

Contents

<u>1. Introduction</u>	3
<u>2. History of the Regional Policy in EU</u>	6
<u>2.1. Free Trade Era from 1958</u>	8
<u>2.2. European Regional Development Fund 1975</u>	10
<u>2.3. Single European Act and 1988 ERDF Reform</u>	12
<u>2.4. Treaty on European Union 1992</u>	16
<u>2.5. Agenda 2000</u>	18
<u>3. EU Structural Funds</u>	20
<u>3.1. Structural Funds' programmes</u>	22
<u>3.2. Community Support Framework</u>	25
<u>3.2.1. The transmission mechanism</u>	28
<u>3.3. Operations co-financed by the Structural Funds</u>	30
<u>3.4. Structural Funds</u>	33
<u>3.4.1. Eligibility and co-financing rates</u>	33
<u>3.4.2. Management and monitoring</u>	35
<u>3.4.3. The annual implementation report</u>	36
<u>3.4.4. Programme adjustment</u>	37
<u>3.4.5. Monitoring committee</u>	38
<u>3.4.6. The Fund's allocation</u>	39
<u>3.4.7. Control Systems</u>	40

<u>4. Econometric models and analyses of National and Regional</u>	
<u>Convergence in Member States of EU</u>	41
<u>4.1. Convergence vs. divergence</u>	42
<u>4.2. Measuring of convergence</u>	45
<u>4.3. Income distribution inequality</u>	48
<u>4.4. Real convergence</u>	56
<u>4.4.1. Measuring of β-convergence</u>	57
<u>4.4.2. Measuring of σ-convergence</u>	62
<u>5. Conclusions</u>	66
<u>References</u>	69
<u>Appendix</u>	73

1. Introduction

Regional policy is one of the most important policies of the European Union, based on financial solidarity. It permits the transfer of over one third of the Union's budget, which basically comes from rich Member States, to the least favoured regions and social groups. It was the existence of disparities between regions of each Member State and, furthermore, between regions across the EU, that pushed the policymakers to establish common regional policy. First operations towards reduction of regional disparities started in 1960s through support of industrial and rural areas in decline and reduction of long-term unemployment. Since establishing the Single Market and later (and more important) the Economic and Monetary Union, there was a rising interest in measuring and diminishing disparities between countries and regions - especially in the less developed economies.

The aim of this paper is to examine the regional policy within the European Union at both national and EU level. I focus on economic growth and on relative per capita Gross Domestic Product (GDP) levels of the European Union, its Member States and its regions. Regional GDP is currently the key and most widely used indicator of wealth. This study observes, whether there is present real convergence between Member States and its regions in terms of real income within European Union. The reason for measuring real convergence is the unequal evolution of regions and their growth over the years. It is even more challenging in these days, when the Eastward enlargement is just about to take place¹. Hence the Candidate countries are generally less wealthy with unsatisfactory legislative framework, it is a great challenge for Union's regional policy to concentrate on diminishing such structural imbalances and thus avoiding major disturbances inside the Union, possibly leading towards economic recession².

¹ On April 1st 2004 ten Candidate countries (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovenia, Slovak Republic) will join the present EU15 to form EU25.

² According to the European Commission, after the association of ten Candidate countries in 2004, the Union's area will increase by 34 per cent, its population by 29 percent, while its GDP will rise only by 5 per cent.

The most essential instruments for fulfilling aims of regional policy are certainly the Structural Funds. It is a very effective way of reducing gaps in levels of development and living standards between regions of EU. Its main aim is to enforce regional cohesion in Europe. They strive to reduce the development disparities across regions, to regenerate industrial and rural areas that are in decline, as well as to reduce long-term unemployment. Structural Funds are mainly allocated to infrastructural projects, the improvement of the productive environment and human resources. They consist of four special Funds: the European Regional Development Fund, the European Social Fund, the European Agriculture Guidance and Guarantee Fund – its guidance section, and Financial Instrument for Fisheries Guidance.

The first Chapter of this study is dedicated to the formation and evolution of common regional policy. It makes an overview of what has happened in Europe during last half a century from creation of European Economic Community in 1958. This period is specific with lack of regional policy, mainly due to homogeneity of first six members. Situation changes after first enlargement in 1973, when serious regional problems start to occur. As a consequence European Regional Development Fund is being established in 1975 as the most important component of the Structural Funds. In 1986 the Single European Act lays the base for reform of the Structural Funds (1988), necessary to realize Single Market. Such reform is also forced by joining of laggard Spain and Portugal. Next stage of regional policy evolution is associated with establishment of Cohesion Fund by the Maastricht Treaty. This is to support Ireland, Portugal, Spain, and Greece and prepare them for the Economic and Monetary Union. The last section is about development of European policies into the new Millennium. This is signed under Agenda 2000, where new Objectives of support are created, as well as, support for Candidate countries.

Next Chapter concentrates on Structural Funds – the most effective instrument of cohesion. Firstly I describe Single Programming Documents (SPD), Operational Programmes (OP), and Community Support Frameworks (CSF) – the essential programmes for Structural Funds expenditures. So far three continuous CSFs were laid down to decrease income differences across EU regions: first one for period 1989-1993, second for 1994-1999, and the present one for 2000-2006. Following parts of this

Chapter explain the technical functioning of Structural Funds in practise: eligibility, co-financing rates, management and monitoring, annual implementation report, adjustment of programmes, monitoring committee, allocation, and control system.

In Chapter 4 I try to solve the problem of real convergence; moreover whether or not convergence occurs in states and regions of EU. Testing for real convergence over period of years has become a key task of economic research, with implications for regional, national and EU policies. It investigates whether poor regions catch up with the rich ones. First, I review the theoretical concept of convergence and then I try to reach some empirical conclusions.

In the economic literature, there are two distinct positions relative to the process of regional growth and the catching up hypothesis. The first is the theory of regional convergence, suggesting long-run convergence of the real economies, while higher integration attenuates the initial regional disparities. Consequently, there are additional reasons for a faster integration in the EU through the establishment of the monetary union. The second is the theory of regional divergence, which argues that a higher integration towards a single currency increases factor mobility, which can be in favour of the prosperous regions. We can find different approaches and elaborations, based on these assumptions, for testing the relation of European Structural Policy and convergence of the Member countries.

In the empirical part of this Chapter I ask question, whether there is evidence of convergence in EU both on Member State and regional level? And if so, which of them is faster? To answer these questions I firstly measure regional disparities, using rank, Gini and Theil indexes and secondly I use the regression analysis for measuring beta-convergence. To get more overall view I count then the standard deviation of GDP per head to get the sigma-convergence.

The last and concluding Chapter should answer my questions.

2. History of the Regional Policy in EU

European regions could be defined as economic, cultural and historical units with certain form of self-governance and decentralization. Because their definition varies from country to country, they differ in terms of size, population, economic progress, infrastructure, unemployment rate, etc. This makes the EU very diverse and heterogeneous community where supranational regional policy is such difficult task. Only the smallest state with a developed range of public policies could operate without regional or local structures of government. However, the present form of the EU regional policy is not a matter of one document or treaty, which would create the correct framework. It is a long lasting half-century process full of obstacles, which started from the very beginning of Community creation.

In this chapter I divided last half-century of regional policy development into four different phases as the time went on and the common regional policy formed.

The time from establishment of European Community in 1957 to establishment of European Regional Development Fund in 1975 is typical with lack of common regional policy. We can hardly speak about any tendency towards regional policy creation.

First apparent regional policy phase begins in 1975, when European Regional Development Fund came into force. The European Community carries out a substantial reform of the Community budget in order to accelerate economic development in the regions lagging behind. These actions are aimed at strengthening the factors that are thought to be playing a decisive role in promoting growth and competitiveness and help to reduce economic disparities within the European territory (Tsoukalis, 1993).

Second phase starts in 1988, while support of economic and social cohesion remains the key objective of the EU. The reform of instruments to fulfil this objective are the European Structural Funds, namely the European Regional Development Fund (ERDF), the European Social Funds (ESF), and the European Agricultural Guidance and Guarantee Fund (EAGGF), aiming at promoting growth and transferring income to the backward regions.

The start of third phase is dated by 1992 Treaty on European Union, where most important was the establishment of Cohesion Fund to support poorest Member States on

their way towards European Monetary Union and also creation of Financial Instrument for Fisheries Guidance (FIFG).

And finally last phase has started with document called Agenda 2000, presented in 1997, dealing with eastward enlargement. Let us take a look at each of these phases.

2.1. Free Trade Era from 1958

Since the establishment of *European Economic Community* in 1958, Member States realized that big differences between its regions are destructive factors for future of Community. The Treaty of Rome refers in its preamble to the need “to strengthen the unity of their economies and to ensure their harmonious development by reducing the differences existing between the various regions and backwardness of the less favoured regions”.

The Treaty establishing the European Community (called the Treaty of Rome) did not explicitly create a requirement for creation of common regional policy. And that is mainly because of strong belief in free market forces, which were supposed to deal with such regional imbalances. Anyway we can find some articles about regional policy in the Treaty, like article on special treatment for different agricultural regions, state aid support for regions with low standard of living or high unemployment rate.

The Treaty also established *European Investment Bank* (EIB) with its Article 130. That was quite an important step because EIB could finance projects for less developed regions and also provide loans and guarantees for projects in such regions. Another important step towards active regional policy was the establishment of *European Social Fund* (ESF), which should help improve employment opportunities in the internal market and contribute thereby to raising the standard of living and also strengthening economic and social cohesion. It was to support mobility of labour force mainly through requalification. *European Agricultural Guidance and Guarantee Fund* (EAGGF) and its tendency to increase living standards in agricultural regions was another sign of increasing role of regional policy in the Community. Unfortunately its Guidance section operated with only 5 per cent of total budget for agricultural policy. Also the *Common Agricultural Policy* (CAP) was created to increase living standards in agricultural regions. The Treaty also gave the right to the European Commission to monitor regional policies of Member States.

At this stage of integration, when nearly all Member States were economically homogenous (except for Italy – its southern part Mezzogiorno showed much worse results compared not only to the rest of the Community, but also to the rest of Italy –

which had a special protocol attached to the Treaty of Rome), there was not much of real interest in active supra-national regional policy. During the 60s the differences between regions even decreased mainly thanks to boom in European economy characterized by rapid economic growth, high employment rates, and relative monetary stability. It is worth noting that regional policy on national level was very developed at this stage. Governments of Member States were seriously involved in income redistribution even in times of prosperity.

An interest in supra-national regional policy came in 70s with first enlargement of the Community in 1973. Three new Members - United Kingdom, Ireland and Denmark – brought serious regional problems within the EC. Member states admitted necessity for regional policy in terms of strengthening of social and economic cohesion. This was followed by agreement to establish *European Regional Development Fund* (ERDF) to redistribute part of the Member States' budget contributions to the poorest regions, to promote economic and social cohesion by correcting the main regional imbalances and participate in the development and conversion of regions (Evans, 1999).

As a consequence of Community's enlargement was the Thompson report from 1973. It identified 2 basic types of problematic regions:

- Agricultural peripheral regions (like Mezzogiorno or Ireland), where was a long-run structural unemployment and serious agricultural dependence.
- Regions with high share of output coming from declining industries with high unemployment rate. Characterized by slow restructuring process and long-run structural unemployment (several UK regions).

2.2. European Regional Development Fund 1975

The European Regional Development Fund - subsequently the most important component of the Structural Funds - came in progress in March 1975. It was created at Britain's behest, as a mechanism to compensate the United Kingdom for its significant budget contributions on Common Agricultural Policy. The aim of ERDF was not to replace national regional policies of Member States, but to financially support these national programs. In first years the Fund operated with only small amount of money and distributed its aid between Member States through fixed quotas by four following criteria:

- Support for countries with GDP per head below average of Community
- Support for countries with regions highly dependant on agriculture or industries in decline
- Support for countries with regions with high rate of unemployment and/or emigration from such regions
- Support for countries where free trade policy had negative effect on its regions

This meant that the support from ERDF was coming automatically. Member State just had to present its regional projects to the Commission. The Community reacted on initiatives of Member states. Each Member State could then distribute this aid between its regions in their own way. Less than 5 per cent of the Community's budget was initially devoted to this Fund. The main emphasis was, however, on infrastructural investment (about 85 per cent of total expenditures for projects for the period 1975-1988). There was also a clear redistributive bias in favour of countries with more severe regional problems and an increasing concentration of resources on the least developed regions (Tsoukalis, 1993).

Little change came in 1979, when 5 per cent of total expenditures were set apart as a non-quota element, allocated at the discretion of the Commission. At the same time higher coordination of national policies was reached as a result of requirement of *National Development Plans*.

ERDF was very criticized and that is why another reform had to come. That was in 1984 when quotas were replaced with initiative ranges for each country's allocation of funds. Intermediate changes in terms of country allocation were introduced in 1981 and 1986 as a result of second and third enlargement. From that time on, all financial sources were counted for 3-year period. The Fund was covering up to 55 per cent of national expenditures on regional projects (Evans, 1999). Another aim of this reform was to coordinate regional policy of Member States with other Community's policies effecting regions and their development (environment, agriculture, etc.).

2.3. Single European Act and 1988 ERDF Reform

The decision to establish the internal market (1992) signed in *Single European Act* (SEA) in 1986 was a catalyst for main reform of Structural Funds in 1988. The ERDF was given Treaty status with the passage of the SEA, which included a new title on 'Economic and Social Cohesion' stating that the Union 'shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas' (Article 130a of the Treaty). SEA also calls for coordination and rationalization of Structural Funds. The reform had a lot to do with accession of Spain and Portugal in 1986 with their economy levels far below Union's average and so the gap between the richest and poorest regions even widened. Another reason was bad economic environment of 80s with high rates of unemployment basically all around the Community but mainly in regions with high concentration of traditional industries like steel, textile or coal mining (Tsoukalis, 1993).

The reform of the Structural Funds started with the agreement of European Council in February 1988 with doubling resources of European Regional Development Fund, European Social Fund and European Agricultural Guidance and Guarantee Fund (its Guidance section). This decision was part of a package of measures known as *Delors Package*, including the reform of Common Agricultural Policy and the EC budget. It was a radical change for future development of regional policy. Its main aim was to increase its effectiveness through coordination of operation of Structural Funds, European Investment Bank and other financial instruments (Council Regulation (EEC) No. 2052/88 of 24 June 1988). Four basic principles were set out in the new regulation governing the Structural Funds:

□ **Concentration**

This principle intended funds to be concentrated in the most disadvantaged regions. There were identified fundamental priority Objectives:

- Objective 1** promoting development and structural adjustment of regions whose development is lagging behind;
- Objective 2** converting the regions, frontier regions, or parts of regions (including employment areas and urban communities) seriously affected by industrial decline;
- Objective 3** combating long-term unemployment;
- Objective 4** facilitating the occupational integration of young people;
- Objective 5a** speeding up the adjustment of agricultural and fisheries structures in the framework of the reform of the Common Agricultural Policy
- Objective 5b** facilitating the development and structural adjustment of rural areas; and
- Objective 6** for development of areas with extremely low population (established after joining of Sweden and Finland - as well as Austria - in 1995)

Table 1 shows eligibility for each Objective as a share of population in period 1994-1999. We can see that Objective 1 aid is used by one quarter of Union's population, with Ireland, Portugal, and Greece being eligible in all of their regions. On the other hand Denmark, Finland, Luxembourg, and Sweden are not eligible for Objective 1 at all. Finland and Sweden are the only drawing from Objective 6. Finally we can see that more than 186 million inhabitants of European Union, which presents nearly 51 per cent of the whole population within this area, are using money from Structural Funds.

□ ***Programming***

This principle referred to the abandonment of a short-term project-to-project approach and its replacement by multi-annual programmes of three or five years. The aim was to move towards more effective and coherent policy-making. This involved a three-stage planning procedure with a plan submitted to the Commission from the appropriate member state which would be responded to as 'Community Support Framework' before being implemented as 'Operational Programme' (Cram, Dinan, Nugent, 1999).

□ ***Partnership***

This concept was intended to lead to closer cooperation between different levels of government - the Commission, national and regional authorities both at the planning and implementing stage, thus also establishing direct lines of communication between regional authorities and the EC Commission. Through the creation of *Monitoring Committees* (bodies bringing together all national, regional and local partners with the European Commission to implement the agreed policy priorities) in the eligible regions the scope for regional and local aid increased.

□ ***Additionality***

This meant that Structural Funds should be additional to, and not simply a substitute for, existing or planned domestic investment. That is, Member State governments should not use Funds to replace national funds that they would have spent anyway (Cram, Dinan, Nugent, 1999).

Table 1: Percentage of inhabitants of Member States eligible for Objective 1, 2, 5b, 6, and total amount in period 1994-1999

Member State	Objective 1	Objective 2	Objective 5b	Objective 6	Total
Belgium	12.8	14.0	4.5	-	31.3
Denmark	-	8.8	7.0	-	15.8
Finland	-	15.5	21.5	16.6	53.6
France	4.4	25.9	17.3	-	47.6
Ireland	100.0	-	-	-	100.0
Italy	36.6	10.8	8.4	-	55.8
Luxembourg	-	34.2	7.8	-	42.0
Germany	20.7	8.8	9.6	-	39.1
Netherlands	1.5	17.3	5.4	-	24.15
Portugal	100.0	-	-	-	100.0
Austria	3.5	8.2	28.9	-	40.6
Greece	100.0	-	-	-	100.0
Spain	58.2	20.3	4.4	-	82.9
Sweden	-	11.0	8.6	5.0	24.6
United Kingdom	6.0	31.0	4.9	-	41.9
EU in %	25.0	16.4	8.8	0.4	50.6
EU in million inhabitants	92.151	60.459	32.748	1.292	186.65

Source: European Commission (1996)

2.4. Treaty on European Union 1992

The Treaty on European Union signed in Maastricht on February 1992 (coming in force on November 1993) promoted economic and social cohesion as one of Union's tasks within the context of the accomplishment of the internal market and of reinforced cohesion and environmental protection. The Union commits itself to concentrate mainly on reducing disparities between its regions with great accent to less developed regions including agricultural areas.

Maastricht Treaty added two elements to the institutional system of EU, which are very coherent with regional policy. First the *Committee of Regions* was formed to enable regional and local bodies to participate in decision-making process of the European Union. Their main scope was within five Community policies: education, culture, health care, trans-European networks, and economic and social cohesion (Cram, Dinan, Nugent, 1999). The function of the Committee is purely advisory. The second element was much more important. Change in Article 130a established the *Cohesion Fund* to support projects focused on creation of trans-European networks and environmental protection. Two conditions must be fulfilled: first, the GDP per head of Member State must be less than 90 per cent of the Union average; second, there must be a programme leading to the fulfilment of the conditions of economic convergence, as set out in Article 104c of the Treaty. In effect, the Fund was designed to assist Ireland, Portugal, Spain, and Greece in meeting the economic convergence requirements for participation in the third stage of monetary union (Evans 1999).

In February 1992 the Commission presented second *Delors package*. The aim was to agree on the main budgetary guidelines for the next five years (1993-1997). It called for more flexibility in the planning and implementation stages, more decentralization towards the regional level, more money for Community Initiatives, higher EC participation rates, especially in cases of budgetary constraints linked to the convergence effort undertaken by member countries, and the extension of EC action into new areas, such as health and education (Tsoukalis, 1993).

On behalf of these proposals, another Structural Funds reform was to be made after the Edinburgh Summit in December 1992. Minor changes were made, but the

basic structure created in 1988 was maintained. One of the changes was creation of sixth eligibility Objective to support regions with extremely low population density, unfavourable climate, and peripherality. This *Objective 6* was directed to northern regions of Sweden and Finland also called Arctic and sub-Arctic regions. Another one was the additive help for fishing areas – *Financial Instrument for Fisheries Guidance (FIFG)*. Such funding sought to ensure that specific problems of the fishing industry were taken into account more effectively than previously possible. It is not a Structural Fund as such, but finances structural actions in the fisheries sector within the framework of Structural Fund programme. To help with the conversion and diversification of their economic fabric, most of the areas dependent on fishing can also apply for funding from the European Regional Development Fund (ERDF) and the European Social Fund (ESF).

The regulations for reform covered the period 1994-1999. In this six year-period, around 51 per cent of the EU population lived in a region eligible for European regional support (whether under Objectives 1, 2, 5b, or 6) (Cram, Dinan, Nugent, 1999). Total amount of 141,471 billions ECU (in 1992 prices) was provided for structural instruments for this period. That is the year's average of 25 billions ECU from 1993 to 1999, compared to 13 billions ECU from 1988 to 1992 (European Commission, 2001).

2.5. Agenda 2000

The European Commission presented a Communication entitled *Agenda 2000: For a Stronger and Wider Europe* in July 1997. It constituted an ambitious, single framework for the development of European policies into the new Millennium, including preparations for the accession of the countries of Central and Eastern Europe. But it also consisted of agricultural reform, reform of Structural Funds, and specification of the finances necessary over this medium term (European Commission, 1997).

Agenda 2000 sets new priorities of economic and social cohesion. It consists of a series of complementary reforms responding to the future challenges associated mainly with the forthcoming enlargement. It is a strategy for strengthening growth, competition and employment, strategy for modernization of key policies and Union's enlargement. In March 1998, the Commission published its proposal for the reform of the Structural Funds. However, it did not propose a dramatic increase in the share of EU resources allocated to the Structural Funds, as had been the case at the time of previous reforms. It proposed, that the ceiling of 0,46 per cent of Union's GDP (which has been set for economic and social cohesion expenditure in previous period 1994-1999) should be maintained for the period 2000-2006. So that the total amount of Structural Funds directed to recent Member States should be presented by 195 billion Euros for the period of 2000-2006 as the Berlin Summit conclusion explains, compared to 163 billion Euros in previous 1994-1999 period (all in 1999 prices). Only amount of 40 billion Euros was set apart for potential new members, mainly due to the date of enlargement (between 2003 to 2006).

The Commission clearly signalled its intention to concentrate eligibility for European regional policy resources upon the most needy regions. Commission proposed that a number of regions should see their eligibility phasing out, so that by 2006 the ERDF would cover only 35 to 40 per cent of the EU population (Cram, Dinan, Nugent 1999), against 51 per cent currently. To help achieve the greater concentration of expenditure, the Commission proposed a strict application of the GDP criterion for

Objective 1 by which assistance would only go to regions with GDP per capita less than 75 per cent of the Union average.

The main reason for such precautions was certainly associated with the forthcoming eastward enlargement. In fact most of the new Members' regions will be eligible for Structural Funds. This proposal proved to be most controversial of the Commission's reform.

Another element of that reform was a radical simplification of the Structural Funds. The number of Objectives was reduced from six (actually seven, because Objective 5 had a and b part) to just three:

- ***New Objective 1***.....promoting development and structural adjustment of regions whose development is lagging behind (no change for this Objective; regions currently eligible under Objective 6 shall be integrated into Objective 1)
- ***New Objective 2***.....supporting the economic and social conversion of areas facing structural difficulties (this Objective brings together Objective 2 and 5b and extends them to cover other areas facing the same problems due to a lack of economic diversity)
- ***New Objective 3***.....supporting the adaptation and modernization of education, training and employment policies and systems (brings together Objectives 3 and 4. It should assist regions throughout the EU except those covered by Objective 1)

Other simplifications proposed included a radical revision of the way in which finances were paid to Member States and regions, and a reduction in the level of detail to be included in the formal regional policy 'contracts' between the Commission, Member State and regional partnership (Cram, Dinan, Nugent 1999).

Even though the Commission's proposals received a mixed reception, heads of governments reached agreement on the *Agenda 2000* reform programme in March 1999. The total spending was to be reduced from 29,4 billion Euros (1999 prices) in 2000 to 26,7 billion Euros (1999 prices) in 2006 and EU regional policy and funding forced to become more concentrated, simplified, and decentralized.

3. EU Structural Funds

One of EU's main pillars is to support less developed regions to reduce the disparities in income differences and living standards among the Member State's regions. Disparities between EU regions existed from the very beginning of Communities creation. And they became even more apparent with the accession of countries as Ireland, Greece, Spain or Portugal. The education of such social and economic regional differences and promotion of EU development is one of the aims of the EU Regional Policy. It is implemented with the help of the Structural Funds and the Cohesion Fund.

The EU Structural Funds assist the regions undergoing difficulties in adapting to the changing economic and social conditions. Projects financed under the Structural Funds help problematic enterprises and their employees take on different, more sustainable activities. Another aim is to increase the economic effectiveness of the branches of economy undergoing crisis so that they could resist the competitive pressure. For example, unemployed persons are trained to acquire qualifications, which are in demand. However, the Structural Funds do not finance passive social policy measures (like unemployment benefits, etc.). It also promotes solidarity by demonstrating that membership provides benefits all round as well as imposing costs. The drawback here is, however, a conflict with the aim of concentration of support. All 15 Member States receive some transfers from the Structural Funds, even though for many of them the net receipts are negative.

The Structural Funds are widely considered to be a useful policy instrument, although part of their attraction is that they are simply an alternative to national resource transfers. The Structural Funds are a form of co-finance, which must always be supplemented with national funding, whether public or private. Its aim is to enhance economic and social cohesion and to improve the structural imbalances across the EU, by supporting projects, which create investment and jobs, improve infrastructure, and enhance economic and social development (European Commission, 2001). It is the EU's most significant funding mechanism accounting for around a third of the total EU budget. They namely are: European Regional Development Fund (ERDF), European

Social Fund (ESF), European Agriculture Guidance and Guarantee Fund (EAGGF)- its guidance section, and Financial Instrument for Fisheries Guidance (FIFG). The Funds' contributions have grown from 8 billion Euros per year in 1989 to 32 billion Euros per year in 1999. They should remain at about 28 billion Euros per year in period from 2000 to 2006 or 195 billion Euros over total seven years (at 1999 prices).

There is also a special Fund dedicated to countries with low-income level (Spain, Greece, Ireland and Portugal, as mainly their transport and environmental infrastructure remain inadequate). This is the Cohesion Fund, whose resources amount to about 2.5 billion Euros per year from 2000 to 2006, for a total of 18 billion Euros (at 1999 prices)³. This was formed mainly to diminish (or shrink) growth rates between Member States⁴.

The size of these budgets granted by the Council and the European Parliament is due to the persistence of large economic and social disparities within the European Union. Even though these discrepancies have been reduced, at the end of the 1990s the 10 most affluent regions still had a per capita GDP over three times that of the 10 poorest regions, and the unemployment rate in the 10 worst off regions was over seven times that in the most favoured regions (Solanes, Dolores, 2001). Yet under the Treaty establishing the European Community, economic and social cohesion is just as fundamental an objective as the single market or economic and monetary union (Articles 158 and 160 of Treaty). The extent of the problems makes the task particularly hard, and the purpose of the Union's assistance is to support the efforts that states are already making through their own regional development policies.

³ For instance, over the period 1994-99, gross receipts from Structural Funds to so-called Cohesion countries amounted to nearly 4 percent of GDP for Portugal, 3,7 percent for Greece, 2,8 percent for Ireland and 1,7 percent for Spain (European Commission, 1996).

⁴ All these numbers for both Structural Funds and Cohesion Fund are taken from European Union official website <http://europa.eu.int>.

3.1. Structural Funds' programmes

Although the Structural Funds are part of the European Union budget, the way in which they are spent depends on a sharing of responsibilities between the European Commission and the Member State governments. In each Member State, national authorities, the Commission and sub-national actors have different degrees of influence, reflecting factors such as the existence of regional institutions, the allocation of competencies to different levels, the scale of EU funding and administrative experiences of economic development. To further complicate the picture, implementation structures do not stay static but are affected by new approaches to economic development, shifting national balances of power and regulatory change (Evans, 1999). The Commission negotiates and approves the development programmes proposed by the states, and allocates funding. The states and their regions manage the programmes, implement them by selecting projects, and control and assess them. The Commission contributes to monitoring the programmes, commits and pays out approved expenditure, and checks the control systems established.

This Community fund management system is based on the principles of subsidiarity and partnership with a view to delivering prompt and efficient assistance. It nevertheless requires all parties involved to play their part and take their share of responsibility in the implementation of programmes (European Commission, 2001).

Structural Fund expenditure is programmed in three types of documents:

- ❑ *Single Programming Documents* (SPDs),
- ❑ *Operational Programmes* (OPs), drawn up by the national and regional authorities and approved by the Commission, and
- ❑ *Community Support Frameworks* (CSFs) - necessarily connected with each OP.

Two different ways of programming systems can occur:

- The Community Support Frameworks and Operational Programs generally relate to a country, or a group of regions within a country, eligible under Objective 1. The CSFs describe the social and economic context of certain country or region(s) covered by the Structural Funds, set out development

priorities and targets to be attained, and provide for financial management, monitoring, evaluation and control systems (European Commission). The OPs list priorities of a CSF for a particular region or a particular development sector (transport, business, training, support, etc.).

- The Single Programming Documents feature aspects of both CSF and OP. In most cases they involve assistance co-financed by the Structural Funds amounting to less than a billion Euro in an Objective 1 region, assistance in Objective 2 regions or national assistance under Objective 3 and in the fisheries sector (European Commission, 2001).

It is important to mention that the Structural Funds only supplement national or regional financing by the principle of Additionality. This means that no programmes are ever totally covered by the European budget, and that there is always national co-financing from either the public or the private sector.

Each programme is made up of priority themes and measures, although the latter are not described in detail. Taken together, these elements form the development strategy to be implemented throughout the life of the programme. To be eligible for financing under a programme, projects must fit within this strategy.

Depending on their specific nature, the four Structural Funds each finance certain types of projects. The European Regional Development Fund (ERDF) primarily supports productive investment, infrastructure and SME development; the Guidance Section of the European Agricultural Guidance and Guarantee Fund (EAGGF-Guidance section) supports measures for the adjustment of agricultural structures and rural development; the European Social Fund (ESF) supports measures to promote employment (education systems, vocational training and recruitment aids); and the Financial Instrument for Fisheries Guidance (FIFG) supports measures for the adjustment of structures in this sector, and the “accompanying measures” of the common fisheries policy.

Account also needs to be taken of the fact that it may not be possible for all of the expenditure on a project to be financed by the Structural Funds. In principle, the national regulations relevant to government support apply to the Structural Funds, with the exception of certain specific cases provided for by a special regulation. Certain

kinds of plans are simply not eligible for financing from the Community budget. In addition, any expenditure carried out before the date when the Commission receives the request for support cannot benefit from Community assistance (European Commission, 2001). The same applies for expenditures after the final date for eligibility set out in the Funds' decision.

3.2. Community Support Framework

The main objectives of the Community Support Framework include:

- Objective 1:** Promotion of the development and structural adjustment of regions whose development is lagging behind.
- Objective 2:** Supporting the economic and social conversion of areas facing structural difficulties
- Objective 3:** Supporting the adaptation and modernization of education, training and employment policies and systems.

In 1989, the first CSF was approved by the European Commission to cover the period 1989-1993, as a reaction to continual widening of regional disparities right at the doorsteps of successful realisation of the Single Market. The programme provided 37,3 billions ECU (at 1989 prices) allocated to seven countries. Such aid package, in favour of the least developed regions, has sometimes been compared to the European Recovery Programme⁵. In 1992, the second CSF was decided. The Commission's intention was to provide assistance to regions whose development was lagging behind, in view of the third stage of EMU. The second CSF for the period 1994-99 had a total volume of 208 billions ECU (at 1994 prices). It was allocated to Spain, Greece, Ireland, Italy, Portugal, Northern Ireland and Germany. In terms of GDP, the CSF 1994-99 amounted to about 2 per cent of the receiver countries' GDP on average (over 3 per cent of GDP for Greece and Portugal).

Finally, in 1997, a new round of EU structural interventions, the CSF for the period 2000-2006, was decided by the European Commission, arising from the document *Agenda 2000*. The current CSF covers the years from 2000 to 2006 and aims at promoting cohesion during the first period of the operation of the EMU. The EU

⁵ From April 1948 to June 1952 Western Europe received 12 billion dollars of aid, a sum that was equivalent to 2,1 percent of the average of the receiver nations' GDP. Indeed Community grants made available for the five-year period from 1989 to 1993 and the six-year period 1994-99 represent a similar magnitude in terms of GDP.

funds amount to about 1,6 per cent of the cohesion countries' GDP on average - about 3 per cent of GDP for Greece and Portugal (European Commission, 2002). Also, in *Agenda 2000* there is provision for pre-accession EU financing to the candidate Central and Eastern European Countries.

The CSF includes Operational Programmes, which are set in a comprehensive framework. The Operational Programmes have either a national coverage (e.g. Operational Programme for Industry) or a regional coverage. The latter are almost equally important as the national programmes, in terms of allocated funds. The Operational Programmes are financed both by EU - transferring from the Structural Funds - and national sources of the beneficiary country at about equal proportions. Private sector usually does not stay aside.

The development priorities of the programme include the creation of economic infrastructure, the support of productive investment and directly related infrastructure, as well as development of human resources, agricultural and rural development (European Commission). Finally, the CSF aims at developing the regions' growth potential, local development and technical assistance.

Around 30-35 per cent of expenditure is spent on investment in new physical infrastructure like construction, machinery, or equipment (European Commission, 2001). Moreover, if we include the Cohesion Fund, such infrastructure investment represents over 40 per cent of total investment allocated to the Objective 1 regions. There is a substantial increase in infrastructure expenditures for period 2000-2006 – mainly in transport networks - due to increased needs from the cohesion countries.

Nearly a quarter of total expenditures is allocated to human resources. The gradual decline of human resources investment is compensated by the higher priority given to active labour market policies.

And finally, over 35 per cent of total expenditure supports productive investment, including direct aid to industry. It also includes the improvement of access to peripheral regions, and developing research activities for the enhancement of the “information society” which without EU support would not be carried out, due to national fiscal constraints (European Commission, 2001).

The resources of the Cohesion Fund, allocated to countries with GDP per head below 90 per cent of EU average, are distributed between transport and environment at equal proportions. Main accent in transport goes towards investment in railways, while the main goal in environment is to improve wastewater facilities in order to meet obligations imposed by EU directives.

3.2.1. The transmission mechanism

The principal channels through which the CSF affects the economy are usually considered to be the following:

- ***The EU Transfer***

Initially, there is the EU capital inflow of the CSF, which is identified as an autonomous capital flow. This amount is directly reflected in the balance of transfers of the current account.

- ***Demand Side Effects***

The demand effects are of short-term nature and they appear through the usual multiplier process. The demand effects stop with the termination of the Programme. The demand effects are of three kinds:

- The *first* includes financial assistance to public investment (infrastructure investment), including investment to public enterprises. These funds are registered in the Public Investment Programme and are the most important component of the CSF.
- The *second* channel is related to financial assistance for the improvement of human resources and skills. These programmes concern education and training for the upgrading of the labour force and the improvement of the efficiency of enterprises. Their direct short-run effect is to a great extent reflected in the creation of personal incomes through transfers to households. It is also reflected in the improvement of the profitability of enterprises through a direct effect on profits.
- The *third* transmission channel refers to various forms of financial assistance to enterprises for restructuring and the improvement of competitiveness.

- ***Supply Side Effects***

Apart from the demand side effects, the various components of financial assistance through the CSF have also important implications on the supply side of the

economy. These supply side effects stem from an improvement in the productive capacity of the economy and they appear during the implementation and especially after the termination of the programme. They are of a long-run nature and they are induced by improvements in productivity of various sectors through investment in physical and human capital.

For example, the expenditure for the construction of a new road will boost incomes and employment (demand effect). At the same time the construction of the road will increase the productivity of the transport sector. This will result to a decrease in the transport cost which will benefit the other sectors of the economy (supply-side effect).

3.3. Operations co-financed by the Structural Funds

Here is a short overview of the scope of the various funds, which contribute to the European Union's structural policies⁶:

European Regional Development Fund (ERDF)

- In the regions eligible under Objective 1, the emphasis is on catching up: large infrastructure projects essential for economic development, particularly in the context of trans-European networks (transport, telecommunications or energy) and environmental protection (in particular management of water resources), concrete investment in the fields of education and health.
- In the areas eligible under Objective 2, efforts focus on the diversification of economic activities and the establishment of businesses in an attractive setting: rehabilitation of industrial sites and rundown urban areas, opening up and revitalisation of rural areas and regions dependent on fishing (renovation, environmental improvement, investment in infrastructure and equipment, etc.).
- In all disadvantaged regions (Objectives 1 and 2): direct investment in production to create sustainable jobs. Assistance for SMEs and local development: business services (management, market surveys, support for innovation, etc.), infrastructure on a local scale, facilities for local community services, and tourist and cultural activities. Special attention should be given to local employment initiatives and, in particular, those drawing on the experience of the territorial pacts for employment; capacity building in research and technological development; development of the "information society".
- The ERDF also finances the Community initiatives INTERREG III and URBAN II.

⁶ This whole section draws from European Union's official website Inforegio at <http://europa.eu.int>.

European Social Fund (ESF)

- Assistance for individuals in the field of education and training: initial training, apprenticeships, and development of work skills, careers guidance and ongoing training.
- Aids for employment and for self-employed activities. Training for executives and technical staff in research centres and businesses. Exploitation of “new employment sources”, particularly in the social economy.
- Improvement of education and training structures (including through the training of teachers and of trainers), employment services and links with research centres.
- Anticipation of developments in working patterns and employment needs. Equal opportunities for men and women. Projects aimed at combating and preventing discrimination and inequalities of any kind in the labour market are also eligible for Social Fund assistance through the EQUAL Initiative.

European Agricultural Guidance and Guarantee Fund (EAGGF)

- Investment in agricultural holdings: modernisation, reduction of production costs, product quality, the environment, animal welfare, etc.
- Start-up support for young farmers; agricultural training schemes.
- Processing and marketing of agricultural products.
- Forestry and sustainable forest management.
- Miscellaneous measures for the integrated development of rural areas: basic services for residents, renovation of villages, alternative activities (e.g. tourism, and craft activities), maintenance of natural environments, etc.

Rural development projects submitted by local action groups are also eligible for financing under the Community initiative LEADER+.

Financial Instrument for Fisheries Guidance (FIG)

- Renewal of the fleet and modernisation of fishing vessels, adjustment of fishing activity to fish stocks, and socio-economic measures.
- Assistance for small-scale coastal fishing, protection of fish stocks in sea coast areas, fishing port equipment, and fish farming.
- Processing and marketing of products, etc.

3.4. Structural Funds

3.4.1. Eligibility and co-financing rates

While the broad priorities of a programme are identified in co-operation with the Commission in Brussels, the choice of measures and practical projects is the sole responsibility of the Member States.

The programme complement describes in detail the measures already specified and summarised in the programme. These are the measures of interest to the people on the ground, since the individual projects for which they are seeking finance must fit into them. A precise budget is earmarked for each measure, which the programme managers use to finance individual projects.

The “programme complement” is adopted by the managing authority designated by the state, after consulting the partners concerned. This is also the document that specifies how the funds available are to be distributed between the measures and the final beneficiaries.

The level of Structural Fund contribution is not the same for all regions. It is not even the same for all measures within a single programme. In fact, the rate varies first according to the region in which the project is launched and, more specifically, according to the Structural Fund Objective it comes under (European Commission, 2001). Quite obviously, the rate is higher in the regions experiencing greatest difficulties, which are those coming under Objective 1.

The particular ceilings for each Objective of the Structural Fund are set as follows:

- under *Objective 1* a maximum of 75 per cent of the total cost of the project, with the exception of regions within a state covered by the Cohesion Fund, and outermost regions. Such exceptional areas might be covered by EU up to 80 or 85 per cent of this total cost;
- under *Objectives 2, 3* and support for fisheries a maximum support of 50 per cent of the total cost of the project.

Within these ceilings, the financing rates can also vary according to other general criteria such as environmental protection and promoting equal opportunities between men and women. Also, in addition to these general principles, the rate is subject to particular ceilings applying in certain specific cases. Reduced contribution rates have, for example, been established for investments in firms and infrastructure investments generating substantial revenue. With regard to investments in firms, maximum of 35 per cent of the total cost might come from Union's budget under Objective 1 and maximum of 15 per cent under Objective 2. Moreover investments in infrastructure - generating substantial revenue – might be supported up to 40 per cent of the total cost under Objective 1. Again an exception has been made for Cohesion countries, where support can rise up to 50 per cent. Under Objective 2 Structural Funds might finance a maximum of 25 per cent.

The regulations also encourage the use of part of the Community finance in a form other than grants, such as, for example, loans, interest-rate subsidies or venture capital.

3.4.2. Management and monitoring

The detailed management of any programme financed by the Structural Funds is always the responsibility of the Member State. For each programme, the State designates a *managing authority*. It is this authority, which, first of all, adopts the programme complement and then, if necessary, amends it. It also handles the selection of projects, for example through calls for proposals. Thus, this is the authority that local authorities, associations, firms, and other organisations willing to receive support from the Structural Funds must approach.

The managing authority, for instance, is responsible for organising the collection of financial and statistical data on the programme being managed. This information is essential in correct running and monitoring of different operations. The managing authority also deals with publicising the assistance. This means that it must notify potential beneficiaries – and the general public – of the possibilities offered by the programme.

3.4.3. The annual implementation report

Every year, the managing authority (one of its duties) has to prepare so-called annual implementation report of each programme. This document is essential for smooth running of the programme and furthermore for achieving progress in its targets. It is forwarded to the European Commission, which examines the main outcomes of the previous year and monitors the programme's progress. The Commission can, moreover, make observations or request certain changes to the programme.

The implementation reports play a significant part in ensuring sound programming. Their content is precisely laid down in the regulations. They must set out:

- the financial implementation of assistance (with, for each measure, a record of expenditure paid and a record of payments received from the Commission);
- the progress in the implementation of priorities and measures in relation to their specific targets;
- indications of any change in the general conditions which may be of relevance to the implementation of the assistance (socio-economic trends; changes in national, regional or sectoral policies, etc.);
- the steps taken to ensure the effectiveness of implementation (monitoring, financial control and evaluation measures, any adjustments in management, the use made of technical assistance, etc.);
- the steps taken to ensure compatibility with Community policies (notably rules on competition, the award of public contracts, environmental protection, the promotion of equality between men and women, etc.).

3.4.4. Programme adjustment

Most of the programming documents must be adjusted during its authenticity. Implementing a programme can, for instance, reveal certain defects which should be remedied, such as a measure which is poorly targeted or too restrictive, a financial appropriation which is badly distributed between “successful” measures and other less popular ones, the omission of some types of beneficiaries, etc (European Commission, 2001). Moreover, it should be remembered that the programmes are spread over seven years. During this period, major changes can occur in either social, labour or economic situation or market.

The body, which is responsible for such adjustments, depends on the type of adjustment necessary. Generally it is either the *managing authority*, which modifies the programme complement, or the Commission, which acts in agreement with the Member State. None of the adjustment provided by the managing authority has the power to affect the total amount of Structural Fund assistance. If necessary, such adjustment must be decided by the Commission in agreement with the Member State (Evans, 1999).

Even though the need for an adjustment can occur at any time, it is generally common to arise after evaluation of the programme, which must be carried out at mid-term. Similarly, the allocation of the performance reserve to the programmes showing the best results will require adjustments to those programmes.

3.4.5. Monitoring committee

Together with the managing authority, the Member States also set up *monitoring committee* for both *Single Programming Documents* and *Operational Programmes*. The committee's duty is to ensure the quality and effectiveness of the implementation of assistance. The monitoring committee is in close contact with the European Commission – which participates in its discussions in an advisory capacity. The monitoring committee has its specific responsibilities:

- ❑ It strengthens the programme complement and adjustment made to it by the managing authority (it may also request an adjustment)
- ❑ It grants criteria for selecting the operations financed
- ❑ It assesses the progress made towards achieving the specific objectives of the assistance
- ❑ It checks the results of implementation and the midterm evaluation before it is forwarded to the Commission
- ❑ It approves both final and annual implementation reports before they are forwarded to the Commission
- ❑ It approves any proposal to amend the contents of the decision on the contribution of the Funds

Generally speaking, it may suggest to the managing authority any adjustment it considers as necessary to improve the management of assistance.

3.4.6. The Fund's allocation

Programmes financing is based on system of budgetary commitments and payments. The commitments are basically nothing else than financial contracts for allocation of European funds between Member State and Commission. At this stage, there is therefore no “physical movement” of funds. The commitments are paid in annual payments, while the first one is made when the Commission approves the assistance.

The beneficiaries of assistance receive no funds directly from the Commission. They deal with a “paying authority” designated by the Member State. A three-tier system is therefore established, between the Commission, the paying authority and the beneficiaries (European Commission, 2001).

After adopting a programme, the Commission makes a payment on account amounted to maximum of 7 per cent of the total contribution from the Funds. This “advance payment” is intended to get the programme started. It must be repaid, though, if no expenditure is declared within 18 months.

3.4.7. Control Systems

One consequence of the increased decentralisation in programme management is the improvement of management and control arrangements in order to allow verification of the regularity and reality of expenditure at any time (European Commission, 2001). Proper use of funds and assurance that the Union's expenditures are correct and legal is forced by regulations on control systems and management requirements. They also enable the necessary corrections to be made in the event of irregularities.

The responsibility of the Commission is most importantly to verify the effectiveness of the control systems. So it may carry out on-the-spot checks, in collaboration with the relevant Member State, or request the State to carry out these checks (European Commission, 2001). In both cases the Commission examines once a year, together with Member State, the results from the checks carried out as well as the corrective measures already taken, and the financial impact of irregularities.

For such irregularities, corrections must be made by cancelling the part of the funding that was ineligible and, if necessary, recovering undue payments with interest. However, the Member State has the main responsibility for financial corrections. The Commission stays wholly informed of all the irregularities noted as well as of the progress in administrative and financial proceeding.

Corrections by the Commission, on the other hand, are possible where the Member State fails and where there is absence of management and control systems. When this occurs, the contribution of the Fund concerned is withdrawn and may not be used again for other operations in the programme. The financial correction may be limited to the irregularity detected, or extended by extrapolation or at flat rate if the irregularity results from a more general weakness in the management or control system (European Commission, 2001). Corrections are also imposed for irregularities without exact value, like the event of non-compliance with a particular provision of Community law.

4. Econometric models and analyses of National and Regional Convergence in Member States of EU

The issue of cohesion between Member states of European Union has grown to one of major ones in recent years. The growth of its importance started in 80s, while most of the Member states were preparing for Monetary Union, signed under Maastricht Treaty. Between 2000 and 2006 more than 200 billion Euros of structural and cohesion funds are being allocated to Member states (respectively its regions) that lag behind in development, have industries in decline, or deal with other specific problems. This amounts to more than 40% of the EU budget, making it the second largest budget item. Moreover, with the forthcoming Eastward enlargement, cohesion will even gain on its importance. One of most common instruments for cohesion measurement is being the process of real convergence over period of years. Testing, whether real convergence occurs or not became a key task of economic research, which has implications for regional, national and EU policies. Economic convergence has two different faces: nominal and real convergence. Until 1991 member states of the EU were in control of their own monetary and fiscal policies (policy of inflation, interest rate, exchange rate, etc.), which could be used to stimulate regional or national economies. After the Maastricht Treaty, the monetary and fiscal policies of the candidate countries to the EMU were constrained by the need to meet the nominal convergence criteria set out in the Treaty, and so monetary and fiscal policy became the slaves of convergence rather than the tools of demand management (Button, Pentecost, 1999). Hence lagging regions are no longer able to engage in demand-side stimulation, it is very important that the real economies of the member states converge.

4.1. Convergence vs. divergence

Process of real convergence occurs when regions or states with low rate of growth and factor endowment show tendencies of catching-up process with more prosperous ones, mainly through correct policy decisioning. Also opposite, if the growth rate of rich regions is being slowed down in order to diminish differences compared to poorer regions (through industrial decline, for example). A combination of both can work even more efficiently. It is understood as approximation of the levels of economic welfare across the countries, generally proxied by per capita GDP. So, the question of real convergence has to do with the study of economic growth, which in turn has traditionally been approached through an aggregate production function (Martin, Sanz, 2001). Real convergence has, on one hand, been fostered by the Single Market, but is, on the other hand, potentially handicapped by the single currency (Meeusen, Villaverde, 2002).

We can find lots of empirical studies on real convergence, mainly from the 90s. Two principal mechanisms of real convergence can be distinguished with very different predictions. On one hand, there is the traditional neo-classical model of economic growth, suggesting long-run convergence of the real economies, while on the other hand there are endogenous growth models that suggest sustained divergence between economies.

The neo-classical model, firstly presented by Solow (1956), assumes perfectly competitive factor markets. It implies convergence between rich and poor regions, due to the diminishing marginal returns of capital. Because poor regions (countries) have low capital stock and per capita income, higher relative marginal product of capital has greater incentive to save. Higher savings lead to higher investment, which causes higher rate of growth and reducing of gap between themselves and the rich regions (countries) and so convergence occurs. Another factor influencing growth and convergence is technology improvement. Because they assume that technologies are identical and exogenous, the mechanism behind convergence must rest on diminishing returns to capital.

In an open economy the process of convergence is even faster. The model predicts a tendency that prices, costs and income levels converge in Member countries, with trade and international factor mobility acting as the convergence mechanism (Martin, Sanz, 2001). In case of monetary union, the process of real convergence is even more stimulated thanks to the reduction of transaction costs and elimination of foreign-exchange uncertainty.

So in this model there is no space for policy, because it is predicted that poor economies will grow faster than rich ones and finally converge to the same long-run equilibrium level of income.

The endogenous growth model, represented mainly by Romer (1986) and continued by Lucas (1988), for example, is, however, less optimistic about economic convergence. Actually this approach is often being called as theory of divergence. This theory is not based on diminishing returns to capital, like in the Solow case. It, on the other hand, counts on increasing returns to reproducible factors, such as human capital. Here the return on investment is an increasing function of the accumulated stock of capital. For Lucas the human capital is the main driving force of economic growth and he admits the possibility of the 'brain drain' acting as a vehicle of cross-country growth divergence. Another factor of growth in this model is research and development (R&D) effort. This is how new growth models explain permanent technological and income gaps between regions (countries).

In this case government policy can – and should – positively affect the long-run growth rate through economic incentives for the accumulation of capital (physical and human) and through promotion of technological innovations. The regional policy plays a significant role in achieving real convergence.

Another way towards real convergence in growth models is through knowledge spillover effects, especially in an international scope. Speaking about technological progress, it is clear that imitation is cheaper than innovation and though technological diffusion can be a positive step towards real convergence.

The differences between the neo-classical and new (endogenous) growth theories are, however, not as big as it might seem. Even though the neo-classical assumptions are very restrictive, its representatives admit, that conditions can vary from country to

country (region). Some authors even give up the assumption of automatic catch-up process. Different conclusions can be reached when these rigid assumptions are relaxed, particularly that production technologies are identical and exogenous across countries. Then opening economy to trade and factor mobility can be source of divergence. The degree to which catch-up takes place in a given country depends upon on its 'social capability' to absorb foreign technologies (effectively schooling and education) and to adapt them to its own needs and to a conducive political and macroeconomic environment (Meeusen, Villaverde, 2002). So the neo-classical convergence could be called conditional convergence. That means convergence in the sense that relative income levels are eventually stabilized.

Anyway it is obvious that laggard regions (countries) need to boost efficient investment to improve their factor endowment to encourage new growth mainly through technology, human capital and infrastructure. Very effective way of growth stimulation is also through technological spillovers, as mentioned above. Such spillovers are possible only where good human capital endowment exists.

4.2. Measuring of convergence

Convergence between two variables occurs when one of them gradually approximates to the other. There are many different approaches to real convergence (also called income convergence) measurement. If we look at specialized literature, we can find lots of different measures based on distinct data and assumptions with not always common results. Barro and Sala-i-Martin (1992) have estimated the model to study convergence of per capita income across 48 states of the USA during a very long period from 1880 until 1988. They found evidence of “beta” convergence, running at a rate of 2 percent per year. Similar estimates have been found when a different set of data was used referring to the per capita gross state product of the 48 states over the period 1963 - 1986. Furthermore Dewhurst and Mutis-Gaitan (1995) used similar approach to test the convergence of GDP per head among 63 NUTS 1 regions of the EU over the period 1981-1991. Their conclusion of conditional convergence was less optimistic with slow rate of convergence, slower than 1 percent per year. Armstrong (1995) has tested the convergence hypothesis of GDP per capita across 85 NUTS 1 level regions within the European Union over much longer period from 1950 to 1992. His results are very close to former ones. He found regional convergence of 1 percent per year. On the other hand, some studies as Knight et al (1993), Islam (1995), Cuadrado et al. (1999), for instance, measure real convergence, using the panel technique with least squares dummy variable for countries to reach unobserved fixed effects. They found totally different convergence rates with values of up to 20 per cent. Indeed, as mentioned above, there is a wealth of measures and an open debate on their relative merits. Other estimations are represented by Mankiw, Romer and Weil (1992), Quah (1996), Baumol, Nelson and Wolff (1994), Boyle and McCarthy (1999), and others.

It is not quite sure, which of them is closest to reality, while all of them show signs of imperfection. And so debate on their relative merits maintains opened.

Definitely most common and effective method of real convergence assessment between countries (regions) within an area is testing their relative per capita GDP

compared to the average of total area. To do so, there are two common measures. That is *beta*-convergence and *sigma*-convergence.

Beta-convergence

Beta-convergence implies that the poor countries (regions) grow faster than the richer ones, as the neo-classical model assumes. It is generally tested by regressing the growth in per capita GDP on its initial level for a given cross-section of countries (regions) and we distinguish two special types of convergence: absolute and conditional.

Absolute β -convergence assumes that observed countries (regions) share the same GDP per head stationary state, and that therefore the relationship between the growth rate of that variable and its initial value is not conditioned by other parameters. Though, in the long run, expected per capita income is the same for all members of the group, independently of its initial value (de La Fuente, 2002). But that does not mean that income differences will totally disappear, hence different territories intersect with different random shocks with uneven results. Such disturbances, however, have only transitory effects implying that in the long run, we should observe a fluid distribution in which the relative positions of the different regions change rapidly (de La Fuente, 2002).

Closer to reality stays conditional β -convergence, which on the other hand assumes that each territory converges only to its own steady state, which can be very different from each other. Different preferences, technology, population growth rate, human capital, and other real factors are examples of conditional parameters possibly setting countries on different growth paths. Another factor explicitly influencing income growth is the amount of Structural Funds distributed to countries and regions. Hence, a high degree of inequality can persist, even in the long run; we can observe high persistence in the relative positions of the different economies. In other words, rich economies generally remain rich while the poor countries stay behind without real chance to catch-up. This is the neo-classic critic, presented mainly by Quah (1996) and

his ‘convergence clubs’, which basically never get the chance to reach the same steady state.

Sigma-convergence

Under *sigma*-convergence we mean the reduction of per capita GDP dispersion within a sample of countries (regions). The σ -convergence occurs, when the difference between two or more-time series becomes arbitrarily small (or converges on some constant α) as time elapses, such that $\lim_{t \rightarrow \infty} (X-Y) = \alpha$ (Meeusen, Villaverde, 2002).

None of existing procedures can be unambiguously accepted as a superior to others in any circumstances. It is important to admit that different questions need different approaches, to be answered correctly. In another words, the relative merits of each of the measures may differ depending on what the purpose of the empirical analysis is. Here in this paper I ask, whether countries of European Union converge to similar GDP-per-head level in long run. And because most of existing studies concentrate only on state level of convergence, which might be little misleading, I will try to examine both state and regional level of convergence and compare their trends. For such purpose I will use first regression analysis for testing β -convergence (absolute and conditional), and then also σ -convergence - in order to achieve a global assessment of real convergence in the EU.

4.3. Income distribution inequality

Before I turn to advanced regression analyses, I start with simple income distribution tests. If we compare the best-off region with worst-off region (or possibly sets of regions) in time, we can get the first impression on income distribution and possibly convergence within set of years. This is what is called a *rank* index and even though it measures only values at extremes of distribution, it can be significant indicator. We can compare, for example, regions of EU, as they improved their GDP per capita (hopefully) in years 1986 and 2000⁷. We can see that in year 1986 Hamburg - the most prosperous region - had a relative per capita income of 198 percent of EU average, which is just six times higher than that of worst-off region - Thüringen (33 percent). Then in year 2000 the most prosperous region, Inner London with 245 percent of EU average, shows about five times higher income rate than weakest region Ipeiros with its 47 percent of EU average. Even though there is a sign of meeting, such result cannot be taken seriously. More helpful, though, should be the same comparison, using set of average of ten best off and ten worst off EU regions. While result for ten best off regions increased from 172 percent in 1986 to 175 percent in 2000, the latter increased from 37 percent to 53 percent between 1986 and 2000. In this case, as we see nearly no improvement for ten best off regions' income, worst off regions' income grew over years by more than 40 percent. Table 1 shows the best off and worst off regions of EU15 in the year 2000.

Even more precise is such calculation with 25 (possibly more) regions on each extreme of distribution. Results for best off regions correspond with the former calculation, whilst they remain nearly stable between the years 1986 and 2000 (slight increase from 148 percent to 150 percent). Again there is improvement in set of worst off regions from 45 percent in 1986 to 58 percent in 2000 (that is by nearly 30 percent). In addition, between years 1994 and 1999 there is a noticeable sign of gap decrease in income distribution in EU, as plotted in Figure 1.

⁷ The year 1986 is the year when Spain and Portugal joined the Union to form EU12 and year 2000 is the year with latest statistical database.

Table 1: Best off and worst off regions in the EU by GDP per capita in 2000
(in PPS, EU15 = 100)

1	INNER LONDON (UK)	241		1	IPEIROS (EL)	47
2	BRUXELLES (B)	218		2	REUNION (F)	50
3	LUXEMBOURG (L)	195		3	DYTIKI ELLADA (EL)	51
4	HAMBURG (D)	182		4	ACORES (P)	52
5	ILE DE FRANCE (F)	158		5	EXTREMA DURA (E)	53
6	WIEN (A)	157		6	GUYANE (F)	54
7	OBERBAYERN (D)	154		7	CENTRO (P)	54
8	DARMSTADT (D)	149		8	ALENTEJO (P)	54
9	STOCKHOLM (S)	147		9	ANATOLIKI MAKEDONIA, THRAKI (EL)	55
10	LONDON (UK)	147		10	DEPARTEMENTS DOUTRE MER (F)	56
11	BREMEN (D)	143		11	NORTE (P)	56
12	UUSIMAA (SUURALUE) (FIN)	143		12	PELOPONNISOS (EL)	58
13	UTRECHT (NL)	140		13	GUADELOUPE (F)	58
14	ALAND (FIN)	139		14	KENTRIKI ELLADA (EL)	59
15	TRENTINO-ALTO ADIGE (I)	136		15	IONIA NISIA (EL)	59
16	LOMBARDIA (I)	135		16	THESSALIA (EL)	61
17	STUTTGART (D)	134		17	ANDALUCIA (E)	61
18	SALZBURG (A)	131		18	SUR (E)	62
19	BERKSHIRE, OXFORDSHIRE (UK)	131		19	CALABRIA (I)	62
20	NOORD-HOLLAND (NL)	130		20	DESSAU (D)	64
21	HESSEN (D)	129		21	VOREIA ELLADA (EL)	64
22	EMILIA-ROMAGNA (I)	129		22	GALICIA (E)	65
23	MITTELFRANKEN (D)	126		23	CAMPANIA (I)	65
24	SOUTHERN, EASTERN (IRL)	126		24	SICILIA (I)	65
25	ANTWERPEN (B)	125		25	CORNWALL, ISLES OF SCILLY (UK)	65

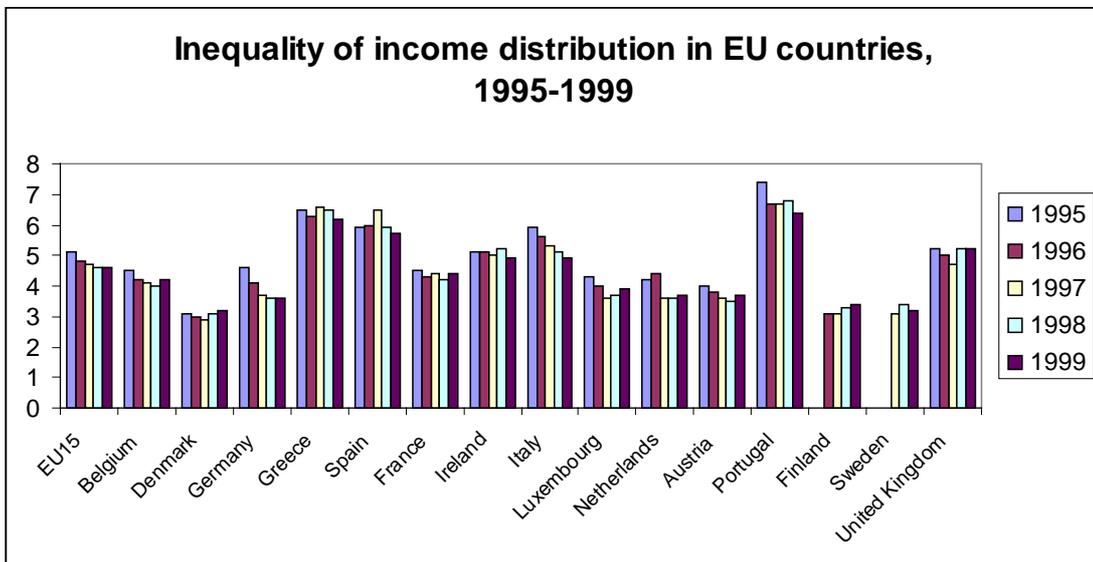
Source: Eurostat, 2001

Although *rank* index shows improvement of income distribution over years, we must remember, that it counts only samples on extremes of our distribution, no matter what is happening inside this distribution - with 'average' regions. To correct such imperfection I present Gini and Theil indexes that should give more general results.

To calculate Gini coefficient, we need to draw Lorenz curve, where cumulative percentage of regions in the Union is on horizontal axis and the cumulative share of per capita GDP is on the vertical axis⁸. It is constructed again for two different years – 1986 and 2000. From Figure 2 we can see, that the two curves do not intersect at any point inside interval, and that the curve, using data from year 2000 is closer to the 45° line. These two facts confirm the diagnosis, that regional income distribution is more equitable in year 2000 than in the former year. The intuition behind the Gini coefficient is that it sums up the differences across all pairs of regions. The closer its value to zero, the more equal the distribution of regional per capita GDP in the Union. The maximum that Gini coefficient can take is one, which means maximum inequality within the Union. If we look at the Figure 2 again, we can see the values of Gini coefficient in graphic form. Gini is presented by area between the Lorenz curve and the 45° line, divided by whole area below 45° line. During the whole period of 1986-2000, the Gini index dropped from 0,167 to 0,128. This represents reasonable decrease in regional inequality; however, it was not uniform for all the years. In Martín (1999) it is pointed out that inequality tends to decrease in periods of economic expansion and to level off or slip back in times of recession.

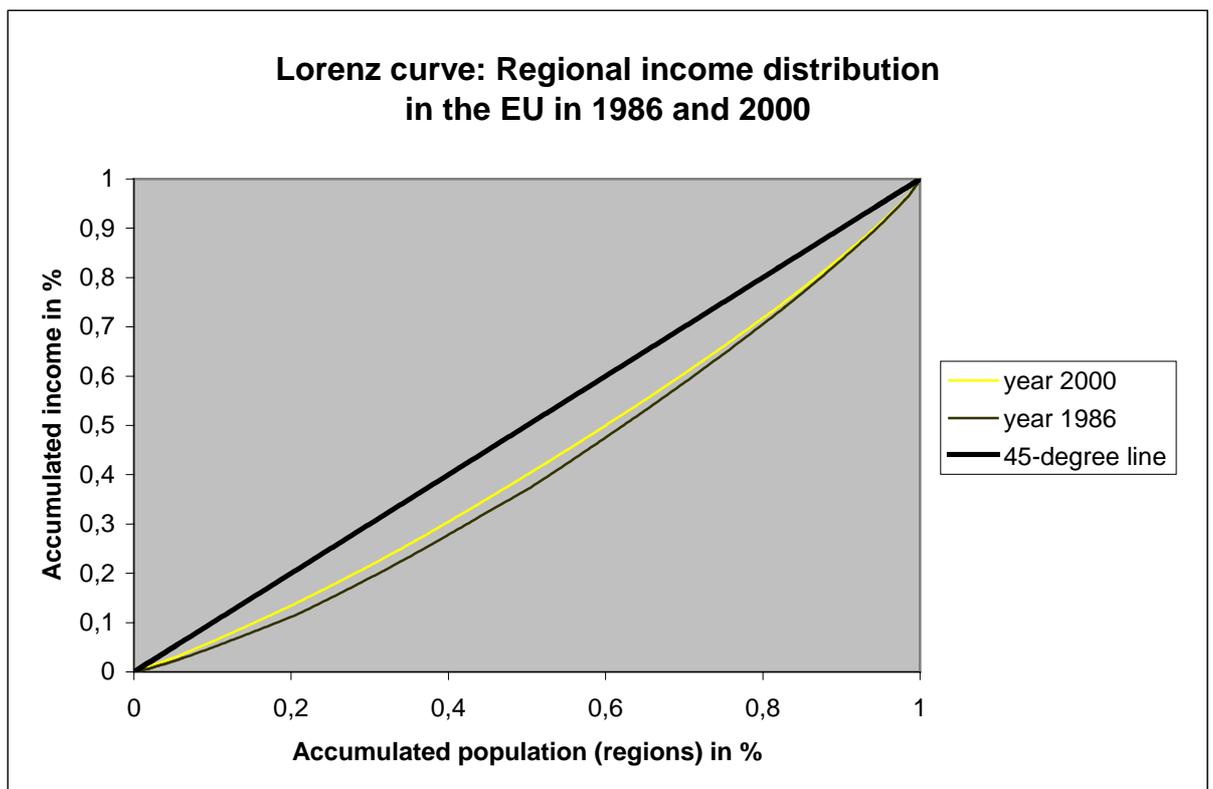
⁸ The Lorenz curve relates the accumulated proportion of income to that of the population, with per capita income arranged in descending order. In our case, the individuals are the 210 regions of the EU at a NUTS II level of disaggregation with an associated frequency equivalent to the proportion of their population to the total. Thus, the smaller the area between the curve and the 45° line, the more equitable the income distribution is. Due to its construction, the Lorenz curve only allows us to compare two distributions when the curves do not intersect.

Figure 1: Income distribution inequality in countries of EU in years 1994-1999



Source: Eurostat, 2003

Figure 2: Regional income distribution in countries of EU (years 1986 and 2000)



Source: own calculation, based on Eurostat database

These indicators, however, do not allow us to ascertain the extent to which this improvement in territorial equity in the EU is attributable to the regions and/or to the Member States. Therefore next I calculate Theil's index (0), which does indeed provide this information. It is calculated as sum of a disparity measure

$$\log [AGDP_{total}/GDP_i],$$

where $AGDP_{total}$ is the average GDP per capita of the total area, and GDP_i is the GDP per capita of each region, weighted by the share of population. From regional data of each Member State I first compute the Theil (0) index for each country separately in two different years, 1986 and 2000, to make a comparison over years. This is shown in upper part of Table 2. Then I count weighted sum of these regional measures to reach total regional inequity. Next I use the Theil (0) index of each country to measure total state inequity and finally, using the data for all of the Union's regions, as if they were part of same area, I calculate total EU inequity. This total EU inequity can also be obtained by addition of total state inequity to total regional inequity. This shows the bottom of Table 2.

Before I start with conclusions stemming from Table 2, it is important to explain, that Luxembourg and Denmark have both just one NUTS 2 region, respectively there is no NUTS 2 division, and so no regional inequity within country can occur. Also Ireland's regional inequity is excluded in Table 1, because its division in two NUTS 2 regions came very late, in terms of our calculation - in 1997.

Now, if we follow Table 2 and we start with total EU inequity, we can see clear improvement in Union's income distribution between its regions over time. The decrease from 0,058 in 1986 to 0,038 in year 2000 represents fall of inequity of over 30 percent during period of fourteen years. Next up, the data from total state inequality are showing similar tendency, as well as inter-region differences. While drop from 0,015 to 0,009 in state inequity represents 40 percent decrease, only 30 percent fall occurred in regional inequity. This means, in another words, that reduction of income differences is relatively more successful on Member State level, rather than on level of Member states' regions. Because, as noted above, total EU inequality is calculated as a sum of

total state and regional inequality, it is very interesting to realize that nearly three quarters of total EU inequality is due to inter-regional income differences, which is not a positive sign for regional policy.

After looking at aggregated results for regions, states, or whole Union, we should also take a short look at single Member States. What we find out first, is probably the fact, that the biggest thanks to decrease in total inter-regional inequality goes to Germany and Portugal and their significant drop of inequity between its regions. And that is albeit most of other Member States showed opposite trend. On the other hand, the worst results are being showed by Sweden, followed by Finland. Here it is important to mention that in 1986 Germany was still divided in two countries (West and East Germany). Furthermore Sweden, Finland and Austria were not members of Union at that time. So for purpose of this study I had to use data of regions outside Union.

Finally, looking at cohesion countries, there is certain difference between trend of Portugal and Greece. While Greece has, on one hand, concentrated on national level of income through the years, it has lost much of its regions' equity. This shows lack of effective mechanisms of national regional policy. On the other hand, results for Portugal are very satisfactory on both national and regional levels. Though, Portugal can serve as good example of combined positive regional and state redistribution policies. Even though Spanish regions of Catalonia and Madrid have experienced a rate of convergence that many other regions have not been able to follow, Spain has increased its regional income inequity over years. As already written, results for Ireland were not included, due to its very late regional division. In this context only results from year 2000 for NUTS 2 regions Mid-west (81%) and South-east (122%) can be used for this elaboration and they are significantly unequal.

Table 2: Theil (0) index – regional and state contribution to the total income disparities in EU, years 1986 and 2000

Country	Theil(0) index	
	1986	2000
Belgium	0,025	0,024
Netherlands	0,015	0,010
Luxembourg	-	-
Sweden	0,004	0,011
Finland	0,014	0,025
Denmark	-	-
United Kingdom	0,017	0,023
Germany	0,107	0,042
France	0,034	0,031
Italy	0,035	0,045
Austria	0,027	0,030
Ireland	-	-
Portugal	0,038	0,018
Spain	0,023	0,027
Greece	0,006	0,012
Total regional inequity	0,043	0,029
Total state inequity	0,015	0,009
Total EU inequity	0,058	0,038

Source: own calculation, based on Eurostat database

4.4. Real convergence

Until now I tried to compare different regions and Member States with different approaches. But these indexes were only measuring income inequality, which does not allow us to capture the dynamics of territorial income distribution satisfactorily. So at this place we have to get back to what was already explained as instruments for real convergence measuring. I will start with measuring absolute β -convergence and afterwards extend the model by measuring conditional β -convergence. Finally σ -convergence will be examined, for more detailed and wider conclusions.

The difference between β and σ convergence is the following. In case the speed and extent of the catching up of per capita income of a particular economy to the average of per capita incomes across economies is of interest, β -convergence is the appropriate concept. However, in case the interest concerns the development of the distribution of per capita income across economies, σ -convergence matters. Evidently, as Barro and Sala-i-Martin (1995) declare, β -convergence is a necessary but insufficient condition for σ -convergence. A positive β -convergence tends to reduce the dispersion of per capita income but another new shock is able to widen the gap between the steady state and the 'current' per capita income. So, in case there is no β -convergence but divergence, it is not possible to have σ -convergence.

4.4.1. Measuring of β -convergence

The measuring of β -convergence was firstly introduced by Barro and Sala-i-Martin (1991,1992). It results from a neo-classical framework and it is obtained by a regression analysis estimating the growth of per capita income of a certain period of time on the initial level of per capita income. The regression coefficient β with a negative sign indicates that regions with a lower initial level of per capita income grow more rapidly than regions with a higher initial level of per capita income. It can be split into absolute and conditional convergence.

Under absolute (or unconditional) β -convergence a regression equation, based on Barro and Sala-i-Martin (1995), is considered as follows,

$$(\ln y_{T,i} - \ln y_{0,i}) / n_t = \alpha + \beta \ln y_{t,i} + \varepsilon_{t,i},$$

where $y_{t,i}$ represents each country's per capita income relative to the aggregate per capita income over all countries at each time t . T is the number of years run, n_t is the number of periods considered, α is a constant (influenced by technological progress and the steady-state growth rate of per capita income), β is the annual convergence rate of GDP per head to the common stationary state, and $\varepsilon_{t,i}$ is a disturbance term, that is independently and identically distributed. The left side of the equation represents the rate of growth of GDP per head rate, of country i , between $t-1$ and t . It is said that β -convergence occurs in case there is a negative correlation between initial levels of real GDP per capita and its average annual growth rate.

Conditional β -convergence, on the other hand, takes place in case where negative relationship still holds after conditioning for other variables. Intuitively this implies following: if a country starts with a lower income per capita compared to the average, it can have a higher income relative to other countries after T periods. In this case it catches up. To test whether poorer countries grow faster after conditioning for certain observed variables implies adding other variables to the equation, specific for particular country and time (technology, investment ratio, industrial structure, human capital qualification, etc.).

In following measuring I use method slightly different to Barro and Sala-i-Martin's (1995). My approach comes from Cuadrado, García and Raymond's (1999) work and its main difference is that it uses the rate of growth of the regions defined in relation to the average growth of the area for its regression. Its advantage, compared to Barro and Sala-i-Martin (1995), is that conditional β -convergence can be estimated without the need to establish the variables determinant of the steady state of the regions (that is the Barro's α constant). The equation is as follows:

$$\ln \text{GDP}_{i,t} - \ln \text{GDP}_{\text{EU},t} = \beta (\ln \text{GDP}_{i,t-1} - \ln \text{GDP}_{\text{EU},t-1}) + \varepsilon_{i,t} ,$$

where:

$\text{GDP}_{\text{EU},t}$ is per capita income of the EU in purchasing power standard (PPS) in year t,

$\text{GDP}_{i,t}$ is per capita income of the region or country i in PPS in year t,

i represents 15 Member States for country convergence and 210 regions of the EU at the NUTS II level of disaggregation for regional convergence,

t represents all the years in the period 1986-2000.

To get a more general view on behaviour of income convergence within EU region, I calculate both national and regional convergence. This means that I use this equation twice, with different sets of data. Concretely, first I use data of the 15 Member States and then data for all EU regions at NUTS 2 level. The data are then related to EU average and results are shown in Table 3. The time period for this estimation is between years 1986 and 2000. The year 1986 is the year when Spain and Portugal joined the EU and 2000 is the year with latest accessible data on GDP per capita. Because the β coefficient is negative and significant in both cases, existence of β -convergence in EU is present over years. But what is important is the fact that the regional convergence is slower (2.3 percent per year) compared to Member states level convergence (3.5 percent per year). We cannot say, however, that regional convergence is slow – due to our results. Barro and Sala-i-Martin's results come to conclusion, that long run convergence is equal to about 2 percent per year – and that is what our regional convergence shows.

Also other studies come to similar conclusions, even though we must remember that results always depends on data set, actually on homogeneity of observed regions (states). It should also be mentioned, however, that the results obtained for the case of the estimation of regional convergence, could be biased by the 'country effect', which in fact means, that regional growth is more affected by the development of the country to which regions belong, than by the actual features of the region. We can imagine, that lagging behind region of rich country has higher chance of catching up with others, rather than poor region from poor country. It is obvious that richer countries find more funds in their budget for killing disturbances of income distribution.

Table 3: Absolute and conditional β -convergence in EU on regional and state level between years 1986 and 2000

	Absolute β -convergence		Conditional β -convergence	
	Regional level	State level	Regional level	State level
β	-0,023	-0,035	-0,106	-0,154
t statistics	-7,365	-5,813	-6,109	-8,537
R2 adjusted	0,0854	0,0962	0,1976	0,2893
Number of observations	2954	210	2954	210

Source: own calculation

So before moving to conditional convergence, I once again calculate for absolute regional convergence with the use of dummy in the equation, to avoid such biases. Again, I take the equation using regional data including this dummy for the 15 Member

States. Our dummy takes value of 1 if the region belongs to a particular country and value of 0 if otherwise. Thus, we reduce the spatial self-correlation caused by the fact of the regions belonging to the same geographical areas (Armstrong, 1995). The result for this kind of convergence has the same value of 2.3 percent, as before, when the country dummy was excluded. Next, I precede the same calculation as before, using again regional GDP per capita, but instead of putting the data in relation to Union's average GDP per head, I use Member state's average to which each region belongs. In this case the result of annual convergence is 2.1 percent. Hence, from both procedures, it may be verified that there is a convergent tendency specific of the regions (technology, industrial structure, investment ratio, human capital qualification, etc.).

Although, according to the previous results, different countries would seem to converge to a unique and common stationary state, we should not overlook the possibility that in actual fact national values might tend to different levels in the long run. Therefore, in order to be able to detect the possible existence of the different steady states for each country and region, new estimation of the equation has to be performed for state and regional convergence by means of so called panel data procedure.

Here assuming convergence with fixed effects, I use equation including per country dummy in the case of state convergence, and per region dummy for regional convergence. This procedure allows for different steady states for each country or region. Table 3 sets out the results obtained in this new estimation.

Thus, for the case of the regions, conditional convergence of 10.6 percent is obtained, much higher than that obtained for absolute convergence. On Member State level, however, conditional β -convergence reached value of 15.4 percent per year. This significant increase (in both cases) is due to the fact that the individual effects of each region display a positive correlation with per capita income. Moreover, currently available evidence indicates that if diversity of long run stationary levels is relevant, the introduction of fixed effects in the convergence equation increases the estimated value of the speed at which each zone converges to its own stationary state (Meeusen, Villaverde, 2002).

Results for absolute β -convergence are quite satisfactory and they correspond with other studies' conclusions. There is a clear tendency of faster convergence on Member

State level, rather than regional level. Such discovery is also supported by results from conditional β -convergence, even though obtained rates of convergence are not very realistic. It must be remembered, though, that there are many conditional parameters in real economies that should be involved in model, but none of existing models can absorb all of them within its assumptions. Hence the calculations did not come to unambiguous conclusion, in terms of values – they certainly show a trend of GDP per capita convergence, with higher speed on Member State level – it would be reasonable, at this point, to check the β -convergence conclusion with the other convergence measure – the σ -convergence.

4.4.2. Measuring of σ -convergence

The discussion above focused on the relation between initial levels and the growth rates of per capita income. As already stated, β -convergence (both absolute and conditional) is a necessary but not a sufficient condition of σ -convergence. The sigma-convergence measures the dispersion of real per capita income or product between regions based on the standard deviation of the cross-section series. When the standard deviation tends to fall over time, such a result indicates that the differences of per capita income between regions in absolute terms decrease with the passage of time, which is an evidence of convergence. On the other hand, divergence implies that the standard deviation of the series in terms of per capita income increases over time. An alternative way of measuring the sigma-convergence is to use the coefficient of variation, which is obtained by dividing the standard deviation of the series by the mean of the sample. Similarly, a decreasing value of the coefficient of variation over time reflects regional convergence and an increasing value reflects divergence.

In this estimation I use the calculation based on standard deviation of real income. I use Eurostat databases of GDP per capita between years 1991 and 2000. In this case I start the measuring in year 1991 to obtain more accurate results, mainly due to lack of complex information available in former years. So while for β -convergence I used database starting in 1986, which was in some segments incomplete and tricky, here I work with shorter timeline, expecting more precise conclusions. Again, results were calculated for each Member State, using regional data available and then calculated convergence for whole Union on both regional and Member state bases. Table 4 reveals the measuring. Thus, on the bases of σ -convergence, following Table 4, it may be established that the variability of GDP per head between Member states has decreased, same as with β -convergence estimations. That is certainly positive factor but if we look closer and examine the regional data, we can see that the trend is not very optimistic in the EU. While results on the Member state bases show considerable decrease from 13,6 to 10,5 over the years, regional convergence is rather slow and the trend of standard deviation between 1991 and 2000 changes just faintly from 29,6 to 28,3. Such results are disappointing. Moreover during the years there is evident stagnation, in some years

even increase, in variability between regions on both EU and Member state level. This is plotted in Figure 3. Such tendency is significant from early creation of European Community. It is due to heterogeneity of states, respectively regions. The EU main target in past was on convergence of state inequity, rather than regional inequity. While there have been positive signs of state GDP per head convergence, as a result of Union's interventions, it is a matter of last years that convergence between regions has been tracked. Big role is played by national governments and their regional policies. Table 4 also shows how Member states lack with own regional policy towards regional convergence. It is a trend in which most prosperous regions are still prospering, while lagging regions are struggling. Only Germany stays aside, with fast convergence over the years. That is principally due to 1990 reunion. Specifically, after reunion regional inequity grew rapidly (as high standard deviation rate shows – 38,5 in 1991) and restrictive regional policy towards new lagging areas was inevitable. It can be also seen that such fast convergence was present until 1996 and then nearly stopped. Austrian regions converge too, especially in mid 90s. On opposite side, Belgium and United Kingdom show immense divergence over the same period. Results for France and (surprisingly) Italy are reasonably good - compared to the others, even though their regions are still much heterogeneous. The rest is slightly diverging, with Greece, Ireland and Finland having the worst results⁹. Portugal and Spain are showing similar trend over the period.

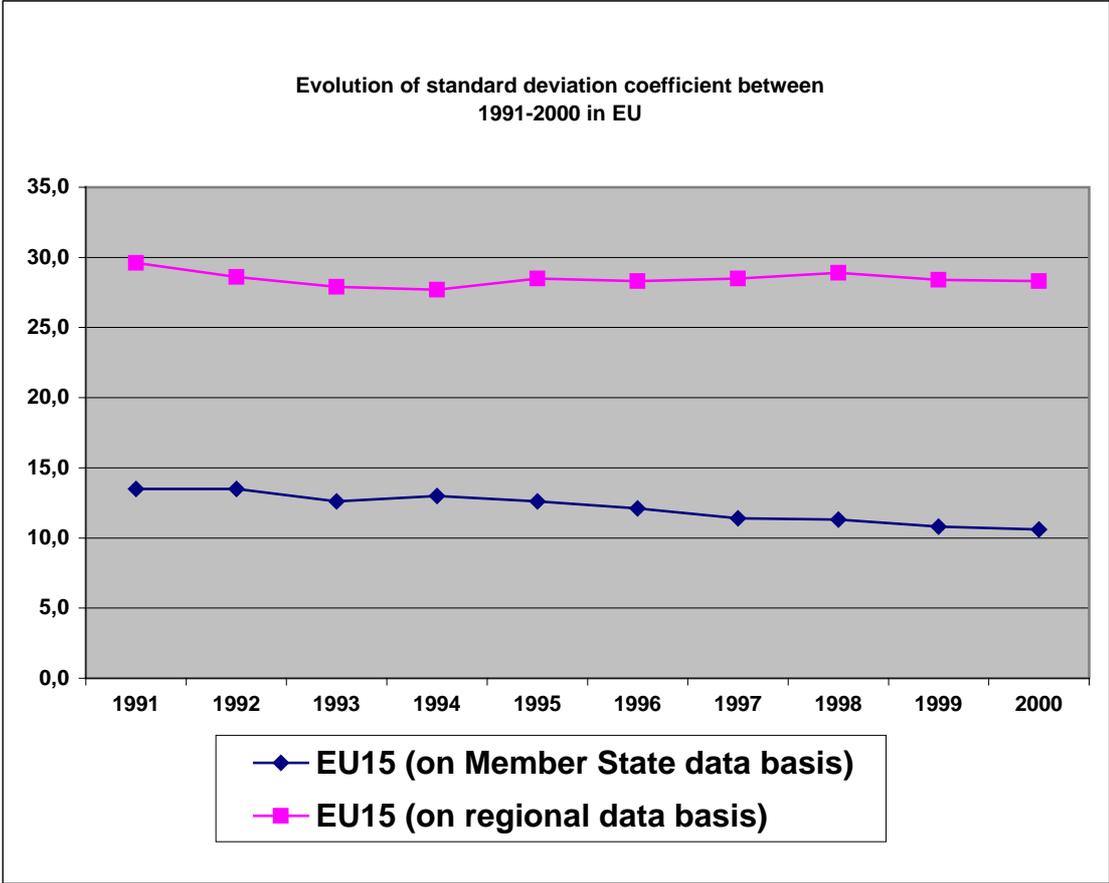
⁹ Ireland formed its NUTS 2 regions in 1995 and so the convergence could be measured only since that year.

Table 4: Regional income disparities in EU as a standard deviation of index (EU15=100) between 1991 and 2000

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Country										
Belgium	25,1	25,9	26,9	26,0	38,6	39,9	40,3	40,3	40,1	39,5
Netherlands	11,3	11,2	11,5	10,9	13,6	14,6	15,2	16,0	16,2	16,0
Sweden	12,0	10,7	12,7	11,3	12,9	13,9	16,3	17,1	16,5	16,7
Finland	17,7	15,5	16,6	17,1	19,2	20,8	20,6	23,1	24,1	24,0
United Kingdom	20,2	19,6	20,7	18,6	30,4	31,3	33,2	35,1	34,3	34,5
Germany	38,5	35,8	32,0	31,3	30,1	25,9	25,5	25,2	25,3	25,2
France	27,9	28,8	29,9	30,7	27,9	28,2	27,6	27,0	27,2	27,3
Italy	25,0	24,9	24,6	25,7	28,4	28,8	28,0	28,2	27,9	27,7
Austria	27,9	28,7	30,0	28,6	25,8	25,1	24,0	22,8	22,4	22,5
Ireland	-	-	-	-	13,3	13,2	16,9	16,5	17,2	17,5
Portugal	15,2	13,9	14,1	13,8	16,1	16,6	18,0	19,1	19,2	19,0
Spain	15,1	16,1	15,5	15,8	16,5	17,3	17,9	18,2	18,8	18,5
Greece	6,1	6,7	7,6	7,9	10,8	10,0	9,6	9,5	9,5	9,8
EU15 based on Member States data	13,5	13,5	12,6	13,0	12,6	12,1	11,4	11,3	10,8	10,6
U15 based on regional data	29,6	28,6	27,9	27,7	28,5	28,3	28,5	28,9	28,4	28,3

Source: own calculation based on Eurostat database

Figure 3: Trend of coefficient of standard deviation between 1991 and 2000



Source: own calculation, results from Table 4

It is a clear sign, that in most countries (mainly southern ones) the level of development depends on its steady state. This corresponds with the theory presented by Quah (1995), where he believes in formation of ‘convergence clubs’ with different steady states, which never get the chance to reach the same level.

5. Conclusions

This paper was written in order to take a closer look at present regional policy performed by European Union. Actually it started with broad description of the most important milestones in its short, half-century history. From Chapter 2 we can realize how tough the process of forming common regional policy was. That it is not a collection of regulations built to serve present aims and policies, but rather an organic body constantly forming, side by side with the evolution of the European Community. At present, the biggest task for EU regional policy is certainly the forthcoming Eastward enlargement, which will take place next year. Because nearly all of the regions of new Member States are lagging behind the average of EU15 regions, in terms of income level, there is a great fear about the future of regional policy. Concretely, present Member States realize, that financial aid from regional policy, directed to them mainly through channels of Structural Funds, might shrink after enlargement or even fade away.

Structural Funds are the essential and most effective instruments of regional policy. Between years 2000 and 2006 more than 200 billion Euros of Structural and Cohesion Funds is being allocated to regions of Member States. This represents more than 40 per cent of EU total budget, making it the second largest budget item. Because it is of such importance, existence of functioning framework, with exact rules and regulations on drawing and eligibility, is necessary condition for undemanding functioning of regional policy.

The main part of my study is an empirical estimation of income convergence across the states and regions of European Union. Because regional policy and its instruments are of such importance, it should be expected that its presence lead towards narrowing gaps between the rich and the poor. In the first Chapter I asked several questions about the real convergence. This empirical section tries to answer.

Even though it is not clear whether economies tend to converge or diverge in long run and that we can find a serious debate on this in recent literature on economic growth, representatives of both principal mechanisms measure convergence and majority of empirical evidence suggests that it is the most likely outcome. In my

estimation, simple test of comparison between best of and worst off regions of EU15, called rank index, as well as other two indexes – Gini and Theil helped to get the first impression of whether the poor regions are catching-up with the rich ones. There is a clear sign of catch-up process for all three indexes between estimated years 1986 and 2000. Here I suggest twofold explanation. Either the convergence is present and, though, the poorer regions are clearing the growth gaps between them and their richer ‘colleges’, or this is just an evidence that the very poor regions catch-up with the poor regions much faster, than the poor catch-up with the richer ones. Furthermore, richer regions find even harder to catch-up with the rich. To find out whether the former is true or not, I had to calculate for both β and σ convergence.

The results across EU countries show that there is significant β -convergence over the estimated period from 1986 till 2000, even though results for absolute convergence show slow tendency towards catching-up. This supports above mentioned. Conditional β -convergence, on the other hand, shows much higher rates of convergence. In constructing σ -convergence I used different database to get more precise results, mainly because of reunification of Germany in 1990. The σ -convergence was calculated between years 1991-2000. Results for σ -convergence are quite satisfactory on the Member State level, but on regional level there is a clear sign of stagnation, rather than convergence. What this means in practise, is that convergence on Member State level followed by stagnation on regional level comes to general conclusion closer to divergence, rather than convergence. Because in such case convergence on the Member State level is probably being pushed by the rich, agglomerated regions, which grow faster in terms of income over time.

As a general conclusion, the income convergence on the Member Stat level is happening, in practise, while the effect of regional convergence is not occurring in European Union and the gaps between the poor and the rich regions are not being cleared. We should accept some regional inequality as the normal state of affairs. The existence of urban hierarchy is a universal phenomenon. If the existence of a major urban centre or of a network of connected medium-sized cities is a major factor for growth, then not all regions can perform equally if only because historical accident has led to unequal urbanisation. This means that growth brings local agglomeration, where

inter-regional convergence comes at the cost of greater intra-regional polarisation. Furthermore, in some cases the laggard regions are not prepared for such support from regional policy, yet. In fact, most of the poor regions (mainly in the southern parts of EU) have high ratio of employment in agriculture or in sectors in decline. So until the restructuralization occurs, not much can be done.

References

- Abramovitz, M. (1986): "Catching Up, Forging Ahead and Falling Behind", in *Thinking About Growth and Other Essays on Economic Growth and Welfare*, Cambridge University Press
- Allen, D. (2000): "Cohesion and the Structural Funds", in Wallace, H. and Wallace, W: *Policy Making in the European Union*, Oxford University Press
- Armstrong, H. (1995): "Convergence among regions of the European Union, 1950-1990", *Papers in Regional Science*, 74(2)
- Badinger, H., Muller, W. and Tondt, G. (2002): "Regional Convergence in the European Union 1985-1999. A spatial dynamic panel analysis", IEF Working paper, No. 47
- Bailey, D. and De Propris, L. (2002): "EU Structural Funds, Regional Capabilities and Enlargement", University of Birmingham Business School
- Barro, R. and Sala-i-Martin, X. (1991): "Convergence across States and Regions", *Brookings Papers on Economic Activity* 1
- Barro, R. and Sala-i-Martin, X. (1992): "Convergence", *Journal of Political Economy*, 100(2)
- Barro, R. and Sala-i-Martin X. (1995): "Economic Growth", McGraw Hill, New York
- Baumol, W., Nelson, R. and Wolff, E. (1994): "Convergence of Productivity. Cross-national Studies and historical evidence", Oxford University Press
- Begg, I. "Reform of the Structural Funds after 1999", *European Policy Paper Series*, South Bank University, London
- Boldrin, M. and Canova, F. (2000): "Inequality and Convergence: reconsidering European Regional Policies", Mimeo, University of Minnesota and Universitat Pompeu Fabra
- Boyle, G. E. and McCarthy, T. G. (1997): "A Simple Measure of β -Convergence", *Oxford Bulletin of Economics and Statistics*, 59(2)

- Button, K.J. and Pentecost, E. (1999): “Regional and Fiscal Policy in EMU: Complements or Substitutes?”, to the 39th European Congress of the Regional Science Association, Dublin
- Cour, P. and Nayman, L. (1999): “Structural Funds and Regional Disparities in Europe”, La letter du CEPII, No. 177
- Cram, L., Dinan, D. and Nugent, N. (1999): “Developments in the European Union”, Macmillan Press 1999
- Cuadrado, J. R., Garcia-Greciano, B. and Raymond, J. (1999): „Regional Convergence in productivity and productive structure: The Spanish case“, International Regional Science Review, Vol. 22(1)
- Cuadrado, J. R. and Parellada, M (2002): “Regional Convergence in the European Union”, Springer 2002
- Daianu, Daniel (2002), “Is Catching Up Possible in Europe?”, Tiger Working Paper, Warsaw, No. 19
- Dewhurst, J. and Mutis-Gaitan (1995): “Varying speeds of regional GDP per capita convergence in the European Union, 1981-1991”, in Armstrong, H. and Vickerman, R.: “*Convergence and Divergence among European Regions*”, Pion Limited
- Ederveen, S., Gorter, J. and Nahuis, R. “The Wealth of Regions. The impact of structural funds on convergence in the EU”, CPB Netherlands Bureau for Economic Policy Analysis, Discussion Paper, No. 15
- European Commission (1996): “First report on economic and social cohesion”, Luxembourg - Office for Publications
- European Commission (1997): “The Impact of Structural Policies on Economic and Social Cohesion in the Union 1989-99”, Brussels - Commission of the European Communities
- European Commission (1999): “Reform of the Structural Funds 2000-2006: Comparative analysis”
- European Commission (1999): “Sixth Periodic Report on the Social and Economic Situation and Development of the Regions of the Community”, Brussels - Commission of the European Communities

- European Commission (1999): “The Structural Funds and their coordination with the Cohesion Fund”
- European Commission (2000): “Eight survey on state aid in the European Union”, Brussels - COM(2000) 205 final
- European Commission (2000): “Gender equality in the new European Social Fund programming (2000-2006)”, Committee of the European Social Fund
- European Commission (2001) ‘Unity, Solidarity, Diversity for Europe, its People and its Territory: Second Report on Economic and Social and Economic Cohesion’, Luxembourg, CEC.
- European Commission (2001): “Reports”, official EU website EUROPA – Regional Policy Inforegio
http://europa.eu.int/comm/regional_policy/sources/docoffic/official/repor_en.htm
- European Commission (2002): “Unity, Solidarity, Diversity for Europe, its People and its Territory - Summary of the Cohesion Report”, official EU website EUROPA – Regional Policy Inforegio
http://europa.eu.int/comm/regional_policy/sources/docoffic/official/reports/conclu2_en.htm
- Eurostat: “Statistics in Focus – General Statistics”, different years
- Eurostat (2001): “Eurostat Main Regional Indicators”, Eurostat Yearbook 2000
- Eurostat (2002): “Eurostat Main Regional Indicators”, Eurostat Yearbook 2001
- Eurostat (2003): “Eurostat News Releases”: <http://europa.eu.int/comm/eurostat>
- Fuente, de la A. (2002): “Convergence across countries and regions: theory and empirics”, Instituto de Análisis Económico (CSIC) 2002
- Evans, A. (1999): “The EU Structural Funds”, Oxford University Press
- Islam, N. (1995): "Growth Empirics: A Panel Data Approach", Quarterly Journal of Economics, 110(4)
- Knight, M., Loayza, N. and Villanueva, D. (1993): "Testing the neoclassical theory of economic growth: a panel data approach." IMF Staff Papers 40,
- Lucas, R. (1988): “On The Mechanics of Economic Development”, Journal of Monetary Economics, Vol. 22(1)
- Mankiw, G., Romer, D. and Weil, D. (1992): "A Contribution to the Empirics of Economic Growth", Quarterly Journal of Economics, Vol. 107(2)

- Marques, A. and Soukiazis, E. (1998): “Per capita income convergence across countries and across regions in the European Union. Some new evidence”, International meeting of European Economy
- Martin, C., Velazquez, F. J. and Funck, B. (2001): “European Integration and Income Convergence. Lessons for Central and Eastern European Countries”
- Martín, C. and Sanz, I. (2001): “Real Convergence and European Integration: The Experience of the Less Developed EU Members”, International Institute for Applied Systems Analysis, No. 65
- Martin, R. and Tyler, P. (2000): "Regional employment evolutions in the European Union: A preliminary analysis", Regional Studies, 34
- Meeusen, W. and Villaverde, J. (2002): “Convergence Issues in the European Union”, Edward Elgar 2002
- Molle, W. (1994): “The Economics of European Integration”, Ashgate 1997
- Neven, D. J. and Gouyette, C. (1995): "Regional convergence in the European Community", Journal of Common Market Studies, No.33
- Quah, D. (1996): "Empirics for economic growth and convergence", European Economic Review, 40
- Romer, P. (1986): "Increasing Returns and Long-Run Growth", Journal of Political Economy, Vol. 94(5)
- Solanes, J. G. and Dolores, R. M. (2001): “The Impact of European Structural Funds on Economic Convergence in European Countries and Regions”, University of Murcia
- Solow, R. (1956): "A Contribution to the Theory of Economic Growth." Quarterly Journal of Economics, Vol.70(1)
- Tsoukalis, L. (1993): “The new European Economy. The politics and economics of integration”, Oxford University Press 1993

Appendix