

DYNAMICS OF DEVELOPMENT IN EUROPE: ANALYSIS OF TWENTY YEARS DATA ON GDP AND HDI

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The aim of this study is to analyze the data on both GDP per capita and HDI related to the member States of European Union for the period from 1990 to 2010 in order to verify if these data are more related to the macro-region to which each State belongs than to European area. In particular, this paper considers four macro-regions: North, Centre, East and Mediterranean. Each of the four macro-regions are characterized by a peculiar dynamic of economic growth over the temporal period here considered. The results show that macro-regional dynamics prevail on European ones when European States are characterized by low values of both GDP per capita and HDI. More specifically, the values on GDP per capita are more correlated to the macro-regional average than to the European one. At the same time, States with high values of both GDP per capita and HDI are more related to the macro-regional dynamics of HDI.

Hence, it is possible to observe that not only allows a macro-regional level of analysis to highlight socio-economic dynamics of dependence, but also to underline that some macro-regions are characterized by the prevalence of the economic component on the social one whereas other macro-regions are typified by the opposite dynamic. In fact, if the level of both GDP per capita and HDI are high, the social aspect prevails on the economic one.

Keywords: socio-economic development, European economies, correlation analysis.

JEL code: C32, O11, O52.

1. Introduction and related literature

“United in diversity”, which is the official motto of the European Union (EU) adopted in May 2000, shows two of the main characters of EU: the desire for integration and the diversity. That European diversity is undeniable and inescapable is clear as EU is an economic and political union of 27 member States. The EU arises from member States’ desire for achieving a complete integration. In fact, one of the basic principles of the European Governance is the commitment to promote integration by also making reference to the idea of conditionality (Smith 1998). Conditionality “*entails the linking, by a State or international organisation, of perceived benefit to another State, to the fulfillment of conditions relating to the protection of human rights and the advancement of democratic principles*” (Smith 1998, p. 256). The path towards the European Strategic Development Framework has revitalized the current European debate about GDP and HDI analysis, making it a key element of European socio-economic development and, in particular, of the new strategic framework for cohesion policy (Barca 2009, Evers 2010). Indeed, the socio-economic reality of the European Union is quite unbalanced today, with the growing presence of situations of macro-regional disparities. One of the main objectives is represented by the challenge of promoting a development which bridges economic gap in the EU by implementing policies of socio-economic cohesion (Barro and Sala-i-Martin 1991, Allard *et al.* 2008). On this regard, our research is related to the studies concerning European socio-economic

development and is aimed at describing relationships among European States. In particular, our main purpose is to observe if economic growth and human development of each European State are more related to European area than to the macro-region to which each State belongs.

2. Research methodology

We have chosen to use the Gross Domestic Product per capita in current US\$ (GDPpc) to represent economic growth and the Human Development Index (HDI) to describe human development. We have analyzed 28 European States; indeed, we have also considered data concerning Croatia which is an acceding State of the European Union, with full membership expected in July 2013. Each European State belongs to one of the following macro-regions:

- NORTH (N): Denmark, Finland, Ireland, Sweden, United Kingdom;
- CENTRE (C): Austria, Belgium, France, Germany, Luxembourg, Netherlands;
- EAST (E): Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic;
- MEDITERRANEAN (M): Croatia, Cyprus, Greece, Italy, Malta, Portugal, Slovenia, Spain.

The time period considered goes from 1990 to 2010.

Data on GDPpc have been obtained from World Bank database accessed on 24 April, 2012 whereas the data on HDI have been gotten from UNDP database retrieved on 24 April, 2012.

Firstly, we have determined both GDPpc percent variations (VGDPpc) and HDI percent variations (VHDI) over a five years horizon. The data on VGDPpc and on VHDI are presented on Table no 1.

Secondly, we have calculated the following correlations with the aim of verifying if the data on GDPpc for each European State are more related to European area than to the macro-region to which each State belongs:

- CEU: correlation between GDPpc of each State on yearly basis between 1990 and 2010 and the European yearly average of GDPpc;
- CEUc: correlation between GDPpc of each State on yearly basis between 1990 and 2010 and the European yearly average of GDPpc. This average was corrected by removing the GDPpc value of the considered State;
- CMR: correlation between GDPpc of each State on yearly basis between 1990 and 2010 and the yearly GDPpc average of the macro-region to which each State belongs;
- CMRc: correlation between GDPpc of each State on yearly basis between 1990 and 2010 and the yearly GDPpc average of the macro-region to which each State belongs. This average was corrected by removing the GDPpc value of the considered State.

Finally, we have determined the following differences in order to highlight if data on macro-regional basis describe data on national basis better than data on European basis: DIF (difference between CMR and CEU) and DIFc (difference between CMRc and CEUc). The obtained values are shown in Table no 2.

Table no 1 - Percentage variations of data on GDPpc and HDI for European States from 1990 to 2010

EU country	VAR GDP 90-95	VAR GDP 95-00	VAR GDP 00-05	VAR GDP 05-10	VAR HDI 90-95	VAR HDI 95-00	VAR HDI 00-05	VAR HDI 05-10
AT (C)	40	-20	55	22	3,04	3,07	2,50	2,67
BE (C)	38	-19	59	20	5,30	2,58	-0,34	1,37
FR (C)	24	-17	55	16	5,41	3,30	2,72	1,61
DE (C)	43	-26	46	20	5,03	3,47	3,59	0,89

LU (C)	52	-8	74	30	3,55	4,66	1,29	0,00
NL (C)	37	-11	62	20	3,71	1,85	0,91	2,13
BU (E)	-35	3	133	69	0,00	2,44	4,76	2,54
CZ (E)	59	3	120	50	-	3,55	4,66	1,05
EE (E)	-5	37	149	39	-0,14	8,38	5,80	1,34
HU (E)	38	3	141	18	4,39	5,16	3,61	1,37
LV (E)	-25	59	111	54	-2,89	8,77	7,10	2,30
LT (E)	-23	50	133	44	-	7,61	5,87	1,51
PL (E)	113	24	79	54	-	5,91	2,73	2,53
RO (E)	-5	6	177	65	-1,86	2,47	6,25	4,14
SK (E)	112	13	114	41	0,67	3,59	3,98	2,72
HR (M)	-9	3	108	36	-	4,91	4,28	1,79
CY (M)	47	-6	67	28	5,49	1,52	1,13	3,71
EL (M)	34	-7	90	23	1,31	3,35	6,73	0,70
IT (M)	-1	-3	57	12	4,06	3,77	4,36	1,39
MT (M)	34	6	48	35	2,39	3,63	3,25	0,61
PT (M)	48	-1	58	19	6,07	3,60	1,41	2,41
SI (M)	21	-5	78	28	-	6,06	5,34	4,01
ES (M)	13	-5	81	17	6,94	4,74	2,15	2,22
UK (N)	13	26	51	-5	4,88	2,08	2,64	0,82
DK (N)	32	-14	59	17	2,97	3,36	2,79	0,90
FI (N)	-8	-8	59	19	3,53	1,82	4,54	0,57
IE (N)	36	37	91	-3	3,96	6,89	3,34	1,00
SE (N)	1	-3	47	19	4,78	4,56	0,22	0,56

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3. The result of the research

Each of the four macro-region N, C, E and M is characterized by a peculiar dynamic of economic growth. Indeed, the VGDPc analysis shows that, for some States, macro-regional dynamics are more significant than the European ones. This is particularly evident in the region E whose values of economic growth are higher than 100% over the period 2000-2005 (see Table no 1). The VHDI analysis reveals, on one hand, that macro-regions with the lowest values of GDPpc are characterized by a great internal variability, and, on the other hand, that macro-regions with high values of GDPpc are typified by a level of HDI which varies according to their typical ranges of VHDI. Moreover, the study of the correlation of GDPpc (see table no 2) shows that States belonging to macro-region E are strongly correlated with macro-regional data.

If we focus on VGDPpc, it is possible to note (see Table no 1) that the variations of each macro-regions are coherent in both sign and value. In general, the range of variation is between 14% and 30% for each macro-region. In particular, it is between 39% and 69% for E, between 16% and 30% for C, between 17% and 36% for M, and between -5% and 19% for N. It is possible to identify best in class States for each macro-region. For example, if we look at E, the economic growth rate of Poland and Hungary is high, above all over the period 1995-2000, and then, it tends to coincide with the economic growth rate of the macro-region they belong to.

Then, if we pay attention to VHDI (Table no 1), it is possible to note that there is a variability which is higher than the variability related to VGDPpc. The VHDI trends are characterized by a high variability within the macro-regions with low values of GDPpc rather than within the macro-regions with high values of GDPpc where the values of HDI varies according to the typical macro-regional ranges of VHDI. For example, if we consider N, there is an increase of 4% over the period 1990-1995 and a growth of 0,80% from 2005 to 2010.

Now, it is important to observe if the data on GDPpc for each European State are more related to European area than to the macro-region to which each State belongs. On this regard, when DIF and, more specifically, DIFc (see Table no 2) assume positive values, the macro-regional dynamic explains the data better than the European one. Moreover, the data on GDPpc for 17 States out of 28 are more correlated to CMRc than to CEUc. Specifically, in E, 7 States out of 9 are more correlated to CMRc than to CEUc whereas in N, the most of countries is more correlated to CEUc. Hence, the average value of macro-regional GDPpc reasonably well represents the potential dependence of each State on macro-regional dynamics.

Table no 2 - *Correlations between national GDPpc and European GDPpc and macro-regional GDPpc*

EU country	CEU	CMR	DIF	CEUc	CMRc	DIFc
AT (C)	0,986771	0,997813	0,011042	0,985561	0,997124	0,011562
BE (C)	0,990789	0,99888	0,008091	0,989963	0,998536	0,008573
FR (C)	0,990215	0,997037	0,006823	0,989463	0,996273	0,00681
DE (C)	0,959552	0,982048	0,022496	0,956804	0,977973	0,021169
LU (C)	0,996929	0,997245	0,000316	0,99593	0,992593	-0,00334
NL (C)	0,998071	0,997086	-0,00099	0,997857	0,995948	-0,00191
BU (E)	0,963483	0,978941	0,015458	0,962799	0,976476	0,013677
CZ (E)	0,991935	0,995566	0,00363	0,991473	0,993723	0,00225
EE (E)	0,991433	0,996584	0,005151	0,990999	0,995364	0,004365
HU (E)	0,992376	0,988569	-0,00381	0,992073	0,985523	-0,00655
LV (E)	0,976552	0,990509	0,013957	0,975618	0,987947	0,012329
LT (E)	0,985407	0,995471	0,010064	0,98486	0,994332	0,009472
PL (E)	0,981825	0,990315	0,008489	0,981178	0,988022	0,006844
RO (E)	0,980463	0,991948	0,011485	0,979956	0,990607	0,010652
SK (E)	0,994594	0,994488	-0,00011	0,994317	0,992493	-0,00182
HR (M)	0,985393	0,988359	0,002967	0,984791	0,986063	0,001272
CY (M)	0,995916	0,996781	0,000865	0,99562	0,995565	-5,5E-05≈0
EL (M)	0,997621	0,998615	0,000994	0,997449	0,998095	0,000646
IT (M)	0,984744	0,986497	0,001753	0,983731	0,981911	-0,00182
MT (M)	0,991007	0,993626	0,002619	0,990603	0,992242	0,001639
PT (M)	0,993408	0,993724	0,000315	0,993084	0,992216	-0,00087
SI (M)	0,991837	0,9927	0,000863	0,991305	0,990273	-0,00103
ES (M)	0,994492	0,994846	0,000354	0,994071	0,99277	-0,0013
UK (N)	0,942739	0,974726	0,031986	0,937463	0,963693	0,02623
DK (N)	0,996285	0,983306	-0,01298	0,99583	0,97323	-0,0226
FI (N)	0,978411	0,976723	-0,00169	0,97623	0,965613	-0,01062

IE (N)	0,962621	0,983654	0,021034	0,956226	0,967594	0,011368
SE (N)	0,970875	0,972958	0,002082	0,968182	0,961355	-0,00683

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4. Conclusions

The analysis of the data on GDPpc reveals that European States with low values of GDPpc are more linked to the macro-regional trend than to the European one. In particular, the values of GDPpc are better explained by the average values of the macro-region to which each country belongs than by the European average values. This is verified by a corrected correlation which is calculated by removing the value of the considered State from both macro-regional and European averages. The percentage variations of HDI are slightly different from the ones of GDPpc. The analysis of the variations of both GDPpc and HDI show that States with high values of both GDPpc and HDI are rather tightly linked to the dynamics of the macro-region to which they belong. In conclusion, the macro-regional dynamics especially influences the States with low values of both GDPpc and HDI. Therefore, in an era of globalization, it is still fundamental to take into consideration the socio-economic characteristics of macro-regions in order to understand the European dynamics of development.

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