

CATCHING UP?

A study on the effects of the European Union's regional policy during 2000–2006

Abstract: Regional policy is in monetary terms the second largest priority area of the EU, currently representing 37 percent of the annual budget. Our work shows that the policy measures and huge resource allocations are based mainly on political considerations, rather than critical analysis of effects and efficiency. The objective of the regional policy is to enhance cohesion for the member countries, both at the national and regional level. Based on a panel dataset for the period 1998-2008 with statistics on GDP and unemployment levels, we have analyzed the impacts and effects of the regional policy in terms of growth and cohesion. We have also analyzed cohesion and growth on an aggregated country level, to put regional development into a broader context, both politically and economically. Our main findings are that regions have experienced positive effects in terms of economic growth and decreasing unemployment levels after having received regional support. However, we cannot find any significant support for domestic cohesion. Regional differences tend to endure while countries converge.

Keywords: *regional policy, regional development, polarization, EU, EMU, Objective 1, cohesion, structural funds, unemployment, GDP*

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1. INTRODUCTION

1.1 Regional policy – context and background

The European Union is a political and economic cooperation organization comprehending a large geographical area as well as a wide variety of nations, nationalities, social structures, cultures and religions. One of its fundamentals is to strengthen the political and economic stability of Europe. The number of member states currently adds up to 27. All of them differ in economic development and in terms of political history, both between the countries as well as on a domestic level.

Enhancing cohesion in Europe, both on an aggregated country level and between regions within the respective member states, has been outlined as a top political priority for the EU. The regional cohesion policy is currently the second largest issue in terms of budget, following the common agricultural policy, and has grown consistently over time. The overall ambitions of the regional policy is to increase cohesion and to “reduce disparities between the levels of development of various regions”, enhancing economic development, increasing levels of employment, improving environment and eliminating inequalities.¹

The EU’s regional policy has been subject to both research and debate and its efficiency has been evaluated, confirmed and questioned. Whether the regional policy is implemented in the most efficient way is a recurring question among both politicians and economists. The rationale for regional support can also be debated – if it is the role of wealthier nations to support less developed countries and regions. The regional development policy of the EU has changed from its establishment in the 1980s, but the underlying fundamentals remain the same: to create cohesion between both regions and countries within the European Union. However, representing over 42 percent of the EU total budget in 2007–2013, the public knowledge and awareness of the regional policies appears to be limited and the issue is somewhat lost in the common debate, in the light of economic difficulties and expansion of the union.

¹ Tatzberger, G. (2008), “A Global Economic Integration Zone in Central Europe?”

1.2 Historical overview

Regional policy has been an important subject in the EU since the mid 1980s. In 1993 when the Maastricht treaty entered into force, cohesion was made a priority objective. Since 1993 up until today, the cohesion policy has been divided into different programme periods; from 1994–1999, 2000–2006 and current one from 2007–2013. During the programme period 1994 to 1999, the EU allocated 168 EUR billion, representing one third of the total EU budget for regional policy. During the following periods the share of the total EU budget allocated to regional policy has increased consistently, from 16 percent in 1992 to 37 percent of the total budget in 2000–2006 and 2007–2009. In 1999, the priority objectives were redefined and funds available were targeted to favor the most disadvantaged regions and social groups.²

1.3 The programme period 2000–2006

During the programme period 2000–2006, the regional policy was divided into different funds which, together with the Cohesion Fund, were used to co-finance the member countries' projects and initiatives to reduce regional differences. The EU budget for these four funds added up to 195 EUR billion for the programme period 2000–2006, equivalent to one third of the total EU budget.³

Three general objectives were defined as the primary targets for the cohesion policy:⁴

Objective 1: Development and structural adjustment of regions with a GDP per capita less than 75 percent of the EU average. About two thirds of the total fund resources were used for this objective. Some 20 percent of the EU population lived in such regions. Objective 1 includes investments in infrastructure, competitiveness, education, agriculture, technology and efforts to enhance employment.

Objective 2: Structural difficulties in regions not eligible for Objective 1, i.e. regions with a GDP per capita higher than 75 percent of the EU average but still with socio-economic and structural problems. About 18 percent of the EU population lived in such regions.

Objective 3: Human resource development in regions not eligible for Objective 1

² EU Official website: European Union – Regional Policy (2008), “EU Cohesion Policy 1988-2008: Investing in Europe's future”

³ EU Official publication: Summaries of EU legislation (2008), “Common classification of territorial units for statistical purposes”

⁴ EU Official publication: Summaries of EU legislation (2008), “General provisions on the Structural Funds”

The general ambition is that planning and implementing of the EU's regional policy should be decentralized in the largest possible extent. However, all plans and conditions are still approved and decided by the European Commission. There is no predetermined allocation system of the resources, either between countries or individual regions. This is instead subject to political negotiation.

One important aspect of regional policy is additionality, which in practice means that regions receiving support are obliged to co-finance all projects funded by the EU. This is a principle that can be debated from several aspects. First of all, it is hard to determine beforehand if a given project would not have received domestic financial support if the EU had not contributed. Second, as will be discussed later, there is always a risk of crowding out and moral hazard when additional funding is received. This suggests that regions that receive support decrease their own investments, i.e. crowding out, or make investments because they have available funds and make somewhat less relevant or "bad" investments – a form of moral hazard.

1.4 Statement of purpose

The purpose of this paper is to shed light on and evaluate the effects of the EU's regional policy in the context of the general economic development in Europe. This will be conducted by looking at domestic development within the member states and by analyzing how countries are developing on an aggregated level.

Further, we will not only see if cohesion is achieved and regional development is enhanced, but also discuss why cohesion is a major ambition of the EU and the rationale underlying it. Given that such a large share of the EU's budget is allocated to regional support, we will argue that it deserves an open and critical debate, rather than being seen as a generally accepted principle that may be an efficient tool for economic development and cohesion.

The area of economic development in Europe and the efficiency of the structural funds have been subject to previous research and debate. We intend to contribute by taking a broader analytical approach than previous studies, both in terms of the econometric models used as well as the qualitative perspectives applied. Also, the developments following the expansion of the EU in 2004 will be included and analyzed, which to a large extent is still unexplored in terms of the role of regional policy. Our objective is not to construct a complete model for all potential determinants and for that reason the hypotheses formulated later will represent the limitations for this paper.

We intend to derive conclusions with respect to our purpose by answering the following questions:

- 1) *Have the EU's structural funds and regional policy had any effects on cohesion and growth, in terms of GDP and employment, among the regions eligible for Objective 1 support during the EU regional policy programme period 2000–2006?*
- 2) *What inference can be drawn from the aggregated economic development on the country level within the EU?*

1.5 Scope and limitations

This study is limited to only concern the regional policy programme period spanning from 2000 to 2006. The following period started in 2007 and will finish in 2013. From a regional support perspective, this paper is restricted to analyzing the economic development in NUTS-3 regions eligible for Objective 1 support, i.e. regions with GDP below the 75 percent threshold of the EU average. Two thirds of the total fund resources were used for Objective 1 projects. These limitations were deemed necessary due to that the policies and objectives for the various programme periods have differed over time, making a comparative analysis between different programme periods difficult. The definition of a NUTS-3 region, in generalized terms, is a region with between 150 000 and 800 000 inhabitants while the exact definition varies from country to country. From now on in this paper, whenever referred to the term region, it will denote NUTS-3 regions.⁵ Cohesion, or convergence, is defined as decreasing differences between a given region or country in terms of either GDP per capita or unemployment.

⁵ EU Official publication: Summaries of EU legislation (2008), “Common classification of territorial units for statistical purposes”

2. THEORETICAL FRAMEWORK

This section describes the general theories underlying our study and the current research front. It is divided into four different categorizes, based upon the stated purpose and the defined questions. After each section we will present a hypothesis that will be tested and analyzed.

2.1 Effects of regional support within the EU

A working paper by Falk and Sinabell that analyzed regional development among the EU 15, excluding the new members of 2004 and based on NUTS-3 regions during the period 1995–2004, found support for the statement that GDP growth rates is higher in regions receiving support than in other regions, using robust LM test.⁶ However, the causal effect is weak and factors population density and industry share are seemingly more determining for GDP growth. They concluded these factors to be more important than the extent of Objective 1 support granted.

Rodríguez-Pose and Fratesi presented another working paper that took a somewhat broader approach and incorporated the development of regions in Europe from 1989 to 2001.⁷ They analyzed economic growth and employment developments using different methods. Their findings are somewhat different to those of Falk and Sinabell, since Rodríguez-Pose and Fratesi found no significant effects following Objective 1 support, even after the general reform of the regional policies of 1992, when significant changes were made to the regional policies. They note some positive effects relating to agricultural development after support being granted, though only short term. However, investments in human capital are the ones that seemed to yield medium to long term effects on growth. Another remark made by the authors is the lack of statistical consistency. For a long period during the 1990s, it is hard to track the economical developments on a regional level. They also highlight treatment of factors difficult to control for, especially the differences in cultural, social and institutional development in different areas of the EU.

⁶ Falk, M. and Sinabell, F. (2008), "The Effectiveness of Objective 1 Structural Funds in the EU 15: New Empirical Evidence from NUTS 3 Regions"

⁷ Rodríguez-Pose, A. and Fratesi, U. (2004), "Between Development and Social Policies: The Impact of European Structural Funds in Objective 1 Regions"

An additional paper by Ederveen *et al.* added some more interesting aspects.⁸ Their study was based upon developments within the EU12 (12 member states in the EU before the expansion in 1995) before 2001. The authors concluded that support is efficient since less developed regions receiving support tend to grow faster than the more developed ones. However, they also show tendencies of moral hazard and also crowding out. Firstly, the authors claim that the guidelines and policies regarding the type of projects eligible for support are vague and that there is a lot of room for regional authorities to invest in projects that may or may not be beneficial for cohesion and economic development. Secondly, they find that for every EUR spent in EU support, the domestic investment in less developed areas decrease by 0.17 EUR.

Boldrin and Canova go the other way and claim that no positive effects could be found in terms of increased economic growth, during the programme periods before 2001, but rather that the effects observed were re-distributional.⁹ They also raised concerns regarding whether the current policies are deemed possible to continue after the expansion of the EU in 2004.

Becker *et al.* took a different approach in that they analyze effects of regions on a NUTS-3 level, regions within the larger NUTS-2 regions, where the NUTS-3 regions become eligible for funding because the region in which they are located is below the 75 percent of average EU GDP threshold, even though the NUTS-3 regions themselves may be above the threshold level.¹⁰ They conclude that for every EUR spent on receiving regions, GDP grows with 1.21 EUR. Even so, they do not find any significant effects on unemployment developments.

Hypothesis 1

The previous research is evidently somewhat divided whether or not receiving regional support enhances cohesion and regional development. To analyze effects of regional support in terms of GDP, we will test the following hypothesis:

H0: NUTS-3 regions receiving regional support do not experience effects in terms of GDP per capita growth, compared to if they would not have receiving support

H1: NUTS-3 regions receiving regional support experience effects in terms of GDP per capita growth compared, compared to if they would not have received support

⁸ Ederveen, S., Gorter, J., de Mooij, R. and Nahuys, R. (2002), "Funds and Games: The Economics of European Cohesion Policy"

⁹ Boldrin, M. and Canova, F. (2001), "Inequality and Convergence in Europe's Regions: Reconsidering European Regional Policies"

¹⁰ Becker, O.S., Egger, H.P., von Ehrlich, M. and Fenge, R. (2008), "Going NUTS: The Effect of EU Structural Funds on Regional Performance"

Hypothesis 2

To test for effects relating to effects of regional support in terms of unemployment rates, we will test the second hypothesis following the same structure:

HO: NUTS-3 regions receiving regional support do not experience effects in terms of unemployment rate, compared to if they would not have received support

H1: NUTS-3 regions receiving regional support experience effects in terms of unemployment rate, compared to if they would not have received support

2.2 Domestic and regional cohesion

Persson and Tabellini discuss whether inequality is harmful for development and growth or not, based on endogenous growth theory.¹¹ Their main finding is that inequality across a country has negative impact on economic growth, especially because it tends to lead to policies that do not enhance further growth and protection of property rights.

Xavier present another interesting work based upon historical data from the US, Japan, Canada and Europe, dating back to 19th century, analyzing regional convergence within a country.¹² Their finding, claimed to be both robust and significant is that regions tend to converge at a rate of 2 percent annually, i.e. it would take 35 years for 50 percent of the differences to disappear. Their conclusion is that these results are not explained by redistributive policies or other interventions, and tend to be consistent over time.

A study by Eggert *et al.* analyzes the convergence and growth effects of the European regional policy in Germany for the period 1995 to 2004.¹³ The authors come to the conclusion that there is a trade-off between regional convergence and aggregate growth and in the case of Germany. The study suggests that the EU's regional support speeds up convergence while having a negative impact on long run aggregate growth of Germany. The study also discusses how much of the convergence that can be attributed to support from the EU's regional policy as opposed to "market" convergence.

Another study supporting theories of a trade-off between aggregate growth on country level and convergence between regions within a country is a paper by Martin.¹⁴ He concludes that maximizing growth at a country level could lead to increased regional divergence. Financial

¹¹Persson, T. and Tabellini, G. (1994), "Is inequality harmful for growth?"

¹² Sala-i-Martin, X. (1996), "Regional cohesion: Evidence and theories of regional growth and convergence"

¹³ Eggert W., von Ehrlich M., Fenge R. König G. (2007), "Convergence and Growth Effects of the European Regional Policy in Germany"

¹⁴ Martin, P. (1998), "Can Regional Policies Affect Growth and Geography in Europe?"

support is not necessarily good for both poor regions and the country as a whole. The new economic geography and the new growth theory imply that, due to self-reinforcing agglomeration effects, the financial support could even result in negative effects on the regional level. The author argues that trade, growth and location effects of regional policies are highly correlated and therefore emphasize the political-economy dimension of regional policies in the EU.

Myrdal introduced the polarization theory for regional development. He defined two counteractive types of effects: spread and backwash effects. He claimed that development of physical infrastructure and relocation or expansion of institutions lead to positive (spread) effects in the form of reduced differences between regions and hence improved equality. However, the economies of scale are so prevailing that investments in already existing structures in strong regions give better effects and hence lead to regional convergence (backwash) effects. The cumulative causation process means that it is difficult for regions to overcome the convergence. Myrdal, a macro-economist with strong ties to the social-democrats, emphasized the need for political intervention to overcome such economic barriers.¹⁵

¹⁵ Behrens, P. and Smyrl, M. (1997), "EU Regional Policy in Theory and Practice"

Hypothesis 3

The research and theories presented will be used to analyze domestic cohesion in the EU. We analyze the effects of regional support on domestic cohesion by testing the following hypothesis:

HO: Domestic convergence in terms of GDP per capita between NUTS-3 regions and the country average is not affected when regions receive support, compared to if they would not have received support

H1: Domestic convergence in terms of GDP per capita between NUTS-3 regions and the country average is affected when regions receive support, compared to if they would not have received support

Hypothesis 4

We will also test if the effects of regional support in terms of domestic cohesion in levels of unemployment:

HO: Domestic convergence in terms of unemployment rates between NUTS-3 regions and the country average is not affected when regions receive support, compared to if they would not have received support

H1: Domestic convergence in terms of unemployment rates between NUTS-3 regions and the country average is affected when regions receive support, compared to if they would not have received support

2.3 Theories of economic growth and national convergence

Economic growth is usually measured in terms of GDP, a debated but still commonly used indicator. The growth rate and the GDP per capita indicate the average trend and level of the economy. However, it says nothing about how resources are distributed between regions and people. Very poor groups can still exist in countries with fairly high GDP per capita, and differences can actually increase. It is therefore not a good indicator of economic development. Analysis of investment policy for education, health and other areas contributing to development is therefore an essential supplement. Economic development requires social and technological change.¹⁶

Economic development, with a number of qualitative indicators is harder to determine than quantitative economic growth. Even so, both are important to understand and analyze the real economic development in a country or region. According to Neoclassical growth theory, a country's long-term growth rate is determined by a "steady state", meaning that growth at a constant rate. An economy that is not in steady state moves against it at a rate that increases with the distance from the steady state. This is called conditional convergence. In the Solow model, the economy grows until reaching a steady state, where the savings rate of the country's output is

¹⁶ Todaro, Michael P. and Stephen C. Smith (2009), "Economic Development"

equal to the investment rate. In steady state, per capita income varies inversely with population growth and directly with savings rate and technological level. This model assumes diminishing returns to the production factors capital and labour. Therefore, if countries are on the same long-term growth path, poor countries grow faster in the short term. Countries converge toward an equilibrium growth rate independent of their initial state.¹⁷

2.4 Theories of socioeconomics in the context of regional development in the EU

By leaving the qualitative discussion, Borrás *et al.*, gives a new view on the economics and politics of the EU, where they attempt to put cohesion policy in a new context. They claim that the cohesion policy is driven by politics rather than economics, using a hegemonic argumentation, and has been so since the mid 1980s.¹⁸

The presented theories, research and studies represent a sample of the vast literature available and cover what is deemed a relevant scope for a relevant quantitative and qualitative analysis.

¹⁷ Mankiw, N. Gregory (2009), “Macroeconomics”

¹⁸ Borrás, S. and Johansen, H. (2001), “Cohesion Policy in the Political Economy of the European Union in Cooperation and Conflict”

3. EMPIRICAL METHOD

We begin by presenting data, proceeding afterwards to discuss the variables and finally to set up the regression models used in the analysis. Throughout this paper we will use a hypothetical, deductive method.

3.1 Data

Some discrepancies can be observed in the statistics provided by the EU, as not all member countries specify which regions that have received support according to the official policy. Countries that entered the EU after the expansion in 2004 and received support in accordance with the regional policies did not target specific regions within the country, but rather engaged in country wide projects. This means that there is an inconsistency in how countries allocated regional support. In this paper, we have assumed that concerned regions in the recent member countries from 2004 have received the same share of GDP in support. These countries are important for the continued analysis and this assumption seems to represent the best possible estimate. The support received is treated as it was distributed over the entire programme period, 2000–2006 for countries already members in the EU before the expansion in 2004. For countries that became members in 2004, the support is treated as distributed over the period 2004–2006. This implies that even though the payment consisted of a one-time payment, the effects are expected to be seen over the entire programme period.

We use panel data, combining a cross-sectional and a time-series dimension, which follows the same country or region over time. The dataset consists of statistics from Eurostat and covers the period 1998 to 2007 for regional GDP per capita and from 1999 to 2008 for regional unemployment rates. Data available on the country level covers the period from 1999 to 2007. This incorporates the regional support period between 2000 and 2006 and the expansion of the EU in 2004.

3.2 Missing and dropped observations

We also took into account outliers and missing values in the dataset. Poland reported unemployment rates of over 80 percent, according to statistics provided by Eurostat. We chose to drop 36 observations of unemployment rates above 50 percent as we considered them to be outliers. "Inner London - West" was the only evident outlier in the dataset for regional GDP per capita and we therefore chose to not include the 10 observations of this NUTS-3 region. For both GDP per capita and unemployment, we have also dropped for missing values in the dataset.

On a regional level, this led 379 less observations for GDP and entire 4562 observations for unemployment rate. Concerning the country level, only 75 observations for GDP and 27 for unemployment rate were excluded. It is reasonable to question why there were nearly 5000 observations missing for unemployment on the regional level. We have noted that unemployment data reporting from Eurostat have tendency to be inconsistent and incomplete, especially in rural and in sparsely populated areas.

3.3 Variables

3.3.1 Dependent variables

GDP per capita

GDP per capita is defined as EUR per inhabitant. We have used GDP data on both NUTS-3 levels as well as the respective country averages, to capture aggregated effects, provided by Eurostat. GDP is used to estimate both regional or country specific growth and convergence.

Unemployment

We will also estimate our models testing for different factors affecting levels of unemployment, to allow for broader analysis and inference, both in terms of growth and cohesion. However, the nature of this variable is more complex since unemployment is defined differently for the EU member countries. The labor statistics are somewhat arbitrary and suffers from consistency issues, especially in rural areas, discussed more in detail later on.

3.3.2 Independent variables

In the following section, we briefly describe the explanatory variables that we have used in the respective models. For a complete overview on how variables in each model are defined, coded and interpreted, see Appendix 1. The rationale underlying each one is elaborated on in the results and analysis sections.

Inflation

The inflation rate within the EU has been continuously converging from 1998 on forth, up until late 2006, illustrated by decreasing standard deviation in the average annualized level.¹⁹ A harmonized index of consumer prices (HICP) is an indicator that measures how prices of

¹⁹ See Appendix 2, *Graph 1*

consumer services and goods, used or paid for by households change over time, indexed as (2005=100).²⁰

European Monetary Union

Controlling for membership in the Economic and Monetary Union (EMU) is a way to capture effects, if any, from being a member of the currency union, following its introduction in 2002. There are currently 16 members in the EU that have adopted the euro and the European Central Bank (ECB) is responsible for conducting the monetary policy for all member states. In the regional analysis, we used an interacted term (EMU*Support) to observe effects of EMU membership, while receiving regional support.

Hourly Labour Cost

Hourly Labour Cost (HLC) is defined as total labour costs in EUR divided by the corresponding number of hours worked. The wage level effect, measured in terms of HLC, is included in order to see if a countries growth rate or employment levels are affected by the respective wage levels.

Political orientation

Political orientation is a dummy for the largest party in the government. We classified politics into 3 categorizes: right, middle and left. In order to avoid the so called dummy variable trap, one of these, middle, will be excluded in the model. The reason why we controlled for political orientation was to study if there is any significant pattern between the country level growth rates and political orientation of the government.

Support

We use dummy variables consisting of NUTS 3-regions that have received support from the structural funds and regions that have not received any Objective 1-support for the programme period 2000 to 2006. Support is defined as equal to 1 all the years a country that receives support from the regional policy and structural funds. The reasons is that the interaction term, see definition in Appendix 1, should represent regions and countries differences in GDP per capita and unemployment rate both before, during and after receiving support.

We also tested for if the level of support received was determinant for its effect. We constructed dummies for three categories, measured as the level of support received on average per year, in

²⁰ Source: Eurostat

relation to the average annual GDP for the program period; 0–1, 1–2, and 2–5 percent of average annual GDP.²¹ In order to avoid the dummy variable trap, the dummy variable 2-5 percent will be excluded in the model.

Year

We included the variable *Year* in the regression models both as a linear control variable and also as year specific dummies. This gave us a generalized version of the difference in difference regression and allowed us to control for macroeconomic factors that are different before and after the programme period and to control for all the year-specific macroeconomic factors that may vary from year to year for all countries, such as business cycle effects.

Support*Year

In order to capture any time trends, we integrated *Year* with the *Support* dummy, to observe any differences between regions that emerge over time.

After

Time period starting from the year when regions begin to receive support to the last year available in the data set (2008)

Interaction

The interaction term is defined as *After* multiplied with *Support*. This captures the difference between GDP/unemployment in regions and countries when/after receiving support, compared to what it would have been with no support.

3.4 Method of analysis

To observe effects of regional support, in terms of growth and cohesion, we tested how GDP was affected in “treated” regions, in other words regions that received regional support, followed by tests for unemployment developments for the same regions. We estimated what we call the “Support-models”, measuring effects of support, followed by running the “Cohesion-models”, capturing convergence and tested the respective hypothesis for GDP growth and unemployment development.

²¹ See Appendix 2, Table 5

To get a comprehensive view of the developments in Europe on the aggregated level for the same period, we conducted a country level analysis. First, we looked at the general tendencies and growth rates for different countries, both previous members and new members that joined the EU in 2004, before and after their entry into the union. Secondly, we tested a generalized version of the cohesion model for both GDP development and unemployment developments, to observe effects from different factors that can help explain cohesion and convergence in Europe, or lack there off, between the respective countries and the EU-average. The model is similar to the regional cohesion models, with additional control variables.

When estimating the regressions models, we first used a simplified specification as a benchmark. This gave us the opportunity to observe effects when additional control variables were added. Each of the six multi-factor regressions was first run using Ordinary Least Square (OLS) with heteroskedasticity-robust standard errors. Given that Gauss-Markov assumptions MLR.1–MLR.6 are fulfilled, it can be shown that OLS gives “Best Linear Unbiased Estimators” (BLUE). This means that we have made an assumption of normality distribution in our dataset.²²

In addition to these OLS regressions, we ran difference in differences estimations (DID), since we use panel data. We chose DID model based upon a Hausman test and also controlled for anticipatory effects by using one and two year leads for the regions and countries receiving regional support.

Using DID is also the best way to overcome a possible endogeneity problem. The endogeneity problem occurs when exogenous variables are correlated with the error term which implies that the regression coefficients in the model are biased, due to omitted variables. These factors can be both qualitative and quantitative, in order words that inflation may be correlated with domestic fiscal policies. Another problem potential problem in our models is that of multicollinearity in the sense that the exogenous variables are highly correlated with the error term or with another independent variable. This does not affect the significance or goodness-of-fit (R^2) of the regression as a whole, but can change the significance of our explanatory variables, i.e. that inflation may be correlated with membership in the EMU.

We also generated year specific dummies to give us a generalized version of the DID regression. This enable control for macroeconomic factors that are different before and after the programme

²² Wooldridge, J. M. (2008), “Introductory Econometrics: A Modern Approach”

period and to control for all the year-specific macroeconomic factors that may vary from year to year for all countries, such as business cycle effects.

3.5 Considerations of the dataset

When we use lags and leading effects in the respective models, we assume that no support was given in the years prior to the first year of the observation period. This is a correct assumption for the new member states that entered the EU in 2004. It is also reasonable for previous member states, as the investment focus of the regional policy varies between the different programme periods. This means that we replace the missing values generated of when applying time lags with zeros (0). This gives the dataset approx. 4500 additional observations for the regional analysis, for GDP and unemployment data respectively and an additional 75 observations for the country level analysis.

We also tested whether there was reversed causality in the models by including leads for the independent variables determining effects of receiving support and testing for joint significance. Lags are considered as "post-treatment effects" and the leads as "anticipatory effects". To give a significant causal interpretation to the differences-in-differences estimator anticipatory effects must ideally not be evident; i.e. that leads jointly insignificant. We also tested the common trends assumption; i.e. that the supported countries and regions followed the same trend as those not receiving support if they had not received any support.

3.6 Regional level model specifications

Support model

GDP

$$\text{GDP}_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support} * \text{Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU} * \text{Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Hypothesis 1:

HO: NUTS-3 regions receiving regional support do not experience effects in terms of GDP per capita growth, compared to if they would not have receiving support

$$\delta_2 = 0$$

H1: NUTS-3 regions receiving regional support experience effects in terms of GDP per capita growth compared, compared to if they would not have received support

$$\delta_2 \neq 0$$

Unemployment

$$\text{Unemployment}_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support} * \text{Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU} * \text{Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Hypothesis 2:

HO: NUTS-3 regions receiving regional support do not experience effects in terms of unemployment rate, compared to if they would not have received support

$$\delta_2 = 0$$

H1: NUTS-3 regions receiving regional support experience effects in terms of unemployment rate, compared to if they would not have received support

$$\delta_2 \neq 0$$

Cohesion model

GDP

$$[\text{GDP region} - \text{Benchmark GDP (Country average)}]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support} * \text{Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU} * \text{Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Hypothesis 3:

HO: Domestic convergence in terms of GDP per capita between NUTS-3 regions and the country average is not affected when regions receive support, compared to if they would not have received support

$$\delta_2 = 0$$

H1: Domestic convergence in terms of GDP per capita between NUTS-3 regions and the country average is affected when regions receive support, compared to if they would not have received support

$$\delta_2 \neq 0$$

Unemployment

$$[\text{Unemployment region} - \text{Benchmark Unemployment}(\text{Country average})]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support} * \text{Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU} * \text{Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Hypothesis 4:

HO: Domestic convergence in terms of unemployment rates between NUTS3 regions and the country average is not affected when regions receive support, compared to if they would not have received support
 $\delta_2 = 0$

H1: Domestic convergence in terms of unemployment rates between NUTS3 regions and the country average is affected when regions receive support, compared to if they would not have received support
 $\delta_2 \neq 0$

3.7 Country level model specifications

GDP

$$[\text{GDP} - \text{GDP EUAverage}]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support} * \text{Year}_i + \delta_4 \text{inflation}_{it} + \delta_5 \text{left}_{it} + \delta_6 \text{right}_{it} + \delta_7 \text{EMU}_{it} + \delta_8 \text{HLC}_{it} + \delta_9 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Unemployment

$$[\text{Unemployment Country} - \text{Unemployment EUAverage}]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support} * \text{Year}_i + \delta_4 \text{inflation}_{it} + \delta_5 \text{left}_{it} + \delta_6 \text{right}_{it} + \delta_7 \text{EMU}_{it} + \delta_8 \text{HLC}_{it} + \delta_9 \text{Year}_{it} + D_t + \varepsilon_{it}$$

4. RESULTS

4.1 Regional level models

The use of the granted support in different regions varies, as investment deemed needed to support growth differ. We attempted to make controls for different types of investments, to see if any particular kind tended to render better returns. However, the effort failed, as the way investments are described and presented vary to a great extent. What is investment in “quality of life” in one region or “human development” may be the similar, but also differ to a great extent. The lack of consistency is general tendency for a majority of the statistics available in evaluating regional policies. We also tested to create investment categories in forms of subgroups, such as infrastructure, agriculture, education and so on, to capture any differences in the effects of various types of investments and to allow for a more qualitative analysis, but also this attempt failed due to consistency problems.

The time lags for any yields of the investments may also differ, i.e. projects in infrastructure, tourism, health or education. We have attempted to compensate for this by allowing time trends and time lags. It can also be argued if it is appropriate to evaluate cohesion policies based upon an aggregated economic growth variable and if short term effects displayed are relevant for long-term trend inference, but given that GDP and unemployment development are the generally accepted qualitative measures, they are considered the most relevant ones for our analysis.

4.1.1 Support model – GDP growth

We ran the support model using different econometrical methods, both with and without lagged effects. Hypothesis 1 was tested using a two sided F-test. The full is outlined as stated:

$$GDP_{it} = \delta_0 + \delta_1 Support_i + \delta_2 interaction_{it} + \delta_3 Support(0-1\%)_i + \delta_4 Support(1-2\%)_i + \delta_5 Support * Year_i + \delta_6 EMU_{it} + \delta_7 EMU * Support_{it} + \delta_8 Year_{it} + D_t + \epsilon_{it}$$

OLS

The simplest version of the model was first tested using interaction as the explanatory variable, together with dummy variables for the respective years and receiving support. The interaction term came out as significant all relevant levels and with a positive coefficient, giving a first indication of the effects of receiving regional support. The observed R^2 value was strong, 0.34. This may indicate omitted variables, as it is unlikely that 34 percent of the variance in GDP growth is explained alone.

Testing the full model gives some interesting findings. First of all, the interaction parameter δ_2 is still significant and positive. However no effects can be observed that higher levels of support should render better effects. Instead, the parameter for the time trend δ_5 Support*Year_i is significant and negative, which implies diminishing effects of support over time, all other factors hold constant. The full model has an $R^2 = 0.36$, partly explained by a positive effect of EMU membership, as δ_7 for EMU*Support also was both significant and positive when added to the model. After having estimated the full model, we tested Hypothesis 1 accordingly, using an F-test:

Hypothesis 1

H0: NUTS-3 regions receiving regional support do not experience effects in terms of GDP per capita growth, compared to if they would not have receiving support
 $\delta_2 = 0$

H1: NUTS-3 regions receiving regional support experience effects in terms of GDP per capita growth compared, compared to if they would not have received support
 $\delta_2 \neq 0$

F (1, 15213) = 48.71
 Prob > F = 0.0000

The results of the F-test display strong evidence against the H0, suggesting that regional support has effect on growth at the NUTS-3 level. As the coefficient is positive, it can be concluded to have a positive effect on growth.

Leading and lagged effects

Time lags were used to test for any anticipatory or lagging effects of receiving regional support. Only the two year lag was significant on the 5 percent significance level, which would indicate that it takes time for investments to render positive yields; an expected effect given the nature of many investments made, i.e. infrastructure or agriculture. We also tested one and two year leads to determine any anticipatory effects, for the casual inference of the differences-in-differences estimator. Testing for joint significance, we can reject the null hypothesis that leads are equal to zero.

Differences-in-differences

A Hausman test resulted in a $(\text{Prob} > \chi^2) > 0.05$, which led us to use random effects estimation. After testing the model we got somewhat different results compared to OLS. The interaction parameter δ_2 did not come out as significant on any relevant levels. This could indicate that there is insufficient robustness in the effects of receiving regional support. However, the positive growth effect of the parameter δ_7 for EMU*Support is still evident and strongly significant.

We can infer that the support model shows that NUTS-3 regions benefit in terms of GDP growth from receiving support from the structural fund, but the effect is diminishing over time and it is debatable whether it is robust or due to differences across various regions.

4.1.2 Support model – Unemployment development

We also tested the support model to capture effects on unemployment rates across the NUTS-3 regions. A simplified model, with only the interaction term gave us a similar effect as when testing the Support model for GDP growth. The interaction parameter δ_2 was both significant and had a negative coefficient, indicating that regions receiving support from the structural funds experience decreasing levels of unemployment over time. The simplified model rendered an explanatory value of $R^2 = 0.09$. After testing the full model we noticed that δ_2 was still significant but also that regions that received higher levels of support benefitted more in terms of unemployment rates. The full model has an explanatory value of $R^2=0.147$.

$$\text{Unemployment}_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support} * \text{Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU} * \text{Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Testing Hypothesis 2 against a two-sided alternative, using an F-test, resulted in a similar conclusion as above; we can reject the null hypothesis on all relevant levels of significance.

Hypothesis 2:

HO: NUTS-3 regions receiving regional support do not experience effects in terms of unemployment rate, compared to if they would not have received support

$$\delta_2 = 0$$

H1: NUTS-3 regions receiving regional support experience effects in terms of unemployment rate, compared to if they would not have received support

$$\delta_2 \neq 0$$

$$F(1, 10836) = 11.90$$

$$\text{Prob} > F = 0.0006$$

A somewhat different effect compared to GDP development, was that the parameter δ_7 for $\text{EMU} * \text{Support}$ came out as positive and significant, indicating that NUTS-3 regions suffered from higher levels of unemployment due to either the start of the EMU in 2002 or their entry into the EMU in 2004, for the new member states in eastern Europe.

Lags, leads and anticipatory effects

Allowing for a one year and a two year lag resulted in some interesting effects. The interaction parameter δ_2 becomes insignificant, while the one and two year lag, L1.Interaction and L2.Interaction became significant, with the strongest negative effect for the two year lag. The interpretation is that it takes time for investments to render positive employment effects in the NUTS-3 regions, which would follow the same logic as the lagging GDP growth. Controlling for anticipatory effects, we also tested one and two year leads for joint significance. Neither this time could the null hypothesis of $L1 = 0$ and $L2 = 0$ not be rejected.

Further, we used fixed effects to test for differences-in-differences following a Hausman test. A similar pattern emerges as for OLS estimation, with significant negative coefficients for the interaction term not using any lag and increasingly negative effects allowing for one and two year lags respectively. The findings suggest that unemployment effects are generally negative and robust; however, the effects of increasing support are somewhat unclear. We cannot infer that higher levels render significantly lower levels of unemployment compared to regions receiving less support, at least not using fixed effects estimation.

4.1.3 Cohesion model – GDP Growth

Apart from the Support model, we also tested domestic cohesion in terms of GDP, comparing the development of the difference between specific regions GDP and the national average, to observe any convergence or lack thereof. We first tested the model using a linear OLS model.

$$[\text{GDP region} - \text{Benchmark GDP (Country average)}]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support*Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU*Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

The initial observations were that our model is very weak in terms of explanatory ability, with an observed $R^2 < 0.01$. We got significant results and negative coefficients for both δ_2 and for δ_7 , in line with the observations in the support model. Negative coefficients imply cohesion, or decreased difference between the respective regions averages and the country average. We can also see a significant time trend, as the coefficient for δ_5 (Support*Year) came out as negative, with an increasing effect over time. Further, Hypothesis 3 was tested accordingly, using the standardized F-test.

Hypothesis 3:

H0: Domestic convergence in terms of GDP per capita between NUTS-3 regions and the country average is not affected when regions receive support, compared to if they would not have received support

$$\delta_2 = 0$$

H1: Domestic convergence in terms of GDP per capita between NUTS-3 regions and the country average is affected when regions receive support, compared to if they would not have received support

$$\delta_2 \neq 0$$

$$F(1, 15213) = 15.82$$

$$\text{Prob} > F = 0.0001$$

The results display strong evidence against the null hypothesis (H0), concluding that domestic convergence is evident. Even if the model as such is weak, we can still observe a clear pattern when allowing for both one and two year lags. Following the same logic as the support model, the effects of regional support tend to increase over time as the observed explanatory value increases, even so from very low initial levels. Testing for leading effects and anticipatory tendencies did not render a rejection of the null hypothesis for joint significance, implying that anticipatory effects are not evident. A random effect estimation following a Hausman endogeneity test could not support that cohesion due to receiving regional support is evident, as the coefficient of the interaction term were not significant on any relevant levels, regardless of the level of support received. However, membership in the EMU tends to consistently enhance domestic cohesion. Even if a certain trend can be observed relating to lagged effects in terms of support, any general inference based upon the cohesion model for GDP developments is difficult due to its weakness in explaining variance in the dependent variable.

4.1.4 Cohesion model – Unemployment development

When running the cohesion model for domestic unemployment development, a similar pattern as previously observed emerges. Running the linear OLS regression we got significant results for the interaction term coefficient and could observe larger effects when a region received higher levels of support. Also, the coefficient for EMU members that received support tends to increase the differences in terms of unemployment rather than enhance convergence. The model as such is weak, as the adjusted $R^2 = 0.03$. The explanatory value is stronger compared to the GDP cohesion model, which is consistent with the findings that the Support models shows larger effects for employment effect than GDP growth.

$$[\text{Unemployment region} - \text{Benchmark Unemployment}(\text{Country average})]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support}(0-1\%)_i + \delta_4 \text{Support}(1-2\%)_i + \delta_5 \text{Support} * \text{Year}_i + \delta_6 \text{EMU}_{it} + \delta_7 \text{EMU} * \text{Support}_{it} + \delta_8 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Hypothesis 4:

HO: Domestic convergence in terms of unemployment rates between NUTS3 regions and the country average is not affected when regions receive support, compared to if they would not have received support

$$\delta_2 = 0$$

H1: Domestic convergence in terms of unemployment rates between NUTS3 regions and the country average is affected when regions receive support, compared to if they would not have received support

$$\delta_2 \neq 0$$

$$F(1, 10836) = 4.35$$

$$\text{Prob} > F = 0.0371$$

Testing Hypothesis 4 confirms the results from the OLS model, that cohesion is affected by regional support. The null hypothesis can be rejected on all relevant levels, which together with the negative coefficients for the interaction term imply convergence in terms of unemployment rates. A difference to the observations made after running the Support model for unemployment development, was that a lagging effect could be observed. We could find no support for this running the linear OLS, allowing for one and two year lags respectively, as both were insignificant on any relevant levels.

To infer any anticipatory effects, we tested for joint significance on the one and two year leads in the model. The null hypothesis cannot be rejected on any relevant level, which is in line with the observations for the GDP cohesion model. The observations from a random effects estimation following the Hausman endogeneity test, consistently supports the OLS observations which implies that the model is seemingly robust.

4.2 Country level results

4.2.1 General developments

The countries that have had the highest growth rates over the last decade are the ones that entered the EU in 2004, with Slovenia being the only country trailing among the top performers. What comes out as especially interesting is that the countries that joined the EU in 2004 actually benefited, in terms of growth rates after joining the union.²³ Another observation is that all of the less developed economies in the EU grew faster on average, with exception for the outstanding growth in Luxembourg, especially 2005-2007, including the member states in southern Europe. This development indicates that convergence is evident on an aggregated level in the EU.²⁴

	Average (04-08)	Average(98-03)	Diff. joining EU
Latvia	19.16%	11.72%	7.44%
Lithuania	14.90%	11.52%	3.38%
Estonia	13.54%	12.22%	1.32%
Slovakia	16.92%	8.44%	8.48%
Czech Republic	12.48%	8.06%	4.42%
Poland	13.82%	5.08%	8.74%

Table 4.1: GDP development in fastest growing countries that were members in the EU in 2007, 1998-2008
(Source: Eurostat)

4.2.2 Cohesion model - Factors affecting convergence in terms of GDP

$$[\text{GDP} - \text{GDP EU Average}]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support} * \text{Year}_i + \delta_4 \text{inflation}_{it} + \delta_5 \text{left}_{it} + \delta_6 \text{right}_{it} + \delta_7 \text{EMU}_{it} + \delta_8 \text{HLC}_{it} + \delta_9 \text{Year}_{it} + D_t + \varepsilon_{it}$$

To observe specific factors affecting cohesion in the EU, the model was tested using linear OLS estimation. We got significant results for the parameter for HLC which is expected in the sense that wages can be used to explain why countries converge, with reference to the developments in the global economy where low wage countries gain comparative advantages, especially in labor intensive industries. What is somewhat unexpected though, is that the parameter for HLC has a positive coefficient, suggesting that when a country has higher average wage levels, the difference between to the European average increases. What we had expected was that countries with lower wage levels were to converge faster to the EU average, rather than the opposite. But this effect

²³ See Table 4.1

²⁴ See Appendix 2, Table 7

can also be interpreted as that when a country has better productivity, as a proxy for a better developed economy, the wages also tend to increase.

Allowing for longer time lags, especially for the countries that entered the EU in 2004, would be likely to render somewhat different results, as the effects of having lower wages may increase over time. However, the restrictions of the dataset limit the ability to capture longer time lags. We also got significant results for δ_6 i.e. testing for right-wing political orientation of the largest party in the government for each year. This finding would suggest that countries with right-wing governments tend to converge toward the EU average rate at a slower pace than others. However, this effect should be interpreted with some caution. Well developed nations, with a GDP above the European average, to a greater extent had right wing governments compared to less developed member states, during the period 2000-2006. The model has a very high explanatory value of Adj. $R^2 = 0.81$, which suggest that foremost wage levels has a large impact on the cohesion development within the EU. Given that so few of our independent variables were significant, we conclude that the wage level variable captures effects of certain omitted explanatory factors.

Performing a Hausman test, suggests the use of random effects estimation, which gave some different results compared to the linear OLS. First of all, countries that received regional support from the structural funds tended to close the gap to the European average, but this effect is also likely to be explained by the general convergence, rather than effects of support as such.

We also got significant and positive results for the inflation coefficient, which is a somewhat difficult effect to interpret. First of all, it indicates that higher levels of inflation would render a larger gap to EU-average GDP. But inflation has also converged over time and the countries with the highest initial levels of inflation were also the ones with the largest gap to the EU average GDP.²⁵ Secondly, higher inflation is empirically correlated with higher levels of growth. This assumption is consistent with that the countries with the highest growth rates also had the highest levels of inflation.²⁶ As there is convergence observed among countries in the EU, increasing inflation should be expected to render higher convergence, in other words a negative coefficient. But also, as converging levels of inflation can be observed within the EU, which is an expected consequence of the EMU, the effects of inflation can also be indirect, i.e. stabilization of the respective price levels may enhance growth over time.

²⁵ See Appendix 2, *Graph 1*

²⁶ See Appendix 1, *Table 7* and *Graph 1*

4.2.3 Cohesion model - Factors affecting convergence in terms of levels of unemployment

$$[\text{Unemployment Country} - \text{Unemployment EU Average}]_{it} = \delta_0 + \delta_1 \text{Support}_i + \delta_2 \text{interaction}_{it} + \delta_3 \text{Support} * \text{Year}_i + \delta_4 \text{inflation}_{it} + \delta_5 \text{left}_{it} + \delta_6 \text{right}_{it} + \delta_7 \text{EMU}_{it} + \delta_8 \text{HLC}_{it} + \delta_9 \text{Year}_{it} + D_t + \varepsilon_{it}$$

Testing the cohesion model for unemployment development, we got similar results as for the GDP cohesion model. The only parameter that turned out as significant when running a robust linear OLS regression was δ_8 for the wage level HLC. The coefficient is negative, which would suggest that increasing average wages reduces the differences in unemployment between a given country and the EU-average level, all other factors hold constant. This effect can be interpreted somewhat arbitrary. Either, it can be seen as that countries with higher wages also are more productive and have better competitiveness and converge toward the EU average.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	8.6	7.0	6.6	7.5	8.2	8.4	8.4	8.2	7.5	7.0
Latvia	13.8	14.2	13.1	12.1	10.5	10.4	8.9	6.8	6.0	7.5
Slovakia	16.4	18.8	19.3	18.7	17.5	18.2	16.3	13.4	11.1	9.5
Lithuania	13.4	15.9	16.8	13.7	12.4	11.4	8.3	5.6	4.3	5.8
Estonia	11.6	13.6	12.6	10.3	10.0	9.7	7.9	5.9	4.7	5.5
Czech Republic	8.8	8.8	8.2	7.3	7.8	8.3	7.9	7.1	5.3	4.4
Poland	12.3	16.1	18.2	19.9	19.6	18.9	17.7	13.9	9.6	7.1
Luxembourg	2.4	2.3	1.8	2.6	3.7	5.1	4.5	4.7	4.1	5.1
Greece	12.1	11.4	10.8	10.3	9.7	10.5	9.8	8.9	8.3	7.7
Slovenia	7.4	6.7	6.2	6.3	6.7	6.3	6.5	6.0	4.8	4.4
Ireland	5.8	4.3	3.9	4.4	4.7	4.5	4.3	4.4	4.6	6.0
Spain	15.7	13.9	10.5	11.5	11.5	11.0	9.2	8.5	8.3	11.3
Malta		6.3	7.1	6.9	7.6	7.2	7.3	7.3	6.4	6.0
Netherlands	3.6	2.9	2.3	2.8	3.7	4.5	4.7	3.9	3.2	2.8
Portugal	4.5	4.0	4.0	5.0	6.3	6.6	7.6	7.7	8.0	7.6
Austria	3.7	3.5	3.6	4.0	4.3	4.9	5.2	4.7	4.4	3.8
France	12.0	10.2	9.1	9.2	8.9	9.3	9.3	9.3	8.3	7.8
Finland	10.2	9.8	9.1	9.1	9.0	8.8	8.4	7.7	6.9	6.4
Denmark	5.6	4.6	4.6	4.6	5.4	5.5	4.8	3.9	3.8	3.3
Italy	11.4	10.6	9.5	9.0	8.6	8.0	7.7	6.8	6.1	6.7
Germany	8.9	7.9	7.8	8.5	9.8	10.7	11.1	10.2	8.6	7.5
United Kingdom	6.0	5.6	5.0	5.1	5.0	4.7	4.8	5.4	5.3	5.6
Sweden	7.6	5.4	4.8	5.1	5.7	6.5	7.5	7.1	6.2	6.2
Cyprus		5.0	4.0	3.3	4.1	4.3	5.3	4.5	3.9	3.7

Table (4.2): Unemployment levels (percent) in Europe, 1999-2008.

This can also be an effect of that the countries that entered the EU in 2004 rapidly decreased their levels of unemployment, while at the same time experiencing higher wage levels. These effects are interesting, but also somewhat difficult to render generalized inference. The model as

such is strong, with an Adj. $R^2=0.81$. This value is too high not to suspect that data suffers from consistency problems and that HLC also captures unobserved effects in the dataset. Even though the dataset may be biased, we still see interesting tendency when running the model with a two year lag of the wage level. The variable is still significant but the effect is diminishing, suggesting that the effect of having higher levels on productivity decreases over time, in other words that wage levels are converging.

After a Hausman test, we estimated cohesion model for unemployment rates using random effects. The results are similar the ones observed using linear OLS, but we also see significant results for the inflation level, suggesting that higher inflation renders greater differences in unemployment rates within the EU. This effect can be explained by that when the new member states joined the EU in 2004, they had both high levels of unemployment and high levels of inflation, i.e. stagflation. This would to a certain extent explain the positive inflation coefficient.

4.3 Concluding remarks

Testing our respective hypothesis using the support and cohesion models as well as empirical data, we found support for that convergence is taking place on national level, but no consistent support for that domestic cohesion is evident or that regional support should have significant positive growth effects or on the development of unemployment, even though some tendencies toward positive developments can be observed over time.

On the regional level, we did not find any consistency in that regional convergence should be evident, which suggests that the EU regional policies fail to live up to their desired goals. We cannot conclude any significant effects regarding the impact of support on unemployment rates, but we do however see weak tendencies toward domestic cohesion in terms of the levels of unemployment. Given that underdeveloped regions eligible for support in accordance with Objective 1 funds do not display any higher growth than the average country growth rate, questions can be raised regarding how efficient the regional policy and structural funds actually were during the 2000–2006. This efficiency issue can, as we see it, be considered from two primary perspectives. First of all, if cohesion is possible to enhance through support and second, if the distribution and investment processes are appropriate in order to achieve the outlined ambitions and goals.

5. ANALYSIS

5.1 Politics, economics and investments

First of all, a discussion needs to be taken to why cohesion as such is an objective for the EU. Who is the true beneficiary? It needs to be made clear that economic development is only one side of the EU coin. The debate if politics and economics really can be separated is ever ongoing. We can infer that economic growth, development and convergence is evident on the aggregated country level in the EU, following the neo-classical theories of Solow, where higher scale returns to labour and capital causes less developed countries to grow faster than more developed ones, due to diminishing returns to production factors.

The importance of the more socioeconomic perspective is something that is pointed out by Borrás *et al.* concluding this as a major driver for policy decisions within the EU.²⁷ The European Union is just as much a political union as it is an economic one. Creating political stability, both between and within member states is just as important, especially from a historical point of view.

The article by Martin suggests that there is actually a trade-off between aggregated growth and regional cohesion.²⁸ Any growth and cohesion trade-off may in such context be perfectly acceptable, even though not economically rationale. Even if a trade-off would be evident between cohesion and aggregated growth, it is reasonable to accept cohesion as political ambition to redistribute resources. The latter is also a case that would be supported by Persson and Tabellini in the sense that domestic regional differences actually are harmful for growth.²⁹

But then the next problem follows, is it really an efficient approach that is being undertaken by the EU or is political ambition overpowering economically efficient resource allocation? Our findings that nations tend to converge, but regional differences endure or at least by almost unaffected by regional policy efforts, puts the ambitions to support less developed regions into question. We did, as Falk and Sinabell also suggests, find support for positive effects of regional policy, but only to a limited extent.³⁰ The weak effects observed that cohesion is ongoing, slowly but still, could according to Xavier be explained in a more neo.-classical manor as a “natural

²⁷ Borrás, S. and Johansen, H. (2001), “Cohesion Policy in the Political Economy of the European Union in Cooperation and Conflict”

²⁸ Martin, P. (1998), “Can Regional Policies Affect Growth and Geography in Europe?”

²⁹ Persson, T. and Tabellini, G. (1994), “Is inequality harmful for growth?”

³⁰ Falk, M. and Sinabell, F. (2008), “The Effectiveness of Objective 1 Structural Funds in the EU 15: New Empirical Evidence from NUTS 3 Regions”

process”.³¹ What instead tends to be the case is that already well developed regions within a country benefit from the convergence on the national level, without the less developed regions being able to catch up. These are findings similar with polarization and backwash theories previously presented by Myrdal.³²

It can of course be argued that without the support granted, the less developed regions would suffer even more. But given that only limited and inconsistent evidence can be found that increasing levels of supports (1-2 percent of GDP or more) should have greater impact than 0–1 percent of GDP in support, refutes such inference. Rather, the evident conclusion is that regions actually tend to grow at a somewhat slower pace, after support has been received, given observed negative time trends. Anticipatory effects may well play a certain role, in that regions that previously have received support one period expect to do so the next period as well. Crowding of domestic investment may also help explain such an effect. This was suggested Ederveen *et al.* who found that tendencies toward crowding out exist in supported regions.³³ Diminishing effects could also be interpreted as that when support is being granted, projects that would not otherwise be funded are invested in, even if they are co-financed by the region in question, draining capital and other institutional resources from better investments. Put in different terms – the quality of the investments made, may decrease and the distribution of capital becomes more arbitrary, compared to funding from solely domestically generated tax payer money, in something of a rush to spend the received funds.

5.2 Lagged effects

An important finding is that effects of receiving structural support tend to have a lagging effect, especially after two years. Given the limitations in our data set, we only tested for up to two year lags. Testing for longer lags would be interesting as many of the investments made relate investments in infrastructure, education, health and innovation – all which are expected to suffer from time lags longer than two years. The study by Rodriguez-Posé and Fratesi found only limited effects using longer time lags for the programme periods preceding that of 2000–2006, but could not demonstrate any strong effects.³⁴

³¹ Sala-i-Martin, X. (1996), “Regional cohesion: Evidence and theories of regional growth and convergence”

³² Behrens, P. and Smyrl, M. (1997), “EU Regional Policy in Theory and Practice

³³ Ederveen, S., Gorter, J., de Mooij, R. and Nahuis, R. (2002), “Funds and Games: The Economics of European Cohesion Policy”

³⁴ Rodriguez-Pose, A. and Fratesi, U. (2004), “Between Development and Social Policies: The Impact of European Structural Funds in Objective 1 Regions”

5.3 Wages and unemployment

Differences in relative costs of labor have played an important role in the recent developments in the global economy. Labor intensive industries are being re-located, subject to outsourcing and off-shoring, to countries with lower labor costs. It could be expected that similar effects should be observed within Europe and the EU, where countries with lower wage levels in that case would benefit in terms of comparative advantage. The results of our study do not support such a finding, in the sense that lower wage levels do not increase convergence between countries. Domestic re-location (outsourcing, off-shoring) of production resources is expected to be even smaller on the than as domestic differences in wages unlikely to have any explanatory effects. We can conclude that regions that receive regional support from the structural funds tend to close the gap to the country average unemployment, but that the effects are weak.

Whether or not there is a substitution effect in terms of that jobs move across Europe, resulting in increasing convergence rates. This would imply that there is mobility in the tradeable jobs sector (jobs in industries not bound to a specific country or region) between different countries in Europe. In that case, unemployment would moves from one area to another, decreasing differences in aggregated unemployment rates, but leaving the absolute number of unemployed members in the aggregated workforce at constant levels. The rapid decrease in unemployment rates among the new member states could support such a conclusion, as convergence has been observed in terms of GDP.³⁵ But a substitution effect or “transfer” of unemployment should to a certain extent be explained by lower wages, but this does not appear to be the case, as the results of our support and cohesion models show that higher wages tend to increase unemployment differences. Further modeling and research would be needed to make any broader inference.

5.4 The current state of affairs

The financial crises of 2008 shuck the very fundaments of the global economy. During 2009 it became evident that Europe did not only face a business recessions across every industry segment, but also significant macro economic difficulties in several member countries within the EU, caused by large budget deficits and skyrocketing national debts. The countries that have suffered the most during the crisis are namely the Baltics and those in the common tongue known as PIIGS (Portugal, Ireland, Italy, Greece, Spain). Troubles in the public finances have not been contained to the economies of Sothern Europe, as also the UK has exceeded a 12 percent budget deficit in 2010. The recent developments have taken their toughest toll on

³⁵ See Appendix 2, *Table 6*

Greece, as the country recently has been on the verge of bankruptcy. The real concern in the EU perhaps not the Greece national debt situation as such, but the potential remedies this development may have on the monetary union, EMU.³⁶

But is this development in any way related to the cohesion policies of the EU during 2000–2006? We argue that it is. A number of interesting pieces have been published relating to the development of the EMU, with regard to the macroeconomic stability of the member states. The EMU has by many leading economists been labeled something of an economic high risk project. One of the main concerns have been the between centralized monetary policy and the risks of being exposed to asymmetric chocks, i.e. exogenous shocks to certain areas of the EMU resulting in recession in one or several countries, whereas others may experience stable growth.³⁷

De Grauwe presents interesting facts with regard to how the criteria of the stability pact were implemented.³⁸ Ambitious goals set out in the early 90's were discarded when the EMU was to become reality in the early years of 21th century. He concludes that neither Greece, Portugal, Ireland, Spain, Italy, Austria nor the Netherlands and to some extent Germany met the “convergence criteria” in terms of gross debt, deficit levels or inflation rate. Still, the EMU was formed and developed accordingly up until the crisis of 2008, when significant difficulties became evident.³⁹ Buiter presents further perspectives on how the EMU suffers from a severe issues regarding how the implementation of the monetary Union were thought through or rather the lack there off.⁴⁰

What conclusion can be drawn from the recent developments and early critiques of the EMU and foremost - how does this relate to regional policy? We see three relevant parallels: 1) politics often come before economics, 2) there is a need to enhance stability in the EU and the Eurozone, 3) the EU is often in a rush.

Foremost, economic rationale may not always go hand in hand with political reality. Even though the Maastricht convergence criteria as outlined in 1992, would possibly, if fulfilled, have decreased the consequences of the financial crisis of 2008. They were to a large extent ignored

³⁶ De Grauwe, P. (2010), “Greece: The start of a systemic crisis of the Eurozone?”

³⁷ Ibid.

³⁸ De Grauwe, P. (2009), “The politics of the Maastricht convergence criteria”

³⁹ De Grauwe, P. (2010), “Greece: The start of a systemic crisis of the Eurozone?”

⁴⁰ Buiter, W.H. (1999), "Alice in Euroland"

when the EMU was launched in 2002. The political stakes that were on the table in actually making the EMU happen simply appears to have been too high.

We claim that the same reasoning can be applied for the regional policies and structural funds in the EU. The issue at hand is whether politics determine how regional support is designed and funds are allocated, rather than economic rationale and efficiency. Given how the EMU was designed and launched, a similar pattern emerges. It seems to be so much political prestige invested in the cohesion policy in Europe that the strictly economic rationale is being set aside. The huge amounts of funds allocated to regions across Europe, without any consistent empirical evidence on its efficiency, certainly seems to support such a statement.

Another issue that must be raised is whether the need for stability to consolidate and enlarge the EMU is the driving force for cohesion. This would imply that the importance of avoiding asymmetric shocks, e.g. regional business cycles and other economic imbalances, requires active cohesion policies to be imposed even if they may not be particularly beneficial for the EU as a whole. Such a conjecture implies that the EMU cost tag, equivalent to some 40 percent of the EU budget, is the price of the cohesion policy which aims to avoid future crises. It is a bit provocative and controversial to claim that regional policy is driven by the need for stability in the monetary union, but that it is a factor of critical importance for cohesion ambitions is not a distant conclusion.

There is no clear-cut division between politics and economics. Political stability and economic stability go hand in hand, resulting in a need for actions for continued cohesion, even if the design and execution of the regional support may need to be evaluated and improved.

5.5 Conclusions

Regional policy and support had positive effects on growth and employment levels in receiving NUTS-3 regions during the programme period 2000–2006. However, the effects were not substantially much higher than in regions which did not receive support. Rather, countries as a whole tend to converge over time, with already developed rich regions benefitting more in a domestic perspective. Thus, regional differences endure while countries converge.

It is not possible to conclude whether EU's regional policy and use of structural funds represents inefficient use of tax payer money, but the results of this study give reason to question how the policy is designed and resources are distributed. The European Union is a political institution as much as an economic union. The design and implementation of EU regional development policy may be debated, but the conclusion based on observations and analyses of our study is that support to less developed areas should not aim only for economic effects. This represents a too narrow approach to a complex context which involves societal, political, historical, cultural and economic considerations.

6. DISCUSSION

6.1 The context of our study

Previous research has held opposing views as to whether or not the regional policy is efficient in achieving cohesion or not. There are studies that have found statistically significant and positive effect of the regional support and those that have come to the conclusion that the structural funds have either no impact or even a negative effect. We had also noted that the majority of previous research only includes developments until 2004 and we therefore chose to analyze data available until 2007 and 2008. This means that we have included the first two years of the current programme period (2007–2013), which may also have influenced our results. However, not doing so would have made it impossible to test the effects of different time lags for final years of the programme period in the largest extent deemed needed. Our ambition has been to take a more qualitative analytical approach in putting the regional policy into a broader context and using other types of explanatory variables compared to the previous conducted research.

A major concern throughout the study has been the somewhat inconsistent reporting of data available from Eurostat. The statistics reported in particular from Eastern Europe (the new member states in 2004), Malta and Cyprus do not follow the same pattern as the other member states reporting principles, in terms of subdividing which NUTS-3 regions that received a certain level of support. This forced us to treat several countries as a whole region, which have had negative impact on our data and caused biased estimate. Even so, we determined this to be the most appropriate treatment of the data available.

6.2 Econometrical and analytical remarks

Our study is only concerned with a relatively short period of time, making it somewhat difficult to isolate the effects of support and cohesion developments, especially as many of the investments made are long term, it may take several years for any positive effects to be seen. Therefore, using lags in a larger extent than possible by the data used in this study may well show even more interesting results. This is especially relevant for the countries that entered the EU in 2004, compared to the member states that benefitted from the regional support the entire period from 2000–2006, as it may take some time to adapt the domestic institutions to receiving support.

In terms of the models and variables used, a major econometrical concern was the variables included and perhaps foremost the omitted ones. The variables that we have chosen to include have both upsides and drawbacks. The regional level analysis has foremost focused on the specific effects of receiving regional support and the level of support received. Further variables could have been included, testing for more qualitative factors, such as institutional standards and how the allocation process was handled on the regional level and why certain investments were chosen. We expect the non-quantitative factors to play important roles in determining the effects of regional support. However, the statistics available are very limited on the NUTS-3 level in general and in terms of qualitative factors in particular.

On the country level, we chose variables based upon what expected to render significant results, such as wage levels, inflation and political orientation of the government. Especially the wage level effects have been relevant for our analysis. But wage levels are measured as average country levels and there may be relevant differences that are hard to observe, i.e. manufacturing intensive countries compared to service intensive countries. Wage differences may also differ domestically. There are more variables available for countries as a whole, compared to specific regions. However, we wanted to conduct the analysis following the same logic and structure and test the same dependent variables as for the regional level analysis, which imposed some restrictions in the number and types of variables that could be included.

6.3 Broader implications

We believe that several findings in our study can be used to explain developments not only within the EU, but also in a broader sense. Regional development and national convergence in a political context is evident on many continents and countries around the world. The EU can to a large extent be seen as a socio economic and political science experiment, that observers can learn a great deal from, both in terms of what to do and perhaps foremost what not to do. We have observed that countries converge while regional differences endure. This effect is likely to be evident on many emerging markets and developing economies on forth. Just as likely is that attempts will be made to counter both domestic and cross country imbalances. The EU serves as a great example for what can be achieved in a very short period of time, but also the consequences of trying to achieve too much too fast, not only in terms of regional development policies but foremost on in a broader institutional sense. Political will and economic rationale is not always a good fit. Separating the two is necessary, but also one of the most difficult tasks in times where the boundary between what is public and what is private diminishes at a constantly

increasing pace. Still so, we believe that it is crucial to shed light on and have a transparent debate of the consequences of political decisions and general policies.

6.4 Further research

The areas of development economics and regional cohesion in a political context are very interesting for continued research, both within and independent of the EU. In the EU, foremost more qualitative analysis of the regional policy could bring new, important perspectives, instead of always trying to search for the answers in increasingly complex quantitative econometric models. All effects of investments are not captured in aggregated economic variables. Instead we see a great need to understand what type of support that really would be beneficial for different geographical areas. Further, a shortcoming in this study has been limitations in the use of lags; much of regional development and cohesion is a matter of long term investments, with extensive time lags, rather than short term quick fix. To better comprehend the time dimensions is an area that we believe could make important contributions to increase the understanding in how to implement and evaluate regional policy and public support in best possible way. In a broader sense, it would also be very interesting to make comparative analysis between how regional support is implemented on various emerging markets, as say in China, with highly centralized investment planning, or India, compared to the EU and evaluate differences in policy, processes and effects.

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Appendix 1

	Coded:	Interpretation:
Dependent variable:		
Diff_GDP	-18065 – 51967	Difference between national GDP per capita (2900 – 78100) and the EU average GDP per capita (18929 – 26133) for 25 member countries. (EUR per inhabitant)
Explanatory variables:		
EMU	0, 1	Member of the European Monetary Union, 0: non-member, 1: member
HLC	1.85 – 34.74	Average hourly labour costs, defined as total labour costs divided by the corresponding number of hours worked. (EUR)
Inflation	-1.08 – 12.19	National inflation rate (%)
Left	0, 1	Political orientation of largest party in the government, 0: non-left, 1: left
Middle	0, 1	Political orientation of largest party in the government, 0: non-middle, 1: middle
Right	0, 1	Political orientation of largest party in the government, 0: non-right, 1: right
Support	0, 1	Receiver of regional support, 0: non-receiver, 1: receiver
After	0, 1	Time period starting from the year when countries begin to receive support to the last year available in the data set (2007)
Interaction	0, 1	Support*After, 0: Before the programme period 2000-2006 for non-receiving regions 1: During and after the programme period for receiving.
SupportYEAR	0 – 2006	Time trend
Time variable:		
YEAR	1999 – 2007	9 years
Panel variable:		
ID	1 – 25	25 member countries
Total observations:	225	

Table 1: Dependent and explanatory variables for our country GDP per capita model

	Coded:	Interpretation:
Dependent variables:		
Diff_UN	-6.9 – 11	Difference between national unemployment rate (1.8 – 19.9) and the EU average unemployment (7.2 – 9.2) for 25 member countries. (%)
Explanatory variables:		
EMU	0, 1	Member of the European Monetary Union, 0: non-member, 1: member
HLC	1.85 – 34.74	Average hourly labour costs, defined as total labour costs divided by the corresponding number of hours worked. (EUR)
Inflation	-1.08 – 12.19	National inflation rate (%)
Left	0, 1	Political orientation of largest party in the government, 0: non-left, 1: left
Middle	0, 1	Political orientation of largest party in the government, 0: non-middle, 1: middle
Right	0, 1	Political orientation of largest party in the government, 0: non-right, 1: right
Support	0, 1	Receiver of regional support, 0: non-receiver, 1: receiver
After	0, 1	Time period starting from the year when countries begin to receive support to the last year available in the data set (2007)
Interaction	0, 1	Support*After, 0: Before the programme period 2000-2006 for non-receiving regions 1: During and after the programme period for receiving.
SupportYEAR	0 – 2006	Time trend
Time variable:		
YEAR	1999 – 2007	9 years
Panel variable:		
ID	1 – 25	25 member countries
Total observations:	225	

Table 2: Dependent and explanatory variables for our country unemployment rate model

	Coded:	Interpretation:
Dependent variables:		
Diff_GDP_regional	-18300 – 62500	Difference between regional GDP per capita (1400 – 96000) and national GDP per capita (2500 – 78100). (EUR per inhabitant)
GDP	1400 – 96000	Regional GDP per capita. (EUR per inhabitant)
Explanatory variables:		
EMU	0, 1	Member of the European Monetary Union, 0: non-member, 1: member
Support	0, 1	Programme period, 0: before and after programme period, 1: during programme period
After	0, 1	0: before programme period, 1: year when regions begin to receive support to the last year available in the data set (2007)
Interaction	0, 1	Support*After, 0: Before the programme period 2000-2006 for non-receiving regions 1: During and after the programme period for receiving.
Support01	0, 1	Support measured as share of GDP: 0-1% of average annual GDP during the programme period, 0: not 0-1%, 1: 0-1%.
Support12	0,1	Support measured as share of GDP: 1-2% of average annual GDP during the programme period, 0: not 1-2%, 1: 1-2%.
Support25	0, 1	Support measured as share of GDP: 2-5% of average annual GDP during the programme period. 0: not 2-5%, 1: 2-5%.
SupportEMU	0, 1	Support*EMU, 0: non-members and/or before and after programme period, 1: members of EMU during the programme period
SupportYEAR	0 – 2006	Time trend
Time variable:		
YEAR	1998 – 2007	10 years
Panel variable:		
ID	1 – 1573	1573 regions
Total observations:	15240	

Table 3: Dependent and explanatory variables for our two regional GDP per capita models

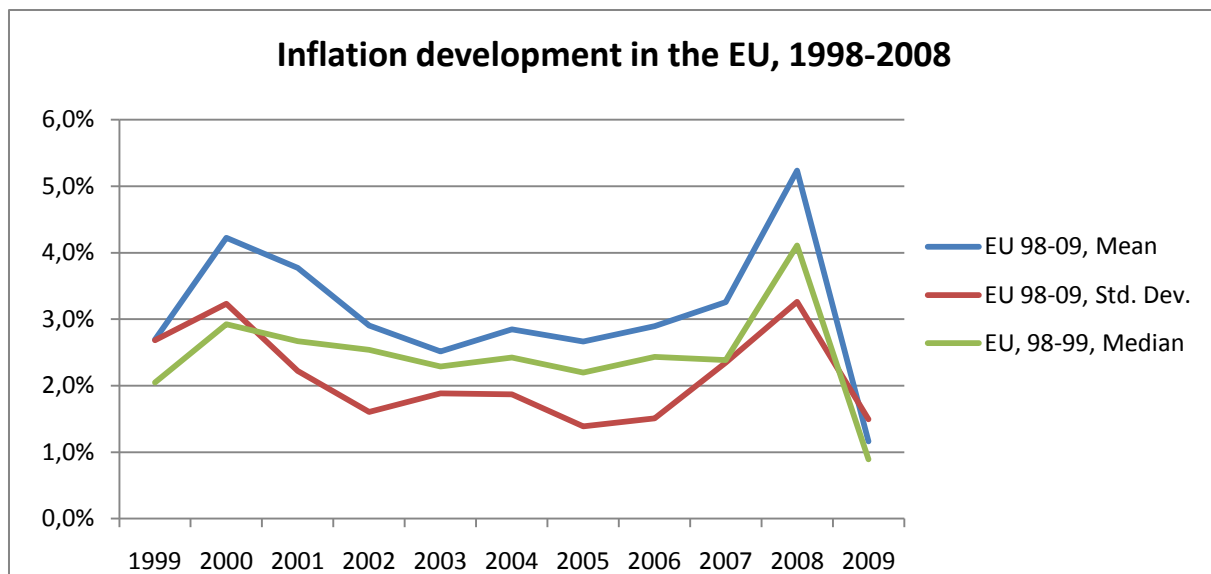
	Coded:	Interpretation:
Dependent variables:		
Diff_UN_regional	-11.5 – 32.9	Difference between regional unemployment rate (1.3 – 49.9) and national unemployment rate (1.8 – 19.9). (EUR per inhabitant)
Unemployment	1.3 – 49.9	Regional unemployment rate. (%)
Explanatory variables:		
EMU	0, 1	Member of the European Monetary Union, 0: non-member, 1: member
Support	0, 1	Programme period, 0: before and after programme period, 1: during programme period
After	0, 1	Time period starting from the year when regions begin to receive support to the last year available in the data set (2008)
Interaction	0, 1	Support*After, 0: Before the programme period 2000-2006 for non-receiving regions 1: During and after the programme period for receiving.
Support01	0, 1	Support measured as share of GDP: 0-1% of average annual GDP during the programme period, 0: not 0-1%, 1: 0-1%.
Support12	0, 1	Support measured as share of GDP: 1-2% of average annual GDP during the programme period, 0: not 1-2%, 1: 1-2%.
Support25	0, 1	Support measured as share of GDP: 2-5% of average annual GDP during the programme period. 0: not 2-5%, 1: 2-5%.
SupportEMU	0, 1	Support*EMU, 0: non-members and/or before and after programme period, 1: members of EMU during the programme period
SupportYEAR	0 – 2006	Time trend
Time variable:		
YEAR	1999 – 2008	10 years
Panel variable:		
ID	1 – 1573	1573 regions
Total observations:	10862	

Table 4: Dependent and explanatory variables for our two regional unemployment rate models

Appendix 2

Slovenia (C)	0.186%	Andalucia (Spain)	1.602%
Czech Republic (C)	0.216%	Sicilia (Italy)	1.642%
Attiki (Greece)	0.271%	West Wales and The Valleys (UK)	1.664%
Malta (C)	0.272%	Castilla y León (Spain)	1.667%
Slovakia (C)	0.401%	Norte (Spain)	1.691%
Border. Midlands and Western (UK)	0.413%	Castilla-la Mancha (Spain)	1.696%
Norra Mellansverige (Sweden)	0.463%	Mecklenburg-Vorpommern (Germany)	1.697%
Centro (Spain)	0.481%	Ionia Nisia (Greece)	1.706%
Poland (C)	0.561%	Hungary (C)	0.296%
Pohjois-Suomi (Finland)	0.629%	Merseyside (UK)	1.713%
Thessaloniki (Greece)	0.697%	Asturias (Spain)	1.794%
Kentriki Makedonia (Greece)	0.741%	Sachsen-Anhalt (Germany)	1.828%
Estonia (C)	0.797%	Galicía (Spain)	1.869%
Mellersta Norrland (Sweden)	0.923%	Algarve (Spain)	1.891%
Lithuania (C)	1.005%	Cornwall and Isles of Scilly	1.902%
Latvia (C)	1.098%	Calabria (Spain)	1.958%
Kriti (Greece)	1.139%	Dytiki Makedonia (Greece)	1.972%
Peloponnisos (Greece)	1.157%	Sardegna (Italy)	2.115%
Melilla (Spain)	1.165%	Anatoliki Makedonia. Thraki (Greece)	2.214%
Stereia Ellada (Greece)	1.233%	Ipeiros (Greece)	2.247%
Sachsen (Germany)	1.237%	Basilicata (Italy)	2.481%
Dytiki Ellada (Greece)	1.266%	Alentejo (Portugal)	3.013%
Campania (Italy)	1.306%	Voreio Aigaio (Greece)	3.070%
Ceuta (Spain)	1.332%	Extremadura (Spain)	3.450%
Itä-Suomi (Finland)	1.343%	Burgenland (Germany)	3.608%
Murcia (Spain)	1.377%	Reunion (France)	3.685%
Notio Aigaio (Spain)	1.468%	Martinique (France)	3.688%
Brandenburg (Germany)	1.519%	Região Autónoma da Madeira (Portugal)	4.140%
South Yorkshire (UK)	1.571%	Guadeloupe (France)	4.250%
Thüringen (Germany)	1.589%	Região Autónoma dos Açores (Portugal)	5.980%
Valencia (Spain)	1.595%		

Table 5: Average share of GDP received in support for the period 2000-2006 on the regional level. Aggregated level presented for countries that entered the EU in 2004.



Graph 1: Inflation development in the EU 1998-2008. (Source: Eurostat)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	8.6	7.0	6.6	7.5	8.2	8.4	8.4	8.2	7.5	7.0
Latvia	13.8	14.2	13.1	12.1	10.5	10.4	8.9	6.8	6.0	7.5
Slovakia	16.4	18.8	19.3	18.7	17.5	18.2	16.3	13.4	11.1	9.5
Lithuania	13.4	15.9	16.8	13.7	12.4	11.4	8.3	5.6	4.3	5.8
Estonia	11.6	13.6	12.6	10.3	10.0	9.7	7.9	5.9	4.7	5.5
Czech Republic	8.8	8.8	8.2	7.3	7.8	8.3	7.9	7.1	5.3	4.4
Poland	12.3	16.1	18.2	19.9	19.6	18.9	17.7	13.9	9.6	7.1
Luxembourg	2.4	2.3	1.8	2.6	3.7	5.1	4.5	4.7	4.1	5.1
Greece	12.1	11.4	10.8	10.3	9.7	10.5	9.8	8.9	8.3	7.7
Slovenia	7.4	6.7	6.2	6.3	6.7	6.3	6.5	6.0	4.8	4.4
Ireland	5.8	4.3	3.9	4.4	4.7	4.5	4.3	4.4	4.6	6.0
Spain	15.7	13.9	10.5	11.5	11.5	11.0	9.2	8.5	8.3	11.3
Malta		6.3	7.1	6.9	7.6	7.2	7.3	7.3	6.4	6.0
Netherlands	3.6	2.9	2.3	2.8	3.7	4.5	4.7	3.9	3.2	2.8
Portugal	4.5	4.0	4.0	5.0	6.3	6.6	7.6	7.7	8.0	7.6
Austria	3.7	3.5	3.6	4.0	4.3	4.9	5.2	4.7	4.4	3.8
France	12.0	10.2	9.1	9.2	8.9	9.3	9.3	9.3	8.3	7.8
Finland	10.2	9.8	9.1	9.1	9.0	8.8	8.4	7.7	6.9	6.4
Denmark	5.6	4.6	4.6	4.6	5.4	5.5	4.8	3.9	3.8	3.3
Italy	11.4	10.6	9.5	9.0	8.6	8.0	7.7	6.8	6.1	6.7
Germany	8.9	7.9	7.8	8.5	9.8	10.7	11.1	10.2	8.6	7.5
United Kingdom	6.0	5.6	5.0	5.1	5.0	4.7	4.8	5.4	5.3	5.6
Sweden	7.6	5.4	4.8	5.1	5.7	6.5	7.5	7.1	6.2	6.2
Cyprus		5.0	4.0	3.3	4.1	4.3	5.3	4.5	3.9	3.7

Table 6: Unemployment rates (%) in Europe 1999-2008.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Avg. growth:
Latvia	16.0%	24.1%	11.1%	5.0%	2.4%	11.6%	18.8%	22.8%	32.9%	9.7%	15.44%
Lithuania	3.6%	20.7%	11.4%	10.3%	11.6%	10.4%	15.1%	16.4%	19.7%	12.9%	13.21%
Estonia	8.3%	15.4%	13.3%	11.8%	12.3%	12.5%	15.3%	18.1%	18.4%	3.4%	12.88%
Slovakia	-2.7%	13.9%	7.3%	9.1%	14.6%	14.5%	12.7%	16.9%	22.9%	17.6%	12.68%
Czech Republic	1.9%	9.1%	13.3%	14.7%	1.3%	8.9%	14.0%	13.3%	10.8%	15.4%	10.27%
Poland	2.5%	19.5%	14.3%	-1.8%	-9.1%	6.0%	20.8%	10.9%	15.5%	15.9%	9.45%
Luxembourg	13.3%	9.1%	1.8%	5.3%	6.3%	4.7%	8.7%	11.1%	8.0%	3.1%	7.14%
Ireland	13.7%	14.5%	9.8%	9.2%	5.7%	4.9%	6.3%	6.4%	4.8%	-6.0%	6.93%
Slovenia	7.2%	3.8%	5.6%	7.9%	4.9%	5.4%	5.9%	7.6%	10.3%	7.6%	6.62%
Greece	7.1%	4.1%	6.3%	6.7%	9.1%	7.7%	4.8%	7.4%	6.9%	5.4%	6.55%
Spain	7.4%	8.3%	6.4%	6.0%	5.1%	5.9%	6.1%	6.7%	5.4%	1.7%	5.90%
Cyprn	5.6%	9.0%	6.2%	1.9%	3.8%	5.5%	4.7%	5.6%	6.8%		5.46%
Netherlands	6.6%	7.8%	6.1%	3.2%	2.1%	2.7%	4.3%	5.1%	4.8%	4.3%	4.70%
Malta	6.8%	14.9%	0.9%	3.7%	-1.8%	0.9%	5.4%	5.9%	6.4%	3.8%	4.69%
Finland	5.3%	7.6%	5.1%	3.0%	1.1%	4.3%	3.1%	5.0%	7.6%	2.4%	4.45%
Portugal	6.7%	7.1%	5.0%	4.0%	1.5%	3.0%	2.9%	4.3%	4.8%	1.9%	4.12%
Denmark	4.8%	5.9%	3.1%	2.7%	1.7%	4.3%	4.9%	5.0%	3.5%	1.9%	3.78%
Belgium	4.0%	5.6%	2.4%	3.2%	2.3%	4.9%	3.6%	4.5%	4.3%	2.2%	3.70%
Austria	4.2%	4.4%	1.9%	2.7%	1.5%	3.6%	3.9%	4.7%	5.2%	3.7%	3.58%
Sweden	6.7%	10.3%	-5.7%	4.6%	4.1%	3.9%	1.9%	5.8%	4.9%	-2.2%	3.43%
France	3.7%	4.4%	3.4%	2.4%	2.4%	3.5%	3.0%	4.0%	4.2%	2.4%	3.34%
Italy	3.7%	5.6%	4.8%	3.7%	2.2%	3.0%	2.1%	3.3%	3.2%	0.8%	3.24%
United Kingdom	8.1%	13.3%	2.2%	3.6%	-3.8%	6.9%	2.7%	5.6%	4.4%	-11.6%	3.14%
Germany	2.9%	2.4%	2.4%	1.2%	0.8%	2.3%	1.5%	3.7%	4.6%	3.1%	2.49%

Table 7: Country level growth rates in the within the EU zone 1998-2008. (Source: Eurostat)