995; Beugelsdijk, 2004).



With regards to cooperation it may be said that it is primarily those with whom we have ongoing relationships, either directly or indirectly, that we trust<sup>9</sup> (Harding, 2001: 3), i.e. “*trust lubricates cooperation, and cooperation itself breeds trust*” (Nahapiet & Ghosal, 1998: 255). Much of the literature on the benefits of spatial proximity for innovation builds its argument on such rationale. One example is how low trust has been identified as the main barrier for cross-cluster cooperation between Member states within the EU, greater than barriers relating to language (European Commission, 2008b).

If a low-trust environment signifies the local milieu, betrayal of trust and opportunistic behaviour will be common and the sharing of information kept at a minimum resulting in lower pay-offs for all actors involved (Maskell & Malmberg, 1999b: 18). Trust, in that sense, can act as a catalyst which safeguards from uncertainties that would be damaging to innovation due to the restrictions it puts on knowledge-sharing. Following the rationale seen in many trust games, such as the Prisoners Dilemma, continuing interactions between actors creates “repeated games” that lowers the risk of being cheated (Gibbons, 2001; see also North, 1993).<sup>10</sup>

### 3.5 Policy implications

On the background of EU’s innovation and cluster policies described in more detail in chapter two and with references to what has been discussed above regarding different types of innovation systems and the role of space and trust, what are the implications on relevant national policymaking and what new roles should policymakers preferably take? These questions are discussed below starting with a brief description of the rationale behind taking a regional approach when discussing some aspects of economic policy before moving on to the preferred new roles for policymakers in facilitating cooperation (the associational repertoire) and in strengthening clusters at the regional level. The core argument presented here is that as national competitiveness of EU Member States nowadays is a result from many factors, innovation being a crucial one, this alters many of the traditional roles of economic policymaking historically governed by state-centric policymaking with strict division between regional/national and industry and R&D policy families. Instead, a multi-level governance perspective where economic policy crosses traditional policy families and which link supranational, national, regional and local policymaking, in addition with a strong focus on growth and innovation within specialized regions instead of specific sectors and firms, is advocated. The main argument is that such changes have, and will continue, to be the implication on national economic policymaking when taking an innovation and cluster approach towards the EU’s competitiveness.

**Table 3.4: Towards a new view on economic policy**

<u>Traditional economic policy</u>	<u>New economic policy</u>
Focus on sectors and firms, alternatively general infrastructure	Focus on industrial systems: innovation systems, triple helix, clusters
Distributing resources	Focus on growth and innovation
Flexibility, enhanced adaptation in the economy	Upgrading existing clusters and resources
Regional similarities	Regional differences and specialization
Strict division of policies: industry, labour market, R&D	Policy crosses traditional vertical policy families
National policies separated from regional/local policies	Projects which links national-regional-local policies

Source: Sölvell, 2004: 35

### 3.5.1 A decentralization of economic policy?

National economic policy has shifted from static price competition towards innovation benefiting those firms that are able to produce knowledge more rapidly than their rivals (Porter, 1990; Maskell & Malmberg, 1999a). According to Asheim and Isaksen (1997) the globalized and deregulated world economy and the transfer of nation-state authority to supranational organizations such as the EU and WTO has led to a shift in the regime of international trade relations towards socially produced competitive (absolute) advantage and away from comparative advantage based on best access to, and most efficient use of, “natural” production factors. The effect on the sub-national (regional) level is a polarized development between successful and unsuccessful regions in terms of growth and innovation where the innovative capacity of individuals, firms and regions are dependent on their ability to *learn*. The ability to learn in turn in what Lundvall and Johnson (1994) calls the ‘learning economy’ entails “*the promotion of firms that enhance learning capabilities by networking, lateral information exchange, inter-firm staff mobility, and the reflexivity of learning organizations; also governance systems that promote the means, incentives, capability, access, and intelligence to learn*” (Cooke & Morgan, 1998: 213). The RSI approach advocates that this is best organized at the regional rather at national level, for reasons stated above, and recommend a shift towards a more decentralized innovation policy (ibid: 213).

According to Porter (1990: 158) it is the combination of national and intensely local conditions that foster competitive advantage, whereof national policies will be inadequate in and of themselves for industry success while local governments have to continue to play a prominent role. Storper and Scott (1995: 524) state that “*the regionalization of industry policy is necessary to competitiveness in the contemporary world economy*”, as regional policy is likely to be as important as macroeconomic or sectoral policies in ensuring industrial competitiveness as the economic differences within nations may be as great as those between nations (Saxenian, 1994: 6). Simply put, “*regions compete with each other worldwide in providing the best framework conditions in order to facilitate business growth and to attract investment and a talented workforce*” (European Commission, 2008b). The question for the EU however arises regarding what roles the regional, national and supranational level ought to have in providing this framework, and what affects it will have on actual policymaking. The answer to these questions is what we will turn to next.

### 3.5.2 The associational repertoire

In the conjunction between the Keynesian state-centered repertoire and the market oriented neo-liberal repertoire we find the associational (i.e. collaboration) repertoire put forward by Cooke and Morgan (1998). Here the key issue is not the prominence of state intervention over the market or vice versa, but the framework for effective interaction. Drawing insights from the innovation system approach literature on interactive learning, the key development role of the state is to facilitate “*associational, networked interaction and even team-like relationships within and among firms and between them and key non-firm organizations such as government bodies, universities and many kind of intermediaries from venture capitalists to skill-providers*” (Cooke et al, 2000: 13). Hence, the importance of social capital and trustful relationships within the economic sphere is highlighted and in turn fostered by empowering intermediate associations that exists between state and market such as trade associations, labour unions, chambers of commerce or even groups of firms (Cooke & Morgan, 1998: 22). This goes along with Saxenian’s notion that “*the starting point for a regional industrial strategy is fostering the collective identities and trust to support the formation and elaboration of local networks*” (1994: 167). However, fostering social capital and engaging in regional networks have important policy implications for administrators engaged in economic development at every level of government (Feiock et al, 2008).

Even though the associational perspective puts emphasis on what in EU-jargon is usually referred to as subsidiarity, the state still is still considered a unique institution with responsibility for social cohesion and the national system of

innovation (Cooke & Morgan, 1998). However, two important institutional innovations are put forward by the associational perspective:

- 1) *the devolution of power from remote central departments to the regional level where interactive relations with firms and their associations are better sustained and created; and*
- 2) *the delegation of tasks such as enterprise-support services to business-led associations which have more knowledge and credibility among their members than a state agency (Cooke & Morgan, 1998: 23).*

The regional government can make a difference by using its local knowledge and promote strong networks of collaboration between private and public sectors as well as providing a more customized support infrastructure (ibid: 161). The associational perspective put forward by Cooke and Morgan (1998) specifies three policy themes up for change in a decentralized industrial policy: *First*, due to the increased specialization of regional economies, as described in lengths above, it is at the regional level where the knowledge about labour market demand and supply relationships are the greatest. Therefore, the regional level is most suitable for organizing, for example, vocational training; *Secondly*, innovation should be supported by policies formed at the regional level. Moreover, innovation support expenditure are to be directed towards SMEs and innovative start-ups, which by the OECD (1994) is identified as the only sector having real job-growth potential in the future, in contrast to the public sector and the large private sector (See also Armstrong & Taylor, 2000). Furthermore, this expenditure is to be allocated also to other organizations such as research institutes and universities in the region; *Thirdly*, business intelligence, enterprise support and general funding assistance in the form of networks of higher education institutes for example is best coordinated at the regional level in association with representatives from the local public and private sector as well as associational bodies (Cooke & Morgan, 1998: 220).

As associational networks are believed to be an important driver of innovation and regional development, it is crucial for local and regional governments to support these types of networks (van Winden & Woets, 2003). The way in which local governments can promote such networks are to invest in basic research and improve links between local firms (mainly SMEs) and knowledge infrastructures (Asheim & Cooke, 1999). In other words, the role for public agencies is to help firms to learn how to learn by providing encouragement for cooperation (Cooke et al, 2000: 16). At the regional level, business-government-university dialogue is more attainable and regional/local governments can act as a key driver in this triple helix constellation by providing for the needs of the other actors that is under its control (See challenges to this university-industry relationship in Cooke et al, 2000: 18-9). In conclusion, the ability of a given region to face changes in demand, competition and new trends following from globalization will be affected by the degree to which it's firms engage in fruitful cooperation and learning with all actors in the innovation system, which in turn is affected by the ability of the regional/local government in supporting and encouraging such collaboration.

Putnam (1993) and Sabel (1996) forward that social capital, of which trust is an essential component, is the most important missing ingredient in economies which fail to develop to a satisfactory level. Public policy, therefore, may need to be refocused to address such issues<sup>11</sup> (Cooke et al, 2000: 152). However, associational strategies in the form of promoting clusters bring with it several challenges for policymakers, which we will turn to next.

### 3.5.3 Taking a cluster approach – implications on economic policy

Policymakers at all levels have in recent years increasingly started focusing on local networks of firms and public-private cooperation in attempts to create clusters (Brenner & Fornahl, 2003; OECD, 2007; Sölvell, 2003; Power and Lundmark, 2004; Ketels, 2009). Hence, taking a cluster approach share great resemblance with the associational repertoire explained above. A distinction must however be made between **Cluster policies**, which can be defined as an expression of “*specific governmental efforts to support clusters*”, e.g. industrial policies or research and innovation policies (Commission, 2008b) and **Cluster initiatives**, which can be defined as “*organised efforts to increase growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community*” (Sölvell, Lindqvist & Ketels, 2003).

Cluster policies are about restructuring traditional policies such as science-, innovation-, industry-, and regional policy (Sölvell, 2009: 128). Taking a cluster approach also focuses on growth and increased specialization, i.e. increased regional differences within the national economy. As national economies very seldom develop evenly some regions will be more prosperous than others. A common policy response in such cases has been to support the depressed areas with subsidies aimed at convincing companies to locate in that specific region. These sorts of policies are rarely effective, as they do not create a true competitive advantage for the companies in the region, as they will be dependent on external subsidies in order to compete internationally. A much more effective regional policy will be to build on clusters where resources should be aimed at universities, research laboratories and specialized infrastructure (Porter, 1990: 657). Hence, clusters “*represent a new way of thinking about national, state, and local economies, and they necessitate new roles for companies, government, and other institutions in enhancing competitiveness*” (Porter, 2000: 15).

Most cluster initiatives are set up as “public-private-partnerships” and in terms of financing the source of finance is usually governments (54%) or from industry (18%) or equally from both (25%) (European Commission, 2008b). According to the 2006 Innobarometer on cluster’s role in facilitating innovation in Europe, over two thirds of cluster company managers agreed that public authorities have at least an important if not fundamental role in supporting the cluster

(Eurobarometer, 2006: 13). Although there is a consensus in the cluster literature on that policymakers cannot “pick winners”, that is select a new and “hot” industry such as clean-tech or ICT and create a cluster from scratch, a debate still exist regarding the government’s role for cluster success. These range from an “evolutionary” perspective where cluster success is driven solely by market forces without assistance from any “constructor” in contrast to the second perspective where cluster success is strongly dependent on government policies and programs. While many economists are too market oriented, many policymakers are too constructive (Sölvell, 2009: 126).

Government policy’s central goal toward the economy is to “*deploy a nation’s resources (labour and capital) with high and rising levels of productivity*” (Porter, 1990: 617). Economic policy such as governing competition through establishing microeconomic rules and incentives and initiate long-term economic action programs for government, business, institutions, and citizens, has in the last decade been expanded to also include facilitating cluster development and upgrading (Porter, 2000).

The view on innovation as a linear process, i.e. where research is the starting point for all innovations, are often phrased as first-generation innovation policies. Second-generation innovation policies are built on the interactive model put forward by Lundvall (1988) and acknowledge that several policy families, such as R&D, basic education, industry, labour market etc. are important in affecting innovations in the economy. Third-generation innovation policies view such traditionally vertically separated policy areas aimed at specific sectors or firms as ineffective and advocates a coordination of policies which crosses traditional vertical policy families and involves not just firms but the whole knowledge society and not deadlocked within certain sectors (Oxford Research, 2007). Furthermore, policies originating from EU-level aimed at strengthening the Union’s clusters are to be implemented at national, regional and local level not in isolation from each other at separated levels, but in an intertwined and cooperative way where each level has an important act to play. Consequently, there should be a merge of innovation policy not only vertically between different policy families but also between different levels of government, i.e. local, regional, national and supranational. Davies (2006) has identified the following policy trends when it comes to taking a modern and cluster approach towards economic policy.

<b>Policy stream</b>	<u>Old approach</u>	<u>New Approach</u>	<u>Cluster Programme Focus</u>
<b>Regional policy</b>	Redistribution from leading to lagging regions	Building competitive regions by bringing local actors and assets together	Target or often include lagging regions; focus on smaller firms as opposed to larger firms; broad approach to sector and innovation targets; emphasis on engagement of actors
<b>Science and technology policy</b>	Financing of individual, single sector projects in basic research	Financing collaborative research involving networks with industry and links with commercialization	Usually high-tech focus; both take advantage of and reinforce the spatial impact of R&D investment; promote collaborative R&D instruments to support commercialization; include both small and large firms and emphasize support for spin-off start ups
<b>Industrial and enterprise policy</b>	Subsidies to firms; national champions	Supporting common needs of firm groups and technology absorption (especially SMEs)	Programmes often adopt one of the following approaches: 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 export

*Source: Davies 2006. Cited in Oxford Research, 2007: 11*

A cluster-based focus aim government investments towards the whole business environment as such, instead of subsidies to broad sectors or individual industries, through grouping together firms, suppliers, related industries, service providers, and institutions that benefits a broad range of firms without threatening competition (Porter, 2000). A cluster-oriented way of thinking thereby will cover a broader spectrum of policy areas that appear far from the common perception of economic policy and in turn will engage new parts of government in influencing a nation’s competitiveness (ibid).

The focus of economic policy has traditionally been at the national level, where many aspects of general business such as setting interest rates, creating private property rights, setting tax rates etc. were best dealt with (Porter, 2000). However, taking a cluster approach in policymaking underlines the importance of government at all levels, most notably the local level, working together in strengthening the clusters and hence the competitiveness of the region and nation as such.

### 3.5.4 A multi-level governance perspective on modern economic policy

National and EU level programmes in support of clusters originate from broad policy families such as regional policy, innovation policy, science and technology policy and industrial/enterprise policy. These policy areas have all undergone changes in policy orientation away from a top-down and single sector approach towards policies in favour of co-operative, multi-actor and often place based approach (OECD, 2007: 2). The importance of government efforts at several levels has made the local and regional level more influential vis-à-vis the national level due to the dominant affect the former levels has on important aspects of cluster development (Porter, 2000). Furthermore, “*nowhere has the regional role in innovation been more forcefully championed than in the European Union*” (Cooke & Morgan, 1998: 213). The Green Paper on Innovation (European Commission, 1995) revealed this point clearly when stating that its policies for innovation (e.g. the Framework Programme for Research and Technological Development) was intertwined with its policies for regional development (e.g. the Structural Funds) (ibid). The Green Paper on Innovation put forward several tasks for the regional level in order to promote more intense collaboration:

- To foster co-operation among enterprises (large and small) and strengthen groupings based on technology or sector in order to realize the potential of local know-how
- To improve or add to business support structures by introducing mechanism to facilitate dialogue between the various local partners involved in innovation
- To reinforce university-industry co-operation in order to facilitate transfers of technology, knowledge and skills (European Commission, 1995: 45)

It can be argued that a division of functions and growing responsibilities at all levels (regional, national and supra-national) regarding innovation are becoming evident in the EU. While the EU has developed a quite dominant role in technology policy with its Framework Programmes that stimulates scientific cooperation across European borders, the national governments plays a central role in providing economic resources to basic research and science and technology research, i.e. states govern science policy and direct it towards specific strategic areas for that state, e.g. military research, funding of specific university departments, etc. (Cooke et al, 2000: 23; European Commission, 1998: 85). Consequently, while the state-level mainly controls science policy, and technology policy is becoming highly influenced by the EU, what role does, and should, the regional level have? From what has been described in lengths above regarding the decentralized economy, the importance of regional innovation systems and the effects on knowledge creation that spatial proximity brings with, the region’s role in having an associational function as a way to foster innovation becomes clear. The national level is still important in promoting innovation but it has to work with EU-institutions above and regional authorities below because it neither has the competence or the legitimacy to act in the old hierarchical and state-centric way (Cooke & Morgan, 1998: 217). Consequently, as van Winden



and Woets (2003: 23) points out “*policies are most likely to be successful when there is close collaboration with the private sector, with other (regional, national, European) government initiatives and incentives*”.

As formal authority on this issue to some degree has “*dispersed from central states to supranational institutions and down to regional and local governments*” (Hooghe & Marks, 2004: 15) the theory of multi-level governance (MLG) becomes useful in order to understand the division of responsibilities in the initiation and implementation of a modern economic policy focusing on innovation in the EU. MLG view European integration as “*a polity creating process in which authority and policy-making influence are shared across multiple levels of government – subnational, national and supranational*” (Marks, Hooghe & Blank, 1996: 342). Subnational actors are not exclusively nested within nation states but operate in both national and supranational arenas that are interconnected. The governments of the Member States give up control, if the loss of control is not superficial, as they believe that they will receive something in return.

The fusion of the Structural Funds (e.g. the European Regional Development Fund) and the Framework Programme for Research and Technological Development as well as the emphasis put on the implementation of EU’s innovation policies at the regional level in the Green Paper on Innovation (European Commission, 1995) clearly build on the notion that “*governance across multiple jurisdictions is both more efficient than, and normally superior to, central state monopoly [as well as] governance must operate at multiple scales in order to capture variations in the territorial reach of policy externalities*” (Hooghe & Marks, 2004: 15). It is on the implementation stage of EU regional policymaking where these characteristics of MLG are most prominent (Marks et al, 1996: 365).

The MLG approach emphasize the overlapping competences of different policy actors in contrast to the more state-centric view presented by for example Liberal intergovernmentalists such as Moravcsik (1993). Surely, a great number of government policies at both national and EU-level can have direct or indirect effect on entrepreneurial activities. Policies aimed at the removal of monopolies, operation of foreign firms, foreign exchange rules, individual and corporate taxation, level of bureaucracy to name just a few (Manimala, 2008). However, removing barriers for cooperation and learning between different actors are most forcefully championed at the regional level while coordination of for example technology policy is best dealt with at EU-level. Therefore, the EU’s goal to develop a learning culture among European firms, universities and innovation agencies through becoming more open-minded toward inter-firm and firm-university collaboration is best attained through a combination of measure on all levels, most notably the regional (Cooke et al, 2000: 153). Hence, regional competitive efforts have to take a broader agenda and consider the institutional capital and trust between public and private partners as an asset (Ketels, 2009).

### 3.5.5 Public intervention in facilitating innovation – always motivated?

It is advocated above that some parts of modern economic policy should take an associational and cluster perspective towards policies relating to innovation. However, the question arises concerning when such measures are truly motivated? For example, the European paradox relates to high public R&D spending but low output in the form of commercialization, i.e. bringing research to the market. This means that R&D at universities and research institutes etc. either ‘stays’ within that sphere or that firms operating in other countries outside the EU are commercializing it. Although such facts are alarming and cries for action from a European perspective, two conditions according to Edquist (2002: 50) must be met in order for a public intervention to be motivated in a market economy when it comes to policies relating to innovation.

- First, the market mechanisms and the firms must have failed in meeting the goals that have been formulated in the political process, for example the aim to create more high productive jobs or higher commercialization of publically funded R&D. In other words, a *‘problem’* exists when markets and firms fail to naturally or automatically reach the goals that have been determined politically. There is no motivated reason for public intervention if a problem does not exist, i.e. that the market and firms by themselves are capable of reaching the goals set by politicians. Innovation policy in that sense should not replace firms and markets but complement them. The potential problem is identified through analysis of the firms and the market in which they act. One example is the “European Paradox” of low commercialization of research expenditure.
- Second, public intervention by the state or other political organs at national, regional or local level must have the *ability to solve the problem*. If the public sector lacks the ability to solve the problem it should not intervene as the problem then will persist. Reasons behind the incapability by the public sector to solve a certain problem is either that it cannot be solved through political measures or that it lacks the proper problem-solving capabilities to address the problem. Through a detailed analysis of the problem and its causes, the ability to address and render the problem will increase (Edquist, 2002: 50).

A problem of low innovative output within the EU can be the cause from several factors such as low R&D input in some Member States, lack of venture capital, judicial framework, state-owned monopolies, corporate taxation, level of bureaucracy, or barriers to cooperation and learning among European firms and research institutes etc. While policymakers in the EU have identified a problem that markets and firms have failed to naturally solve, i.e. the “European paradox”, the question is if policymakers have the ability to solve the problem? The argument put forward here, based on the theories on innovation systems and recent EU policy initiatives described above is that the governance, and especially implementation, of innovation policy is more effective when operating across

multiple jurisdictions in a MLG framework and that this constitutes a possible solution (Hooghe & Marks, 2004).

However, one main barrier to cooperation and learning is said to be a lack of trust between a given set of knowledge bearers. However, how do policymakers know if there is a lack of trust acting as a barrier for innovation if they do not ask the actors involved? When it comes to problems relating to intellectual property rights, for example, a measure could be to introduce new patent laws or set up a new patent authority. This thesis has advocated that while such measures are appropriate at the national level, the problem of lacking trust and fostering cooperation is best dealt with at the regional or even local level. Hence, the remaining issue to be dealt with is how trust can be quantified and how such a tool may be developed in order to help policymakers address a potential problem of lacking trust. Given the importance of clusters for regional development and innovative output this is the level at which the tool will be developed.

## 4 Measuring trust within clusters

This thesis has presented the argument that the concept of trust, often found in sociology and political science, may also have important implication on economic matters and the innovative capacity of a given region. If the EU is to boost its innovative output, a tool used to measure trust within clusters and which later can be benchmarked with other cluster, within and outside the EU, may prove to be very helpful in strengthening the competitiveness of its Member States.

### 4.1 Measuring trust

Researchers usually set out to measure trust in order to explain underlying factors behind voter participation (Bingham-Powell, 1986), economic prosperity of a nation (Zak & Knack, 2001) or as emphasized in this thesis, barriers to innovation. The underlying idea is that *“to do any research we must be able to measure the concepts we wish to study”* (Kidder & Judd, 1986: 40). The concept of trust is multidimensional involving, among others, political trust, trust between superiors and subordinates, social trust, interpersonal trust, etc (See Joseph & Winston, 2005). The literature on trust and all its dimensions are extensive resulting in that some parts of the academic debate on trust for matters of space and relevance are here left out, focusing instead on the core matters of measuring trust and the definition of the term in the context of innovation and clusters.

The main focus in this thesis is intra- and interorganizational trust, i.e. trust within and between organizations. Even though scholars such as Fukuyama focuses on social trust, in which intra- and interorganizational trust naturally are embedded, a distinction between the different kinds of trust are justified. Saxenian (1994), for example, presents significant evidence that two regions (Silicon Valley and Route 128) within a single nation (US) may differ substantially when it comes to interorganizational trust and cooperation, i.e. the business climate of a region. Here, one explaining factor was the difference in culture between the east and west coast of the US. Distinct ‘societies’, then, can be seen also at the regional or even cluster level in the form of specialized and unique social bonds, norms and institutions (Sölvell & Birkinshaw, 2000: 87). Referring to interorganizational trust, defined by Sydow, (2003: 35) as *“the confidence of an organization in the reliability of other organizations, regarding a given set of outcomes or events”* one must understand that even though trust is inevitably tied to individual human

beings, individuals can nevertheless also trust abstract social systems such as organizations. At the same time, the notion of interorganizational trust cannot ignore the personal embeddedness of trust and trust attributions (Sydow, 2003: 42).

A large debate surrounds the ideal way to measure trust and trustworthiness, which in turn relates to the debate regarding the correct definition of the term (see e.g. Fukuyama, 1999; Williamson, 1993). Trust, in addition to civic engagement (Putnam, 2000), has often been used as a proxy when measuring social capital through attitudinal survey questions in the World Value Survey or the General Social Survey (in the US). Such surveys are also sometimes added with trust games to measure actual trusting behaviour (see e.g. Ben-Ner & Halldorsson, 2009; Glaeser et al, 2009). The question posed in the WVS and the GSS for measuring trust “*Generally speaking, would you say that most people can be trusted or that you can’t be too careful dealing with people*” is however often criticized for being too vague (Fukuyama, 1999). Or as Hardin (2001: 14) puts it “*the respondents are forced by the vagueness of the question to give vague answers*”. Guinnane (2005) even believes that no meaningful results can come out of such statistical analysis as trust in the survey is not put in context, i.e. I might trust most people in one situation but not in others. Glaeser et al (2009: 815) states that responses to the GSS or WVS question on trust are hard to interpret as variation in responses might arise for a number of reasons such as who constitutes “most people” and what does it mean to “trust” someone? The problem is that a single question, like the one asked in the WVS and GSS, cannot capture the true extent of the meaning of trust (Ben-Ner & Halldorsson, 2009). Going back to the definition of trust used in this thesis as “*the inclination of a person A to believe that other persons B who are involved with a certain action will cooperate for A’s benefit and will not take advantage of A if an opportunity so arises*”, clearly shows the problems of using a single, context-free question for measuring trust as “*in any real-world context, I trust some more than others, and I trust any given person more in some contexts than in others*” (Hardin, 2001: 14).

The method used to measure trust in this thesis tries to avoid such problems by taking an inclusive stand towards the very concept of trust and, in accordance with the definition provided above, specify the *certain action* in which the respondent may or may not find the other person trustworthy. However, any way one chooses to define and measure trust, some objections can and will always be raised. The crucial point is to make a good argument of why the method chosen to measure trust is as accurate as possible given the opportunities at hand and be humble towards the results. This thesis is the first step in developing such a tool through designing a questionnaire that later will be deployed in a full-scale study. The logic and procedure behind this approach is explained in more detail below.

## 4.2 Conducting a pilot study

The aim of the second part of the thesis is to develop a tool in the form of a questionnaire that measures trust within clusters, i.e. within a distinct society. This is performed as a first step for the company this thesis is partly written for in offering a tool for policymakers who wish to identify a potential problem of lacking trust in a given cluster. The tool will be able to specify among which actors in the cluster where a lower degree of trust is present. With such knowledge, the idea is that policymakers both will know if a problem of lacking trust exists and where to direct its measures, as well as if they have the ability to address the problem. With regards of constructing a tool dealing with the difficult task of measuring such a multidimensional concept as trust will doubtless be a problematic undertaking. Therefore a decision has been made to try the tool in a pilot study before more time, effort and money is spend on the project. A pilot study, i.e. the testing of questions and procedures (Oppenheim, 1992), refers to a specific pre-testing or 'trying out' of a particular research instrument, in this case a questionnaire (Baker, 1994: 182-3). As Oppenheim (1992: 6) notes, there are occasions when we want to study a finite, special group, in our case a chosen cluster, and not to generalize the results to others but rather to improve a procedure. In addition to what has previously been mentioned, the reasons behind doing a pilot study is underlined by Oppenheimer (1992: 48-55) as the following:

- It is better to learn from mistakes in the pilot study than realizing them too late in the full-scale study
- Any aspect of a questionnaire must be tested beforehand in order to safeguard that it works as intended
- Pilot work lets the researcher test the phrasing of the questions
- If questions from other surveys are 'borrowed', they need to be piloted to make sure that they work for a new set of respondents in a new context
- If the contact person chosen to distribute the questionnaire is in the right position to do so.

Van Teijlingen & Hundley (2001) provides additional reasons for conducting a pilot study:

- Increases the likelihood of success in the full-scale study
- Developing and testing adequacy of research instruments
- Assessing the feasibility of a full-scale study
- Establishing whether the sampling frame and technique are effective
- Identifying logistical problems which might occur using proposed methods
- Determining what resources (finance, staff) are needed for a planned study
- Convincing other stakeholders that the main study is worth supporting

What is clear is that when developing a research tool in form of a questionnaire, a pilot-study provides an array of important lessons to be learned before deploying it in a full-scale study. The aim of the pilot study is to estimate the time and effort needed for a full-scale study. As this will constitute future consulting activities, this is an important issue. If serious problems are discovered already in the pilot study when it comes to get in contact with the right persons, costs, availability, choosing the right sample etc. the structure of the survey and how such problems can be overcome can be dealt with before a larger amount of time, effort and capital is put into the project.

The methodological aspects which has to be taken into consideration for this purpose are the following:

- **Sample** – On what cluster should the tool be tested? On which grounds should we select the cluster? How do we define and limit our sample? Who are the relevant actors involved?
- **Measuring trust within organizations** – How is trust within organizations measured?
- **Designing the questionnaire** – How do we best design a tool measuring trust between organizations in clusters?
- **Pilot study** - Trying out and discussing the questionnaire with representatives from the chosen cluster.
- **What have we learned?** – What lessons followed from the pilot study in term of deploying the questionnaire on the cluster? How can we improve the procedure?

### 4.3 Choosing a cluster and defining its scope (sample)

Clusters are “*geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate*” (Porter, 1998). One problem that has to be dealt with in any full-scale study is how to define the scope of the cluster that is being analyzed. There are mainly two ways of identifying a cluster and defining its scope, i.e. determine where a cluster starts and ends and if it even exists. One common way is qualitative in nature and approaches the cluster through desk research and interviews with local experts that document the history, activity and impact of clusters on regional development, employment and innovation (European Commission, 2008b: 14). Another approach is more quantitative and aim at identifying clusters indirectly by statistically measuring indicators such as concentrated employment or higher productivity, which in turn is assumed to be observable when a cluster is present. Such cluster mapping is a good way of identifying existing, growing and declining clusters statistically in a certain geographical area (see

www.clusterobservatory.eu for the use of both techniques in practice). As clusters always change, and case studies are a time consuming activity, the qualitative approach is often used as a complement to the quantitative approach.

The cluster that will constitute the focus of our pilot study is Copenhagen Finance and IT Region (CFIR). CFIR is a non-profit organization that focuses on innovation and growth within the financial and IT sector in the Copenhagen region. Behind the initiative are 14 partners including business federations, unions, universities and the public sector.<sup>12</sup> The goal of CFIR is to develop and promote the Danish and the Öresund Regional financial sector focusing on the potential of the high degree of interaction between finance and IT. The cluster organization's partners covers approximately 400 000 employees, 900 Danish companies, and 50 000 students and researchers at Denmark's largest universities and educational institutions (CFIR, 2010). Data on the different actors that make up the cluster has already been gathered by CFIR. Hence, there is no need in our case to identify the cluster or determining its scope a second time.

We will not be able, nor is it the ambition, to generalize the result from the full-scale study to other people or other settings, i.e. external validity, as *“no single study can have external validity, since it is impossible to know whether the results will replicate in another context”* (Hogg & Cooper, 2003: 36). Consequently, further research aimed at gathering more empirical data, which is also the long-term aim of the tool developed here, will be required. As Asheim et al (2006: 15) points out, *“Clusters vary considerably in type, size, origin, structure, organization, dynamics and developmental trajectory. It seems most unlikely that different clusters can all be explained in the same way”*. In addition, what constitutes a high degree of trust in a cluster must be seen in relation with identical studies in other clusters.

The reasons behind choosing CFIR are numerous. First, a detailed analysis of the cluster and related industries has already been carried out, providing a good overview of the cluster and the actors involved. Second, CFIR is a newly started cluster organization, making it an interesting case going back to in the future to see if the cluster initiative has had any effects on the degree of trust. Third, the company for which the results of this thesis are provided for have personal relationships with the secretariat of CFIR which has acted as a door-opener. Fourth, as the aim is to pilot a questionnaire, logistical and geographical issues are important to consider as a way to keep costs low. Copenhagen is in that sense ideal.



## 4.4 Measuring trust within organizations

A common methodology used to measure trust *within* organizations will act as a great source of inspiration when designing a tool that measures trust *between* organizations in clusters. For this purpose, the work of Robert Levering, founder of the Great Place to Work Institute (GPW)<sup>13</sup>, will be used. The tool (the Trust Index Survey) was initiated in the 1980's and constitutes of roughly 60 statements to employees in different organization. It is the first and most widely-used tool to measure trust in the workplace and annually gathers data from over 1.2 million employees belonging to over 3,800 organizations in 40 countries worldwide. According to Robert Levering trust is the currency of good workplace relationships. Without trust, the workplace becomes dehumanized but with trust, workplace relationships can flourish. The main message is that *“in a great workplace, trust manifests itself in every relationship. In a high-trust environment, people cooperate and collaborate, leading to positive workplace interactions, higher profits, and greater productivity”* (Great Place to Work, 2010). In other words, an undeniable correlation exists between employee satisfaction and financial performance of a company. Through the Trust Index Surveys, researchers have been able to quantify how much value trust in the workplace has, and how damaging a lack of trust can be (Great Place to Work, 2009a).

Approximately 45 statements related to trust are asked to employees in the Trust Index Survey. The statements are in turn related to the three dimensions of Credibility, Respect and Fairness, which constitutes the core of the Great Place to Work Institute's Trust Model. Going back to the definition of trust used in this thesis, the rationale behind the three dimensions is that person A will trust person B to a higher degree if he finds that person to be credible, respectful and fair. Trust in that sense relates to the personal characteristics of the persons you interact with i.e. employees trust management when they *“act in ways that convey their credibility, show respect and insure fairness in the implementation of policies and practises”* (Great Place to Work, 2009b). In figure 4.1 below the components of the three dimensions that make up trust in the Great place to Work Institute's Trust Model are presented in more detail.

**Figure 4.1: The GPW Trust Model** (Great Place to Work Institute, 2010)

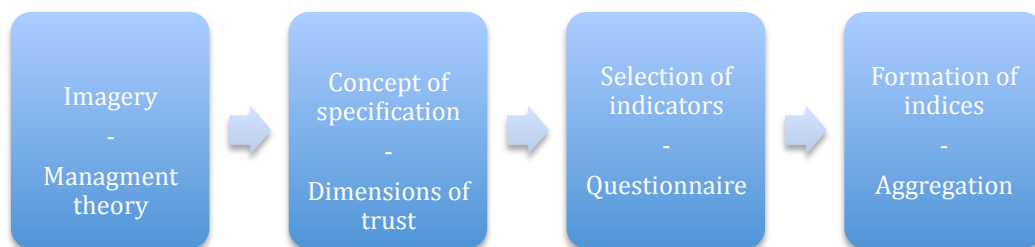


Roughly 15 statements relating to *each* of the three dimensions are asked in GPW’s survey, such as “*Management makes its expectations clear*” (Credibility), “*Management recognizes honest mistakes as part of doing business*” (Respect) and “*Promotions goes to those who best deserve them*” (Fairness).<sup>14</sup> The respondents then answer on a five-scale either almost always untrue, often untrue, sometimes untrue/sometimes true, often true, almost always true. The percentage answered on each statement then make up an average on which the degree of trust is based upon. For example, if less than 60 percent of the respondents have given a positive answer, i.e. not answered ‘often true’ or ‘almost always true’ to the statements, this signifies a weakness within that dimension. Between 60 to 80 percent is considered slightly better but not significant for high trust workplaces, while over 80 percent of positive answers to a specific question correspond with a high trust workplace. With the help of this tool, management can identify specific problem areas that have a negative impact on the degree of trust within the organization. Perhaps management does not make their expectations clear or promotions go to those who do best not deserve them. In both cases the actual degree of trust is said to be affected in a negative way.

## 4.5 Designing the questionnaire

The aim of the questionnaire is to transfer the logic behind the tool used to measure trust *within* organizations to instead measure trust *between* organizations in clusters. The operationalization of concepts like trust is difficult to pin down and requires an “*obligation to specify the meaning of particular concepts precisely and to develop sound measuring procedures which will stand for them*” (Bryman, 2004: 22). A good way of handling such a task is forwarded by Lazarsfeld (1958) through ‘the flow from concepts to empirical indices’ whereof the flow involves four stages in a certain sequence (see figure 4.2). *First*, through the help of theories regarding trust we develop an *imagery* of particular parts of the concept of trust. *Second*, we *specify* that imagery and break it down to different ‘dimensions’. In our case, the dimensions of trust are credibility, respect and fairness. *Third*, and crucial for the ability to measure the concept, we develop *indicators* for each of the three dimensions, i.e. a group of questions in the questionnaire which combined signifies a certain dimension. In the GPW’s Trust Index Survey, questions such as “*Management makes its expectations clear*” is one indicator of credibility while “*Promotions goes to those who best deserve them*” relates to fairness and so on. *Fourth*, the indicators are aggregated in what Lazarsfeld calls the *formation of indices* in either one overall index of trust or for each of the dimensions. (Bryman, 2004: 26).

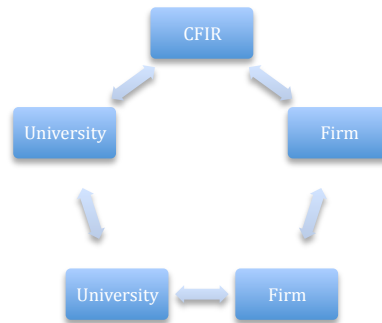
**Figure 4.2: Scheme for measuring concepts** (Bryman, 2004: 25)



The scheme presented above suggests a move from dimensions to indicators while a factor analysis approach would suggest a move from indicators to dimensions, i.e. trying to reveal the underlying dimensions through the use of indicators (Bryman, 2004: 28). However, by asking employees around the world what trust meant to them led to the formulation of the three dimensions in GPW’s Trust Model. On the basis of the critique forwarded earlier regarding single context-free questions used in the WVS and GSS to measure such a multifaceted concept as trust, each dimension of trust is in our case measured through a range of indicators. The dimensions combined consequently make up the concept. In Appendix A and B the questionnaires aimed at measuring trust within clusters are presented in both its original language (Danish) and English (Appendix A for Firms and Appendix B for Research institutes). Questions 1-28 are set to capture the dimension of Credibility, questions 29-37 Respect, and questions 38-49

Fairness. One questionnaire is set to be presented to firms within the cluster while the other is aimed at the research community. By sending out questionnaires to these two organizations, searching for indicators of either Credibility, Respect, and Fairness among them and the cluster organization (CFIR) the following five-way relationships can theoretically be measured:

**Figure 4.3: Cluster Trust Survey – a five-way relationship**



In the GPW Trust Index Survey, each statement is presented once, as it is a one-way trusting relationship that is measured, i.e. employee-management. (For copyright reasons these are not included in this thesis). In the cluster survey, the focus is on three different actors (firms, research institutes such as universities, and cluster organizations) and the relationships between them as seen in Figure 4.3 above. Consequently, each question in the GPW Trust Index Survey are now asked in three different ways, indicating the relationships between three different organizations. In the full-scale study, one or two suitable respondents from each organization will be chosen. These respondents will be selected based on their knowledge of the organization in which they work as well as involvement in cooperation with other organizations within the cluster. The respondents from each organization will be used as a proxy for how that organization cooperates and trusts other organization in the cluster. This is justified by the notion that a certain ‘culture’ exists within an organization, which in turn will affect the respondent’s degree of trust in other organizations. For example, if a culture exists within a firm that cooperation with universities or other firms are seen as risky or something to avoid, the respondent are likely to answer the questions in a negative way. The same percentage rates as in the GPW Trust Index Survey (<60%= low degree, 60-80%=some degree, >80%=high degree) will be used. The full-scale study will not be distributed to CFIR, i.e. measuring the cluster organization’s trust in other firms and research institutes within the cluster as the secretariat of CFIR comprise of 3 persons whose answers would be hard to keep confidential. Moreover, the obvious risk of portraying a high-trust relationship with the other organizations through biased answers would present weak results.

The main issue when designing the questionnaire is how to transfer a tool developed by the Great Place to Work Institute for measuring trust *within* organizations in order for it to apply also *between* organizations in a cluster environment. The overarching logic behind such a transfer is that the same

preconditions for trusting behaviour also apply in situations both within and outside the workplace, i.e. that person A will trust person B to a higher degree if he finds that person also to be credible, respectful and fair. However, there are a number of issues that have been taken into consideration designing the questionnaire.

According to Foddy (1993: 193) researcher should keep three issues in mind when constructing a questionnaire, also referred to as ‘TAP’, which is an acronym for:

- **Topic** – the topic should be clearly defined so that the respondent understands what is being talked about
- **Applicability** – respondents should not be asked to give information that they do not have
- **Perspective** – the perspective should be specified so that the respondents understand the question in the same way and give the same kind of answers

Relating to the WVS or GSS question on trust, it can be said that it is clearly lacking Perspective as the respondents probably will interpret the question in different ways, i.e. does it mean trusting a person with €5 or €100 etc. In our study, some questions in the GPW Trust Survey were only applicable within organizations and were therefore removed. This **mismatch** referred to questions such as “*This is a physically safe place to work*” corresponding with Respect within organizations but not applicably on firm-firm or firm-university relations. Hence, no party can here be seen as “management” with the power or authority to decide or affect directly the physical safety on the premises where the other party carries out its daily work. While such statements are removed in the survey deployed on clusters, the remaining statements were rephrased to fit its new context. This, in turn, leads us to another important issue, namely that of **validity**.

When dealing with complex concepts such as trust, there is always a risk that we are measuring something else than what is accurately representing the ‘truth’, i.e. are we measuring trust or something else? (Silverman, 1993: 149). In other words, whether the researcher sees what they think they see (Flick, 2009: 387). Three errors can follow from this, either the researcher see a relation that are not correct (type 1 error); reject a relation that are correct (type 2 error); or asking the wrong questions (type 3 error) (Kirk & Miller, 1986: 29-30). Consequently, “*We must realize that a poorly worded item is not necessarily one that causes respondent difficulties in answering: far more dangerous are apparently unproblematic items which, unwittingly, produce spurious negatives or positives*” (Oppenheim, 1992: 48). The issue of external validity has already been dealt with above, more interesting is this context is that of internal validity, i.e. if it is rational to believe that it exists a cause-effect relationship between the independent and dependent variable. In the trust model deployed here, trust (dependent variable) is made up of three dimensions whose indication (independent variables) determines the degree of trust among a given set of actors, i.e. the dependent variable will change with the independent variable. This can be regarded as a rational way to view trust

as someone you find credible, respectful and fair most likely are someone you would trust. The question is rather if we are measuring credibility, respect and fairness in a correct way? For example is the question “*Management makes its expectations clear*” a good indicator of credibility?

Two questions arise relating to the problem if we are measuring the three dimensions in a correct way, namely, how do we know how many and what indicators are needed to ‘capture’ each dimension? One extreme is the GSS and WVS who stop at a single question on trust. Another extreme would be hundreds of questions which in theory all related in some way to any of the dimensions. As underlined by Abramson (1987) we must justify the inclusion of every question. Furthermore, respondents do not have the time or energy to answer hundreds of questions that will lead either to a situation where they quickly answer the questions, if they answer them at all. The reliability of the questionnaire, i.e. for someone to repeat the test and assess whether the results are similar in both cases (Flick, 2009: 473), is critical when dealing with such issues. As forwarded by Cronbach (1951: 297) “*No validity coefficient and no factor analysis can be interpreted without some appropriate estimate of the magnitude of the error of measurement*”, for example by making two independent tests and compare the results. However, we can statistically measure what Cronbach calls internal consistency (reliability), which is the correlation between different indicators in our questionnaire.

Given the three dimensions, we want to make sure that all the questions (indicators) in each sub-section measures (relates to) credibility, respect or fairness at the same time as they contribute with some form of unique information. This is done by applying the statistical tool Cronbach’s alpha, which can be executed in Statistical Package for the Social Sciences (SPSS). The questionnaire will in the full-scale study be distributed with the web-based survey tool Inquisite ([www.inquisite.com](http://www.inquisite.com)) which makes it easy to transfer data to SPSS. The alpha test reveals if some of the questions (1-28) measuring credibility, for example, do not correlate with other questions in this dimension or if we have two questions that are so similar that one of them may be redundant. An alpha value of 0,6-0,9 indicates good reliability while a value over 0,95 may indicate that the question is redundant. To exemplify, question 7 (see Appendix A) “*I receive an honest and direct answer when I ask representatives from CFIR a question*” and question 10 “*Representative from CFIR are available and easy to talk with*” can theoretically both correlate with the dimension of Credibility (alpha value between 0,6-0,9) or, as the questions are quite similar, show an alpha value over 0,95, i.e. that one of the questions may be redundant. The rationale is that if a respondent answered positively on question 7 and 10 but not on question 17 “*CFIR is honest and ethical in the way they do business*” this might indicate poor internal consistency of the questionnaire as CFIR therefore would be both honest and easy to talk with at the same time as they are dishonest in the way they do business.

Most importantly however is the fact that GPW over the years has removed questions from their Trust Index Survey that statistically have not correlated with the answers to the other questions for each dimension or proved to be redundant. This is to be regarded as a strength of the tool deployed in this thesis.

#### 4.5.1 Pilot study

On the 3<sup>rd</sup> of June 2010 the suggested approach on how to measure trust within clusters was presented to Christian Michelsen, Secretary Chief of CFIR as well as Chief of Office of economic and political matters at the Danish Bankers Association (Finansrådet), lead partner of CFIR. The questionnaires (see Appendix A and B) were presented and the following questions and suggested solutions of the research tool was specifically discussed:

Problem/question	Suggested solution
<p><b>The number of respondents in each organization?</b> The rationale behind the use of only a few respondents in organization A as a proxy for organization A's trust in organization B.</p>	<p>The rationale behind using a few (2-3) respondents as representatives for the whole organization is that a local culture is believed to exist within an organization, which in turn will affect the respondent's answers. In other words, the local culture in organization A will have a profound affect on the degree of trust the respondents have in other organizations. (See Saxenian 1994 for a good example of how company culture restricts or build employees trust in other organization). The reason behind not distributing the questionnaire to everyone in the organization or to a representative selection is that it would be very costly seeing the amount of organizations that exists in many clusters.</p>
<p><b>How to choose the respondents?</b> In some large organizations such as Danske Bank, with thousand of employees and different branches and divisions, it is difficult to use one or two respondents as a proxy for how that whole organization cooperate with other organization in the cluster. This problem will be more visible in the finance sector with a few large actors compared to the IT sector where SME's are more common.</p>	<p>The respondent must first of all be someone who works in a position where cooperation/contact with other actors in the cluster are very likely. For example, the research department of a firm, a public research institute or a purchasing manager who deals directly with other actors in the cluster. The answers to the problem of large organizations, such as Danske Bank, lies in analyzing the structure of the organization and choose</p>

	<p>respondents from each separate division. As most cluster only have a few firms of such significant size this procedure is not believed to be frequent. The consequence is that it will be difficult to present a picture of those organizations as a whole but have to be divided into segments.</p>
<p><b>In what way is trust and cooperation related? Do I have to trust someone to cooperate and can I trust someone I have had no prior relations with?</b> Cooperation is based on incentives between two parties to cooperate. If person A does not see any gains from cooperation with person B, cooperation will probably not take place. This alone does not mean that the persons do not trust each other. The question is that if a low degree of trust in the questionnaire also theoretically correlates with a low degree of cooperation? Does non-cooperation mean a lack of trust or a lack of incentives to cooperate and how can we separate them from each other?</p>	<p>The idea behind clusters is that firms, while competing, also have an incentive to cooperate, which they do, as it will strengthen their own position. In this sense cooperation will be much more effective if they trust each other. A lack of cooperation in a cluster context therefore logically would mean more of a lack of trust than a lack of incentives. However, a large debate surrounds the notion if trust precedes cooperation or if it is the other way around. A key point here, as mentioned earlier, is that of reputation. Reputation allows for actors to gain knowledge about other actors without direct contact with those actors. The main issue however that was discussed is how to locate barriers to cooperation within the cluster, if cooperation does not happen naturally. Adding questions relating to judicial issues, geographical distance, lack of forums for different actors to meet, etc. could therefore be included to get a picture of other factors than lacking trust acting as a barrier to cooperation.</p>
<p><b>The problem of a low degree of cooperation in the cluster.</b> This relates to the difficulty in testing the questionnaire on CFIR as it is a newly founded cluster organization with limited experience of cooperation among many of the actors in the cluster, especially between different sectors.</p>	<p>One reason for choosing CFIR was the ability to measure trust when the cluster organization is relatively newly founded, and then send out the questionnaire again in following years to see if their work have had any effects on trust among the actors. However, a prerequisite for the questionnaire is that the organization's answering it has a good idea and understanding about other organizations in the cluster. This does not have to have come about through direct cooperation but as mentioned above through reputation. In our case IT and Finance firms have very little knowledge about each other, not making it an ideal sample for the questionnaire.</p>



<p><b>Can trust <i>between</i> organizations be measured in the same way as <i>within</i> organizations?</b> In other words, is the method developed by GPW for measuring trust within organizations applicable also between organizations?</p>	<p>The rationale is that the same logic is applicable when measuring trust both between and within organizations. In other words, If person A finds Person B to be credible, respectful and fair, person A will be more likely to trust person B despite if he is that person's manager or a person he do business with. However, some questions are left out as they do not fit its new context. The problem also relates to the notion if one can trust not only persons but also organizations. In Sydow's view (2003: 42), even though trust is inevitably tied to individual human beings, individuals can nevertheless also trust abstract social systems such as organizations. One example is the annual Edelman Trust Barometer measuring, among other, trust in large corporations, business sectors and government (Edelman, 2009).</p>
<p><b>Proper definition of the actors?</b> Some of the partners behind CFIR are research institutes and universities making it difficult for the respondents to separate if they trust the research institutions on one hand or CFIR on the other.</p>	<p>The questionnaires are to be sent out to representatives from the research community which are not directly involved with CFIR. It is the Secretariat and full-time staff of CFIR that is the aim of the questionnaire and not the partners behind the initiative. This will be specified in the full-scale study.</p>
<p><b>Is a high degree of trust viewed as positive in the Finance and IT sector?</b></p>	<p>All business sectors are different and some traditionally do not view trust in, and cooperation with, other firms as something positive. Ketels (2009) note that in some industries such as biotechnology, it is especially important while other industries rather prefers access to a specialized labour market. There are reasons to believe that the Finance sector, in opposite to the IT sector, does not view trust quite as useful in order to stay competitive. This leads to difficult question regarding if our sample is ideal for a full-scale study.</p>
<p><b>Phrasing of questions.</b> The word 'cluster' in the questionnaire may cause problems for some respondents.</p>	<p>In the introduction to the questionnaire it must be explained what is meant by the term 'cluster' and to whom it refers to in this particular case.</p>

#### 4.5.2 Lessons learned from the pilot study

From the meeting with CFIR a number of important lessons were learned regarding both the structure of the questionnaire and, more importantly, the sample on which it is executed. A summary of these questions and suggested solution discussed are presented above and represents the main lessons learned from the pilot study. Regarding the choice of questions and their formulation, Applicability – that the respondents should not be asked to give information they do not have – was one problem that became visible through the pilot study. As the relationship between cooperation and trust is of central importance, the questionnaire cannot ask those respondents without information or experience about other actors in the cluster if they do not work in such positions or have those types of responsibilities. To select the right type of respondents therefore will be a costly and time consuming procedure which have to be weighted with the expected gains from receiving a measurement on the degree of trust in the given cluster.

Related to this issue is that of how ideal the chosen cluster is for testing the research tool on. Some problems such as a lack of direct cooperation and knowledge between the Finance and IT sector, how valuable the Finance sector considers trust to be, and the awareness of the actors in the cluster regarding who actually belongs to the cluster are issues that has to be dealt with. Also the possibility to add question relating to other barriers to cooperation than an hypothetical low degree of trust such as geographic distance, lack of incentives, judicial issues etc will have to be included. Many of these questions would not have surfaced if not for the pilot study.

Consequently, one important reason behind conducting a pilot study is that the information about the problems and their possible solution is known in advance, before a full-scale study is launched. An easy solution to many of the problems occurring in this case would be to simply change to another case where the actors have more thorough knowledge about each other and so forth. However, if the aim of the cluster initiative is to create synergies between the Finance and IT sector in and around Copenhagen, a solution to such problems must be overcome. There will in other words not be a full-scale study before important issues such as to which respondents the questionnaire should be distributed to in each organization and how to add questions regarding other barriers to cooperation not relating to trust are resolved. However, CFIR, as many others portraying themselves as clusters, are rather cluster initiatives in the beginning of their cycle where the actor's awareness and cooperation with each other are limited. This in turn is related to many of the problems found in the pilot study. Some questions that might seem strange or odd when asked in this context would not when asked in other more developed clusters. The sample chosen will on this background have significant effects on how it will be received among the actors in the cluster.

## 5 Conclusion

In order to answer the question what governs competitiveness of advanced economies, this thesis has turned to the importance of innovation and clusters. EU initiatives in these areas as seen in documents from the Competitiveness Council of 4 December 2006 (Council, 2006a) and the Green Paper on Innovation (European Commission, 1995) as well as the financial support of clusters found in the Structural Funds, the 7<sup>th</sup> Framework Programme for Research and Development, and the Competitiveness and Innovation Framework Programme (CIP) reveals a strong commitment from the EU in this matter. However, the effects on national economic policymaking following from the EU's recent policy initiatives will have to be significant to be effective. In the advanced and innovation-driven economies of the EU, where the ability to sustain high wages and a high standard of living is determined by the ability of the national economy to produce new and different goods using the most sophisticated production processes, instead of competing on the basis of unskilled labour, natural resources or low wages, a shift towards policies facilitating innovation and clusters is necessary. This in turn will have an impact in the way researchers and policymakers often view political economy, as the roles of both government and its institutions in building a strong economy have, and will continue, to change. Or as Cooke et al (2000: 12) decides to phrase it: "*Globalization and innovation are two key motors of contemporary international political economy*".

According to the National Innovation System (NIS) approach all nation's firms operate in a particular national context governing their innovative capacity. Globalization and new technology has not changed this. At the regional level, the theories on clusters and Regional Innovation Systems (RIS), not disregarding the importance of a national context, put emphasis on the increased ability to learn following from the forging of trustful relations and the intense competition taking place at the local and regional level.

As the EU and its Member States starts taking a cluster approach towards competitiveness, this will necessitate a new way of thinking about national, regional and local economies involving new roles for firms, governments and other institutions for enhancing competitiveness (Porter, 2000: 15). The traditional state-centric view on competitiveness in the EU Member States becomes less relevant for two main reasons. First, the convergence of macroeconomic factors such as wage levels due to the free movement of workers, the inability to introduce trade barriers or protect national industries without violating EC law, as well as and the inability for those Member States who introduced the Euro to devalue its currency hampers many of the traditional roles of the Member States

usually discussed in the traditional economic perspective of political economy. Second, national and EU level programmes in support of clusters originate from broad policy families such as regional policy, innovation policy, science and technology policy and industrial/enterprise policy. These policy areas have all undergone changes in policy orientation away from a top-down and single sector approach towards policies in favour of co-operative, multi-actor and often place based approach (OECD, 2007: 2). The national level is still important in promoting innovation but it has to work with EU-institutions above and regional authorities below because it neither has the competence or the legitimacy to act in the old hierarchical and state-centric way (Cooke & Morgan, 1998: 217). Furthermore, cluster-based policymaking aims at grouping together firms, suppliers, related industries and institutions and thereby covering a broader spectrum of policy areas and engaging new parts of government in influencing a nation's competitiveness (Porter, 2000). Consequently, there has to be a merge not only vertically between different policy families, but also between different levels of government, i.e. local, regional, national and supranational.

The advices given in this thesis emphasizes new roles for governments at all levels in terms of facilitating innovation by moving away from merely investing in R&D towards building a framework in which different actors in the innovation process (e.g. firms, universities, government offices) can interact and learn from each other. Instead of having a regional policy aimed at the redistribution of funds from leading to lagging regions, policymakers must make efforts to bring local actors and assets together in order to build competitive regions (Davies, 2006). Science and technology policy should not merely include the financing of individual and single sector projects but to finance collaborative research involving industry enabling the commercialization of the research being performed. Industrial and enterprise policy should not, which have been common in the past, include subsidies to large national firms but aimed at the common needs of small and medium sized firms (SMEs) (Ibid).

The core argument presented in the theoretical part of the thesis is that as national competitiveness among EU Member States nowadays is a result from many factors, innovation being a crucial one, this alters many of the traditional roles of economic policymaking historically governed by state-centric policymaking with strict division between regional/national and industry and R&D policy families. Instead, a multi-level governance perspective where economic policy crosses traditional policy families and which link supranational, national, regional and local policymaking, in addition with a strong focus on growth and innovation within specialized regions instead of specific sectors and firms, is advocated. An important role for the regional and local government is to facilitate collaboration between different types of knowledge bearers, in what Cooke and Morgan (1998) calls the associational repertoire.

As innovation normally occurs from *“collaboration between different knowledge bearers who succeeds in matching their respective expertise to a new scheme*

*which is able to serve a new economic function*” (Kern, 1998: 205), formal and informal modes of interaction and exchange of information between different actors within clusters are crucial (Malmberg, Sölvell & Zander, 1996). Such interaction is facilitated when it exists a high degree of trust among the actors involved. For this reason the aim of the second part of the thesis was to develop a solid methodological tool from which policymakers and cluster practitioners could evaluate and direct concrete measures in order to increase the degree of trust within a given cluster. However, when developing a tool aimed at quantifying trust within clusters it has become clear that in addition to the theoretical debate surrounding the concept, there are important considerations to be made in terms of which sample the tool is deployed on. Some industries do not view trust and cooperation as something positive for their competitiveness. There is also the possibility that the incentives for cooperation, for whatever reason, might be lacking. This does not have to be something negative but if visible synergies can be found within or between two sectors, trust may serve as an incentive to try new perspectives and thereby increase innovation.

A point can be made that the validity of measuring concepts such as trust will always be debatable, which is evident in the critique of the World Value Survey question aimed at measuring trust. However, the question(s) asked still provide useful information, even if you decide not to call it trust. If the respondents answer positively on the questions constituting trust in the trust model deployed here, i.e. credibility, fairness and respect of other actors, it will regardless be good information to possess. In other words, even though one disagrees with the notion that the three dimensions of trust used in this thesis and by the Great Place to Work Institute does not corresponds with their idea of trust, it will still tell you something about the environment in which the respondents operate. In a low-trust environment, or in an environment where the respondent considers other as not being honest, does not inform oneself about important decisions, do not deliver on its promises, has poor business ethics etc. as asked in the questionnaire, the sharing of information will be kept at a minimum resulting in lower pay-offs in the form of lower innovative output for all actors involved.

This thesis does not make any claims that it has found the ideal or one and only way to measure trust between organizations in cluster. Neither the Trust Model aimed at measuring trust within organization used as a great source of inspiration in this thesis make such claims. Still, a first step has been made in develop a tool that captures the ‘culture’ and probability of cooperation within a cluster. If one then decides to call it trust will be strictly up to them.

## 5.1 Future research

Two different streams of future research are suggested in connection with the result in this thesis. First, Cooke et al (2000: 97) address an important issue when it comes to innovation policies originating from both EU and the national and regional level, i.e. the multi-level governance perspective on innovation. However, EU Member States and regions that receive support from the Structural Funds may have different priorities and needs than a “standard” EU innovation structure. A tension could thereby develop between an “Europeanization” dimension and a national or regional dimension in terms of innovation policies. Do all regions within the EU have similar innovation systems or does the difference in structure make it difficult for the EU to launch unified innovation policies across the whole Union? In other words, is there a tension between the way the EU, most notably the European Commission, and its Member States and regions consider the most suitable way in which to strengthen its innovative output?

A second stream of future research concerns the way trust in clusters is to be measured. The pilot-study has certainly erased some of the problems this endeavor will stumble upon in the future when a full-scale study is conducted. Nonetheless, important insights and experiences will follow from a full-scale study and new problems will arise that has not been thought of in this thesis. The development of a tool measuring trust in clusters will be a lengthy task, whereof this thesis represents the first steps in the process. More time, more trials and more input from people in the field will guide us in the right direction. In other words, what additional lessons are to be learned when designing a tool measuring trust within clusters?

## 6 Executive summary

This thesis tackles the question of why geographic location in advanced economies seems to matter significantly for economic growth, in a time where globalization and new technology has removed many traditional barriers to the flow of information, international trade and collaboration? One plausible answer given is that globalization has exposed regions to intense competition where the most competitive ones have experienced rapid growth while others have grown weaker. Consequently, a region must stay competitive in order to compete on the global market. This naturally applies also to the EU and regions situated between the local and national level. Why are firms in Latin America, for example, 50 times less likely to patent new-to-the-world technology than western European ones (Porter & Stern, 2001: 33)? Why is Silicon Valley world-leading when it comes to developing micro processors and not any other region? Following from this, a crucial question for economists and policymakers is why some firms, and not others, based in particular nations achieve international success in distinct segments and industries (Porter, 1990: 18)?

This thesis puts emphasis on innovation when trying to answer this question by presenting the ideas behind the theories concerning clusters, national and regional innovation systems, and the significance played by trust in the innovation process. The national innovation system approach (NIS) points to national elements of R&D (public and private), education institutions (e.g. universities), financial system, public infrastructure, fiscal and monetary policies, and social capital as playing a major role in influencing a nation's innovative performance (Lundvall, 1988; Nelson, 1993; Isaksen, 2003). The interaction among different national actors such as firms – users and producers, universities and government agencies occurs within a specific national context where interactive learning among these actors is critical for the innovative output.

The regional innovations system (RIS) approach in turn believes that these exchanges of knowledge are facilitated when actors operate in spatial proximity (Cooke et al, 2000). At the regional level, much more so than in a national or international context, the flow of tacit, i.e. implicit, knowledge and social capital are frequently nurtured due to continuing face-to-face contacts, interaction and exchange of information (Maskell & Malmberg, 1999a). However, RIS, more so than NIS, acknowledge that despite globalization, polarization of innovative activities in specific geographical areas is persistent (Pilon & DeBresson, 2003). Social capital, in contrast to physical and financial capital and to some extent human capital, is not as mobile but is overwhelmingly local. Furthermore, a main

factor determining to what degree the sharing of knowledge and learning takes place is trust.

However, a nation's competitive industries are seldom evenly developed across the whole economy but tend to be geographically concentrated in clusters, i.e. *“geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate”* (Porter, 1990: 148; Porter, 1998). While the overall macroeconomic, legal, social and political context of a nation is important, the cluster approach believes that it is not enough in determining national competitiveness (Ketels & Sölvell, 2006). The answer lies also, according to Porter, in the drivers that determine value creation and innovation at the *company level*. The reason behind why clusters form is, among others, that companies operating on globalized markets have an array of choices regarding where to locate their activities. Consequently, companies choose the location that offers the best business environment for their specific needs. In other words, *“the more markets globalize, the more likely resources will flow to the more attractive regions, reinforcing the role of clusters and driving regional specialization”* (Ketels et al, 2008: 5).

A key point in this thesis is that as a large majority of the EU Member States is in the innovation-driven stage of development, i.e. where the ability to sustain high wages and a high standard of living is determined by the ability of national economy to produce new and different goods using the most sophisticated production processes, instead of competing on the basis of unskilled labour, natural resources or low wages, a shift towards policies facilitating innovation and clusters is highly relevant (World Economic Forum, 2009: 12). The EU institutions, most notably the European Commission, has on this background launched a series of initiatives aimed at strengthening the knowledge base in Europe on this emerging policy field (e.g. the European Cluster Observatory) and supporting cluster cooperation throughout Europe (e.g. the European Cluster Alliance). The Structural Funds, the 7<sup>th</sup> Framework Programme for Research and Development, and the Competitiveness and Innovation Framework Programme (CIP) are examples of three funding mechanisms that all includes a number of activities in support of clusters. The strategic importance of clusters for European innovation and global competitiveness is in other words only now becoming fully recognized. Still, in 2008 almost all Member States had at least one cluster programme in place, either at the national or regional level (Sölvell, 2009). The important question that follows, and which the theoretical part of this thesis address, is what consequences on policymaking it will have when the EU starts taking a innovation and clusters view in strengthening its competitiveness?

According to the European Union (EU) innovation is the driver that will shape the European vision of growth and prosperity and reach the goals set forth in the Lisbon Strategy. In this process, the regional level and so also clusters will play a decisive role and act as a catalyst for greater innovation that will improve the



Union's international competitiveness (European Commission, 1995; 2008a). Consequently, a stronger focus on the regional level when it comes to implementing industry, technology, and science policies is advocated. According to Storper and Scott (1995: 524) "*the regionalization of industry policy is necessary to competitiveness in the contemporary world economy*". Furthermore, both theories on clusters and RIS presented in the thesis advocates a shift towards a more decentralized industrial policy as it is at the regional level where the most effective sharing of knowledge and learning activities takes place (Cooke & Morgan, 1998: 213). According to Porter (1990: 158) it is the combination of national and intensely local conditions that foster competitive advantage, whereof national policies will be inadequate in and of themselves for industry success while local governments have to continue to play a prominent role. Hence, regional competitive efforts have to take a broader agenda and consider the institutional capital and trust between public and private partners as an asset (Ketels, 2009).

One crucial effect on policymaking following from viewing trust and cooperation as a prerequisite for learning and consequently innovation is to start forming a regional industrial strategy which supports the formation and elaboration of local networks (Saxenian, 1994: 167). Cooke and Morgan (1998) calls this the associational repertoire underlining the importance of social capital and trustful relationships within the economic sphere which in turn is fostered by empowering intermediate associations that exists between state and market such as trade associations, labour unions, chambers of commerce or even groups of firms (Cooke & Morgan, 1998: 22). The way in which local governments can promote such networks are to invest in basic research and improve links between local firms (mainly SMEs) and knowledge infrastructures (Asheim & Cooke, 1999). In other words, an important role for public agencies is to help firms to learn how to learn by providing encouragement for cooperation (Cooke et al, 2000: 16).

At the same time, the idea presented is that "*clusters represent a new way of thinking about national, state, and local economies, and they necessitate new roles for companies, government, and other institutions in enhancing competitiveness*" (Porter, 2000: 15). Cluster policies are about restructuring traditional policies such as science-, innovation-, industry-, and regional policy (Sölvell, 2009: 128). Government instruments such as subsidies aimed at broad sectors, industry level or even individual firms risks being either too broad, distorting markets or limiting competition. A cluster-based focus, on the other hand, aim government investments towards the whole business environment as such, grouping together firms, suppliers, related industries, service providers, and institutions that benefits a broad range of firms without threatening competition (Porter, 2000). This thesis underlines that a cluster-oriented way of thinking thereby will cover a broader spectrum of policy areas that appear far from the common perception of economic policy, and in turn will engage new parts of government in influencing a nation's competitiveness.

The focus of economic policy has traditionally been at the national level, where many aspects of general business such as setting interest rates, creating private property rights, setting tax rates etc. are best dealt with. However, taking a cluster approach in policymaking underlines the importance of government at all levels, most notably the local level, working together in strengthening the clusters and hence the competitiveness of the region and nation as such (Porter, 2000). Policies originating from EU-level aimed at strengthening the Union's clusters are to be implemented at national, regional and local level not in isolation from each other at separated levels, but in an intertwined and cooperative way where each level has an important act to play. All relevant bodies at all levels (EU, national, regional and local) must therefore cooperate.

In order to explain the roles played by each level, the theory of Multi-Level Governance (MLG) is presented and discussed. National and EU level programmes in support of clusters originate from broad policy families such as regional policy, innovation policy, science and technology policy and industrial/enterprise policy. These policy areas have all undergone changes in policy orientation away from a top-down and single sector approach towards policies in favour of co-operative, multi-actor and often place based approach (OECD, 2007: 2). The national level is still important in promoting innovation but it has to work with EU-institutions above and regional authorities below because it neither has the competence or the legitimacy to act in the old hierarchical and state-centric way (Cooke & Morgan, 1998: 217). The fusion of the Structural Funds (e.g. the European Regional Development Fund) and the Framework Programme for Research and Technological Development as well as the emphasis put on the implementation of EU's innovation policies at the regional level in the Green Paper on Innovation (European Commission, 1995) clearly build on the notion forwarded by MLG theory that "*governance across multiple jurisdictions is both more efficient than, and normally superior to, central state monopoly [as well as] governance must operate at multiple scales in order to capture variations in the territorial reach of policy externalities*" (Hooghe & Marks, 2004: 15).

The core argument presented in the theoretical part of the thesis is that as national competitiveness among EU Member States nowadays is a result from many factors, innovation being a crucial one, this alters many of the traditional roles of economic policymaking historically governed by state-centric policymaking with strict division between regional/national and industry and R&D policy families. Instead, a multi-level governance perspective where economic policy crosses traditional policy families and which link supranational, national, regional and local policymaking, in addition with a strong focus on growth and innovation within specialized regions instead of specific sectors and firms, is advocated. The main argument is that taking an innovation and cluster approach towards EU competitiveness will have considerable implications on traditional national economic policymaking for it to function well.

The second part of the thesis builds on the ideas regarding the role played by trust in the innovation process and its importance for national and regional competitiveness by developing a tool in form of a questionnaire aimed at measuring trust within clusters. As Sabel (1993: 1168) argues “*liberal pessimism about the possibility of creating trust is theoretically untenable, and that the actors’ echo of it can be reconciled with the alternative view that trust is a constitutive – hence in principle extensible – feature of social life*”. If trust indeed can be created, there is a strong need for policymakers at EU, national and regional level to evaluate if initiatives aimed at creating dynamic clusters where knowledge is shared and learning occurs, are hampered by a low degree of trust. A common methodology used to measure trust *within* organizations acted as a great source of inspiration when designing a tool that measures trust *between* organizations. For this purpose, the Trust Model developed by the Great Place to Work Institute (GPW), and used in the Trust Index Survey, the first and most widely-used tool to measure trust in the workplace which annually gathers data from over 1.2 million employees belonging to over 3,800 organizations in 40 countries worldwide, acts as a great source of inspiration.

In the Trust Model the three dimensions of Credibility, Respect and Fairness constitutes trust. According to this model, person A will trust person B to a higher degree if he finds that person also to be credible, respectful and fair. However, designing a research tool aimed at measuring such a heavily debated and multifaceted concept as trust is a difficult task. For this reason, a pilot study was conducted in order to learn how to design the questionnaire, choosing the proper sample, estimate time and costs, and how to analyze the results before deploying it in a full-scale study. The pilot study was launched in cooperation with the cluster initiative Copenhagen Finance and IT Region (CFIR). The main findings of the pilot study concerned the complex relationship between cooperation and trust and deciding how they influence each other. Furthermore, the cluster in which to launch the full-scale study would be made easier if there already was an awareness of other actors in the cluster among the respondents, knowledge about the scope of the cluster as well as an understanding that a higher degree of trust and cooperation would be beneficial to their particular industry.

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## 8 Endnotes

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<sup>1</sup> The research on clusters has been preoccupied with debating the correct definition of the term “cluster”. Some critics, such as Martin and Sunley (2003), lists 10 different ways of defining clusters from the literature and argues that the vagueness of the definition is problematic, thus making the concept an unsuitable source of policy advice. A common element of most cluster definitions, however, is “*the aspect of a concentration of one or more sectors within a given region as well as the emphasis on networking and cooperation between companies and institutions*” (Commission, 2008b). Given the wide range of purposes and contexts in which the concept of clusters are being used and applied, this disagreement of the concept is expected (Robinson, 2002). However, if research on clusters is to be more relevant to policymakers, scholars have to realise that it is not a precisely defined term and move beyond such discussions (Cortright, 2006). Furthermore, practitioner’s that wants to enhance a regions economic development cannot wait for such theoretical disputes to be resolved (Ketels, 2003).

<sup>2</sup> There are also national paradoxes, for example in Sweden where a relatively large input in terms of R&D and scientific publications but with a less impressive output in the form of product innovations brought to the market See e.g. Edquist, C. and McKelvey, M. (1998) ”High R&D Intensity Without High Tech Products: A Swedish Paradox?”, in Nielsen K., and Johnson, B. (eds.) *Institutions and Economic Change: New Perspectives on Markets, Firms and Technology*, Cheltenham: Edward Elgar Publishing.

<sup>3</sup> There are many examples of such scenarios in Europe. One is the World Wide Web, “www”, which was originally created by people at CERN, Switzerland. However as CERN operated in total isolation i.e. the cluster was missing, and the commercialization and job creation was created in clusters elsewhere, most particular in Silicon Valley (Example presented in Sölvell, 2009: 128).

<sup>4</sup> The most appropriate unit of analysis to study RIS, however, is under debate ranging from cities, metropolitan regions to “the local” referring to districts within cities or metropolitan areas (See Porter, 1990; Saxenian, 1994; Asheim & Isaksen, 1997) causing major problems in “*developing a unified conceptual framework towards a construct of ‘the region’ as a theoretical object of study*” (Doloreux & Parto, 2004:12). This in combination with the fact that RIS are not sufficient by themselves to stay competitive in a globalizing economy meaning that firms must also have access to national and supra-national innovation systems create confusion about the correct territorial boundaries (ibid; Asheim & Gertler, 2004).

<sup>5</sup> Power and Lundmark (2004), even though not rejecting the importance of informal contacts as one potential source of knowledge spillover, assumes that knowledge and innovation most commonly develop through interaction at the workplace itself. It is through labour mobility that intra-cluster exchanges of experiences, tacit knowledge and innovation occur. Clusters at the same time exhibits higher rates of interfirm mobility than the rest of the labour market. Others, (Zellner, 2005) point more specifically to the mobility of scientists in creating a direct link between basic research organizations and firms. Such findings strengthen the notion that firms in clusters are more innovative than firms operating in isolation as the ‘distance’ you have to travel to obtain new and external ideas through face-to-face contacts, find highly qualified labour and perceive new buyer trends faster while facing constant pressure from nearby competitors are magnified despite the technological impact of globalization (Sölvell, 2009; Porter, 2000; Ketels, 2003; Wolfe, 2008; European Commission, 2008b).

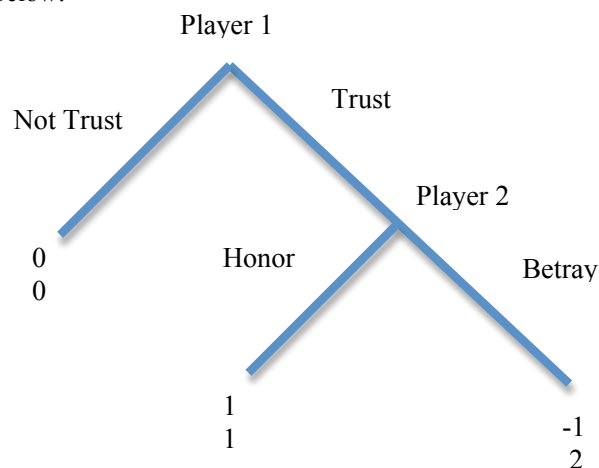
<sup>6</sup> A study conducted by Porter (2003) on US clusters revealed a similar correlation between cluster strength and the region’s patenting levels

<sup>7</sup> Prescott and Louis’ (2010) study surveyed more than 200 scientists in 63 different pharmaceutical companies and found that potential knowledge sharing was highly affected by the knowledge seeker’s reputation. The duration of the two parties’ past interaction was positively related to the likelihood of current knowledge sharing between them while proximity influenced how positively the reputations were perceived.

<sup>8</sup> The economic historian Timothy Guinnane (2005) makes an interesting point on this issue when he relates Putnam's (2000) notion that the United States since the 1950's gradually has become a low-trust environment with little social capital, when it during the same period experienced an overall success of its economy, also relatively those of other nations. Knack and Keefer's (1997) study on the relationship between social capital and economic growth are in this aspect also interesting. In their research they found no positive correlation between organizational activity, as underlined by Putnam, and economic performance. However, when looking at trust they did find a positive relationship between trust, as measured by the World Value Survey, and economic growth.

<sup>9</sup> However, cooperation with actors that we do not have ongoing relationships with, i.e. weak ties, may also consist a fruitful source of useful knowledge as they reasonably possess different types of knowledge and ideas compared with the actors we usually interact with and who share similar kinds of knowledge (Levin & Cross, 2004). This is also facilitated by spatial proximity as interpersonal trust in business relations requires long periods of experience and is seldom offered spontaneously. Actors gain knowledge about each other either through direct contact, where the process of building trust occurs gradually, or indirectly through channels of reputation from reliable third parties (Lane, 1998).

<sup>10</sup> Although Bachmann (2003: 60) rejects Game Theory as a simplified theory unable to grasp the socio-economic world, one example that helps understanding the logic behind repeated interaction and trust is the theoretical trust game originally put forward by David Kreps (1990; in Gibbons, 2001: 335), where one actor (player 1) is to decide whether to share a business idea with another actor (player 2). The situation can be illustrated as in the figure below:



(Source: Gibbons, 2001: 335)

If player 1 chooses to trust player 2, player 2 can choose either to honor or betray player 1's trust. If player 1 chooses not to trust player 2, the game ends, hence player 1 terminates the relationship. At the end of each branch of the game tree player 1's payoff appears above player 2's. If player 1 decides not to trust player 2, both receive zero payoff. If player 1 chooses to trust player 2, the outcome is either 1 for both players if player 2 honors player 1's trust or -1 for player 1 and 2 for player 2 if he betrays player 1's trust. Rationally, in a non-trust environment, player 1 will end the relationship already before trusting player 2 as the payoff for not trusting is 0, which exceeds -1 if he is betrayed. In terms of innovation, a situation as the one described above can hardly be said to foster any transfers of knowledge and the matching of the two players respective expertise. Within clusters, however, this type of negative outcome is believed to be less likely for several reasons. The proximity of firms and institutions enables continuing face-to-face contacts and a culture of trust within the cluster that decreases the likelihood of one actor betraying another. Furthermore, for the same reason, one-shot interactions as the one exemplified above are not likely to occur within a cluster due to 'repeated games', i.e. that player 1 and player 2 most likely will meet again. In such settings, the analysis of the trust game differs dramatically as the actions of player 2 affects the expectation player 1 will have on him tomorrow. In other words, player 2 must weigh the short-term payoffs with total payoffs over time. In the repeated game, if player 2 chooses to betray player 1, player 1 will choose not-trust forever after, hence producing a payoff of zero for player 2 in each subsequent period (Gibbons, 2001: 335).

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<sup>11</sup> Social capital, however, at least according to Fukuyama (1999) cannot be so easily created or shaped by public policy but are strongly governed by historical events and religion.

<sup>12</sup> The 14 partners are Aarhus School of Business, Copenhagen Business School, Copenhagen Capacity, DI/ITEK, DJÖF, Dansk Metal, Finansforbundet, Finansrådet, HK Privat, IT-Branschen, IT-Universitetet, Köpenhamns Universitet, Prosa, Öresund IT. For a more detailed description of the partners and CFIR in general, see [www.cfir.dk](http://www.cfir.dk)

<sup>13</sup> The Great Place to Work Institute currently has 17 national initiatives in Europe. Great Place to Work® Institute provides Trust Assessments and produces Best Companies to Work For lists in over 40 countries around the world, surveying over 1.5 million employees annually and working with thousands of companies to transform their workplace cultures.

<sup>14</sup> For Copyright reasons only a sample of the Trust Survey is presented here.



# 9 Appendix A

## Cluster Trust Survey 2010 – Firms (Danish/English)

- PLEASE INDICATE YOUR ANSWER USING A CROSS MARK.
- IF YOU MARK INCORRECTLY, FILL IN THE WHOLE BOX AND RE-MARK CORRECTLY.
- YOU MAY USE EITHER A BLACK PENCIL OR PEN.



For every statement, fill in one answer that most accurately reflects your opinion. If you feel you cannot answer a question or if you have no prior experience of cooperating in any way with the actor in question, please leave it blank.

Please use the following answer code:

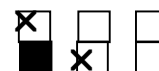
- 1 = Almost always untrue
- 2 = Often untrue
- 3 = Sometimes untrue/sometimes true
- 4 = Often true
- 5 = Almost always true

Statement	1	2	3	4	5
1. CFIR informerer mig altid om vigtige emner og ændringer, der vedkommer min firma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Andre firmaer indenfor klyngen informerer mig altid om vigtige emner og ændringer, der vedkommer min firma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Repræsentanter fra forskningsinstitutioner indenfor klyngen (eksempelvis universiteter) informerer mig altid om vigtige emner og ændringer, der vedkommer min firma	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. CFIR udtrykker sine forventninger og mål med klyngen åbent og tydeligt					
5. Når min firma samarbejder med andre firmaer indenfor klyngen, udtrykker de sine forventninger og mål med samarbejdet åbent og tydeligt					
6. Når min firma samarbejder med forskningsinstitutioner indenfor klyngen, udtrykker de sine forventninger og mål med samarbejdet åbent og tydeligt					
7. Jeg får et ærligt og direkte svar, når jeg stiller repræsentanter fra CFIR et spørgsmål					
8. Jeg får et ærligt og direkte svar, når jeg stiller repræsentanter fra andre firmaer indenfor klyngen et spørgsmål					
9. Jeg får et ærligt og direkte svar, når jeg stiller repræsentanter fra forskningsinstitutioner indenfor klyngen et spørgsmål					
10. Repræsentanter fra CFIR er tilgængelige og lette at tale med					
11. Repræsentanter fra andre firmaer indenfor klyngen er tilgængelige og lette at tale med					
12. Repræsentanter fra forskningsinstitutioner indenfor klyngen er tilgængelige og lette at tale med					
13. CFIR er kompetent til at lede klyngeorganisationen					
14. Andre firmaer indenfor klyngen er kompetente indenfor deres forretningsområde					
15. Forskningsinstitutionerne indenfor klyngen er kompetente indenfor deres forretningsområde					
16. CFIR er god til at stille opgaver og koordinere ressourcer mellem aktørerne indenfor klyngen					
17. CFIR er ærlig og etisk korrekt i sin forretningsmåde					
18. Andre firmaer indenfor klyngen er ærlige og etisk korrekte i deres forretningsmåde					
19. Forskningsinstitutionerne er ærlige og etisk korrekte i deres forretningsmåde					



20. CFIRs handlinger stemmer overens med deres ord.				
21. Andre firmaer indenfor klyngens handlinger stemmer overens med deres ord.				
22. Forskningsinstitutioner indenfor klyngens handlinger stemmer overens med deres ord				
23. CFIR har klare strategier for, hvor klyngen skal hen, og hvordan den kommer derhen				
24. Andre firmaer vi samarbejder med indenfor klyngen, har klare strategier for, hvad samarbejdet skal resultere i, og hvordan vi kommer derhen				
25. Forskningsinstitutionerne vi samarbejder med indenfor klyngen har klare strategier for, hvad samarbejdet skal resultere i, og hvordan vi kommer derhen				
26. Repræsentanter fra CFIR holder, hvad de lover.				
27. Repræsentanter fra andre firmaer indenfor klyngen holder, hvad de lover.				
28. Repræsentanter fra forskningsinstitutionerne indenfor klyngen holder, hvad de lover				
29. CFIR søger og svarer oprigtigt på forslag og idéer				
30. Andre firmaer indenfor klyngen søger og svarer oprigtigt på forslag og idéer				
31. Forskningsinstitutioner indenfor klyngen søger og svarer oprigtigt på forslag og idéer				
32. Repræsentanter fra CFIR påskønner et godt stykke arbejde				
33. Repræsentanter fra andre firmaer indenfor klyngen påskønner et godt stykke arbejde				
34. Repræsentanter fra forskningsinstitutioner indenfor klyngen påskønner et godt stykke arbejde				
35. Repræsentanter fra CFIR viser en oprigtig interesse for mig som person og ikke bare som ansat i firmaet der jeg arbejder				
36. Repræsentanter fra andre firmaer indenfor klyngen viser en oprigtig interesse for mig som person og ikke bare som ansat i firmaet der jeg arbejder				
37. Repræsentanter fra forskningsinstitutioner indenfor klyngen viser en oprigtig interesse for mig som person og ikke bare som ansat i firmaet der jeg arbejder				
38. CFIR undgår at gå bag om ryggen for at få tingene gjort				
39. Andre firmaer indenfor klyngen undgår at gå bag om ryggen for at få tingene gjort				
40. Forskningsinstitutioner indenfor klyngen undgår at gå bag om ryggen for at få tingene gjort				
41. Mit firma bliver behandlet som et fuldgyldigt medlem af klyngen af CFIR				
42. Mit firma bliver behandlet som et fuldgyldigt medlem af klyngen af andre firmaer indenfor klyngen				
43. Mit firma bliver behandlet som et fuldgyldigt medlem af klyngen af repræsentanter fra forskningsinstitutionerne indenfor klyngen				
44. Alle aktører bliver behandlet retfærdigt af repræsentanter fra CFIR, uanset alder, etnisk oprindelse eller køn				
45. Alle aktører bliver behandlet retfærdigt af repræsentanter fra andre firmaer indenfor klyngen, uanset alder, etnisk oprindelse eller køn				
46. Alle aktører bliver behandlet retfærdigt af repræsentanter fra forskningsinstitutioner indenfor klyngen, uanset alder, etnisk oprindelse eller køn				
47. Alt taget i betragtning mener jeg, at samarbejdet med CFIR går rigtigt godt				
48. Alt taget i betragtning mener jeg, at samarbejdet med andre firmaer indenfor klyngen går rigtigt godt				
49. Alt taget i betragtning mener jeg, at samarbejdet med forskningsinstitutioner indenfor klyngen går rigtigt godt				

- PLEASE INDICATE YOUR ANSWER USING A CROSS MARK.
- IF YOU MARK INCORRECTLY, FILL IN THE WHOLE BOX AND RE-MARK CORRECTLY.
- YOU MAY USE EITHER A BLACK PENCIL OR PEN.



**For every statement, fill in one answer that most accurately reflects your opinion. If you feel you cannot answer a question or if you have no prior experience of cooperating in any way with the actor in question, please leave it blank.**

**Please use the following answer code:**

- 1 = Almost always untrue
- 2 = Often untrue
- 3 = Sometimes untrue/sometimes true
- 4 = Often true
- 5 = Almost always true

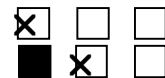
Statement	1	2	3	4	5
1. CFIR keeps me informed about important issues and changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Other firms in the cluster keeps me informed about important issues and changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Research institutes in the cluster (e.g. universities) keeps me informed about important issues and changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The cluster organization makes its expectations and goals for the cluster clear					
5. When my firm is cooperating with other firms within the cluster, they always make their expectations and goals with the cooperation clear					
6. When my firm is cooperating with research institutes within the cluster, they always make their expectations and goals with the cooperation clear					
7. I can ask representatives from CFIR any reasonable question and get a straight answer					
8. I can ask representatives from other firms in the cluster any reasonable question and get a straight answer					
9. I can ask representatives from research institutes in the cluster any reasonable question and get a straight answer					
10. CFIR is approachable, easy to talk with					
11. Representatives from other firms in the cluster are approachable, easy to talk with					
12. Representatives from research institutes in the cluster is approachable, easy to talk with					
13. CFIR is competent at managing the organization					
14. Other firms in the cluster are competent within their business area					
15. Research institutes in the cluster are competent within their fields					
16. CFIR does a god job of assigning and coordinating resources among the actors within the cluster					
17. CFIR is honest and ethical in its business practices					
18. Other firms in the cluster are honest and ethical in their business practices					
19. The research institutes are honest and ethical when dealing with other actors in the cluster					
20. CFIR's actions match its words					
21. Other firm's actions in the cluster match their words					
22. The research institute's actions match its words					
23. CFIR has a clear view of where the cluster is going and how to get there					
24. When our firm cooperates with other firms in the cluster they have a clear view of where the cooperation is going and how to get there					
25. When out firm cooperates with research institutes in the cluster they have a clear view of where the cooperation is going and how to get there					
26. CFIR delivers on its promises					
27. Other firms in the cluster delivers on its promises					
28. The research institutes in the cluster delivers on its promises					
29. CFIR genuinely seeks and responds to suggestions and ideas					
30. Other firms in the cluster genuinely seeks and responds to suggestions and ideas					
31. The research institutes in the cluster genuinely seeks and responds to suggestions and ideas					

32. Representatives from CFIR shows appreciation for good work				
33. Representatives from other firms in the cluster shows appreciation for good work				
34. Representatives from the research institutes in the cluster shows appreciation for good work				
35. CFIR shows a sincere interest in me as a person and not just as an employee in the firm where I work				
36. Representatives from other firms in the cluster shows a sincere interest in me as a person and not just as an employee in the firm where I work				
37. Representatives from the research institutes in the cluster shows a sincere interest in me as a person and not just as an employee in the firm where I work				
38. CFIR avoid politics and backstabbing as ways to get things done				
39. Other firms in the cluster avoid politics and backstabbing as ways to get things done				
40. The research institutes in the cluster avoid politics and backstabbing as ways to get things done				
41. My firm is treated as a full member of the cluster by CFIR				
42. My firm is treated as a full member of the cluster by other firms in the cluster				
43. My firm is treated as a full member of the cluster by the research institutes in the cluster				
44. All actors in the cluster are treated fairly by CFIR regardless of their age, ethnicity or sex				
45. All actors in the cluster are treated fairly by representatives from other firms in the cluster regardless of their age, ethnicity or sex				
46. All actors in the cluster are treated fairly by representatives from the research institutes in the cluster regardless of their age, ethnicity or sex				
47. All taken into consideration I believe that the cooperation with CFIR works well				
48. All taken into consideration I believe that the cooperation with other firms in the cluster works well				
49. All taken into consideration I believe that the cooperation with the research institutes in the cluster works well				

# 10 Appendix B

## Cluster Trust Survey 2010 – Research institutes (Danish/English)

- PLEASE INDICATE YOUR ANSWER USING A CROSS MARK.
- IF YOU MARK INCORRECTLY, FILL IN THE WHOLE BOX AND RE-MARK CORRECTLY.
- YOU MAY USE EITHER A BLACK PENCIL OR PEN.



For every statement, fill in one answer that most accurately reflects your opinion. If you feel you cannot answer a question or if you have no prior experience of cooperating in any way with the actor in question, please leave it blank.

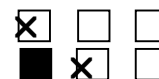
Please use the following answer code:

- 1 = Almost always untrue
- 2 = Often untrue
- 3 = Sometimes untrue/sometimes true
- 4 = Often true
- 5 = Almost always true

Statement	1	2	3	4	5
1. CFIR informerer mig altid om vigtige emner og ændringer, der vedkommer mit forskningsområde	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Firmaer indenfor klyngen informerer mig altid om vigtige emner og ændringer, der vedkommer mit forskningsområde	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Repræsentanter fra andre forskningsinstitutioner indenfor klyngen informerer mig altid om vigtige emner og ændringer, der vedkommer mit forskningsområde	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. CFIR udtrykker sine forventninger og mål med klyngen åbent og tydeligt					
5. Når jeg samarbejder med firmaer indenfor klyngen, udtrykker de sine forventninger og mål med samarbejdet åbent og tydeligt					
6. Når jeg samarbejder med andre forskningsinstitutioner indenfor klyngen, udtrykker de sine forventninger og mål med samarbejdet åbent og tydeligt					
7. Jeg får et ærligt og direkte svar, når jeg stiller repræsentanter fra CFIR et spørgsmål					
8. Jeg får et ærligt og direkte svar, når jeg stiller repræsentanter fra firmaer indenfor klyngen et spørgsmål					
9. Jeg får et ærligt og direkte svar, når jeg stiller repræsentanter fra andre forskningsinstitutioner indenfor klyngen et spørgsmål					
10. Repræsentanter fra CFIR er tilgængelige og lette at tale med					
11. Repræsentanter fra firmaer indenfor klyngen er tilgængelige og lette at tale med					
12. Repræsentanter fra andre forskningsinstitutioner indenfor klyngen er tilgængelige og lette at tale med					
13. CFIR er kompetent til at lede klyngeorganisationen					
14. Firmaer indenfor klyngen er kompetente indenfor deres forretningsområde					
15. Andre forskningsinstitutioner indenfor klyngen er kompetente indenfor deres forskningsområde					
16. CFIR er god til at stille opgaver og koordinere ressourcer mellem aktørerne indenfor klyngen					

17. CFIR er ærlig og etisk korrekt i sin forretningsmåde				
18. Firmaer indenfor klyngen er ærlige og etisk korrekte i deres forretningsmåde				
19. Andre forskningsinstitutioner indenfor klyngen er ærlige og etisk korrekte i deres forretningsmåde				
20. CFIRs handlinger stemmer overens med deres ord				
21. Firmaer indenfor klyngens handlinger stemmer overens med deres ord				
22. Andre forskningsinstitutioner indenfor klyngens handlinger stemmer overens med deres ord				
23. CFIR har klare strategier for, hvor klyngen skal hen, og hvordan den kommer derhen				
24. Firmaer vi samarbejder med indenfor klyngen, har klare strategier for, hvad samarbejdet skal resultere i, og hvordan vi kommer derhen				
25. Andre forskningsinstitutioner vi samarbejder med indenfor klyngen har klare strategier for, hvad samarbejdet skal resultere i, og hvordan vi kommer derhen				
26. Repræsentanter fra CFIR holder, hvad de lover				
27. Repræsentanter fra firmaer indenfor klyngen holder, hvad de lover				
28. Repræsentanter fra andre forskningsinstitutioner indenfor klyngen holder, hvad de lover				
29. CFIR søger og svarer oprigtigt på forslag og idéer				
30. Firmaer indenfor klyngen søger og svarer oprigtigt på forslag og idéer				
31. Andre forskningsinstitutioner indenfor klyngen søger og svarer oprigtigt på forslag og idéer				
32. Repræsentanter fra CFIR påskønner et godt stykke arbejde				
33. Repræsentanter fra firmaer indenfor klyngen påskønner et godt stykke arbejde				
34. Repræsentanter fra andre forskningsinstitutioner indenfor klyngen påskønner et godt stykke arbejde				
35. Repræsentanter fra CFIR viser en oprigtig interesse for mig som person og ikke bare som forskare				
36. Repræsentanter fra firmaer indenfor klyngen viser en oprigtig interesse for mig som person og ikke bare som forskare				
37. Repræsentanter fra andre forskningsinstitutioner indenfor klyngen viser en oprigtig interesse for mig som person og ikke bare som forskare				
38. CFIR undgår at gå bag om ryggen for at få tingene gjort				
39. Firmaer indenfor klyngen undgår at gå bag om ryggen for at få tingene gjort				
40. Andre forskningsinstitutioner indenfor klyngen undgår at gå bag om ryggen for at få tingene gjort				
41. Min arbejdsplads bliver behandlet som et fuldgyldigt medlem af klyngen af CFIR				
42. Min arbejdsplads bliver behandlet som et fuldgyldigt medlem af klyngen af firmaer indenfor klyngen				
43. Min arbejdsplads bliver behandlet som et fuldgyldigt medlem af klyngen af andre forskningsinstitutioner indenfor klyngen				
44. Alle aktører bliver behandlet retfærdigt af repræsentanter fra CFIR, uanset alder, etnisk oprindelse eller køn				
45. Alle aktører bliver behandlet retfærdigt af repræsentanter fra firmaer indenfor klyngen, uanset alder, etnisk oprindelse eller køn				
46. Alle aktører bliver behandlet retfærdigt af repræsentanter fra forskningsinstitutioner indenfor klyngen, uanset alder, etnisk oprindelse eller køn				
47. Alt taget i betragtning mener jeg, at samarbejdet med CFIR går rigtigt godt				
48. Alt taget i betragtning mener jeg, at samarbejdet med firmaer indenfor klyngen går rigtigt godt				
49. Alt taget i betragtning mener jeg, at samarbejdet med andre forskningsinstitutioner indenfor klyngen går rigtigt godt				

- PLEASE INDICATE YOUR ANSWER USING A CROSS MARK.
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- YOU MAY USE EITHER A BLACK PENCIL OR PEN.



For every statement, fill in one answer that most accurately reflects your opinion. If you feel you cannot answer a question or if you have no prior experience of cooperating in any way with the actor in question, please leave it blank.

Please use the following answer code:

- 1 = Almost always untrue
- 2 = Often untrue
- 3 = Sometimes untrue/sometimes true
- 4 = Often true
- 5 = Almost always true

Statement	1	2	3	4	5
1. CFIR keeps me informed about important issues and changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Firms in the cluster keeps me informed about important issues and changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Representatives from other research institutes in the cluster (e.g. universities) keeps me informed about important issues and changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The cluster organization makes its expectations and goals for the cluster clear					
5. When I am cooperating with other firms within the cluster, they always make their expectations and goals with the cooperation clear					
6. When cooperating with other research institutes within the cluster, they always make their expectations and goals with the cooperation clear					
7. I can ask representatives from CFIR any reasonable question and get a straight answer					
8. I can ask representatives from firms in the cluster any reasonable question and get a straight answer					
9. I can ask representatives from other research institutes in the cluster any reasonable question and get a straight answer					
10. CFIR is approachable, easy to talk with					
11. Representatives from the firms in the cluster are approachable, easy to talk with					
12. Representatives from other research institutes in the cluster is approachable, easy to talk with					
13. CFIR is competent at managing the organization					
14. The firms in the cluster are competent within their business area					
15. Other research institutes in the cluster are competent within their fields					
16. CFIR does a god job of assigning and coordinating resources among the actors within the cluster					
17. CFIR is honest and ethical in its business practices					
18. Firms in the cluster are honest and ethical in their business practices					
19. Other research institutes in the cluster is honest and ethical in their business practices					
20. CFIR's actions match its words					
21. The firms in the cluster's actions match their words					
22. Other research institutes in the cluster's actions match their words					
23. CFIR has a clear view of where the cluster is going and how to get there					
24. When we are cooperating with firms in the cluster they have a clear view of where the cooperation is going and how to get there					
25. When we cooperate with other research institutes in the cluster they have a clear view of where the cooperation is going and how to get there					

26. Representatives from CFIR delivers on its promises				
27. Representatives from firms in the cluster delivers on its promises				
28. Representatives from other research institutes in the cluster delivers on its promises				
29. CFIR genuinely seeks and responds to suggestions and ideas				
30. Firms in the cluster genuinely seeks and responds to suggestions and ideas				
31. Other research institutes in the cluster genuinely seeks and responds to suggestions and ideas				
32. Representatives from CFIR shows appreciation for good work				
33. Representatives from firms in the cluster shows appreciation for good work				
34. Representatives from other research institutes in the cluster shows appreciation for good work				
35. CFIR shows a sincere interest in me as a person and not just as a researcher				
36. Representatives from firms in the cluster shows a sincere interest in me as a person and not just as a researcher				
37. Representatives from other research institutes in the cluster shows a sincere interest in me as a person and not just as a researcher				
38. CFIR avoid politics and backstabbing as ways to get things done				
39. Firms in the cluster avoid politics and backstabbing as ways to get things done				
40. Other research institutes in the cluster avoid politics and backstabbing as ways to get things done				
41. My research institute is treated as a full member of the cluster by CFIR				
42. My research institute is treated as a full member of the cluster by firms in the cluster				
43. My research institute is treated as a full member of the cluster by other research institutes				
44. All actors in the cluster are treated fairly by CFIR regardless of their age, ethnicity or sex				
45. All actors in the cluster are treated fairly by representatives from firms in the cluster regardless of their age, ethnicity or sex				
46. All actors in the cluster are treated fairly by representatives from other research institutes in the cluster regardless of their age, ethnicity or sex				
47. All taken into consideration I believe that the cooperation with CFIR works well				
48. All taken into consideration I believe that the cooperation with the firms in the cluster works well				
49. All taken into consideration I believe that the cooperation with other research institutes in the cluster works well				

