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## **Innovative Performance in the CEE Countries: A Cross-Country Study Using Fuzzy-Set Theory**

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## Abstract

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This thesis investigates the existence of innovative performance and its institutional foundations in seven Central- and East European countries that are in a state of transformation since 1989. Innovative performance may be the key feature for these countries ability to develop a robust economy that can diminish the risks of unemployment. The concept of innovative performance is deduced from the global trends of economy and technology. Unemployment, Globalisation, Economic growth, Technology-gap theory and Innovation concepts are the theoretical entities in the body of theories of the global trends of economy and technology. The thesis is also testing a new method for social science, the fuzzy-set social science methodology. This methodology is supposed to ease the difficult explanations between ideas/theory and empirical findings. The result of this investigation is that it exists innovative performance in Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia and Romania, at different levels. These different levels go hand in hand with the presence of a civil society and the geographic location in Europe on an east-west axis. The result shows not surprisingly that the further east the country is located the weaker are the institutional foundations and the innovative performance.

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Peter Johansson, Oslo, January 2003.

## **1. Introduction**

The global concept and framework for this paper is inside a project called: *Transformation in a Comparative European Perspective*. The project description has had an influence over my choice of design, method, and cases. The scope will be on innovative performance and its civil society foundation in the Central- and East European Countries (CEE).

Several CEE countries are candidates to the European Union and are in a process of transformation. We assume that this transformation started from different situations in the particular countries. The idea of ‘path dependence’ rests on the view that specific economic, historical, political and social circumstances differ amongst countries and will influence their transformation (Stark & Bruszt 1998). These countries are now in transformation from different degrees of centrally planned economies and one-party state politics, to a market oriented economy and a multi-party democracy, of different shape in different countries. Not only was the Soviet styled centrally planned economy differently embedded throughout the region of CEE. We also assume that the goal for transformation of the societies in the region is not a static notion of a free market economy, but an open-ended adaptation to a world, which is in the flux of transformation. In other words, the national centrally planned socialistic economies start points differed, and the transformation will probably result in different kinds of Central- and East-European forms of capitalisms, interconnected into a western European system of differing capitalisms<sup>1</sup>. We assume that a society with a fully free market economy does not exist in the world today (Genov 1999: 59).

This master thesis is a Cross-Country Comparative Study of seven Central- and East-European Countries (CEE-7): Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia. We will try to shed some light over the Innovative Performance (IP) and the civil society (CS) in the CEE-7 countries. The hypothesis is that a civil society is an important institutional foundation for innovative performance.

The hypothesis clearly indicates that a relationship between innovative performance (IP) and civil society (CS) must be found to confirm the hypothesis positively. Here we must

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<sup>1</sup> See; Kitschelt, H. Lange, P. Marks, G & Stephens, J D. (1999) For a thorough description of the varieties of capitalism.

emphasise the meaning of relationship as not a covering law of relation but a relation of stronger and looser character unique for every country case. A basic assumption is that it will be found diverted cases in a broader pattern, but not broader that it could fit into the hypothesis and I believe the explanation for this diversity is path dependant and relying on the geographic location on an European east-west axis.

## 1.1 Research Questions

Three questions were deduced from the hypothesis mentioned above:

1. How is the situation for innovative performance today, to what degree do it occur in the CEE-7 countries?
2. And the following question is: If we find empirical evidence for innovative performance, does it relate to or not to the existing strength of a civil society?
3. Does the geographic location on an European east-west axis show similarities with IP and CS in a way that confirm the assumption that peripheral eastern countries has more problems than countries more close to the European core?

We are looking for a broad relation here, innovative performance is of course not depending on only one factor but several and geographic location will be presented as a cause that probably will have an influence over the strength of a civil society. Alternatively, geographic location will possibly have a spurious influence over both civil society and innovative performance and maybe work as an ad hoc explanation. We will be satisfied if we can establish an explanation of a mechanism between Civil Society and Innovative performance for the countries involved in our study. To look for “middle-range” mechanisms instead of covering laws is a social science goal with explanatory power that does not claim for any generality but adds to the repertoire of explanations (Elster 1989:9-10).

A research problem that must be declared initially is that countries as cases can be misleading cases and probably are imperfect objects to measure because of big differences between

domestic regions. Poland A<sup>2</sup> and Poland B<sup>3</sup> are common markers of the Polish internal diversity of economic development. Italy is a well-known example of a country with big internal differences between the Northern and the Southern parts of the country.

If societies are understood as consisting of three sectors (Potucek: 1999); market (economy), government (politics) and civil society (sociology) then the content of this study will be limited to sociology (civil society) and economics (innovative performance), government or politics will not be measured. Innovative Performance represented with Foreign Direct Investments and Research and Development is of course closely linked to how the government designs Investments Policies and administers Research and Development (R&D). This connection is taken for granted and the level of Innovative Performance is also indicating the quality of how government handles these issues. The role of the state through governmental practice is very complicated; a country like South Korea has shown a tremendous innovative performance through a period of dictatorship and Ireland has done the same in a democratic society. It is more or less because of this that I have chosen Civil Society instead of politics as a possible cause for the IP outcome because it seems more relevant. The dictatorship in South Korea was constantly under pressure from strong civic mobilisation urging for democracy and this I interpret as evidence of a strong civil society.

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<sup>2</sup> Northwest-, West- and Central-Poland.

<sup>3</sup> East- and Southeast-Poland.



## **1.2. Disposition**

The thesis will be presented according to the following outline:

Chapter 1 is the introduction that will supply the reader with the hypothesis and the research questions that this paper is supposed to answer.

Chapter 2 will take the reader through the important ideas and theories that will be the body where the refined concept of innovative performance has its fundament.

Chapter 3 is a rather deep introduction to fuzzy-set social science methodology.

Chapter 4 gives an explanation to the choice of cases.

Chapter 5 deals with the existence of innovative performance.

Chapter 6 explains what civil society is and how it used in this paper.

Chapter 7 is a brief presentation of the simplified concept of geographic location.

Chapter 8 gives a summary and conclusion over the results and tries to give an explanation of the findings and future possibilities for the CEE-7 countries.

## **2. Ideas and Theory**

Following Ragin's (1994) theory of how to construct social research this chapter aims to present the ideas that are the fundament for the analytic frame of innovative performance, civil society and geographic location.

I define Innovative Performance by using Shumpeter's well-known definition: "*an innovation is the implementation of a new combination. This comprises product and process innovation as well as organizational innovations and the access to new markets of suppliers of consumers*"(Fritch & Werker 1999: 5). This general definition allows us not to split the term into innovation and diffusion. Because imitation(diffusion) also require a new way of action for the imitator. IP is therefore the level of innovation and imitation a country theoretically obtain by Foreign Direct Investments (FDI) and money spent on Research and Development (R&D). The following presentation in this chapter aims to ground IP inside a theoretical body of: risk and unemployment, globalisation, economic growth, technology gap-theory and innovation concepts.

Why is innovative performance interesting and why do countries, institutions and entrepreneurs strive for it? The answer is; to avoid unwanted unemployment and that innovative performance is the right way to do it as a direct problem solver in a short perspective. In a longer more indirectly perspective can innovative performance act as a buffer that meets future demands of having an flexible economic system that can respond to new and shifting circumstances in a virtuous way. If this is not the case, new circumstances can be vicious. The Irish society has undergone a miracle the last 40 years, an active policy with the aim of attracting foreign direct investments (FDI) and multi national companies (MNC) in the pharmaceutical and electronics sector to settle in Ireland has been a success (Kearns & Ruane 2001 : 229-30).

### **2.1. Risk and Unemployment**

When used in the context of labour market issues, the term 'risk' usually indicates a threat of unemployment. Generally seen, the term has negative connotations. Therefore, it is natural to

strive for a situation where one can avoid or manage the risk and the consequences of the risk scenario. N. Genov defines risk as the “*probability of dysfunctional effects of processes on social systems*” (Genov :1999:32). Risk related problems of unemployment are usually met with strategies of how to obtain a high level of innovative performance in a country. In broader terms, we are dealing with problems related to unemployment in the context of the current technological, economical and political trends of globalisation.

It is of course impossible to cover such a broad subject in the limited framework of a master thesis. But we will try to shed some light on the problem by narrowing it and by explaining some details of the mechanisms of unemployment risks where a well performing innovative system is the key factor for dealing with this risk.

## **2.2. Globalisation**

We are not aiming to find any evidences for the existence of globalisation trends in our contemporary world, we are taking it for granted. However, since globalisation is a contested and heavily discussed concept we will give a short resume of the contemporary discourse of the term here.

In a period of approximately fifteen years has ‘globalisation’ gone from a position of a non-in-use-word to a word on everybody’s lips, often misused (Beck 1998: 36) and too often used (Giddens 2000). Giddens (2000) says that the controversy of ‘globalisation’ diverted into three different question; What it is? What are the consequences of it? And does it really exist? It is more or less clear that nowadays most discussions about globalisation are about its consequences and possibilities; see for example the title on Bauman’s book *Globalization – The Human Consequences* (1998). Following the logic of these discussions, the existence of globalisation should be taken for granted when one is discussing the consequence of it. But since most macro social science empirical research are based on nation state approaches and nation state data and statistics, there are difficulties to present global approaches that fit into the usual style and understanding of social science.

The traditional social science statistical machinery does not apply to globalisation very well. Beck (2001; 2000:80; Anheier et al 2001:221) calls this incapability of nation state approaches to deal with the complexity of ‘globalisation’ and a ‘global civil society’ for

‘methodological nationalism’. Some of the furious critics against the globalisation concept and the social theory supporting the concept as a whole find its fundament in economical rationality beliefs of what social science is (Castells 2001:546) based on analogies from natural science and mathematics. This rational choice oriented belief of what social science really should be, can be traced in Abell and Reyniers (2000) critique of the works about the Information Age by Manuel Castells.

The normative debate about consequences and possibilities of globalisation seems to have supporters with different perspectives. The view from above, that almost without exception is emphasising the possibilities of a global market, and the view from below that is opposing the view from above by organising themselves globally in global interest groups. The protesting movements working against the global institutions such as the World Bank or the World Trade Organisation has shown clear signs of global organisation in Seattle, Prague, Gothenburg and Genoa. The dual substance of globalisation can be exemplified with the following statement: “*Join the worldwide movement against globalisation*” (Poster held by unknown demonstrator at the WTO summit in Seattle<sup>4</sup>)

Having accepted the existence of a social transforming force depending of globalisation we can look at the different parts of this occurring phenomenon. Globalisation of social processes has several elements, Genov (2001) describe this as four major dimensions of globalisation; technological, economical, political and cultural. The technological dimension concerns standards, production processes and design and the converging trends here are due to information exchange and competition. The economical dimension is the market, of finance, of goods, of services and of labour. The political dimension is in fact the interconnectedness inside the global political system; a political event in Japan has a serious impact on the politics in Europe. Striking US steel workers and complaining US steel industrialists can have influence over US trade policy, which in turn can cause problems for Swedish interests and call for political action from the EU. The state as a monopolistic entity on politics is no longer true, Beck (2000: 80) says that the state boundaries has no meaning in many sides of peoples life “.... people shop internationally, work internationally, love internationally, marry internationally, research internationally, grow up internationally and are educated

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<sup>4</sup> Source: Anthony Giddens, from a debate entitled “Globalisation: Good or Bad?” at the London School of Economics and Political Science. October 11, 2000. ©LSE [www.fathom.com](http://www.fathom.com)

internationally...”. However, the state is still an important political entity, no forces can match the state regarding the possession of power (Giddens: 2000). The cultural dimension is about similar universal cultural patterns and this is caused by the modern information technology, TV and the Internet (Genov 2001).

Zygmunt Bauman’s interpretations of the contemporary globalizing world have similar conclusions as Castells have. Bauman (1998) points at the polarization and the interdependence of the local and global dimensions of the present day world. Most people live locally but a lot of interests of organisations and companies are global. Distance, Geography and Space do not count as much as it used to anymore. They were important factors in the Industrial Age because of its dependency of energy (Castells 2000b: 6). Therefore, communities had the possibility and power to put a lot of strain on the local industries during the industrial age because industry couldn’t move away from their energy supply. On the contrary, the capital forces behind the informational industry are global. They are able to move on a short notice anywhere in the world where they find favourable circumstances for capital accumulation. The reason for this spatial liberty is that knowledge industry is organized around the space of flows. It is released from territorial space even if places like Silicon Valley and other infrastructure centres are important and are major nodes in the network society (Castells 2000b: 14). The Network Society is here understood as the form of social structure of humans in relationship of production/consumption, experience, and power, characterised by the Information Age (Castells 2000b: 5).

Castells’ (2000b: 5-6) definitions of the Industrial Age and the Information Age can work as a theoretical image of ideal types that visualise this shift. The former is the historical period primarily organized around the technological paradigm of energy. The latter is the historical period primarily organized around the technological paradigm of information technology based on microelectronics, communication technology and genetic engineering.

The risk of unemployment forces local communities, regions and countries to compete each other to get the needed jobs localised in their neighbourhood. This can be done by providing free land, cheap investment loans, reduced tax or offer a good infrastructure for the enterprise. For instance, there are well-known facts concerning this in the battle between Hungary and Great Britain to get the benefits of huge BMW investments (Deacon 2000: 158).

A strategy to avoid the situation of “underbidding”, which could have social dumping as a consequence, is to create the human resources that cannot be out of use for the modern industry in the Information Age.

A shorthand definition of this labour is the Self-programmable labour with the ability to retrain itself (Castells 2000b: 12). The implementation of this strategy has elements of modern infrastructure financed both from public and private funds and a good education system. M. Castells points out in his book “End Of Millenium”(2000a: 348) in the same direction by saying that jobs are national, regional and local, capital and finance are global. Castells is making us aware of the cleavages of the Information Age developing between the informational and replaceable/generic labour, between the included and the socially excluded workers/consumers whose value is used up and finally between the capital and human experience (Castells 2000a: 337). These cleavages bring about and reproduce unemployment among its consequences. Our assumption is that a good innovative performance is one of the ways to manage some risk factors of unemployment and a way to obtain Self-programmable labour. We do also believe that it is important for the CEE countries to open up their economies and attract Foreign Investments even though there are some dangers as mentioned above, hostile takeovers and social dumping as a consequence of underbidding from country-, regional-, and local-level authorities. Remember the saying; it is only one thing worse than being exploited by Multi National Corporations (MNC) and that is not being exploited by MNCs<sup>5</sup>.

### **2.3. Economic growth**

This section aim to guide the reader through the ideas and theories of economic growth and finally give us the fundament or an image of a theory that match our definition of an indicator of innovation that is coherent with the rest of this inquiry.

The view on the causes and obstacles for economic growth is divided amongst social scientists. The two<sup>6</sup> main opposing schools can briefly be categorised as one that emphasise

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<sup>5</sup> Source: Anthony Giddens, from a debate entitled “Globalisation: Good or Bad?” at the London School of Economics and Political Science. October 11, 2000. ©LSE

<sup>6</sup> I’m leaving Marxist view out.

the embedded economy and another one that emphasise the superiority of economic equilibrium (Amable: 2000: 645-6). The former sees the institutional situation as a seed-bed<sup>7</sup> for how a economy will work and the latter sees all social interference into the market balance as a something that disturb the efficiency of the economy. The institutional school recognise quality and non-price factors like technology as something that must be important attributes when comparing economies. The neo-classical school recognise price factors as unit labour cost as the most important advantage or disadvantage for an economy.

The neo-classical theories of economy's approach to economic growth does not include technology; the base for national growth according to this theory is due to unit labour cost for the manufacturing industry. In neo-classical theory of economics, high wages are the main obstacle for economic growth and welfare. Another way to look on economic growth is to turn the neo-classical theory on its head, and see high labour cost as a qualitative indicator of higher quality and development. (Fagerberg 2002 :1). The view of technology as a free good is something that the neo-classical economists has in common with the previous dogmas of the centrally planned socialist economies (Radosevic 1999:31; Fagerberg 2002: ; Freeman 1995: )

It is outside the limitations of this paper to explain these shortcomings of neoclassical theory thoroughly, but neoclassical equilibrium theory can be stated as not applicable to empirical findings of diversity, especially when developed industrial countries and NICs are taken in to the analysis side by side. It is too many analytic frames of "ceteris paribus" in neo-classical theory; the assumption of full employment is obviously an error when dealing with empirical science. It's a well-known fact that most countries have a labour market situation of an unwanted<sup>8</sup> rate of unemployment. (Fagerberg 1987: 3-4)

### **2.3.1. Technology-gap theory**

The technology gap-theory is a response to the shortcomings of neoclassical attempts to explain the differences of in growth rates amongst countries. The technology-gap theory is an

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<sup>7</sup> Or as a **garden**, if I'm aloud to quote Mr Chance (Peter Sellers)

<sup>8</sup> Unwanted unemployment can be different. A socially acceptable unemployment rate can be something different from what can be acceptable out of macro-economic reasons. Unemployment rates are also more or less problematic according to how politicians recognise the level of unwantedness.

application of Schumpeter's dynamic theory of capitalist development, to a world or global economy of competing capitalist nation-states. The technology-gap theory is putting the disequilibrium between the two conflicting forces, innovation and diffusion in focus. These forces are interplaying, innovation is widening the gap and diffusion is shrinking it depending on where a country is situated in relation to other countries. An innovation frontier country is widening the gap if it proceeds at a higher degree of innovation activity than the other countries. A country lagging behind an innovation frontier country and having a more intensive pace of innovation activities than the frontier country will catch up and eventually pass. Diffusion (imitation) is leading to a catching-up situation but it cannot surpass the frontier country without developing a pure innovative performance. (Fagerberg 1987: 6)

#### **2.4. Innovation concepts**

Innovation concepts flourish today. It is difficult to have a total overview but most of the concepts seem to be related and have some features in common. A complementary configuration of institutions seems to be what holds these concepts together.

An investigation of the contemporary literature on innovation concepts reveal the concept that emphasise a system of innovation and the national system of innovation (NSI) represented by Freeman, Lundvall and Edquist.

Freeman (1995: 5) states that the concept of a NSI's roots can be redrawn from Freidrich List's work from 1841 of "The National System of Political Economy" but the most cited source is in lirture on economic growth is Schumpeter, the modern inventor of NSI is Bengt-Åke Lundvall who was the first to use the concept NSI in 1992. Lundvall (1992) build the NSI on the assumptions that knowledge is important for innovation and that the process of knowledge is learning. Learning is a interactive and socially embedded process and that makes knowledge a different resource than for example natural resources. Also history and especially the forming of the nation states were important for the NSI during industrialisation. Today is the states role challenged by globalisation. Others like Lopez-Martinez & Piccaluga (2000: 1-10) presents a meso-level concept called sociotechnical constitutuencies that attempts to bring together macro- and microelements in the innovation system. The cluster diamond for this approach includes our indicators FDI and R&D amongst others (Molina &



Kinder 2000: 47-9). Laredo & Mustar (2001: 2-4) comes with a wider and newer concept; *Research and Innovation Policies*, that includes antitrust policy, intellectual property rights and regulatory policy. Training of scientists and engineers is also important in this concept.

My own conclusion about these concepts that are used to study countries innovative performance is that the comparative analyses are hard to understand because the configurations shifts from country to country. This conclusion is supported by Amable (2000: 669): “*Most NSI studies are made on one country at a time. When one concentrates on national case studies, it is tempting to have as many configurations as countries. What one can gain in precision is lost in the generality of the principles.*” Amable is also saying that international comparisons, like this one, are made with partial sub-systems and never with the whole national system.

## **2.5. Conclusion**

Both FDI and R&D are interwoven into the global trends of technology and economy (Genov : 2001). FDI is global by nature since the term refers to investments from abroad and R&D is secondarily global. R&D is in fact an important factor of a ‘national system of innovation’ (NSI), which is more national than global even though the international influence on NSI is growing (Freeman 1995: 5).

R&D can be categorized as the greatest invention of all invention in the 19th century because it is the invention of the method of invention (Freeman 1995: 9). The new R&D labs were a giant step forward for economic and industrial development.

The argumentation here supports the view that there are possibilities to attain economic growth by improving technological change through Foreign Direct Investments (FDI) and through the size and quality of a country’s research and development (R&D). The introduction to Edquist (1997: 1) says “*It is almost universally accepted that technological change and other kinds of innovations are the most important sources of productivity growth and increased material welfare – and that this has been so for centuries. They are also a major cause of the destruction of old jobs as well as the creation of new employment.*”

### **3.Fuzzy-set methodology**

This chapter aims to introduce the new Fuzzy-Sets methodology in social science and to explain how it will be applied to our inquiry. This demands an extensive presentation of the methodology and the use of it.

The fs/QCA (Fuzzy-Set Qualitative Comparative Analysis) method is chosen of two reasons. First of all because it is an interesting contribution to social science methodology and it seems tempting to use it for this study, hopefully in an imaginative and proper manner. Second, the fs/QCA method is supposed to be parsimonious in a way that it admits more cases to enter into comparative studies without expanding the limitations<sup>9</sup>.

Comparative studies in time and space have been central in social science from early days, something which classical works of Durkheim, Marx, Tocqueville and Weber clearly shows<sup>10</sup>. Some modern well known social scientists that has used comparative method in their work are: Martin Seymour Lipset, Barrington Moore, Theda Skocpol and Stein Rokkan.

Fuzzy-Set Qualitative Comparative Analysis (fs/QCA) is a new methodology in social science specially designed for comparative studies. The (fs/QCA) method is developed by Charles C Ragin<sup>11</sup>, and it is his recent work “*Fuzzy-Set Social Science*”<sup>12</sup> (2000) that is the primary source for the method used in this paper. However, it is also much relying on Jon Kvist (1999, 2000) examples of applied fuzzy set theory to the Nordic welfare reform and family policy in the 1990:s. The fuzzy set method is a tool to make theoretical terms operational, by recoding them into fuzzy set scores and linguistic qualifiers (see below). Our aim is to obtain such fuzzy and linguistic terms regarding our outcome set of innovative performance and our cause set of degree of civil society. Our first research question is identical with our outcome set. So, if we manage to construct a reliable outcome set, it will also be the answer to our question:

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<sup>9</sup> In this case 50 pages + frontpage, list of contents and reference list.

<sup>10</sup> The comparative method even goes back to the ancient greeks, Aristotle is sometimes called the first *Comparative Political Scientist*. Well, the greeks thought of everything else so why not.....

<sup>11</sup>1989: Awarded Stein Rokkan Prize in Comparative Research by the International Social Science Council of UNESCO for *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies* (University of California Press, 1987).

<sup>12</sup>2002: Honorable Mention, Barrington Moore Book Award for *Fuzzy-Set Social Science*, Comparative and Historical Sociology Section of the American Sociological Association.

How is the situation for innovative performance today, to what degree do innovation occurring in the CEE-7 countries?

The counter positions which frame these fuzzy set scores in both ends can be understood as, and should be defined as ideal-types (See table 2 in this Chapter.). This operationalisation of our cause and outcome set will work as an analytical construction that will help us to see our cases as configurations of aspects related the analytical constructions contents. In other words, our analytical construction has innovative performance as one of its elements and if we put our cases into the innovative performance spectre they will respond differently to this. The response from the case is the strength of which the case reflects innovative performance. The strength of this reflective response is the configured aspect related to the case. This will clearly help us to categorize our cases qualitatively and to put them into our analytical constructions where differences and similarities between medium numbers of cases can be revealed when compared to other cases in the same analytical construction. Therefore, is the fs/QCA an methodological approach that ease the difficulties that comparative research face with case numbers ranging from 10 to 50 (i.e..medium N).

### **3.1. Analytical property space – identifying the ideal types**

We will here define ideal type in general and also explain how we define our ideal types according to fuzzy set methodology.

### **3.2. Ideal Types**

Ideal Types are important within the Fuzzy set method. Max Weber defined ideal types as: “...formed by the one-sided accentuation of one ore more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified analytical construct.” (Weber 1904: 90, Kvist 2000: 75). As we can see, Weber is pointing at the more or less present and diffuse, discrete and occasionally absent (fuzzy) belonging of a case into the span between ideal types. The cases are either fully in or out or belonging partly to the ideal types, and this fact is some of the essence of fs/QCA.

Our ideal types will be: The civil society country and the opponent, the paternalistic country in the cause set. This means that a country with a 0.70 score in the fuzzy set ideal type of The civil society country will have a score of 0.30 in fuzzy set ideal type of a paternalistic country.

Our ideal types in the outcome set will be: innovative performing country and the non-innovative performing static country.

### 3.3. Defining our ideal types

It is necessary to define three different pairs of ideal types for this study. Civil Society and Geography are simplified and will have a single level property space. Foreign Direct Investments and research and development are the two properties for the set of innovative performance. Research and development(RD) and the Accumulated Foreign Direct Investments(FDI) is of course also a simplified model over innovative performance.

The innovative performance set of two properties will give us a property room of four different combinations, the civil society set and the geography set will have one combination.

Our sets of property combinations in the property space comes from a theory of Lazarsfeld<sup>13</sup>. The formula for this is  $2^k$ , where k is properties,  $2^2$ .(Ragin 2000: 76-9)

An analysis of our outcome set will give us this property space (\* = AND, ~ means more out of the set then in):

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**Table 1.** *The analytical property space of the set of innovative performance countries.*

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(FDI) – Foreign Direct Investments	(RD) – Research and Developmen	(IP) Innovative Performance
FDI-(high)	RD – (high)	FDI*RD
FDI-(high)	~RD – (low)	FDI*~RD
~ FDI-(low)	RD – (high)	~FDI*RD
~ FDI-(low)	~RD – (low)	~FDI*~RD

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FDI \* RD is the ideal type of a innovative performing society country where all properties are present and ~FDI \* ~RD is a stagnant society .

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<sup>13</sup> We have not been able to check this source, but it is given as: Lazarsfeld, Paul. 1937: Some remarks on Typological Procedures in Social Theory. *Zeitschrift für Sozialforschung*. 6: 119-39.

An analysis of our outcome set will give us this property space (\* = AND, ~ means more out of the set then in):

**Table 2.** *The analytical property space for our cases.*

(G) – Geographic location	(CS) – Civil Society	(IP) - Innovative Performance	Innovation modCS
G (high)	CS – (high)	IP – (high)	G*CS*IP
G (high)	CS – (high)	~IP – (low)	G*CS*~IP
G (high)	~CS – (low)	IP – (high)	G*~CS*IP
G (high)	~CS – (low)	~IP – (low)	G*~CS*~IP
~G (low)	CS – (high)	IP – (high)	~G*CS*IP
~G (low)	CS – (high)	~IP – (low)	~G*CS*~IP
~G (low)	~CS – (low)	IP – (high)	~G*~CS*IP
~G (low)	~CS – (low)	~IP – (low)	~G*~CS*~IP

G \* CS \* IP is the ideal type of a innovating country where all properties are present and ~G \* ~CS \* ~IP is a non innovating static country where all properties are missing.

### 3.4. Fuzzy score

In this section we will try to explain why and how we do fuzzy score settings. It is important to understand why fuzzy scores have closed ends and where the critical scores are in a fuzzy set. The end- and middle points are related to the ideal type property space (see above).

It is common that social scientists classify countries or individuals as for example, christian or moslem. It is black or white, either you are christian or not, or moslem or not. This view does not fit well into empirical findings in society; a secularised christian subject that never goes to church can be in the same category as a priest – a christian. Clearly, this is wrong and we understand why continuous variables are called “Dummies” when they are recoded into 1 or 0. The method of setting fuzzy scores helps us to solve this problem. Fuzzy set scores vary from Null to Full (0 and 1), where 0.00 indicates that the case is fully out of the set, and 1.00 that it is fully in the set. At 0.5 we have the third critical point to declare, it is where a case is neither more in nor more out of the set. These three points are the critical qualitative ones for

the researcher to declare and it is important that these settings are presented openly in a proper academic scientific way. The sets are closed in the ends because it is not considered to be any substantial change between for example very rich and very much rich when dealing with a set emphasizing problems of poverty. In other words, it does not matter if there is 100 or 10 000 C° hot, humans cannot survive in it anyway.<sup>14</sup>

The fuzzy score enable us to give a score to the grade of membership or measured values to empirical findings and to translate these into verbal qualifiers of normal language. The verbal qualifiers give meaning to our data and helps us to bridge the difficult gap between empirical findings, theories and concepts and the analysis of this relation. Kvist (2000: 77) assumes that it is better to speak about a country with a “high quality of child care” than a country with “a ratio of child/staff that is under X”. This does not mean that variables of child/ratio is not of any use, it means that they should be recoded into fuzzy scores. In our study we will for example speak of countries as: fully, almost fully, fairly, more or less, neither nor not, more or less not, fairly not, mostly not and finally not a civil society country (see table 7).

We could of course decide not to do fuzzy score recoding and carry on to speak about countries as having ratio of 1.50, 2.25, 2.75 and at the nations in transit (2001) ratings of civil society amongst the nations in transition. The latter way works, but compared to the former it comes short: It is easier to recognise that Poland as a fully civil society country than it is to recognise that Poland has a score of 1.50 at a rating of civil society. It is here important to say

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<sup>14</sup> Another important implication in sociological interpretation of numerical indicators of society is the relative and absolute nature of how these numbers apply. Georg Simmel (1908 : 57-59) show us that there is a difference of the social impact of one millionaire in village of 10 000 inhabitants than the impact of 50 in a city of 500 000 inhabitants. The meaning is decreasing even though the arithmetic relation between 1/10 000 and 50/500 000 is constant. Four fractionalist members of a political party of twenty members who decide to leave the party and start a new has lesser impact on the party then if the figures would be ten out of fifty. And finally an army of 100 000 men can control a country with a population of 10 millions, but an army of 100 men can most probably not control a population of 100 000. (Simmel 1908: 57-59, Østerberg 1990: 204-5) This fact should be kept in mind when analysing figures and one must try to imagine this fact when choosing the close ends of a fuzzy score. Let us recall the latter example and expand it: a 200 men army would not control a population of 100 000 any better than an army of 100 men, it would be fully out of a army control set anyway. And an army of 200 000 men would not necessarily control a population of 10 millions significantly better than an army of 100 000 men, it would be fully in the set of army control anyway.

that if we state that Poland is a fully civil society country it is only valid inside the analytical construction of this fuzzy set, which is used here. It would be necessary to construct a new analytic space and ideal types to make comparisons outside the set, with for example the degree civil society in ancient Greece or including EU countries.

The fuzzy score recoding will help us in the attempt to connect the empirical findings to our comparative analysis of configured cases. This demands a lot of substantive knowledge of the researcher and it is important that the fuzzy score settings are declared openly, it is a crucial point for criticism and tests

### **3.5. Three principles of fuzzy set scores**

This subsection aims to explain on what logic fuzzy score and fuzzy score combination rely. These grounds can serve as tests and of quality the quality of a fuzzy score setting done by the researcher.

Fuzzy set gives us a tool to calculate the degree of comparison of fuzzy sets in our analysis. We will her present three of these principles; the principle of negation, the principle of minimum and the principle of maximum.

#### **3.5.1. The principle of negation**

The principle of negation is connected to the fuzzy set score in the opposite set. Consider innovative performance and static as complementary sets that are diametrical opposing each other's. A country with a score of 0.95 in the innovative performance set will be an almost fully innovating performing country and at the same time have 0.05 in the static country set and be almost not a static country.

The score in set A will be the sum of 1 minus the score in the – A set or as shown in our example  $1 - 0.05 = 0.95$ . Or vice versa: The score in the negative set – A will be the sum of 1 minus the score in the A set,  $1 - 0.95 = 0.05$ . This is a good test of how coherent the fuzzy scores are given by the researcher. (Kvist 2000: 78-80).

### 3.5.2. The principle of minimum

The principle of minimum is the way that we combine fuzzy set scores using the theory of that no chain is stronger than its weakest link. This is the logic AND the fuzzy set operand for this is \*. Imagine a set dealing with law and order in a country, it has two sub-sets; the set of numbers of policemen(NoP) in the police force and the set of corruption of the police force(CoP). We therefore believe that the outcome of this never is better than the minimum score, it does not matter if there is an almost fully sized force of policemen if they are neither more or less corrupt.  $NoP * CoP = \text{the lowest score}(0.90 NoP * 0.50 CoP = 0.50)$ . (Ragin 2000:322, Kvist 2000:80)

### 3.5.3. The principle of maximum

The Principle of maximum is the way to combine fuzzy set scores using the theory of substitutability rule. This approach means that we can reconnect all the links in the chain and test them one by one. We will then rely on the strongest link but keep the other ones as complementary substitutes. This is the logic OR and the fuzzy set operand for this is + . We can think that education would substitute for experience, or vice versa when a company is deciding whom to hire for a job. We can also assume that a high degree of democratisation substitute a lower degree of economic liberty, because they usually goes hand in hand but not at the same time. One of them is always a step in front of the other. (Dem + Econ lib = the best score:  $0.65 Dem + 0.50 Econ lib = 0.65$ ) (Ragin 2000 : 322-23)

We will elaborate with our three principles; negation, maximum and minimum principles can when applied to our cases hopefully explain something. The negation principle is a method to test if the fuzzy settings are reasonable. This is necessary because the comparative approach can force us to set a scores relatively between cases that seems reasonable at first glance but not when placed in the negative set.

At first glance it seems easy to let either the minimum- or maximum principle rule the whole systems of set. But we will argue that it would be little gained by letting the principle of minimum rule (Ragin 2000:322-3). The logic of this would be that the researcher just has to look for the lowest score and then do the analysis, or the other way around if one should let



the principle of maximum rule over the whole system of fuzzy sets. The minimum and maximums results will be presented in every fuzzy set.

These principles are important to keep in mind for the evaluation further on. It is also fair to declare the use of what principles to rule the set at this point and not as an ad hoc explanation afterwards. It is open for anyone to test if another rule would have another result in the end.

## 4. Cases

Our project is a comparative study of Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia. The number of seven country-cases is due to the limitation of space in this paper. I decided to leave out all ex-soviet states and all ex-Yugoslavian states except Slovenia.

The reason for selecting these countries is because we can define them as a cluster in two aspects. They are all candidate countries to the European Union and they established communist one-party rule between 1945-48. The CEE-7 countries could be in a rather good position to catch up to EU but not in few years. With a growth range of 4-7 per cent a year it will take about 20 years for the most advanced Visegrad countries to reach the average income level of the EU. (Grabbe, Hughes et al 1999:205). EU will have very different countries and regions after the EU entry of CEE-7 countries, even though the most advanced candidate countries not are poorer than previous EU entering south European countries were (Grabbe et al 1999: 205). When comparing the advanced CEE-7 countries with EU they take a middle position between the more advanced northern EU and the lesser advanced southern EU (Grabbe et al 1999:209). Slovenia, Hungary and the Czech republic are catching up in skill- and R&D intensive areas, for Poland, Romania and Bulgaria the situation is remaining the same or even widening (Grabbe et al 1999: 209).

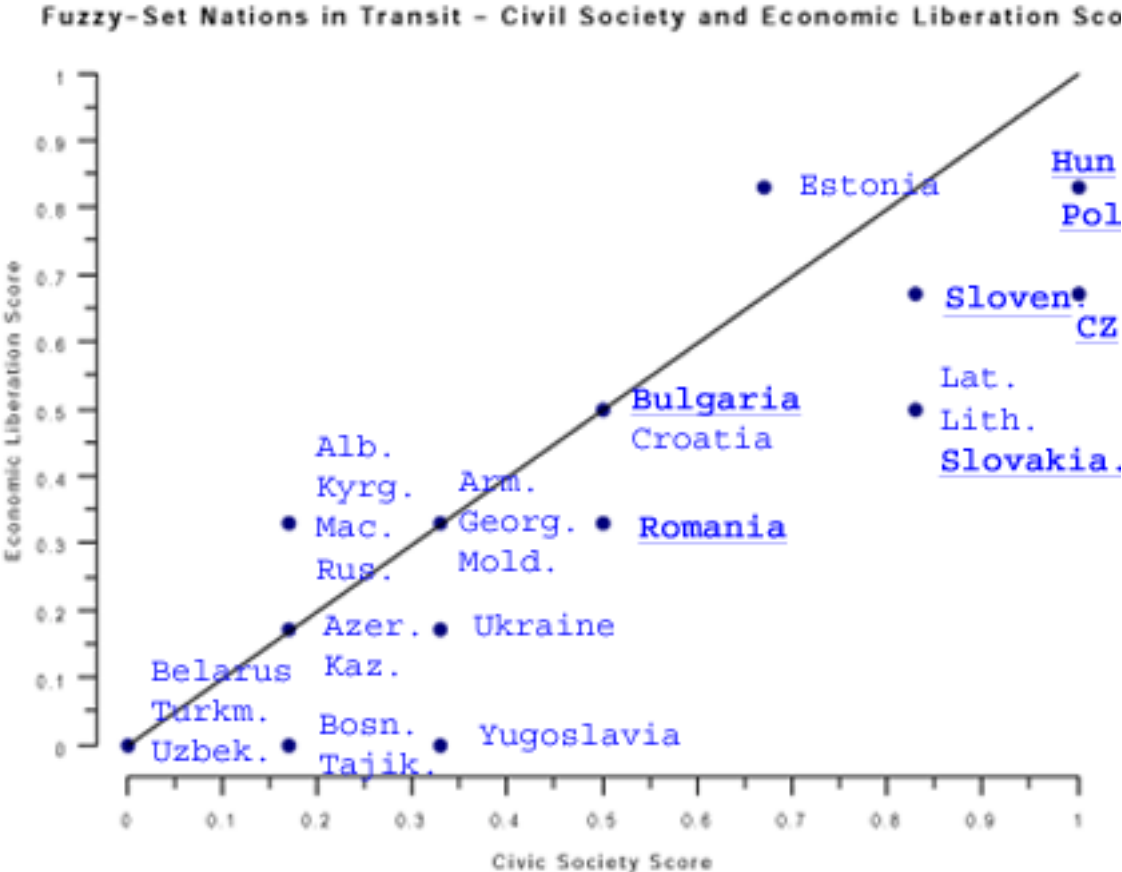
Five of the countries (Bulgaria, Czech Republic, Poland, Slovakia and Slovenia) have Slavic language as a common factor, even though they are different. The homogeneity stops there, these countries are different in multiple ways: area, climate, religion, grade of secularised situation of religion, population, distance to the dynamic half-moon shaped city belt between the southern Baltic region through London and to northern Italy (Rokkans 1999:142-63) and historical experiences. See for example Genov (1999 : 19-21) for a distinct description of differences in Polish and Bulgarian cultural orientation. Bulgarians does not have anything similar to the polish Katyn in their collective memory about Russia and Russians.

The socio-economic situation for these countries differs. Looking at the inter-war period it is a fact that Czechoslovakia was a very developed country and Bulgaria was not. This big difference can possibly be that Czechoslovakia was directly connected or perhaps a free rider

on Germany’s economic miracle and Bulgaria was perhaps a free rider on Russian stagnation. The statement is hypothetical, but Austria, Ireland and Switzerland has been analysed like this by Mjøset (1992: 9). The point here is that this hypothetical diversity is interesting to have between the cases.

Figure 5 (below) is a crude simplification made by computing Nation in transit indicators into Fuzzy scores by a computing procedure. The aim for this figure is to see where these cases are in a bigger universe. We can see that our country cases create a cluster where also the Baltic States; Estonia, Latvia and Lithuania belongs. Croatia is also a member of this cluster if the borderline between the clusters should be drawn with Bulgaria, Croatia and Romania as ultimate cases.

Figure: 5 Fuzzy-Set; Nations in Transit – Civil Society and Economic Liberation Score



Source: (Nations In Transit 2001:25).

It is rare with studies in the medium N range. Ragin suggest that the common methods - quantitative variable oriented and the qualitative case oriented - in social science are the

explanation for the lack of comparative research with medium N. The qualitative research with  $N < 5$  produce a lot of studies and the quantitative research with  $N:s > 100$  is also common. (Ragin 1994:49) We are doing a Small N inquiry with 7 cases, which is a modest increase over the usual limitation of 5 for qualitative studies. This seven case comparison can at first glance look too broad for a thesis of this size. But following the argument above; we are also doing a method test of fs/QCA and we are exploring the possibility to do broader comparisons without expanding the limitations. We hope to fulfil this ambition here.

## **5. Innovative performance – the analytic frame**

In this chapter we are aiming to present the argumentation for our fuzzy score settings to the degree of innovative performance in our country cases. This means that we must present why FDI and R&D is suitable factors for innovation. And to what degree they occur in our country cases. The ideal type nature of the set is presented in chapter 3.

From our innovation concepts (chapter 2) we must deduce an analytic frame (Ragin 2000: 60-6) that can work as an operational tool for dealing with innovative performance. The analytic frame for innovative performance will be limited to FDI and R&D. I defend this limitation on the grounds that none of the available indicators for innovative performance are complete measures that capture all relevant aspects; rather they are partial indicators and not very precise. In addition, according to our knowledge, comes the problem that there exists no explicit theory that gives the precise relationship between single indicators and innovative performance. We are trying to present an imaginative combination of indicators and methodology.

We begin with recalling our definition of innovation from chapter 2 in the present paper: “*an innovation is the implementation of a new combination. This comprises product and process innovation as well as organizational innovations and the access to new markets of suppliers of consumers*” (Fritch & Werker 1999: 5). This general definition allows us not to split the term into innovation and diffusion. We will therefore leave out any attempt to isolate innovation and diffusion, by for example present patenting data as a measurement for isolated innovation. We are dealing with transforming CEE-7 countries and it would be too much to demand these countries to be technology frontier countries in a short time perspective. Our definition of innovation is also defining imitation as an innovation (see above). Technology and technological progress are embedded in social institutions as firms and organisations and imitation is therefore more difficult than expected.

The argumentation about innovation as a positive factor to economic growth is done in chapter 2. Taking these conditions into account, at the end of this chapter we should be able to answer our first research question outlined in the introduction: How is the situation for innovative performance today, to what degree do innovation occur in the CEE countries?

The Innovative Performance(IP) score is an indicator for countries possibility of absorptive conduct combined with the inflow of Foreign Direct Investements(FDI). The absorptive conduct is a term that comes from data of how much R&D capacity a country has. A country's R&D capacity is depending on how much money is spent on R&D and how many people there are involved in R&D. The actual inflow of FDI is here measured in USD pr capita. This is deduced from the argumentation below that innovation is relying on an exogenous factor (FDI) and a endogenous factor (domestic R&D). We will set fuzzy scores to every country according to this system:

- 1.0 -            *The country is fully capable of innovative performance.***
- 0.83-0.99 -    *The country is almost fully capable of innovative performance.***
- 0.67-0.82 -    *The country is fairly capable of innovative performance.***
- 0.51-0.66 -    *The country is more or less capable of innovative performance.***
- 0.50 -            *The country is neither more nor less capable of innovative performance.***
- 0.33-0.49 -    *The country is more or less incapable of innovative performance.***
- 0.17-0.32 -    *The country is fairly incapable to of innovative performance.***
- 0.01-0.16 -    *The country is mostly incapable of innovative performance.***
- 0.00 -            *The country is fully incapable of innovative performance.***

The scores will be defined relatively between the countries, relying on figures from Eurostat 2000, UNECE 2001; Nations in transit 2001 and other literature about the FDI situation in our cases. These sources in combination will hopefully give us a possibility to present a fuzzy set which is not entirely superficial, but have substantial qualities. The relativity is necessary because we have the figures but we must give them some meaning in relation to each other. If our aim were to examine for example Switzerland, Finland, Germany and USA into the set it would most probably demand a totally new definition of the set because all these countries would be fully capable of innovative performance.

## **5.1. Foreign Direct Invesments (FDI)**

Foreign Direct Investments have different effect in different countries. Research and statistics has pointed to this recently. "Economic Growth and Foreign Direct Investment in The

Transition Economies”, UN/ECE, *Economic Survey of Europe*”. 2001. No 1. Presents an hypothesis that is interesting for us: “*Moreover, it is possible that spillovers to the rest of the economy may not occur at all if there are institutional obstacles or deficiencies in the absorptive capacity of domestic enterprises*” (UN/ECE 2001: 185). We have defined a independent fuzzy set of institutional character above; the fuzzy set of civil society. This set will fit well in to our analysis where FDI will serve as a part of the outcome against the fuzzy membership in the civil society set.

FDI has been recommended as a crucial instrument in the transformation of CEE countries, and it has in fact had positive effects in the countries which are the leading candidates to the European Union(EU). These countries have benefited from FDI financing of balance of payments, and the foreign companies has had high rates of growth and output, productivity and exports. But the spillover effects from foreign firms to domestic ones have been rare. (UN/ECE 2001: 185)

Furthermore, even though the spillover effects from FDI are hard to find, all CEE countries want to attract foreign investment enterprises (FIE). FDI can have a positive influence over the technical change and technological learning if the institutional settings for an improvement are present (Knell 1998: 12).

The UN/ECE (2001) and Konings (2001) present almost none empirical findings of positive spillover effects into our transformation countries. Even though both sources come short in explaining this behaviour they also indicates different effect in negative spillovers into different countries. Konings (2001 : 32-33) findings indicates that there is none spillover effects in Poland and negative spillover effects in Bulgaria and Romania. Konings study only deals with these three countries, but we can see that Poland is ranking better than Bulgaria and Romania. Our intermediate classification is that Poland is neither more nor less capable of innovative performance and that Bulgaria and Romania are at the incapable scale. When we turn to the UN/ECE (2001) report we find that Czech Republic, Hungary, Poland and Slovenia have received the bulk of all FDI in the transforming economies. This is four countries out of twenty-seven never getting less than 60%<sup>15</sup> of the total annual inflow of FDI (UN/ECE 2001 : 188). At this intermediate fuzzy score we will definitely range these four

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<sup>15</sup> In the 60% figure also Estonia is included.

countries above the critical 0.5-point in our set. Bulgaria, Romania and Slovakia have had an increase in FDI inflow more recently, due to progress in their political steps towards EU. The split between the first group and the second has been clear since the beginning of the decade. (UN/ECE 2001 : 192) Slovakia has for example until recently been seen as having an unfavourable official attitude to FDI, and Bulgaria and Romania had had problems with policy immobility and periodic economic crises (UN/ECE 2001 : 193). So after examining the UN/ECE (2001) report we can see clearly two clusters: Bulgaria, Romania and Slovakia in one of them and, Czech Republic, Hungary, Poland and Slovenia in the other.

However, there is another way to see at the problem of FDI spillover. Maurice Kugler(2000), is presenting a plausible explanation where he suggest that the problem to see any spillover effects from FDI is because almost all research is done with intra-industry data. Kugler(2000: 3) states that the problems to prove the widespread opinion about the efficiency of FDI is because there is a discrepancy between an insufficient theory ahead of measurements. The correct data to analyse are inter-industry data and not intra-industry data. It is obvious that a Foreign Investment Enterprise (FIE) not would locate to any location where their critical know-how, or core business interests, could diffuse to potential competitors. While, there would be no problem at all to diffuse other not critical knowledge such as more general business concepts as, just-in-time-inventories and total-quality-management. A spillover of this kind can be a positive factor for the FIE because a more business competent surrounding can supply better external services and supply. A FIE is therefore greedy with spillovers of knowledge in their core business sector but are generous with secondary cross-sector knowledge spill because they actually can have benefits from upstream suppliers. The spillover can be of various kinds, business concepts that does not demand a lot of technology investments, generic technologies that needs technological investments and outsourcing of production (Kugler 2000:3).

As we have stated, a generic business concept can be production techniques like just-in-time (JIT) inventories and total-quality-management (TQM). A generic technology connected with investments is for example computer-automated-design (CAD), which needs computer soft- and hardware. Outsourcing is when an FIE close one or several of their own production sectors and instead buy the similar production from a local supplier. It is noteworthy that a FIE will not do this if they cannot have competitive and reliable outsourced suppliers.



We will argue that these three elements of spillover are interlinked over time because an spillover of generic business concepts and generic technology can finally through development and experience create the firms that can take on an outsourcing enterprise. It is a final diffusion where the former locating FIE transfer parts knowledge and parts of control from their own hands to host country hands.

We can therefore conclude from Kugler (2000), that it most definitely is a positive spillover effect of FDI. Konings (2001) and UN/ECE (2001) just miss the point by wrong measurement. It would be strange if there was findings of intra-industry spillover, it is just the scenario that a FIE not want to risk when locating abroad. The inter-industry effects are positive. Kugler (2000) do not inquire any of our country-cases, but the evidence of the positive effects can be transferred. The UN/ECE (2001) and Konings (2001) just bring about how our country cases react on the more difficult obtainable spillover. Anyway the findings of Kugler will lift all our country cases over or at least to the critical 0.00-point (The country is fully incapable of innovative performance), because of the recent increase of FDI inflow to Bulgaria and Romania. The expectations of a future membership in the EU has probably been helpful for the rise of FDI inflows to Bulgaria and Romania (Grabbe, Hughes & Landesmann 1999:212).

The top countries has had a very high growth increase of FDI after a rather weak inflow initially after 1989. The inflow of FDI pr capita into Hungary in 1997 was just below the figures of France, Spain and the UK and in front of Portugal (Grabbe et al 1999: 211) so we can see that we are dealing with levels of FDI that can be applicable with a EU comparison of FDI.

So far we can state that Czech Republic, Hungary, Slovenia and Poland are in a better situation than Slovakia, Bulgaria and Romania. The relative order between the countries seems to follow this pattern. Poland and Slovenia are the cases around the 0,5 point (The country is neither more nor less capable of innovative performance). When we test this hypothesis with figures we get the following results:

**Table 3.** Specification of empirical indicators and the translation of data to fuzzy score ranges and verbal qualifiers – in the area of Foreign Direct Investemnts (FDI) in the CEE-7 countries.

Empirical indicator	Fully in the set	Almost fully in the set	Fairly in the set	More or less in the set	Neither in nor out of the set	More or less out of the set	Fairly out of the set	Mostly out of the set	Fully out of the set
	1.00	.83-.99	.67-.82	.51-.66	.50	.33-.49	.17-.32	.01-.16	0.00
FDI Foreign Direct Investemnts(a)	> 1 000	901 1 000	801- 900	701- 800	601 - 700	501- 600	401- 500	301- 400	<300
Bulgaria (0,17)							407		
Czech Republic (1,00)	2 102								
Hungary (1,00)	1 935								
Poland (0,59)				751					
Romania (0,01)								303	
Slovakia (0,50)					669				
Slovenia (0,60)				768					

(a) FDI – FDI per Capita 1989 – 2000 in USD (\$): **Source:** (Nations In Transit 2001:30).

As we can see, the figures in table 3 verify our literature-based assumptions, but also correct some of our assumptions. Czech Republic and Hungary creates a pair and not a cluster together with Poland and Slovenia. Poland, Slovakia and Slovenia constitute a cluster in the middle and Bulgaria and Romania are below the middle point in the set. With FDI as the single factor for IP we get the following classification of our cases: Czech Republic and Hungary are fully capable of innovative performance. Poland and Slovenia are more or less capable of innovative performance. Slovakia is neither more nor less capable of innovative performance. Bulgaria is fairly incapable to of innovative performance and at last Romania is mostly incapable to of innovative performance.

We control this result by the negation principle of fuzzy scores by changing the set from the set of IP to the set of a static country and get the following result: Romania (0,99) and Bulgaria (0,83) are almost fully static countries. Slovakia (0,5) is neither more nor less a static country. Poland (0,41) and Slovenia (0,40) are more or less not static countries and finally are Czech Republic (0,00) and Hungary (0,00) fully not static countries.

The results seems to hold for the negation test even though the differences between Bulgaria and Romania are more unclear in the static set and the position of Slovakia as a 0,5 case in the set of static countries seems rather odd compared to the same position in the set of IP.

## 5.2. Research and Development (R&D)

From this point we will now bring in the figures for R&D and calculate these with FDI figures to range the countries relatively. We will take the 1997 figures for millions of EUR spent on R&D pr capita, multiplied with the R&D % of GDP, multiplied with the % of R&D personnel of the labour force and finally multiple this with the FDI inflow in USD pr capita<sup>16</sup>. This results in the following order of countries: Slovenia, Czech Republic, Hungary, Slovakia, Poland, Bulgaria and Romania.

**Table 4.** R&D Specification of empirical indicators and the translation of data to fuzzy score ranges and verbal qualifiers – in the area of Innovative Performance (IP) in the CEE-7 countries.

Empirical indicator	Fully in the set	Almost fully in the set	Fairly in the set	More or less in the set	Neither in nor out of the set	More or less out of the set	Fairly out of the set	Mostly out of the set	Fully out of the set
	1.00	.83-.99	.67-.82	.51-.66	.50	.33-.49	.17-.32	.01-.16	0.00
<i>(R&amp;D)</i>									
Research & Development (b)	> 1,50	1,30-1,49	1,10-1,29	0,90-1,09	0,70-0,89	0,50-0,69	0,30-0,49	0,10-0,29	<0,10
Bulgaria (0,33)							0,52		
Czech Republic (0,73)			1,16						
Hungary (0,50)					0,74				
Poland (0,50)					0,72				
Romania (0,38)						0,58			
Slovakia (0,74)			1,18						
Slovenia (0,92)		1,42							

(b) R&D – expenditure as % pf GDP. **Source:** (European Commission 2000:7)

<sup>16</sup> This give us the following function: (Mill EUR/Population)(% R&D expenditure of GDP)(% of R&D personnel of labour force)(FDI inflow USD) = spillover effect.

Country	Mill EUR	Pop.	% R&D of GDP	% R&D pers.lf	FDI in.	Spill. Effect
Slovenia	228	1,9	1,4	1,2	806	157 674
Czech Rep	542	10,3	1,2	1	1609	99 361
Hungary	292	10	0,75	1	1969	41 836
Slovakia	203	5,3	1,2	1	400	17 343
Poland	904	38,6	0,75	0,75	830	140 482
Bulgaria	47	8,2	0,5	0,9	279	739
Romania	181	22,5	0,6	0,5	246	563

The spilloverfigure is only used as an instrument for ranging the countries. (Sources: Eurostat 2000 : 7, UN/ECE 2001: 190)

As we can see the figures in table 4 they hardly verify our literature-based assumptions. Slovenia (0,92) takes the top and Czech Republic (0,73) and Slovakia (0,74) creates the following pair. Poland (0,50) and Hungary (0,50) are in the middle of the set. Romania (0,38) and Bulgaria (0,32) share the below 0,5 position in this set too. With R&D as the single factor for IP we get the following classification of our cases: Slovenia is almost fully capable of innovative performance. Czech Republic and Slovakia are fairly fully capable of innovative performance. Hungary and Poland are neither more nor less capable of innovative performance. Bulgaria and Romania are more or less incapable of innovative performance.

We control this result by the negation principle of fuzzy scores by changing the set from the set of IP to the set of a static country and get the following result: Bulgaria (0,67) and Romania (0,62) are more or less fully static countries. Poland (0,50) and Hungary (0,50) are more or less not static countries. Czech Republic (0,27) and Slovakia (0,26) are fairly not static countries and finally, Slovenia (0,08) is mostly not a static country.

The negation principle test shows again the difficulties with the 0,5 position in the set, it is hard to believe that Poland and Hungary should be more or less static countries regarding our other sources.

### **5.3. Conclusion**

These country scores are the answers to our first research question: How is the situation for innovative performance today, to what degree do innovation occur in the CEE countries?

The IP score is a combination of two sets and we will add them regarding to the principle of maximum and minimum and keep both principals for further analysis against the cause set of civil society even though the minimum principle results seems less plausible regarding the quality of the score of R&D.

The set of R&D is very weak because it has been almost impossible to fix the critical points of fuzzy scores. Poland and Hungary had two work as 0.5 points and this is a break with the demand for substantive knowledge of the fuzzy score settings. We do believe that these figures can be useful even though they will split the picture. Czech Republic, Hungary,

Poland and Slovenia get a higher score at FDI than at R&D. The opposite is the situation for Bulgaria, Romania and Slovakia that get the higher score on R&D.

Table 5. IP score ruled by min or max principle.

Country	Scores	FDI	R&D	Minimum	Maximum
		Scores	Scores	Principle	Principle
				Score	Score
Bulgaria		0,17	0,33	0,17	0,33
Czech Republic		1,00	0,73	0,73	1,00
Hungary		1,00	0,50	0,50	1,00
Poland		0,59	0,50	0,50	0,59
Romania		0,01	0,38	0,01	0,38
Slovakia		0,50	0,74	0,50	0,74
Slovenia		0,60	0,92	0,60	0,92

From table 6 we can see that the problem with the 0,5 position for Slovakia regarding FDI based IP, and the critical 0,5 position for Hungary and Poland regarding R&D based IP, can be solved with using the principle of maximum for the IP set.

An analysis of our outcome set will give us this property space (\* = AND, ~ means more out of the set than in):

Table 6. The analytical property space of the set of innovative performance countries.

(FDI) – Foreign Direct Investments	(RD) – Research and Developmen	(IP) Civil Society	Countries
FDI-(high)	RD – (high)	FDI*RD	Czech Rep, Hungary (max), Poland (max), Slovakia (max) Slovenia
FDI-(high)	~RD – (low)	FDI*~RD	Hungary (min), Poland (min)
~ FDI-(low)	RD – (high)	~FDI*RD	Slovakia (min)
~ FDI-(low)	~RD – (low)	~FDI*~RD	Bulgaria and Romania

The (min) positions for Hungary, Poland and Slovakia is really no more out of the set than in but just visualisation of the complicated neither more nor less capable of innovative performance point.

#### **5.4. Country Scores**

Taken all of the above-mentioned considerations, the fuzzy scores and linguistic qualifiers for our country cases will be as follows when using the maximum principle:

Bulgaria is more or less incapable of innovative performance with a fuzzy score of 0,33

Czech Republic is fully capable of innovative performance with a fuzzy score of 1,00.

Hungary is fully capable of innovative performance with a fuzzy score of 1,00.

Poland is more or less capable of innovative performance with a fuzzy score of 0,59.

Romania is more or less incapable of innovative performance with a fuzzy score of 0,38.

Slovakia is fairly capable of innovative performance with a fuzzy score of 0,74.

Slovenia is almost fully capable of innovative performance with a fuzzy score of 0,92.

These results are transported to chapter 8.

## 6. Civil Society

‘Civil Society’ (CS) is in the same situation as ‘globalisation’ when it comes to the popularity and common use and divided understandings of the term. “*Civil society is not yet fully on the island of meaning in the social science conceptual landscape*”. (Anheier, Glasius and Kaldor 2001:3)

Civil society has its roots in ancient Greece, but the idea of a civil society has blossomed several times through history with a recent revival in the last decades. It was *politike koinona* in ancient Greece and *societas civilis* for the Romans, the meaning of both expressions were a political society with active citizens shaping law and institutions (Anheier, Glasius et al 2001: 12; Cohen, Arato 1995: 89). When the term resurfaces it is in Central Europe and Latin America with different scope. In Central Europe it is used as an intellectual fundament for criticising the communist rulers and in Latin America it is a socialist fundament for opposing the military dictatorships. Vaclav Havel, Adam Michnik and Fernando Cardoso are the most well-known examples, Havel became later the president of Czech Republic and Cardoso the president of Brasil.

Civil society is the sphere between market, state and family. A descriptive definition is: “*global civil society is the sphere of ideas, values, institutions, organisations, networks, and individuals located between the family, the state, and the market and operating beyond the confines of national societies, polities, and economies*” (Anheier, Glasius & Kaldor 2001:17). The overall definition of civil society used by the centre of civil society at London School of Economics and Political Science is: “*Civil society refers to the set of institutions, organisations and behaviour situated between the state, the business world, and the family. Specifically, this includes voluntary and non-profit organisations of many different kinds, philanthropic institutions, social and political movements, other forms of social participation and engagement and the values and cultural patterns associated with them.*”<sup>17</sup>

The civil society definition includes institutions as a central element and the next step is to define institutions as: “... *sets of habits, routines, rules, norms and laws, which by reducing the amount of information necessary for individual and collective action, make reproduction*

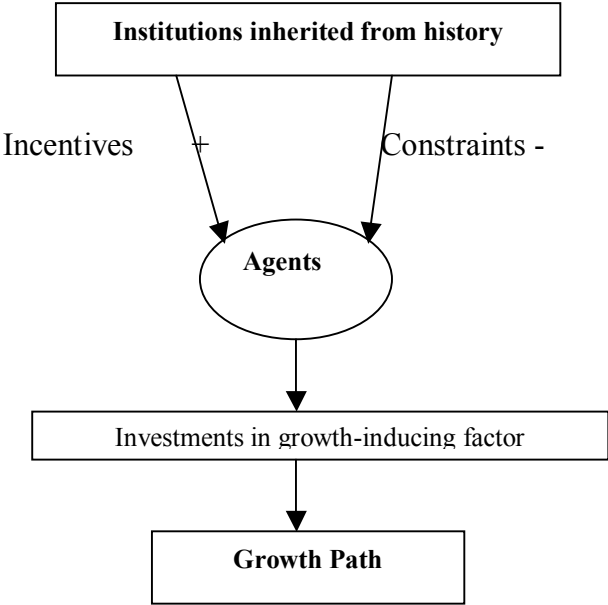
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<sup>17</sup> [http://www.lse.ac.uk/Depts/ccs/what\\_is\\_civil\\_society.htm](http://www.lse.ac.uk/Depts/ccs/what_is_civil_society.htm)

and change of society possible”(Mjøset 1992 : 33). Mjøset (1992 : 33) continues, to say that this definition make institutions to informational devices which reduce uncertainties. Institutions are also signposts in the daily interaction processes, which constitute society.

Civil society as a cause for innovative performance is questionable but there are studies that point in this direction. Putnam (1997) does find different indicators that correlate with civil society, for example political performance, socio-economic and institutional efficiency patterns in Italy. Civil society – measured in for example organisation membership – work as the fundament for a social capital that enhances individuals to be rational in some contexts. But even if the work is excellent it comes short in the explanation of this co related facts. Civil society can if not directly so indirectly work as a institution factor. History had to serve as the explanations for Putnam’s findings (1996: 147-95) and this is an interesting point that can help us to understand this connection.

Figure 6: Why do institutions shape growth regime?



Source: Amable (2000: 649)

The opposite of a civil society is a paternalistic society country where all properties are missing. It is challenge to motivate “paternalistic society” as a counter pole to civil society. Robert D. Putnam (1997:140-41) gives us a helping hand when explaining the opposing



relation between the horizontal civic culture and the vertical *incivisme*<sup>18</sup> culture. The horizontal society engage citizens to participate in public affairs and the vertical society makes individuals suspicious to people outside their social network and they are therefore reluctant to participate in public affairs. This vertical connection has a power structure controlled by the patronage and the dependent clientele as the weaker part in this relation. (Putnam 1997:140:41) The term ideal type ‘paternalistic society’ is deduced from the patronage control of public life.

The belonging to an international system (as for example a global civil society and the global market) improves countries possibility to innovative performance. The costs for IP is lower because they already have the international compatibilities in technological level, firms and system economies of scale, better human capital, and the higher level of skills in the labour force. An institutional change for the CEE-7 countries will therefore be necessary for obtaining an economical catch up. Not only a transformation of technology but also in organisation. (Goglio 1999:85-6)

In the methodology chapter (above) we have stated the importance of an accurate and open declaration of the setting of fuzzy score values. It is important to explain how we define the critical points as we do. Further, it is also important to declare on what grounds we came to the fuzzy values, which are chosen.

We cannot invent data, so we must rely on empirical material that already exists. We can use statistical material, research results or other relevant literature. When we use existing indicators as material it is strength if we can cross-examine two similar indicators and the analysis of them. It is better to rely on several sources if that is possible.

## **6.1. Data**

The main sources here is the Freedom House report “*Nations in Transit 2001: Civil Society, Democracy, and Markets in East Central Europe and the Newly Independent States*”.

The report is a result of a substantial number of scholars from a vast number of credible research institutes and universities. We therefore take objectivity and validity of these data for granted. We also rely on that the Freedom house ratings are consistent, so when we set the

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<sup>18</sup> French Term meanig: absence of Civic Culture.

fuzzy measurement for one rating, we will assume the critical breakpoints at fully in-, fully out- and neither more in nor more out of the set will be the same for every rating. When we define Freedom House rating 3.00 as the midpoint - neither more in nor more out in the set - in political process, we also assume that 3.00 will be the critical midpoint in all Random House ratings coherent in scale.

**Table 7.** Specification of empirical indicators and the translation of data to fuzzy score ranges and verbal qualifiers – in the area of .a Civil Society

<i>Empirical indicator</i>	Fully in the set	Almost fully in the set	Fairly in the set	More or less in the set	Neither in nor out of the set	More or less out of the set	Fairly out of the set	Mostly out of the set	Fully out of the set
	1.00	.83-.99	.67-.82	.51-.66	.50	.33-.49	.17-.32	.01-.16	0.00
<b>(CS)</b>									
<b>Nat.Civil Society(a) –</b>	<b>&gt;=1.50</b>	<b>1.51-1.99</b>	<b>2.00-2.49</b>	<b>2.50-2.99</b>	<b>3.00</b>	<b>3.01-3.50</b>	<b>3.51-4.00</b>	<b>4.01-5.00</b>	<b>&gt;5.00</b>
Bulgaria						3.50			
Czech Republic	1.50								
Hungary	1.25								
Poland	1.25								
Romania					3.00				
Slovakia			2.00						
Slovenia		1.75							

(a) CS - Assesses the growth of NGO:s, their organizational capacity and financial sustainability, and the development of free trade unions; and the interest group participation in the policy process.

We will set fuzzy scores to every country according to this system:

- 1.00**            **The country is fully a civil society.** Czech Republic, Hungary and Poland
- 0.83-0.99 -**    **The country is almost a fully civil society.** Slovenia
- 0.67-0.82 -**    **The country is fairly a civil society.** Slovakia
- 0.51-0.66 -**    **The country is more or less a civil society.**
- 0.50 -**            **The country is neither more nor less a civil society.** Romania
- 0.33-0.49 -**    **The country is more or less a paternalistic society.** Bulgaria
- 0.17-0.32 -**    **The country is fairly a paternalistic society.**
- 0.01-0.16 -**    **The country is mostly a paternalistic society.**
- 0.00 -**            **The country is fully a paternalistic society.**

As we can see: Czech Republic, Hungary and Poland are fully civil societies and this is more or less expected having their historical record of resistance during the post-war period. Slovenia is almost a fully civil society. Slovakia is fairly a civil society. Romania is neither more nor less a civil society. And finally Bulgaria is more or less a paternalistic society.

These results are used in chapter 8.

## **7. Geography**

Geography will here serve as simplified indicator that can explain some of the path dependency situation. The conceptual map of Europe (Rokkan 1999: 136) describes various kinds of evolutionary circumstances beneath the contemporary picture of every country. The analysis of differences between countries today is more complete when the similarities and differences in the present situation are supported with a historic reflection.

This simplification of transforming historic events into a geographical east-west axis must be done in this paper because a thorough detailed expose of path dependency connected to history demands too much text space.

Following Rokkan (1999: 133-69) it is possible to see that countries has been involved in important historical events with different strength according to the countries geographical location. The city belt has been the centre for economic development in Europe for a thousand years. Trade networks with the city belt as centre have mostly traded inside the city belt but also with the more peripheral territories. Even today is this city belt the economic engine of Europe. The area from London, Hamburg, Amsterdam, Stuttgart and further on south to northern Italy is the major dynamic part of Europe. This motivates the connection between geography and innovative performance.

The connection from geography to civil society is grounded on the assumption that the governmental structure or bureaucratic independence were more developed in western Europe than in eastern Europe at the time of politic mass mobilisation. This seems to be crucial for the situation of clientelism and patronage today (Piattoni 2001: 16-30).

We will set fuzzy scores to every country according to this system:

- 1.0**            **The country is close to city belt.**
- 0.75**          **The country is more or less close to city belt.**
- 0.50**          **The country is neither more nor less close to city belt.**
- 0.25**          **The country is more or less far from city belt.**
- 0.00**          **The country is far from city belt.**

The fuzzy score setting will be done by this principle. A country that has borders (not sea border) to two countries that was not a socialistic country under soviet interest sphere during the post-war time will be fully in the set and be a close to city belt country. A country that has a border to one of these western countries will be more or less a close to city belt country. A country with a sea-border to a country that was not a socialistic country under soviet interest sphere during the post-war time will be neither more or less close to city belt. A country with only borders to other previous socialistic countries and Greece<sup>19</sup> will be more or less far from city belt. And finally a country that only has borders to former Soviet Union states is far from city belt. (See Appendix A for Maps)

This classification makes Czech Republic and Slovenia as countries close to city belt. Czech Republics border to former West-Germany (BRD), and Austria. Slovenia is bordering to Italy and Austria. Poland, Hungary and Slovakia are more or less close to city belt. Poland is a strange case with no border to (BRD) but with today's Germany and with sea connections to Scandinavia. Hungary and Slovakia are bordering to Austria. Bulgaria and Romania has borders to other previous socialist countries or Greece. And no of our country cases has only borders to former Soviet-Union states.

These results are transported to Chapter 8.

- 1.0            The country is close to city belt.: Czech Republic and Slovenia.**
- 0.75           The country is more or less close to city belt.: Hungary, Poland and Slovakia.**
- 0.25           The country is more or less far from city belt.: Bulgaria and Romania.**

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<sup>19</sup> Greece is to far from the city belts southern end in northern Italy.

## **8. Summary**

If we look at the results in the introduction and the arguments through this paper we can see that our thesis points in the direction of a clear difference between the countries close or more or less close to the city belt in Europe than those more remote. The nearby countries, Czech Republic, Hungary, Poland, Slovakia and Slovenia scores better on both civil society and innovative performance. This difference across our country cases is not surprising. The disadvantage for Bulgaria and Romania is of historical reasons and has led to a peripheral or a weak semi-peripheral situation in Wallersteinian terms for these two countries. It seems to be a causal connection between CS and IP. However, this connection seems to be overshadowed with the effect of geographic location.

### **8.1. Conclusion**

Civil Society (CS) and Innovative Performance (IP) are related variables. Our inquiry has given a positive answer to this question. What kind of relationship and too what strength these two variables are related is difficult to say something about but we are going to make a fair attempt to explain this here.

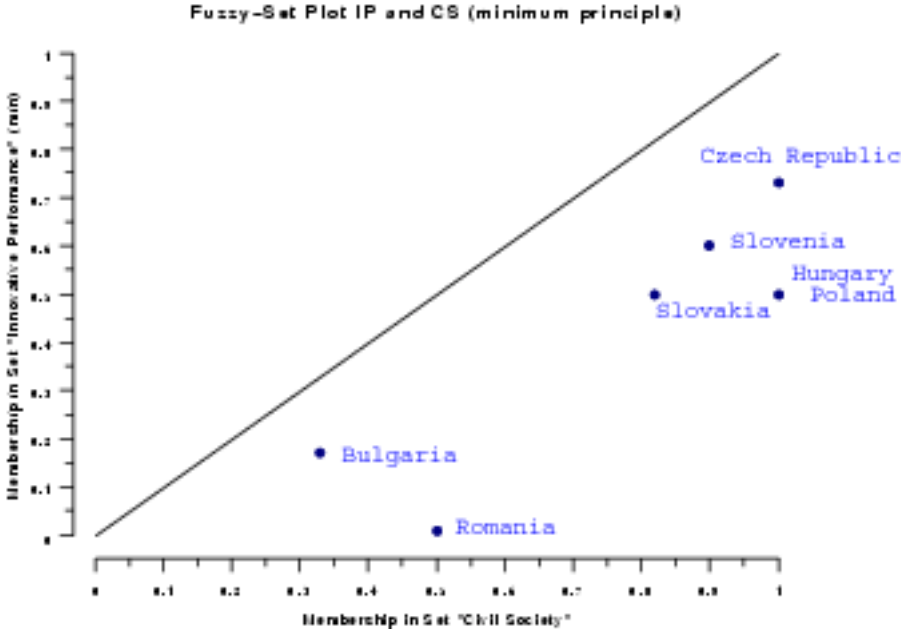
Our data shows that that CS and IP more or less goes hand in hand when analysing our cases. Where we have a strong CS we also have a strong IP and where CS is weak IP is also weak.

It is also clear that our country cases clearly divides into two small clusters. One of the clusters includes the Czech Republic, Hungary, Poland, Slovakia and Slovenia. The other cluster includes Bulgaria and Romania.

Poland and Romania differ from the other countries in two separate tables. The explanation can be that these two countries are bigger and more populated than the rest. According to Mjøset (1992: 39-42) does size matter because small countries are specific in many regards.

This can be shown with this figure:

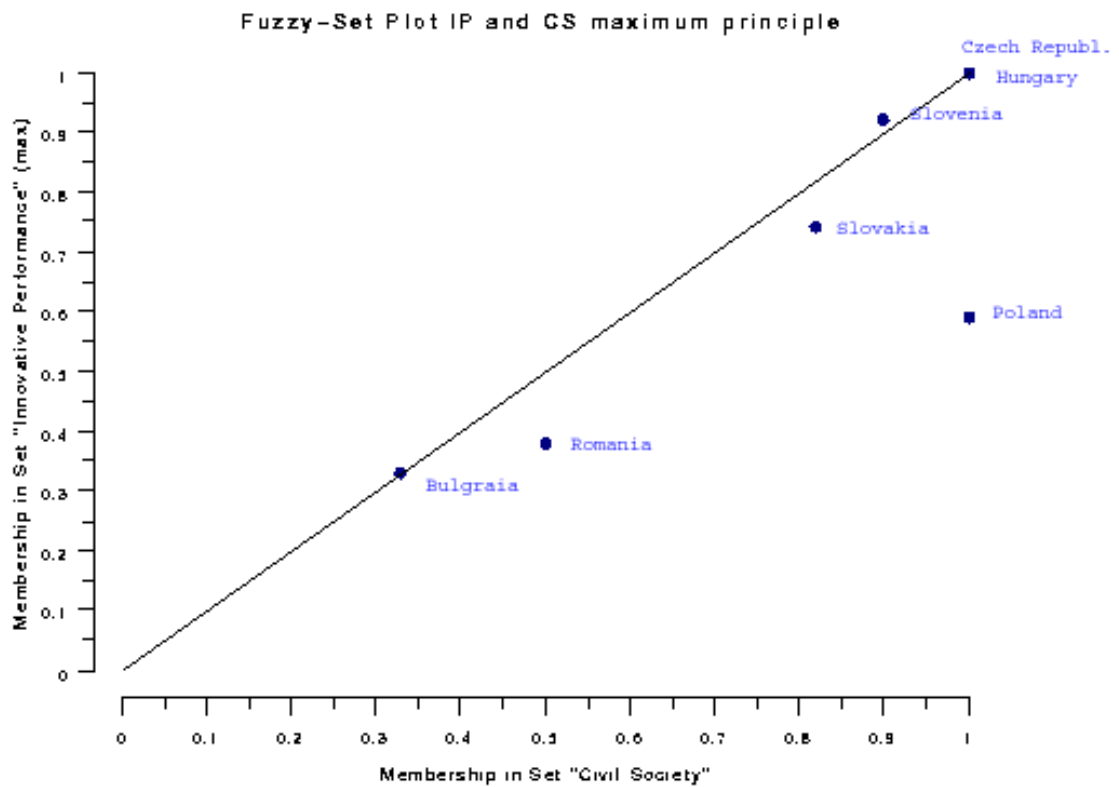
Figure: 1 Fuzzy-Set Plot Innovative Performance and Civil Society (minimum principle)



(all Fuzzy-Set Plot diagrams are done by Ragin & Drass 2002 fs/QCA 0,963 software)

In Figure 1 do six of the countries group similar according to a linear pattern, only Romania falls out of this pattern with a very low score on Innovative Performance even though a better score in the set of civil society. This minimum principle set is weaker the following maximum set (this will be explained below in chapter 5).

Figure: 2 Fuzzy-Set Plot Innovative Performance and Civil Society (maximum principle)



When looking at Table 2 it is possible to see a clear tendency for the countries to group around ascending pattern. Only Poland falls out of the picture, probably due to internal diversity and size. Poland is by margin the biggest country of all country cases.



Figure: 3 Fuzzy-Set Plot over Civil Society and Geographic Score

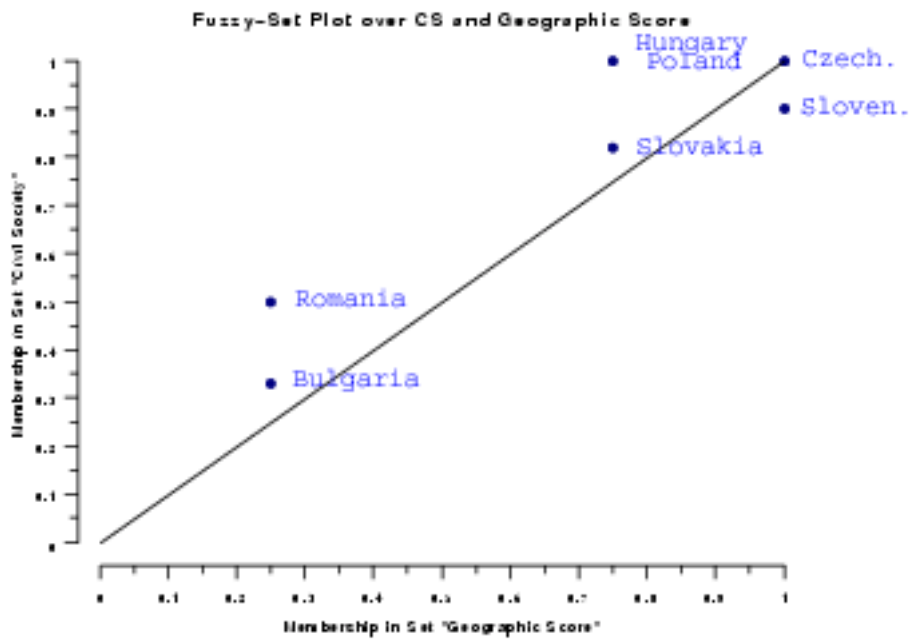


Figure: 4 Fuzzy-Set Plot over Innovative Performance and Geographic Score

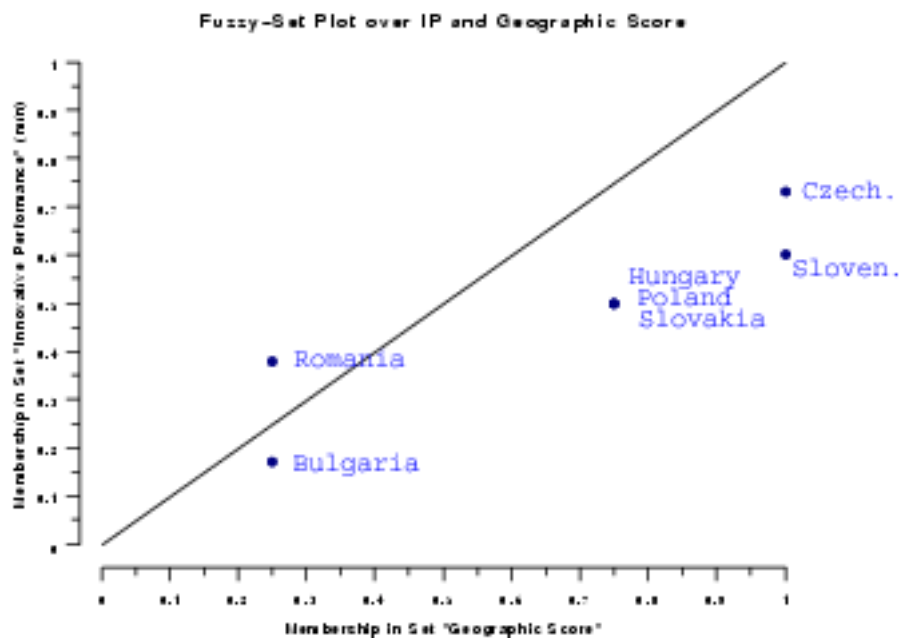


Figure 3 and 4 shows the underlying explanation of geopolitical position on both innovative performance and civil society. The results are almost identical only a parallel downward movement from civil society to innovative performance related to geographic score.

## **8.1. The Irish example as an explanation and an uncertain promising future**

Drawing some attention to the success of Irish economy and the “Celtic Tiger” itself can probably help us to see an explicit plausible explanation and future hopes for the whole set of our country cases, but more for Bulgaria and Romania than to the rest. It is of course substantial differences between Ireland and the CEE countries, but it is far to interesting to not be presented. Ireland was the poorest of western European democracies throughout the 20<sup>th</sup> century. Mjøset (1992: 9) has pointed to the Irish poor performance as being partly explained by the close economic linkage to Great Britain, or as a free rider on the British declining industrial and economical power throughout the 20<sup>th</sup> century. The opposite of this disadvantage has been the advantage of being linked to the German industrial and economical miracle the last century as for example Austria and Switzerland.

Bulgaria and Romania has never been really linked to the German or any other successful economy in modern history. These two countries have had negative economical and industrial connections with Turkey and Russia (Soviet Union).

The recent Irish success gives hope for these countries lagging behind in economical terms. Ireland has gone from being a poor laggard country to becoming a good example of a country with a modern industry and a high innovative performance. It is possible that foreign investments and educational improvements together with the EU membership has helped them to create a good Irish situation and to change their external linking's from being totally dominated by the UK to a more balanced situation where of course the EU and the USA are more important. In the 1970s did the Industrial Development Authority (IDA) in Ireland identify the sectors of pharmaceuticals and electronics as the most promising future for foreign investments in Ireland (Kearns & Ruane 2001 : 229-30). From the Irish peripheral view it was only possible to have a comparative advantage in more or less weightless goods (Görg & Ruane 2000: 417). This strategy has been a true success because foreign MNCs in the high tech sector that has settled in Ireland has brought with them not only production but also R&D and these firms employ more people and seems to have a long time horizon for their Irish presence (Kearns & Ruane 2001: 227-244). The same paper shows negative employment figures for investments in traditional industry.

Or was just Ireland a lucky example? Fagerberg & Verspagen (2002: 61-6) shows that we have a situations of different speeds inside the EU. These different speeds are classified as three growth clubs determined according to the regional level of growth and unemployment: intermediate growth-high unemployment, low growth-intermediate unemployment and high growth-low unemployment. The whole result is not going to be presented here, but the high growth-low unemployment growth club is very similar to the earlier mentioned city-belt.<sup>20</sup> It is argued that EU support to R&D and investments only helps when the rate of unemployment is below a certain threshold level. This seems to be in line with the fact that unemployment has a dysfunctional effect on the social system (Genov 1999: 32). In regions where high unemployment rates are most manifest as for example in southern Italy these contributions are ineffective. The European convergence of income and productivity come to an end during the 1980s. Another uncertain suggestion is that the benefit of a close linkage or belonging to a geopolitical advantaged area is declining because consumer economy is more important than the power triangle of universities, government and military (Schroeder & Swedberg 2002: 390).

The CEE-7 has probably no other alternative than to try to copy the Irish success. If they can find comparative advantages as the industrial planners did in Ireland during the 1970s there is certainly a possibility for positive development. If such a comparative advantage is identified by industrial planners it is important that these plans can find suitable channels to result in industrial policies emphasising industrial functions and not vanish into patron/client relations

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<sup>20</sup> Regional Growth Clubs (Fagerberg & Verspagen 2002: 65-6). Regional scores in unemployment are 1 (high) .2 (intermediate) and 3 (low) when Belgium, France, Germany, Italy, Netherlands and the UK are evaluated.

**Germany 3:** Nordrhein-Westfalen, Hessen and Rheinland-Pfalz

**Italy 3:** Piemonte, Valle d' Aosta, Liguria, Lombardia, Trentino-Alto Adige, Veneto, Friuli-Venez. Giulia, Emilia-Romagna, Marche and Abruzzi.

**France 3:** Région Parisienne, Centre, Alsace, Franche-Comte, Limousin, Rhone-Alpes and Auvergne.

**Germany 2:** Niedersachsen , Bremen , Bayern and Berlin.

**UK 2:** East Midlands , East Anglia , South East and South West

**Italy 2:** Toscana , Umbria and Lazio.

**France 2:** Picardie , Basse Normandie , Bourgogne , Nord , Lorraine , Pays de la Loire , Bretagne , Poitou-Charentes , Aquitaine and Midi-Pyrenees .

**Germany 1:** Saarland and Baden-Wurtemberg .

**UK 1:** North , Yorkshire-Humberside , West Midlands , North West , Wales , Scotland and Northern Ireland .

**Italy 1:** Campania , Molise , Puglia , Basilicata , Calabria , Sicilia and Sardegna .

**France 1:** Champagne and Langedoc-Roussillon .

**Netherlands 1:** Noord , Oost , West and Zuid .

**Belgium 1:** Vlaanderen and Wallonie.

No figures available (**na**): Germany: Schleswig-Holstein , Hamburg . France: Provence-Côte d'Azur , Corse . Belgium: Brussel .

between politicians and existing industrialist lobbies. Piattoni (2001: 14) and Verdier (1995) shows that this logic exist; state subsidies goes often not to industrial structuring and technological innovation, but is used for politicians to stay in power by purchasing support from industrial lobbies. This is the risk if not the civil society is enough developed, or as Verdier says: “*politicians maximize their chances of staying in power through the deliberate use of subsidies to structure the political debate and embed factor owners into stable policy networks*” (Verdier 1995: 5).

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***All sources are given in this Master Thesis.***

## Appendix A – Maps

### Bulgaria:



### Czech Republic:



**Hungary:**



**Poland:**



**Slovakia:**



**Slovenia:**



**Romania:**

