A simulation on the 2013 EU Regional Policy Outcome

Torrisi, Gianpiero

University of Newcastle

2007

A simulation on the 2013 EU Regional Policy Outcome

by

Gianpiero Torrisi

Abstract

The aim of this paper is to estimate the effects of EU regional policy with respect to economic convergence. In particular, I tried to "measure" the effect of EU regional policy on the per capita Gross Domestic Product by means of a simulation that starts from the GDP growth rate estimated by Eurostat concerning the 2006-2008 sample. The original point of my work consists in a way to consider separately GDP growth and Population growth.

I acted as follows: first, I considered the estimated GDP growth rate in the sample 2006-2008 and I calculated the average rate; second, I calculated the average population growth rate in the sample 1998-2003 and, finally, I used the two rate to forecast the GDP per capita in the 2013. The idea behind this technical procedure is that change in demographic variable have a stronger *inertia* than change in the economic variable.

It is important to underline that the purpose of this paper is not to make a good forecast of the 2013 situation concerning the GDP per capita, but representing an optimistic *frame* that does not consider many theoretical factors that should worsen the whole economic performance.

Despite the simplicity of the method adopted this framework may be very powerful. In fact it is able to analyse not only a *ceteris paribus* scenario, but also the effect of Public Policy eventually even year by year without complex assumption on such a rule that governs the two rate here considered.

In this work I propose an analysis that may be thought as divided into two main parts. The first one with the aim to provide a synthesis of the main results achieved in literature about the economic convergence. In a second part, I provide a forecast based on empirical evidence. At margin note that the empirical evidence here considered is consistent with some assertion provided by literature.

A simulation on the 2013 EU Regional Policy Outcome

Abstract - The aim of this paper is to estimate the effects of EU regional policy with respect to economic convergence. In particular, I tried to "measure" the effect of EU regional policy on the per capita Gross Domestic Product by means of a simulation that starts from the GDP growth rate estimated by Eurostat concerning the 2006-2008 sample. The original point of my work consists in a way to consider separately GDP growth and Population growth.

I acted as follows: first, I considered the estimated GDP growth rate in the sample 2006-2008 and I calculated the average rate; second, I calculated the average population growth rate in the sample 1998-2003 and, finally, I used the two rate to forecast the GDP per capita in the 2013. The idea behind this technical procedure is that change in demographic variable have a stronger *inertia* than change in the economic variable.

It is important to underline that the purpose of this paper is not to make a good forecast of the 2013 situation concerning the GDP per capita, but representing an optimistic *frame* that does not consider many theoretical factors that should worsen the whole economic performance.

Despite the simplicity of the method adopted this framework may be very powerful. In fact it is able to analyse not only a *ceteris paribus* scenario, but also the effect of Public Policy eventually even year by year without complex assumption on such a rule that governs the two rate here considered

In this work I propose an analysis that may be thought as divided into two main parts. The first one with the aim to provide a synthesis of the main results achieved in literature about the economic convergence. In a second part, I provide a forecast based on empirical evidence. At margin note that the empirical evidence here considered is consistent with some assertion provided by literature.

1. Introduction

In this paper I analyze the EU regional policy and economic convergence from a particular point of view.

An economic *main stream* approach to this problem is represented by β-*convergence* and σ- *convergence* analysis (Barro and Sala-i-Martin, 1995). In these models is investigated the relation between the start point of each economy and its actual performance: an inverse relation is hypothesized. Some economic relation between demographic trends and economic performance is very briefly presented in this paper.

The purpose of this paper is put the analysis of economic convergence in a different a more intuitive way. Indeed, in the *β-convergence* the growth rate should decrease as the GDP level increase, in my paper I suppose that the growth rate in the sample 2006-2013 has the same average that we can (should) observe in the sub-sample 2006-2008 as estimated by Eurostat, that yet contains some elements of *β-convergence*.

This analysis shows that even under the "unrealistic" hypothesis introduced, European regional policy, as captured by its effects on GDP growth rate estimated by Eurostat, can act to achieve *β-convergence*. Nevertheless, *σ- convergence* is still far to be achieved and data obtained by simulation show an increasing degree in GDP per capita dispersion across EU countries.

A notation is necessary before starting with the analysis. In general data used in this paper are available on Eurostat web site (where not differently specified) and as general rule I tried to use the higher range of data both on sample and on statistical units. Due to the particular nature of data concerning the population (available on the "INTERLINK PROJECT" web site) the units of analysis here presented do not correspond in any point with the political concept of EU over the time to the end to mach the two series of GDP and Population. I preferred data on available on INTERLINK PROJECT because of the sample covered (very large from 1000 to 2003 with some discontinuities) and of the degree of decomposition that it gives possible. This series can be very useful for future research and for the development of this one, too.

Despite the simplicity of the method adopted this framework may be very powerful. In fact it is able to analyse not only a *ceteris paribus* scenario, but also the effect of Public Policy eventually even year by year without complex assumption on such a rule that governs the two rate here considered.

The paper is organized as follows. In section 2 preliminary results achieved in literature are summarized. In section 3 I introduce a model of simulation of the GDP per capita dynamic. Some comments and concluding remarks are provided in section 4.

2. Some points of the relevant literature

In approaching EU regional disparities the Neoclassical growth model is the natural start point even if some of its assumptions are particularly questionable with respect to regional economics. However, solid empirical reason can be found to assert the existence of a significant convergence process.

According the economic approach main stream there are two concept of convergence that should be considered. Since the seminar work developed by Barro and Sala-i-Martin (1995) in the analysis of regional disparities we have to distinguish the beta-convergence from the sigma-convergence. "*The first, called β-convergence, relates to poor economies growing faster than rich ones, and the second, called σ- convergence, involves a decline over time in the cross-sectional dispersion of per capita income* […](Barro and Sala-i-Martin, 1995) ".

In this paper I am not interested in approaching the question in a formal technical way1. However, in extreme synthesis, and even accepting the cost of some inaccuracy, we can argue that we obtain a coefficient β from the estimation of parameters in equation (1) in appendix, while σ, in the simplest version, is the standard deviation of GDP across regions. We observe β-convergence if the coefficient β is positive, while we observe σ-convergence if σ decrease over the time (so in Table1 the index $t \text{ in } \sigma_t$ represents the time)

β	σ
Positive $\beta > 0 \Rightarrow$ β-convergence	$\sigma_0 > \sigma_1 > \sigma_2 > \ldots > \sigma_n \Rightarrow$ σ- convergence

Table 1.

The two concepts should not be considered one as an alternative to the other. Indeed they give to the scholars two different information. We can approach the difference the difference between the β-convergence and the σ- convergence by considering two different kinds of questions. If we are interest in how fast and to what extent the per capita Gross domestic Product (GDP) of a particular economy is likely to catch up the average of per capita GDP across economies we have to refer our analysis to the β-convergence concept. But this information is not all; we could be interest also in how the distribution of the per capita income across economies behaved in the past or is likely to behave in the future. The σ- convergence is the instrument to answer the second question. Note that even if we observe β-convergence this not implies – ipso facto- that also the σ- convergence is achieved. In terms of our super-simplified scheme we can complete table 1 as table 2 shows.

β	σ
Positive $\beta > 0 \Rightarrow$ β-convergence $\not\Rightarrow$	$\sigma_0 > \sigma_1 > \sigma_2 > \ldots > \sigma_n \Rightarrow$ σ- convergence

Table 2

[1] For some technical observation and detail see appendix or refer directly to Barro, R. J. and X. Sala-i-Martin, eds., 1995, *Economic Growth* (Mc Graw Hill) Pages.

Once introduced, very briefly, the framework of analysis used in almost the totality of regional economic studies we can try to give some intuitive "rule of the game". First, note that, referring to this framework, neoclassical economic studies argue that a convergence to a steady-state2 should arise. In what follows I will give some expected relation between β and he productivity of capital and the willingness to save (s). Indeed, "the source of convergence in the neoclassical growth model is the assumed diminishing returns to capital […l If the ratio of capital (and hence output) to effective labour declines relative to the steady-state ratio, then the marginal product of capital rises. Therefore, for a given saving behaviour, an economy grows faster the further it is below the steady state (Barro and Sala-i-Martin, 1995)".

As I said above, this paper consider also data on population about the EU countries. At this point it may be useful to introduce some consideration about the population growth rate and its economic consequences. The point the I would underline here is that the dynamics of the returns of capital is not separate from demographic variables. Starting from the observation of a decreasing population growth rate in the industrialised countries we can argue as follows:

-even if we assume s invariable, demographic change (lower growth rate) can be reflected into (an higher) capital/labour ratio (Solow, 1956);

-if we assume s variable (according to a maximizing behaviour), a lower population growth rate lead to an higher *s* ratio and in turn to a lower GDP growth (Solow,1956; Diamond 1965).

This means that a lower population growth is not only a features of industrialised countries but also a cause a lower GDP growth rate.

In the next section I will provide some analysis focused on empirical evidence about EU countries and a particular forecast concerning the GDP per capita in the 2013, following in the optimistic scenario where all these reducing effects are not considered.

4. A simulation on EU countries

In this Section, I propose an analysis on the EU countries with the aim to approach in a very intuitive way the concept related to the dynamic of the GDP across them. In particular, at the end of this section, I should be able to show a possible situation that will be verified in 2013, when

[2] This steady-state can be thought as a situation in which each economy has the same growth rate.

the actual planning period of regional policy (2007-2013) will end and the EU will face a new bargain about regional funds allocation.

Theoretical models distinguish the β-*convergence* from the σ-*convergence* and was noted that we face two concepts that, even related, have to be treated separately because the former does not imply the latter. In what follows not only I will treat separately the β-*convergence* from σ-*convergence,* but I will consider the demographic dynamic separately from the GDP dynamic. Thus, I will try to "forecast" the final result (GDP per capita in 2013) trying also to "reconstruct" the underlying dynamics[3]. Preliminary , let me introduce some data concerning GDP in EU countries. Data from 1999 to 2008 (forecast) extracted from Eurostat database are presented in the following Table 3.

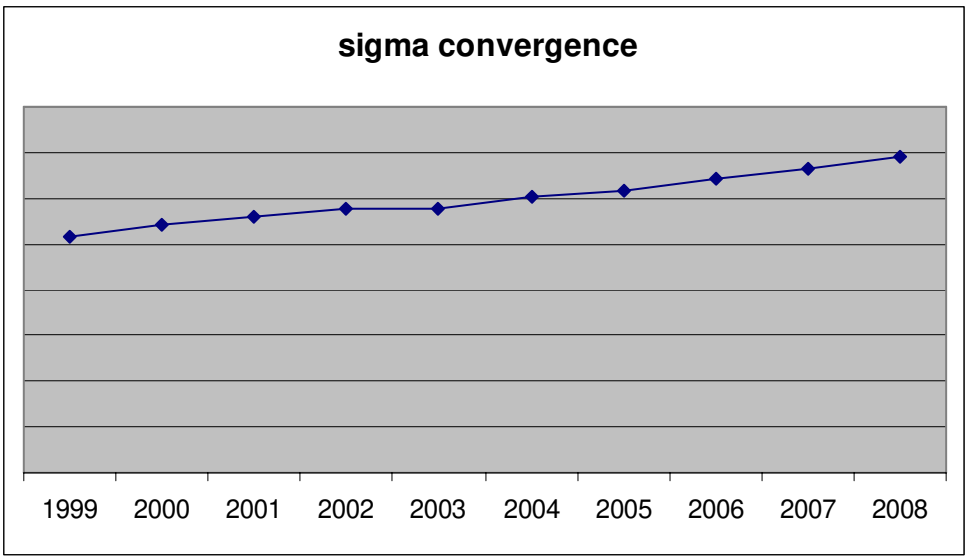
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Austria	200025,3	210392,3	215877,9	220840,9	226243,3	235818,5	245102,8	256464,1	267818,8	278659,8
Belgium	238248,4	251741	258883,4	267652,4	274657,8	289508,5	298540,9	313041,9	326620,9	340630,9
Bulgaria	12163,9	13704,3	15249,6	16588,9	17725,3	19595,2	21448,1	24263,3	26604,9	29498,1
Cyprus	9163,3	10078,8	10801	11153,3	11754,9	12700,5	13629	14542,7	15174,3	16130,3
Czech R	56414,6	61495,2	69044,7	80003,6	80924,1	87205,2	99733,4	112610,5	123374,3	131634,7
Germany	2012000	2062500	2113160	2143180	2161500	2207200	2241000	2302700	2357467	2412352
Denmark	163199,9	173597,9	179226,1	184743,6	188500,3	196158,4	208267,4	221105,1	231491	242356,8
Estonia	5226,4	6103	6916,4	7757,1	8494,1	9375,4	11060,7	12818,3	14648	16695,6
Spain	579942	630263	680678	729206	782531	840106	905455	976503	1042101	1110789
Finland	122747	132272	139868	143974	145938	151935	157377	167371,8	174757,6	181777,8
France	1366466	1441371	1497174	1548555	1594814	1659020	1710024	1781122	1854125	1929051
Greece	117849,5	125892,1	133104,6	143482,2	155543,2	168417,2	181087,5	194777,5	208408,4	223346,4
Hungary	45074,6	52041,2	59530,2	70808,9	74661,6	82302,6	88799,7	89191,3	98083,2	101957,6
Ireland	90612,4	104552,9	116756,5	129946,9	138941,2	147569,2	161162,8	173848,8	188657,4	201635,5
Italy	1127091	1191057	1248648	1295226	1335354	1388870	1417241	1473117	1525862	1581922
Lithuania	10240,5	12360,3	13562,4	15023,2	16452,1	18125,8	20621	23341,6	26621,9	29899,1
Lux.	19886,8	22000,6	22572,3	24081,3	25606,6	26996,1	29396,4	32300,4	34944,5	37519,5
Latvia	6817,5	8495,6	9319,6	9911,1	9977,8	11156,6	12837,3	15481,5	18168,4	21151,8
Malta	3696,3	4216,3	4300,8	4437,4	4350	4366,8	4554,1	4810,4	5051,5	5303,2
Nether.	386193	417960	447731	465214	476945	489854	505646	529245	556027	582647
Poland	157616,5	185774,6	212195,9	209431,1	191408,4	203951,6	243764,8	267371,2	291658,8	312255,4
Portugal	114192,7	122270,2	129308,4	135433,6	137522,8	143477,9	147786,5	152873	158411,4	164758,5
Romania	33387,8	40346,4	44904,2	48441,6	52613	60818	79313,5	96863,1	97502,9	118049,8
Sweden	238020,2	262550,3	247253	258877,9	269548,3	281123,6	287706,3	305214,7	329867	346090,2
Slovenia	20151,7	20813,6	22018,3	23699	24860,2	26232,2	27633,7	29420,8	31686,4	33956,5
Slovakia	19980,6	19313,5	22095,5	23570,3	26033,7	29228,6	33862,9	38113,2	43924,8	47191,2
U K	1272550	1376214	1564001	1603208	1667807	1604497	1733603	1790671	1891401	2010813

Table 3 - Gross domestic product at market prices, millions of euro.

Once introduced this data set, I prefer, briefly investigate the σ- convergence because the concept of β-convergence requires data on GDP growth that I will introduce subsequently.

[3] It will be clear later that what is presented in this section is exactly a non-forecast, in the sense it deliberately does not consider many theoretical factors presented in section 2 of this paper.

σ- convergence. Data presented can be used to investigate σ- convergence in its simplest version. Referring to section 2 we are asking our self: how disparities on GPD across EU countries have changed over the time? Graph 1 below shows the σ trend in the sample considered.



Graph 1.- *σ- convergence*

From the observation of graph 1 we can argue disparities across EU Member State are increased over the time (in the sample considered). Put differently and in a slightly more formal way we can argue that data show that, in the whole sample 1999-2008, we do not observe σ-convergence4. This empirical evidence seems to confirm Allen's claim that EU regional funds are unable to gain macroeconomic effects, and are used as compensation instruments: "[EU regional funds are] essentially a justification for expenditure that is best thought of as compensation for the impact on a country or region of being part of a wider and integrated European economy (Allen ,2005)". Allen's vision is an extremist one, from my point of view data show that regional funds were not sufficient to achieve σ- convergence in the sample considered.

β-convergence. As I said above this concept of convergence refers to the growth rate across economies, I have not the purpose to estimate the β coefficient5; I would only approach this question intuitively. If the theoretical assertion about β-convergence are valid, we should observe that "New Member State" in the EU27 have, not simply an higher GDP growth rate but, there will be considerable differences in the rate observed. In what follows I suggest to consider, to the purpose of our analysis, the average of the GDP growth rate expected6 in the years 2006 , 2007 and

[4] Remember from section 2 that *σ- convergence* in the sample $[0, n]$ implies $\sigma_0 > \sigma_1 > \sigma_2 > ... > \sigma_n$

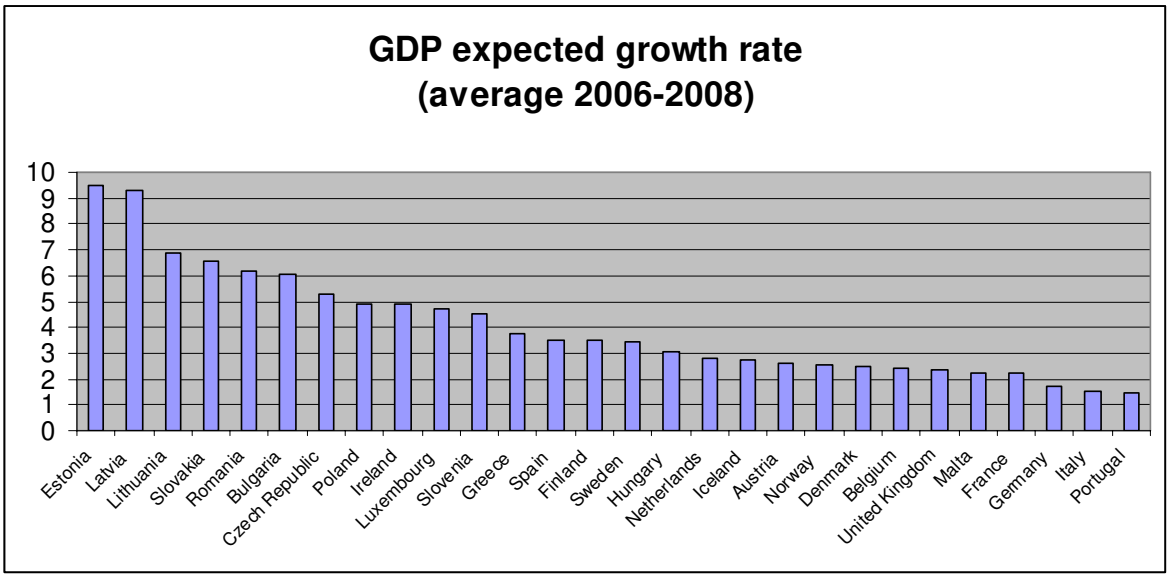
[5] Many studies propose analysis with the aim to estimate the β coefficient, see for example Barro and Sala-I Martin (cited in section 2)

[6] Expectation utilised are from Erostat.

2008. I will indicate this rate with g_a (it should be clear that we have to consider the $\boldsymbol{g_a}$ vector and to denote the single element of this vector with g^i, but when there will not be danger of confusion the simplest notation ga is used both to indicate the single component and the whole vector) .

The idea behind this choice is that this (average) rate may be considered as a "proxy" of the β coefficient. Indeed, the growth rate expected is decreasing in almost all Member States -and this reflect the intuition of the β-convergence- but considering the "average" to analyse and make prevision, we mitigate the decreasing effect. Moreover, by using the concept of average we introduce in a coarse way also the idea of the cyclical economic behaviour of GDP7.

Graph 2 shows this average growth rate (data reported in appendix)



Graph 2.- GDP expected growth rate

Is it possible to find some relationship among the theory just exposed and the empirical evidence here reported? In the first instance, we can argue that the empirical evidence supports the theoretical assertion about β-*convergence:* in general, the higher the level of GDP the lower the growth rate[8]. Not only, New Member States have a considerable higher growth rate than "Old Member States". Basing on this fact I can assert that this *proxy-measure* is consistent with the theoretical framework introduced above.

Note also that the analyzed empirical experience shows that β-*convergence* doesn't imply σ- *convergence*.

The next step that I propose concerns a "simulation" of the GDP (in levels) in each country relative to the period 2007-2013 assuming that in this sample we will observe the average rate

[7] That is for the obvious characteristic of the average to be comprised between the maximum and the minimum of the value considered ($g_{\min} < g_{average} < g_{\max}$, where g denote the GDP growth rate).

[8] Luxembourg requires a separate explanation.

calculated above (g_a). More precisely the series that I am introducing in Table 4 is calculated by assuming that each economy considered, even if over the sample 2007-2013 will register different growth rate, at the end of the sample will be increased at an average (expected) rate equal to the average of the sub-sample 2006-2008. Indeed, in a rather formal way we can write $GDP_t^i = GDP_{t-1}^i \cdot (1 + g_a^i)$ where the index *i* denote the country and *t* the time, *t*=2009,…2013.

	2009	2010	2011	2012	2013
at Austria	285905	293338,5	300965,3	308790,4	316818,9
be Belgium	348806	357177,4	365749,6	374527,6	383516,3
bg Bulgaria	31287,65	33185,77	35199,04	37334,45	39599,4
cz Czech Republic	138567,5	145865,3	153547,6	161634,4	170147,2
de Germany	2454568	2497523	2541229	2585701	2630951
dk Denmark	248415,7	254626,1	260991,8	267516,6	274204,5
ee Estonia	18278,34	20011,13	21908,18	23985,08	26258,87
es Spain	1149667	1189905	1231552	1274656	1319269
fi Finland	188140	194724,9	201540,3	208594,2	215895
fr France	1971490	2014862	2059189	2104492	2150790
gr Greece	231684,7	240334,2	249306,7	258614,2	268269,1
hu Hungary	105050,3	108236,8	111520	114902,8	118388,2
ie Ireland	211468,6	221781,2	232596,7	243939,7	255835,8
it Italy	1605651	1629736	1654182	1678995	1704180
lt Lithuania	31950,18	34141,96	36484,1	38986,91	41661,41
lv Latvia	23118,92	25268,98	27618,99	30187,56	32995
nl Netherlands	599155,3	616131,4	633588,5	651540,1	670000,4
pl Poland	327555,9	343606,2	360442,9	378104,6	396631,7
pt Portugal	167175	169626,9	172114,7	174639,1	177200,4
ro Romania	125368,9	133141,8	141396,5	150163,1	159473,2
se Sweden	358088	370501,7	383345,8	396635,1	410385,1
si Slovenia	35484,54	37081,35	38750,01	40493,76	42315,98
sk Slovakia	54231,86	57775,01	61549,64	65570,88	69854,85
uk United Kingdom	2146583	2197242	2249097	2302176	2356507

Table 5.- expected GDP

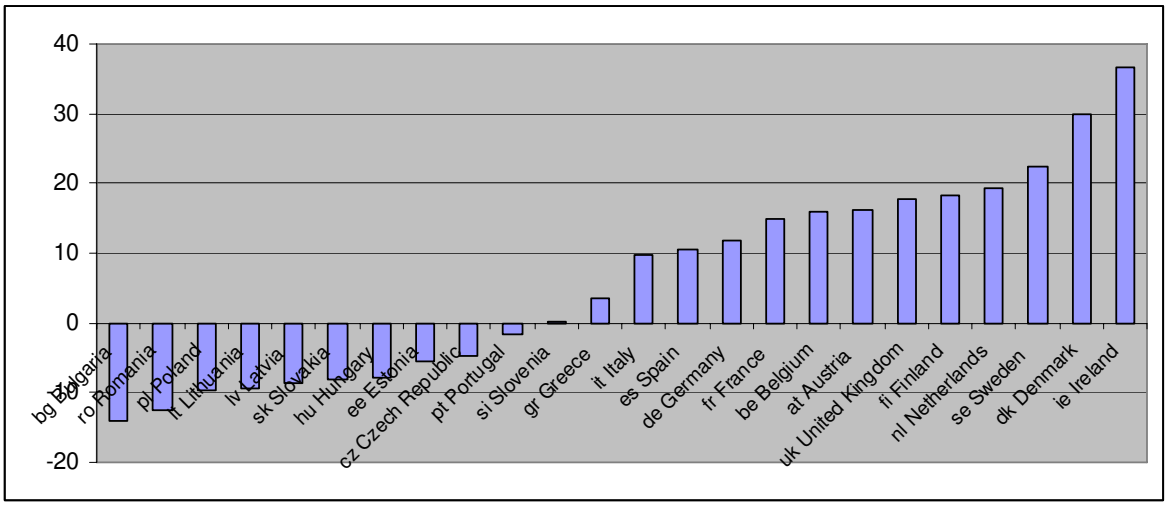
Table 5 contains data to be used at the numerator of the measure of GDP pro capita, in what follows I calculate data about the denominator (i.e. population) in a way similar to the one used for GDP. Data on population here used are available on the "INTERLINK" project website. Table 6 shows data calculated (see appendix) considering the average of the population growth rate between the 1998 and the 2003, n_a The range considered in n_a is different from the range used for g_a, even if arbitrary and questionable like the latter, to give the idea that change in population has a stronger inertia than change relative to the economic variable considered.

	2009	2010	2011	2012	2013
at Austria	8305,971	8325,762	8345,601	8365,486	8385,419
be Belgium	10244,18	10262,19	10280,22	10298,29	10316,39
bg Bulgaria	7713,057	7623,591	7535,162	7447,759	7361,37
cz Czech Republic	10272,73	10264,03	10255,33	10246,65	10237,97
de Germany (including ex-GDR from 1991)	82039,31	82103,75	82168,24	82232,79	82297,39
dk Denmark	5160,679	5169,889	5179,115	5188,358	5197,617
ee Estonia	1433,354	1425,126	1416,944	1408,81	1400,722
es Spain	40110,73	40171,22	40231,8	40292,47	40353,23
fi Finland	5160,679	5169,889	5179,115	5188,358	5197,617
fr France	59694,25	59955,63	60218,16	60481,83	60746,66
gr Greece	10621,61	10643,82	10666,07	10688,36	10710,7
hu Hungary	10095,6	10062,61	10029,72	9996,936	9964,261
ie Ireland	3862,099	3905,579	3949,548	3994,013	4038,978
it Italy	57791,6	57878,23	57964,99	58051,88	58138,9
lt Lithuania	3613,262	3603,406	3593,578	3583,775	3574
lv Latvia	2398,436	2378,333	2358,398	2338,631	2319,029
nl Netherlands	15991,21	16081,68	16172,66	16264,15	16356,16
pl Poland	38570,26	38564,74	38559,23	38553,71	38548,19
pt Portugal	10075,67	10093,59	10111,53	10129,51	10147,52
ro Romania	22400,53	22352,18	22303,94	22255,8	22207,76
se Sweden	8838,923	8841,176	8843,43	8845,684	8847,939
si Slovenia	1927,177	1930,151	1933,129	1936,113	1939,1
sk Slovakia	5407,862	5415,611	5423,372	5431,144	5438,928
uk United Kingdom	59704,07	59919,78	60136,27	60353,55	60571,61

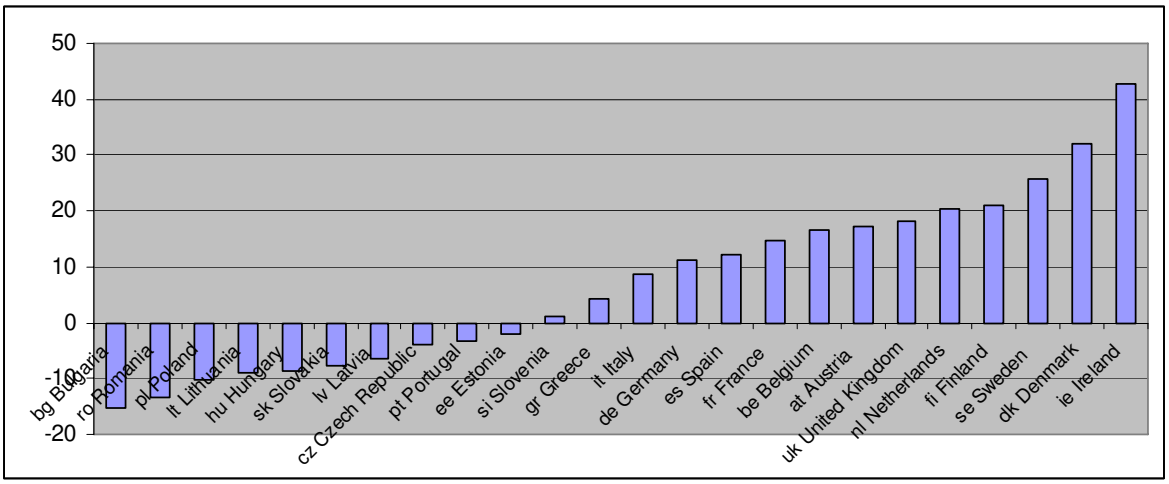
Table 6.- expected Population

With data contained in Table 6 we are able to calculate the GDP per capita in the sample considered (see appendix). Most important, to the purpose of this paper is the difference between the 75% of average GDP per capita in the 2013 and the GDP per capita in each State[9] (see appendix) .

Graph 3 and Graph 4 below show this measure at the begin of the simulation period (2009) and at the end (2013).



Graph 3.- GDP per capita disparities in 2009

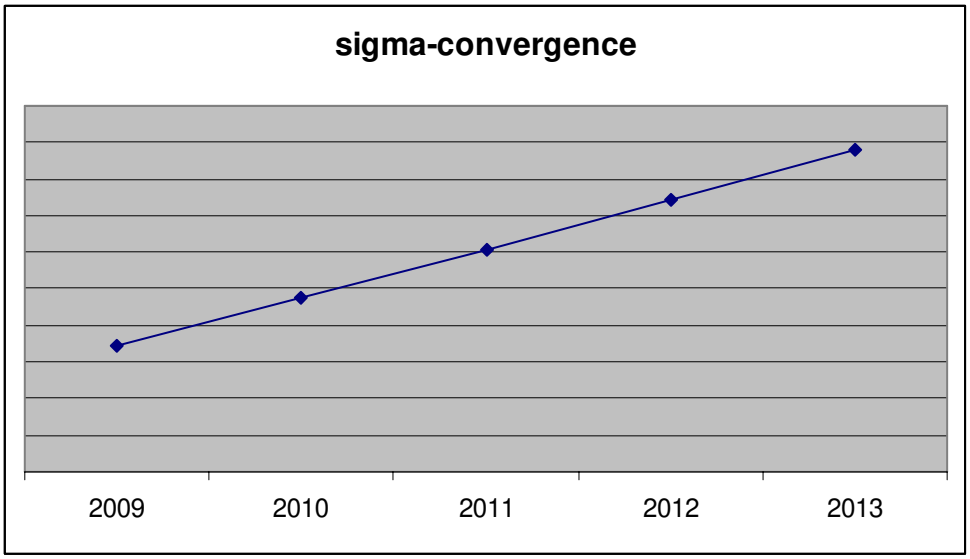


Graph 4.- GDP per capita disparities in 2013.

Many questions arises from the observation of Graph 3 and to develop them in an exhaustive manner is extraneous to the purpose of this paper. Nevertheless, we can point out that, according to this simulation at the end of the current period of regional funds planning States such as Estonia and Czech Republic should improve their relative position, but are growth rate equal respectively to 9,5% or 5,3% sustainable?

And what we can say about the σ- *convergence?* Graph.5 shows the standard deviation of GDP per capita over the time

[9] Because of the rule of assignation of funds to objective 1 i.e. the regions whose GDP per capita is inferior



Graph 4.- GDP standard deviation.

According to Graph 4. the combined effect of population dynamics and GDP growth, dispersion in GDP per capita should increase in the sample considered.

At the margin I have to note that in recent studies a different measure of dispersion is used. This take into account *polarisation* of income within the same region (see Esteban and Ray, 1994).

5. Conclusions

In this paper I have analysed the effects of EU regional convergence from a particular point of view.

From the vast available literature it is well known that an inverse relation between GDP start point and economic performance should appear. The empirical evidence here considered in a really intuitive way is consistent with this theoretical assertion.

This paper, in particular, aimed to hypothesize a possible *scenario* in the 2013 when the current planning sample will finish and a new bargain process will arise. The start point in the 2013 might be crucial for the final outcome. This paper shows that some Member State will improve its economic situation during the sample considered but strong disparities, in terms of σ- *convergence,* are estimated.

As pointed above the forecast presented in this paper represents, under many aspects, an optimistic view. Hence, disparities in 2013 might be more prominent and in turn the

---

to the 75% of the community average.

challenge for each state more difficult. The political interpretation of the results achieved is beyond in this paper's purpose.

Starting from this simplest method to work, analysis might be done in a more complex way. Into the GDP growth rate side a rule of decreasing growth may be introduced; into the population side different growth rule may introduce considering social factors and policy; even the unit of analysis may shift from the State to the NUTS concept.

Even year by year and state by state variations in both the two variables considered are admitted in this framework, this means a powerful analysis instruments for such a (EU) policy where the differences in institutional framework are very marked.

Appendix

Convergence equation.

$$(1) \qquad (1/T) \cdot \log(y_{it}/y_{i,t-T}) = x_i^* + \log(\hat{y}_i^*/\hat{y}_{i,t-T}) \cdot (1 - e^{-\beta T})/T + u_{it},$$

where i indexes the economy, t indexes time, y, is per capita output (equal to income per person as well as income per worker in the standard model), x^*, is the steady-state per capita growth rate (corresponding to exogenous, labour-augmenting technological progress in the standard model), $\hat{y}_{i,t}$ is output per effective worker (that is, the number of workers adjusted for the effect of technological progress), $\hat{y}^*_t$ * is the steady-state level of output per effective worker, T is the length of the observation interval, the coefficient p is the rate of convergence, and u_{it}, is an error term.

	2006	2007	2008	**average**
Austria	3,1	2,6	2,1	**2,6**
Belgium	2,7	2,3	2,2	**2,4**
Bulgaria	6,0	6,0	6,2	**6,1**
Czech Republic	6,0	5,1	4,7	**5,3**
Denmark	3,0	2,3	2,2	**2,5**
Estonia	10,9	9,5	8,0	**9,5**
Finland	4,9	3,0	2,6	**3,5**
France	2,2	2,3	2,1	**2,2**
Germany	2,1	1,2	2,0	**1,8**
Greece	3,8	3,7	3,7	**3,7**
Hungary	4,0	2,4	2,7	**3,0**
Iceland	4,1	1,4		**2,8**
Ireland	5,0	5,3	4,3	**4,9**
Italy	1,7	1,4	1,4	**1,5**
Latvia	11,0	8,9	8,0	**9,3**
Lithuania	7,1	7,0	6,5	**6,9**
Luxembourg	5,5	4,5	4,2	**4,7**
Malta	2,3	2,1	2,2	**2,2**
Netherlands	3,0	2,9	2,6	**2,8**
Norway	3,0	2,4	2,2	**2,5**
Poland	5,2	4,7	4,8	**4,9**
Portugal	1,2	1,5	1,7	**1,5**
Romania	7,2	5,8	5,6	**6,2**
Slovakia	6,7	7,2	5,7	**6,5**
Slovenia	4,8	4,2	4,5	**4,5**
Spain	3,8	3,4	3,3	**3,5**
Sweden	4,0	3,3	3,1	**3,5**
United Kingdom	2,1	2,6	2,4	**2,4**

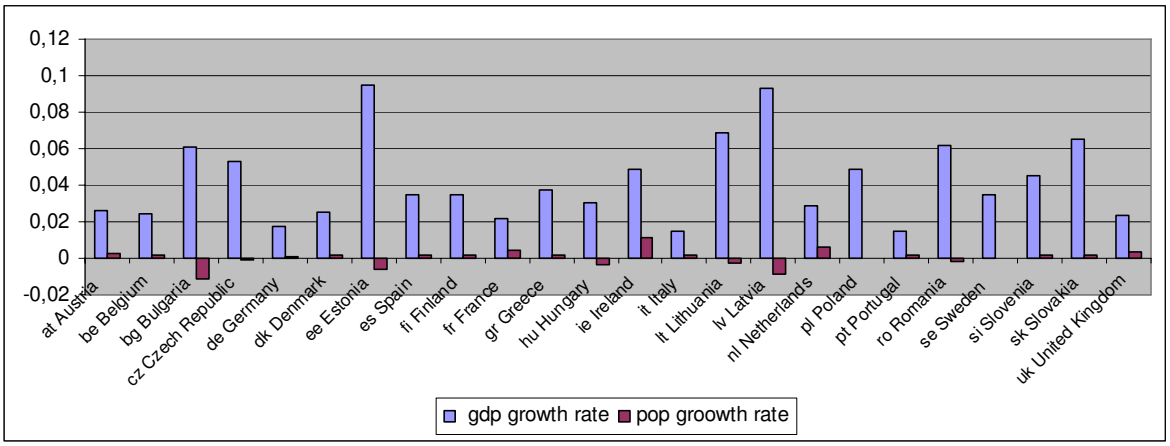
Table i-GDP growth rate (forecast)
percentage change on previous year

	1995	1996	1997	1998	1999	2000	2001	2002	2003
at **Austria**	8.042	8.056	8.072	8.092	8.111	8.131	8.151	8.170	8.188
be **Belgium**	10.137	10.157	10.181	10.203	10.223	10.242	10.259	10.275	10.289
bg **Bulgaria**	8.272	8.181	8.085	7.985	7.889	7.797	7.707	7.621	7.538
cz **Czech Republic**	10.325	10.313	10.301	10.291	10.281	10.272	10.264	10.257	10.249
de **Germany (including ex-GDR from 1991)**	81.654	81.891	82.011	82.024	82.075	82.188	82.281	82.351	82.398
dk **Denmark**	5.106	5.122	5.136	5.148	5.158	5.167	5.176	5.184	5.191
ee **Estonia**	1.484	1.470	1.458	1.449	1.440	1.431	1.423	1.416	1.409
es **Spain**	39.750	39.804	39.855	39.906	39.953	40.016	40.087	40.153	40.217
fi **Finland**	5.106	5.122	5.136	5.148	5.158	5.167	5.176	5.184	5.191
fr **France**	58.150	58.388	58.623	58.866	59.116	59.382	59.658	59.925	60.181
gr **Greece**	10.489	10.511	10.533	10.556	10.579	10.602	10.624	10.645	10.666
hu **Hungary**	10.296	10.274	10.245	10.211	10.174	10.139	10.106	10.075	10.045
ie **Ireland**	3.611	3.633	3.669	3.711	3.754	3.797	3.841	3.883	3.924
it **Italy**	57.275	57.367	57.479	57.550	57.604	57.719	57.845	57.927	57.998
lt **Lithuania**	3.673	3.662	3.652	3.642	3.631	3.621	3.611	3.601	3.593
lv **Latvia**	2.523	2.496	2.470	2.447	2.426	2.405	2.385	2.367	2.349
nl **Netherlands**	15.459	15.533	15.613	15.705	15.800	15.892	15.981	16.068	16.151
pl **Poland**	38.603	38.633	38.656	38.664	38.658	38.646	38.634	38.625	38.623
pt **Portugal**	9.969	9.980	9.995	10.012	10.030	10.048	10.066	10.084	10.102
ro **Romania**	22.693	22.628	22.562	22.509	22.459	22.411	22.364	22.318	22.272
se **Sweden**	8.825	8.859	8.865	8.868	8.871	8.873	8.875	8.877	8.878
si **Slovenia**	1.909	1.914	1.918	1.921	1.924	1.928	1.930	1.933	1.936
sk **Slovakia**	5.362	5.373	5.384	5.393	5.401	5.408	5.415	5.422	5.430
uk **United Kingdom**	58.426	58.619	58.808	59.036	59.293	59.522	59.723	59.912	60.095

Table ii- Population (000 at mid-year)

	1998	1999	2000	2001	2002	2003	average
at Austria	0,002412	0,002429	0,00245	0,002426	0,002343	0,002237	**0,002383**
be Belgium	0,002103	0,001972	0,001831	0,001685	0,001543	0,001411	**0,001758**
bg Bulgaria	-0,01235	-0,01198	-0,0117	-0,01144	-0,01118	-0,01094	**-0,0116**
cz Czech Republic	-0,00102	-0,00097	-0,00086	-0,00078	-0,00073	-0,00074	**-0,00085**
de Germany	0,000154	0,000623	0,001378	0,001127	0,000852	0,000579	**0,000786**
dk Denmark	0,002432	0,002011	0,001763	0,001606	0,0015	0,001397	**0,001785**
ee Estonia	-0,00645	-0,00599	-0,00591	-0,0057	-0,00536	-0,00503	**-0,00574**
es Spain	0,001274	0,001178	0,001572	0,001775	0,001632	0,001616	**0,001508**
fi Finland	0,002432	0,002011	0,001763	0,001606	0,0015	0,001397	**0,001785**
fr France	0,004143	0,004244	0,004491	0,004657	0,004474	0,004264	**0,004379**
gr Greece	0,002143	0,002169	0,002162	0,002104	0,002025	0,001939	**0,00209**
hu Hungary	-0,00329	-0,00359	-0,00349	-0,00324	-0,00307	-0,00294	**-0,00327**
ie Ireland	0,011317	0,011533	0,01165	0,011477	0,011019	0,010554	**0,011258**
it Italy	0,001233	0,000926	0,002009	0,002176	0,001419	0,001232	**0,001499**
lt Lithuania	-0,00281	-0,00284	-0,0029	-0,00282	-0,0026	-0,00238	**-0,00273**
lv Latvia	-0,00955	-0,00873	-0,00849	-0,00819	-0,00785	-0,00749	**-0,00838**
nl Netherlands	0,005887	0,006064	0,005829	0,005615	0,005399	0,005151	**0,005657**
pl Poland	0,000199	-0,00015	-0,0003	-0,00031	-0,00022	-7,3E-05	**-0,00014**
pt Portugal	0,001728	0,001792	0,001803	0,001793	0,001787	0,001763	**0,001778**
ro Romania	-0,00237	-0,00221	-0,00214	-0,0021	-0,00207	-0,00206	**-0,00216**
se Sweden	0,000369	0,000324	0,00027	0,000226	0,000191	0,000151	**0,000255**
si Slovenia	0,001622	0,001841	0,001608	0,001317	0,001443	0,001428	**0,001543**
sk Slovakia	0,001695	0,001492	0,001334	0,001291	0,001372	0,001414	**0,001433**
uk United Kingdom	0,003867	0,004365	0,003865	0,003373	0,003168	0,003041	**0,003613**

Table iii.-Population growth rate



Graph i- GDP and Population expected growth rate.

	2009	2010	2011	2012	2013
at Austria	8305,971	8325,762	8345,601	8365,486	8385,419
be Belgium	10244,18	10262,19	10280,22	10298,29	10316,39
bg Bulgaria	7713,057	7623,591	7535,162	7447,759	7361,37
cz Czech Republic	10272,73	10264,03	10255,33	10246,65	10237,97
de Germany	82039,31	82103,75	82168,24	82232,79	82297,39
dk Denmark	5160,679	5169,889	5179,115	5188,358	5197,617
ee Estonia	1433,354	1425,126	1416,944	1408,81	1400,722
es Spain	40110,73	40171,22	40231,8	40292,47	40353,23
fi Finland	5160,679	5169,889	5179,115	5188,358	5197,617
fr France	59694,25	59955,63	60218,16	60481,83	60746,66
gr Greece	10621,61	10643,82	10666,07	10688,36	10710,7
hu Hungary	10095,6	10062,61	10029,72	9996,936	9964,261
ie Ireland	3862,099	3905,579	3949,548	3994,013	4038,978
it Italy	57791,6	57878,23	57964,99	58051,88	58138,9
lt Lithuania	3613,262	3603,406	3593,578	3583,775	3574
lv Latvia	2398,436	2378,333	2358,398	2338,631	2319,029
nl Netherlands	15991,21	16081,68	16172,66	16264,15	16356,16
pl Poland	38570,26	38564,74	38559,23	38553,71	38548,19
pt Portugal	10075,67	10093,59	10111,53	10129,51	10147,52
ro Romania	22400,53	22352,18	22303,94	22255,8	22207,76
se Sweden	8838,923	8841,176	8843,43	8845,684	8847,939
si Slovenia	1927,177	1930,151	1933,129	1936,113	1939,1
sk Slovakia	5407,862	5415,611	5423,372	5431,144	5438,928
uk United Kingdom	59704,07	59919,78	60136,27	60353,55	60571,61

Table iv-Population (forecast)

	2009	2010	2011	2012	2013
at Austria	285905	293338,5	300965,3	308790,4	316818,9
be Belgium	348806	357177,4	365749,6	374527,6	383516,3
bg Bulgaria	31287,65	33185,77	35199,04	37334,45	39599,4
cz Czech Republic	138567,5	145865,3	153547,6	161634,4	170147,2
de Germany	2454568	2497523	2541229	2585701	2630951
dk Denmark	248415,7	254626,1	260991,8	267516,6	274204,5
ee Estonia	18278,34	20011,13	21908,18	23985,08	26258,87
es Spain	1149667	1189905	1231552	1274656	1319269
fi Finland	188140	194724,9	201540,3	208594,2	215895
fr France	1971490	2014862	2059189	2104492	2150790
gr Greece	231684,7	240334,2	249306,7	258614,2	268269,1
hu Hungary	105050,3	108236,8	111520	114902,8	118388,2
ie Ireland	211468,6	221781,2	232596,7	243939,7	255835,8
it Italy	1605651	1629736	1654182	1678995	1704180
lt Lithuania	31950,18	34141,96	36484,1	38986,91	41661,41
lv Latvia	23118,92	25268,98	27618,99	30187,56	32995
nl Netherlands	599155,3	616131,4	633588,5	651540,1	670000,4
pl Poland	327555,9	343606,2	360442,9	378104,6	396631,7
pt Portugal	167175	169626,9	172114,7	174639,1	177200,4
ro Romania	125368,9	133141,8	141396,5	150163,1	159473,2
se Sweden	358088	370501,7	383345,8	396635,1	410385,1
si Slovenia	35484,54	37081,35	38750,01	40493,76	42315,98
sk Slovakia	54231,86	57775,01	61549,64	65570,88	69854,85
uk United Kingdom	2146583	2197242	2249097	2302176	2356507

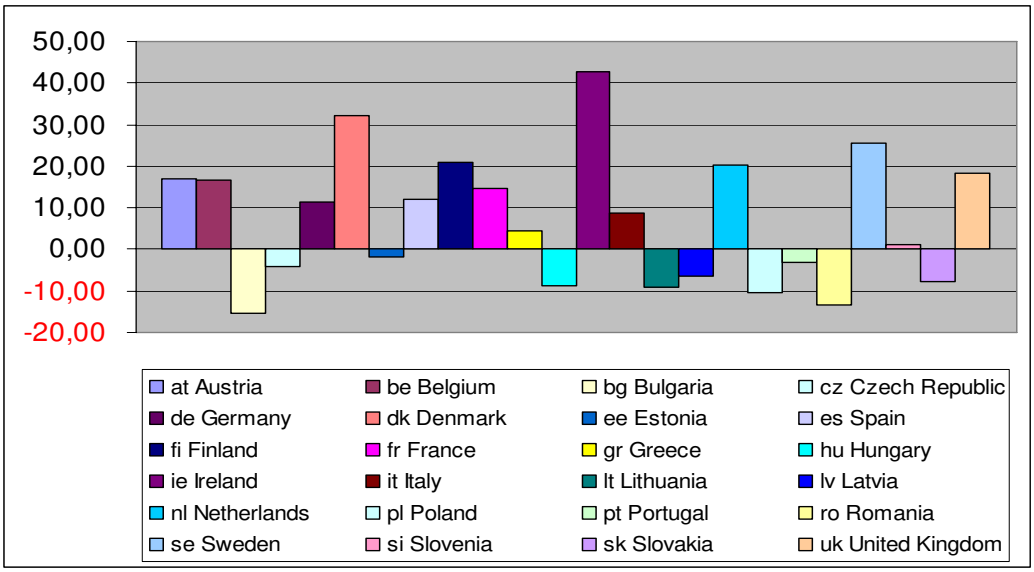
Table v.-GDP (forecast)

		2009	2010	2011	2012	2013
at Austria		34,42162	35,23263	36,06275	36,91242	37,78212
be Belgium		34,04918	34,80519	35,57798	36,36793	37,17543
bg Bulgaria		4,056453	4,353037	4,671305	5,012843	5,379352
cz Czech Republic		13,48887	14,21132	14,97246	15,77437	16,61923
de Germany		29,91941	30,41911	30,92715	31,44367	31,96882
dk Denmark		48,13625	49,25176	50,39312	51,56093	52,7558
ee Estonia		12,75215	14,04166	15,46157	17,02507	18,74667
es Spain		28,66232	29,62083	30,6114	31,63509	32,69302
fi Finland		36,45645	37,66521	38,91404	40,20428	41,5373
fr France		33,02646	33,60589	34,19549	34,79544	35,40591
gr Greece		21,81257	22,5797	23,37382	24,19587	25,04682
hu Hungary		10,40555	10,75634	11,11896	11,4938	11,88128
ie Ireland		54,75483	56,78574	58,89198	61,07635	63,34173
it Italy		27,78347	28,15801	28,53761	28,92231	29,31221
lt Lithuania		8,842474	9,474912	10,15258	10,87873	11,6568
lv Latvia		9,639163	10,62466	11,71091	12,90822	14,22794
nl Netherlands		37,46778	38,31262	39,17652	40,05989	40,96318
pl Poland		8,492447	8,909852	9,347772	9,807216	10,28924
pt Portugal		16,59194	16,80541	17,02163	17,24062	17,46244
ro Romania		5,596692	5,956544	6,339533	6,747147	7,180969
se Sweden		40,51263	41,90638	43,34809	44,83939	46,382
si Slovenia		18,41271	19,21163	20,04522	20,91498	21,82248
sk Slovakia		10,02834	10,66823	11,34896	12,07312	12,8435
uk United Kingdom		35,95371	36,66973	37,4	38,14483	38,90448
	stnd.dev.	14,08652	14,34765	14,61356	14,8849	15,16257
	average	24,21931	25,0011	25,8167	26,66811	27,55745
	75%	18,16448	18,75083	19,36253	20,00108	20,66809

Table vi.-GDP per capita (forecast)

	2009	2010	2011	2012	2013
at Austria	16,25714	16,4818	16,70022	16,91135	17,11404
be Belgium	15,88469	16,05436	16,21545	16,36685	16,50734
bg Bulgaria	-14,108	-14,3978	-14,6912	-14,9882	-15,2887
cz Czech Republic	-4,67562	-4,53951	-4,39006	-4,2267	-4,04885
de Germany	11,75493	11,66828	11,56462	11,44259	11,30074
dk Denmark	29,97177	30,50094	31,03059	31,55985	32,08772
ee Estonia	-5,41234	-4,70916	-3,90095	-2,97601	-1,92142
es Spain	10,49784	10,87001	11,24887	11,63401	12,02493
fi Finland	18,29197	18,91438	19,55152	20,2032	20,86922
fr France	14,86198	14,85507	14,83296	14,79436	14,73782
gr Greece	3,648085	3,828879	4,011295	4,194788	4,378739
hu Hungary	-7,75893	-7,99448	-8,24357	-8,50728	-8,7868
ie Ireland	36,59035	38,03492	39,52946	41,07527	42,67364
it Italy	9,618988	9,407189	9,175079	8,921235	8,644124
lt Lithuania	-9,32201	-9,27591	-9,20994	-9,12235	-9,01128
lv Latvia	-8,52532	-8,12617	-7,65162	-7,09286	-6,44015
nl Netherlands	19,3033	19,5618	19,81399	20,05881	20,2951
pl Poland	-9,67204	-9,84097	-10,0148	-10,1939	-10,3788
pt Portugal	-1,57254	-1,94541	-2,3409	-2,76046	-3,20565
ro Romania	-12,5678	-12,7943	-13,023	-13,2539	-13,4871
se Sweden	22,34814	23,15556	23,98556	24,83831	25,71391
si Slovenia	0,248224	0,460806	0,682695	0,913902	1,154394
sk Slovakia	-8,13615	-8,08259	-8,01357	-7,92795	-7,82459
uk United Kingdom	17,78922	17,9189	18,03748	18,14375	18,2364

Table vii-Difference from 75% of average GDP per Capita (forecast)



Graph ii- Difference from 75% of average GDP per Capita (2013-forecast)

		Convergence			Regional Competitiveness and Employment		European Territorial Cooperation	Total
		Cohesion Fund	Convergence	Statistical phasing-out	Phasing-in	Competitiveness		
		CF	CONV	Ph-O	Ph-I	COMP	TC	
Austria	AT			177		1.027	257	1.461
Belgium	BE			638		1.425	194	2.257
Bulgaria	BG	2.283	4.391				179	6.853
Cyprus	CY	213			399		28	640
Czech Republic	CZ	8.819	17.064			419	389	26.691
Germany	DE		11.864	4.215		9.409	851	26.339
Denmark	DK					510	103	613
Spain	ES	3.543	21.054	1.583	4.955	3.522	559	35.216
Estonia	ET	1.152	2.252				52	3.456
Finland	FI				545	1.051	120	1.716
France	FR		3.191			10.257	872	14.320
Greece	GR	3.697	9.420	6.458	635		210	20.420
Hungary	HU	8.642	14.248		2.031		386	25.307
Ireland	IRL				458	293	151	902
Italy	IT		21.211	430	972	5.353	846	28.812
Latvia	LATV	1.540	2.991				90	4.621
Lituania	LT	2.305	4.470				109	6.884
Luxembourg	LX					50	15	65
Malta	ML	284	556				15	855
The Netherlands	NL					1.660	247	1.907
Poland	PL	22.176	44.377				731	67.284
Portugal	PT	3.060	17.133	280	448	490	99	21.510
Romania	RO	6.552	12.661				455	19.668
Slovakia	SK	3.899	7.013			449	227	11.588
Slovenia	SL	1.412	2.689				104	4.205
Sweden	SW					1.626	265	1.891
United Kingdom	UK		2.738	174	965	6.014	722	10.613
overall EU 27		69.577	199.323	13.955	11.408	43.555	8.276	346.094

notes
Million EUR, current prices.
Source: my elaboration of InfoRegio data

Table viii- Total indicative allocation of regional funds for the 2007-2013 period.

References

Allen, D., 2005, Cohesion and Structural Funds, in: H. Wallace, W. Wallace and M. Pollack, eds., Policy-Making in the European Union (Oxford Univesity Press, Oxford).

Barro, R. J. and X. Sala-i-Martin, eds., 1995, *Economic Growth* (Mc Graw Hill).

Diamond, P., 1965, National debt in a neoclassical growth model. *American Economic Review* 55, 1126-1150.

Esteban and D. Ray, 1994, On the measurement of polarization. *Econometrica* 62, 819–851.

Lucas, R. E., 1988, On the mechanisms of economic development. *Journal of Monetary Economics* 22, 3-42.

Modigliani F., 1970, "The life cycle hypothesis of saving and inter country differences in the saving ratio" in W. Eltis – M. Scott – J. Wolfe, *Induction, Growth and Trade*, Clarendon Press, Oxford, UK.

Solow, R. M., 1956, A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics* 70, 65-94.

Website:

Eurostat general database: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&close=/B/B3/B32&language=en&product=Yearlies_new_economy&root=Yearlies_new_economy&scrollto=189.

Inforegio: http://ec.europa.eu/regional_policy/funds/2007/index_it.htm

Interlink project available on: http://www.economicswebinstitute.org/glossary/gdp.htm#data