Measuring Europe 2020: a new tool to assess the strategy

Pasimeni, Paolo

European Commission, Directorate General for Employment, Social Affairs and Inclusion

15 July 2011

Measuring Europe 2020:
a new tool to assess the strategy

International Journal of Innovation and Regional Development

Issue 5, Vol.4 (365-385)

Paolo Pasimeni [1]

European Commission

Directorate General for Employment, Social Affairs and Inclusion

B-1049 Brussels

Paolo.Pasimeni@ec.europa.eu

Abstract

This paper aims at analysing the performances of the EU member states in the Europe 2020 Strategy and understanding the main factors of success. It builds on the Europe 2020 Index developed in Pasimeni (2011) to quantify and measure progress achieved by the twenty-seven countries in pursuing the objectives of the strategy and extends the calculation of the index to seven years. The results suggest that institutional factors are more relevant than macroeconomic indicators of public finances, such as GDP growth, levels of government debt and deficit, as success factors in the strategy. This applies to both formal institutions, such as good governance, rule of law, and control of corruption, as well as informal ones, such as social capital. This analysis has been conducted at national level; a regional breakdown of the data would enhance its validity. From a policy perspective, these findings suggest that the current emphasis on public accounts as the main criteria to define structural reforms could be enhanced including a broader focus on institutions.

Key words: Europe 2020; measurement; institutions; governance; social capital.

***JEL**: A13; N44; O10; O43; Z13*

March, 2012

[1] The opinions expressed in this paper are the author's alone and do not reflect those of the European Commission. The author is grateful to Mikel Landabaso, the editor Panayiotis Ketikidis, and three anonymous referees for their helpful comments and suggestions. Errors and omissions however are entirely the author's responsibility.

1. Introduction

The Europe 2020 strategy for smart, sustainable and inclusive growth in the European Union (EU) was launched by the European Commission (EC) in March 2010 and approved by the Heads of States and Governments of the twenty-seven member states of the EU in June 2010. The new strategy is the result of a political decision intended to address the main structural challenges the EU faces and can be considered as the successor of the Lisbon strategy. It represents more a political priority than an analytical exercise, so the aim of this paper will be to understand the main factors of success in this strategy, more than to justify the choice of these priorities.

The Commission's proposal for a 10-year development strategy aims at moving out of the crisis, avoiding "the reflex to try to return to the pre-crisis situation" and changing the model of development. Three priorities were identified as main pillars of this strategy: Smart growth – developing an economy based on knowledge and innovation; Sustainable growth – promoting a more resource efficient, greener and more competitive economy; Inclusive growth – fostering a high-employment economy delivering economic, social and territorial cohesion (European Commission, 2010).

The Europe 2020 strategy sets out concrete targets to be achieved within the next decade in areas such as employment, education, energy use and innovation in order to overcome the impact of the financial crisis and promote economic growth. The key deliveries for the Europe 2020 Strategy at national level are the so-called "National Reform Programmes" (NRPs), which are to be presented by the national governments in April of each year, along with the stability and convergence programmes[2]. NRPs contain national targets relating to EU-wide headline targets and explain how governments intend to meet them and overcome obstacles to growth. They also set out what measures will be taken, when, by whom and with what budget implications.

In this framework, new policy instruments for performance benchmarking (Huggins, 2010), such as composite indicators specifically developed for the Europe 2020 Strategy (Pasimeni, 2011), can be useful for the quantification, measurement, monitoring and evaluation of the strategy. The objective is to avoid some weaknesses of the Lisbon strategy, the growth strategy for the European Union in the last decade (2000-2010), whose weaknesses have been related (Saltelli et al, 2011) to the inappropriate use of statistical indicators, not used in the context of an advocacy programme in support of the EU policy.

This paper builds on the index developed in Pasimeni (2011) to quantify, measure and monitor the progress achieved by the twenty-seven member states of the EU towards the achievements of the objectives set by the new strategy and aims at identifying the critical factors of success for this strategy. The structure of the index is maintained, some elements of its calculation are modified, in order to ensure a better consistency over time, and the analysis is enhanced covering seven years instead of three. The index is then be used to identify the main factors which determine the differences in performances among countries. Section 2 of the paper presents the methodology used; section 3 presents an analysis of its external validity; section 4 applies the new tool to

[2] Produced annually by countries of the euro-zone (stability programmes) and other EU countries (convergence programmes) under the Stability and Growth Pact. The aim is to ensure more rigorous budgetary discipline through surveillance and coordination of budgetary policies. In line with the European Semester designed to coordinate economic policy-making in EU countries, the programmes are submitted simultaneously with national reform programmes in April each year, thus before government adoption of national budgets for the following year, and will provide for meaningful discussions on fiscal policy.

examine the critical factors affecting the strategy; section 5 focuses on the role of institutions; and finally section 6 concludes.

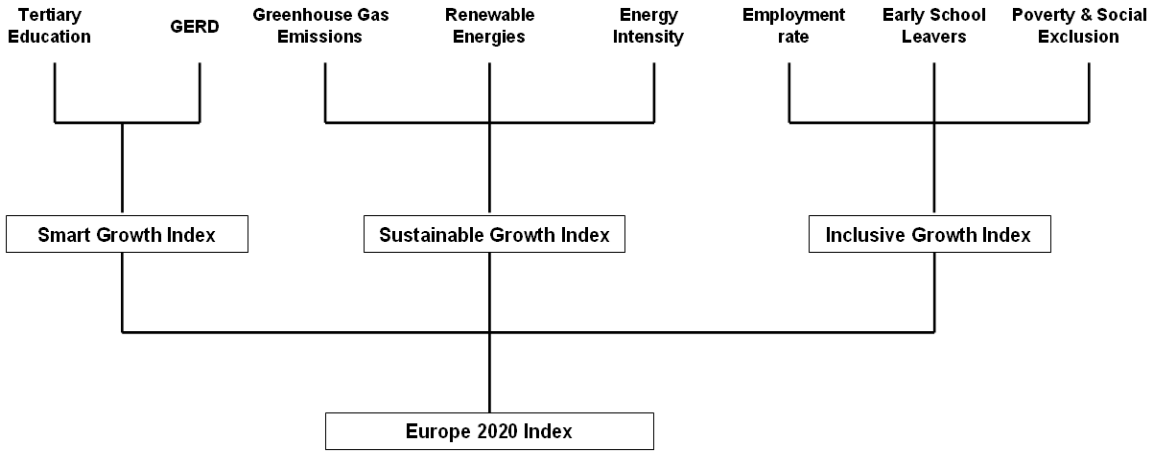
2. The index

The "Europe 2020 Index", as proposed in Pasimeni (2011), is based on three thematic sub-indices representing the three dimensions of growth identified as main pillars of the strategy. These in turn are built on a set of eight indicators agreed and approved by the Heads of States and Governments of the twenty-seven member states of the EU. These indicators are calculated at national level by Eurostat[3] , some of them have quite long time series available, since the early nineties, but others only cover a more limited time span. This paper uses a more complete set of data, allowing the construction of the index for seven instead of three years. The eight official indicators to monitor the Europe 2020 strategy are:

- Tertiary education attainment	(TEDU)	(2000-2010)
- Gross domestic expenditure on R&D	(GERD)	(1990-2009)
- Greenhouse gas emissions	(GGE)	(1990-2009)
- Share of renewable energy in gross final energy consumption	(RNEW)	(2003-2009)
- Energy intensity of the economy	(EINT)	(1990-2009)
- Employment rate of the population aged 20 to 64	(EMPL)	(1992-2010)
- Early leavers from education	(SCHO)	(1992-2010)
- Population at-risk-of-poverty or exclusion	(POV)	(2003-2010)

The structure of the index is maintained, linking each indicator to only one dimension of the strategy, as in Figure 1:

Figure 1: Structure of the Index



The data used are extracted by Eurostat and at the moment the largest common period for which all of them are available is from 2003 to 2009, being the shortest time series for the RNEW indicator. Table 1 provides the summary statistics for these indicators[4] showing the mean over the available time periods, the standard deviation, minimum and maximum values.

[3] Available at: (http://epp.eurostat.ec.europa.eu/portal/page/portal/europe_2020_indicators/headline_indicators)
[4] Data from Eurostat, last extraction: 05 Jan 2012.

Table 1: Descriptive statistics of the indicators used

Variable	mean	sd	min	max
TEDU	*30.10*	*10.67*	*8.90*	*49.90*
GERD	*1.46*	*0.92*	*0.25*	*3.92*
GGE	*96.06*	*32.84*	*40.00*	*193.00*
RNEW	*11.09*	*9.90*	*0.10*	*47.30*
EINT	*310.96*	*227.08*	*104.69*	*1207.91*
EMPL	*68.05*	*6.14*	*50.80*	*81.10*
SCHO	*17.21*	*10.40*	*4.10*	*54.40*
POV	*25.29*	*10.11*	*13.90*	*64.50*

The normalisation method for the eight indicators remains the same, by applying:

$$X_{ic} = \frac{x_{ic} - \min_k \{x_{ik}\}}{\max_k \{x_{ik}\} - \min_k \{x_{ik}\}} \quad \text{and} \quad X_{ic} = \frac{\max_k \{x_{ik}\} - x_{ic}}{\max_k \{x_{ik}\} - \min_k \{x_{ik}\}},$$

where i is the indicator, c the country, and max_{ik} and min_{ik} are the maximum and minimum values of that indicator across the whole period available. These values, however, are different from the previous version of the index: the choice has been made to used absolute higher and lower bounds among the data available for all the countries, even non EU, across the full time series.

The comparability over time of the index, across many years, will be easier and more "sustainable", reducing the probability that some value for EU countries reaches the absolute historical maximum or minimum. Table 2 shows the summary statistics for the normalised values, presenting the mean over the available time periods, the standard deviation, minimum and maximum values:

Table 2: Descriptive statistics of the normalised indicators

Variable	mean	sd	min	max
TEDU	*0.53*	*0.25*	*0.035*	*1.000*
GERD	*0.32*	*0.24*	*0.008*	*0.946*
GGE	*0.65*	*0.20*	*0.062*	*0.988*
RNEW	*0.17*	*0.15*	*0.001*	*0.728*
EINT	*0.90*	*0.10*	*0.495*	*0.992*
EMPL	*0.60*	*0.13*	*0.308*	*0.853*
SCHO	*0.79*	*0.17*	*0.089*	*0.992*
POV	*0.77*	*0.17*	*0.130*	*0.962*

Three thematic indices can be created by grouping these indicators, reflecting the three main pillars of the Europe 2020 strategy: the Smart Growth Index (SMGI), the Sustainable Growth Index (SUGI), and the Inclusive Growth Index (INGI), which in turn form the Europe 2020 Index. The normalised indicators are aggregated with a geometric mean using equal weights (Ebert and Welsch, 2004; OECD, 2008), as in Pasimeni (2011), to build the three thematic indices and the final one. The following tables present the values and the rankings of the twenty-seven member states in each of the new thematic indices for each year, from 2003 to 2009:

Table 3: Values and rankings in the Smart Growth Index (SMGI)

	2003		2004		2005		2006		2007		2008		2009	
Belgium	0.549	5	0.566	5	0.554	5	0.579	5	0.585	5	0.611	5	0.614	6
Bulgaria	0.159	21	0.170	22	0.159	23	0.161	25	0.160	25	0.172	24	0.196	23
Czech Rep	0.175	19	0.177	19	0.195	20	0.209	20	0.212	20	0.239	19	0.277	18
Denmark	0.661	3	0.680	3	0.694	3	0.696	3	0.706	3	0.776	3	0.834	3
Germany	0.497	7	0.516	7	0.506	7	0.508	8	0.515	8	0.549	8	0.587	7
Estonia	0.259	14	0.275	14	0.315	14	0.371	14	0.366	14	0.413	14	0.456	14
Ireland	0.396	9	0.433	10	0.442	10	0.456	10	0.479	9	0.535	9	0.617	5
Greece	0.180	18	0.186	18	0.202	18	0.207	21	0.207	21	0.201	23	0.206	22
Spain	0.364	11	0.380	12	0.411	12	0.425	12	0.450	11	0.469	11	0.475	13
France	0.567	4	0.574	4	0.587	4	0.606	4	0.617	4	0.622	4	0.663	4
Italy	0.186	17	0.207	17	0.224	16	0.237	16	0.253	17	0.265	18	0.269	19
Cyprus	0.159	20	0.174	20	0.195	19	0.221	19	0.227	19	0.224	21	0.246	21
Latvia	0.102	24	0.116	25	0.151	25	0.185	24	0.204	22	0.217	22	0.181	24
Lithuania	0.220	15	0.275	15	0.312	15	0.331	15	0.330	15	0.334	15	0.349	15
Luxembourg	0.292	13	0.451	9	0.493	9	0.493	9	0.478	10	0.513	10	0.583	8
Hungary	0.196	16	0.210	16	0.213	17	0.235	17	0.241	18	0.265	17	0.307	17
Malta	0.034	27	0.138	24	0.152	24	0.185	23	0.175	24	0.166	25	0.162	25
Netherlands	0.499	6	0.519	6	0.527	6	0.533	6	0.527	7	0.553	6	0.565	10
Austria	0.388	10	0.407	11	0.420	11	0.429	11	0.435	12	0.467	12	0.492	11
Poland	0.137	23	0.163	23	0.180	22	0.188	22	0.203	23	0.226	20	0.265	20
Portugal	0.149	22	0.170	21	0.186	21	0.226	18	0.266	16	0.331	16	0.342	16
Romania	0.039	26	0.054	27	0.068	27	0.083	27	0.108	26	0.136	26	0.119	27
Slovenia	0.320	12	0.353	13	0.355	13	0.409	13	0.418	13	0.450	13	0.489	12
Slovakia	0.093	25	0.098	26	0.110	26	0.107	26	0.103	27	0.112	27	0.126	26
Finland	0.815	1	0.837	1	0.844	1	0.872	1	0.883	1	0.896	1	0.926	1
Sweden	0.713	2	0.732	2	0.779	2	0.818	2	0.802	2	0.851	2	0.863	2
UK	0.471	8	0.480	8	0.497	8	0.518	7	0.540	6	0.552	7	0.580	9

Table 4: Values and rankings in the Sustainable Growth Index (SUGI)

	2003		2004		2005		2006		2007		2008		2009	
Belgium	0.250	22	0.258	22	0.275	22	0.291	21	0.305	22	0.314	22	0.359	21
Bulgaria	0.314	18	0.331	15	0.343	16	0.410	13	0.412	14	0.429	14	0.474	14
Czech Rep	0.306	19	0.324	19	0.331	18	0.388	16	0.410	15	0.421	15	0.441	18
Denmark	0.489	5	0.523	5	0.548	4	0.530	8	0.559	7	0.573	7	0.592	8
Germany	0.345	13	0.364	13	0.381	12	0.427	12	0.472	11	0.470	12	0.485	12
Estonia	0.479	6	0.481	6	0.489	7	0.572	5	0.572	5	0.595	5	0.641	5
Ireland	0.220	25	0.232	25	0.255	24	0.276	23	0.289	23	0.300	23	0.343	22
Greece	0.326	16	0.324	17	0.323	19	0.368	18	0.380	18	0.385	20	0.398	20
Spain	0.331	15	0.313	20	0.298	21	0.353	20	0.351	20	0.391	19	0.443	15
France	0.388	11	0.389	11	0.384	11	0.451	11	0.464	12	0.478	11	0.496	11
Italy	0.365	12	0.382	12	0.377	13	0.361	19	0.362	19	0.397	18	0.443	16
Cyprus	0.165	26	0.165	26	0.151	26	0.160	26	0.162	26	0.153	26	0.215	26
Latvia	0.735	1	0.753	1	0.756	1	0.742	2	0.731	2	0.734	2	0.771	2
Lithuania	0.450	8	0.454	8	0.472	8	0.563	6	0.553	8	0.572	8	0.595	7
Luxembourg	0.238	23	0.238	24	0.236	25	0.229	25	0.285	24	0.290	25	0.298	25
Hungary	0.315	17	0.324	18	0.344	15	0.368	17	0.389	17	0.405	17	0.433	19
Malta	0.070	27	0.071	27	0.070	27	0.070	27	0.079	27	0.080	27	0.083	27
Netherlands	0.281	21	0.291	21	0.313	20	0.291	22	0.309	21	0.319	21	0.340	23
Austria	0.534	3	0.547	4	0.543	5	0.585	4	0.609	4	0.616	4	0.649	4
Poland	0.344	14	0.349	14	0.352	14	0.397	15	0.400	16	0.419	16	0.442	17
Portugal	0.460	7	0.430	10	0.407	10	0.496	9	0.518	9	0.530	9	0.552	9
Romania	0.438	9	0.469	7	0.489	6	0.544	7	0.564	6	0.591	6	0.626	6
Slovenia	0.438	10	0.452	9	0.437	9	0.496	10	0.498	10	0.484	10	0.523	10
Slovakia	0.304	20	0.325	16	0.340	17	0.397	14	0.435	13	0.440	13	0.482	13
Finland	0.529	4	0.560	3	0.597	3	0.611	3	0.615	3	0.652	3	0.662	3
Sweden	0.619	2	0.625	2	0.664	2	0.750	1	0.764	1	0.776	1	0.802	1
UK	0.234	24	0.248	23	0.261	23	0.249	24	0.267	25	0.292	24	0.323	24

Table 5: Values and rankings in the Inclusive Growth Index (INGI)

	2003		2004		2005		2006		2007		2008		2009	
Belgium	0.677	15	0.698	15	0.706	15	0.714	15	0.729	17	0.737	17	0.735	14
Bulgaria	0.302	26	0.330	27	0.358	27	0.393	27	0.441	27	0.606	23	0.581	24
Czech Rep	0.793	7	0.794	7	0.803	7	0.822	6	0.840	5	0.844	4	0.837	5
Denmark	0.852	2	0.867	1	0.867	2	0.879	1	0.854	2	0.870	2	0.851	3
Germany	0.746	12	0.753	9	0.758	10	0.764	12	0.785	10	0.798	9	0.805	8
Estonia	0.721	14	0.722	14	0.738	13	0.792	9	0.795	8	0.800	8	0.731	15
Ireland	0.738	13	0.744	12	0.756	11	0.774	10	0.782	11	0.767	13	0.703	17
Greece	0.610	19	0.630	18	0.651	18	0.651	18	0.668	19	0.669	20	0.667	19
Spain	0.549	22	0.551	22	0.586	22	0.602	22	0.607	23	0.591	24	0.555	25
France	0.754	9	0.752	10	0.758	9	0.756	13	0.759	15	0.772	12	0.760	13
Italy	0.561	21	0.582	21	0.591	21	0.605	21	0.613	22	0.619	22	0.610	23
Cyprus	0.754	10	0.725	13	0.733	14	0.766	11	0.790	9	0.796	10	0.802	9
Latvia	0.570	20	0.601	20	0.594	20	0.651	19	0.699	18	0.713	18	0.629	20
Lithuania	0.640	17	0.657	16	0.664	17	0.707	17	0.767	13	0.765	14	0.702	18
Luxembourg	0.749	11	0.751	11	0.755	12	0.756	14	0.773	12	0.761	15	0.800	10
Hungary	0.620	18	0.616	19	0.616	19	0.624	20	0.640	21	0.636	21	0.615	21
Malta	0.292	27	0.410	26	0.441	26	0.431	26	0.455	26	0.463	27	0.470	27
Netherlands	0.803	5	0.804	5	0.814	4	0.833	3	0.854	3	0.869	3	0.870	1
Austria	0.818	3	0.795	6	0.810	6	0.815	7	0.826	7	0.826	7	0.839	4
Poland	0.454	25	0.490	25	0.526	25	0.583	23	0.644	20	0.692	19	0.704	16
Portugal	0.511	24	0.527	24	0.538	24	0.541	25	0.565	24	0.580	25	0.611	22
Romania	0.548	23	0.542	23	0.539	23	0.548	24	0.535	25	0.553	26	0.548	26
Slovenia	0.797	6	0.821	3	0.819	3	0.826	4	0.844	4	0.837	6	0.832	6
Slovakia	0.674	16	0.655	17	0.671	16	0.713	16	0.755	16	0.779	11	0.764	11
Finland	0.806	4	0.807	4	0.813	5	0.825	5	0.836	6	0.840	5	0.821	7
Sweden	0.869	1	0.860	2	0.869	1	0.850	2	0.878	1	0.876	1	0.863	2
UK	0.774	8	0.781	8	0.785	8	0.793	8	0.764	14	0.759	16	0.763	12

Table 6 presents the scores of the new Europe 2020 Index for each country in each year with the relative ranking. It is worth underlying that all countries have improved their score from 2003 to 2009, even though the 2009 performances were already influenced by the consequences of the economic and financial crisis. The effects of the crisis on the dimensions of this index are likely to be stronger for the following year, 2010, especially for the Inclusive Growth dimension.

Table 6: Values and rankings in the Europe 2020 Index

	2003		2004		2005		2006		2007		2008		2009	
Belgium	0.453	9	0.467	9	0.476	10	0.494	11	0.507	11	0.521	11	0.545	10
Bulgaria	0.247	25	0.265	25	0.269	25	0.296	25	0.308	25	0.355	23	0.378	23
Czech Rep	0.349	17	0.357	18	0.373	17	0.405	17	0.418	18	0.440	18	0.467	17
Denmark	0.651	3	0.676	3	0.691	3	0.687	3	0.696	3	0.728	3	0.749	3
Germany	0.504	6	0.521	6	0.527	6	0.550	8	0.576	6	0.591	6	0.612	6
Estonia	0.447	10	0.457	10	0.484	9	0.552	6	0.550	8	0.581	7	0.598	7
Ireland	0.401	13	0.421	14	0.440	14	0.460	13	0.477	13	0.498	12	0.530	11
Greece	0.330	20	0.337	21	0.349	20	0.367	21	0.375	21	0.373	22	0.380	22
Spain	0.405	12	0.403	15	0.415	15	0.449	14	0.458	16	0.477	16	0.489	15
France	0.549	5	0.551	5	0.555	5	0.591	4	0.601	5	0.612	5	0.630	5
Italy	0.336	19	0.359	17	0.368	18	0.373	20	0.383	20	0.402	21	0.417	21
Cyprus	0.271	23	0.275	24	0.279	24	0.300	24	0.308	26	0.301	26	0.349	25
Latvia	0.350	16	0.374	16	0.408	16	0.447	15	0.471	15	0.484	14	0.445	18
Lithuania	0.398	14	0.434	12	0.461	12	0.509	9	0.519	9	0.527	10	0.526	12
Luxembourg	0.373	15	0.432	13	0.445	13	0.440	16	0.472	14	0.483	15	0.518	14
Hungary	0.337	18	0.347	19	0.356	19	0.378	19	0.391	19	0.409	19	0.434	20
Malta	0.089	27	0.159	27	0.168	27	0.177	27	0.184	27	0.183	27	0.185	27
Netherlands	0.483	7	0.496	8	0.512	7	0.505	10	0.518	10	0.535	9	0.551	9
Austria	0.553	4	0.561	4	0.570	4	0.589	5	0.602	4	0.620	4	0.645	4
Poland	0.278	22	0.303	22	0.321	22	0.352	22	0.374	22	0.403	20	0.435	19
Portugal	0.327	21	0.338	20	0.344	21	0.393	18	0.427	17	0.467	17	0.487	16
Romania	0.211	26	0.240	26	0.261	26	0.291	26	0.320	24	0.355	24	0.344	26
Slovenia	0.482	8	0.508	7	0.503	8	0.551	7	0.560	7	0.567	8	0.597	8
Slovakia	0.267	24	0.275	23	0.292	23	0.312	23	0.324	23	0.338	25	0.360	24
Finland	0.703	2	0.723	2	0.743	2	0.761	2	0.769	2	0.789	2	0.795	2
Sweden	0.727	1	0.733	1	0.766	1	0.805	1	0.813	1	0.833	1	0.842	1
UK	0.440	11	0.453	11	0.467	11	0.468	12	0.479	12	0.497	13	0.523	13

Sweden, Finland and Denmark are, in this order, the top performing countries each year. The biggest improvements in the ranking of the twenty-seven member states between 2003 and 2009 were those of Portugal (from the 21st to the 16th position), Poland (from 22nd to 19th), and Estonia (from 10th to 7th). In most of the cases we observe an increase in absolute values of the index for each country, only in very few cases the performance lowers. The two most significant cases of reduction in the value of the index are observed for Romania and Latvia in the year 2009 compared to 2008: the first sees a reduction of 0.011 points, the second, even bigger, of 0.039 points.

This might be an expected result, due to the effects of the crisis on the policies put in place, and by taking a closer look at the three components of the strategy, we can disaggregate this effect. In both cases the decrease is explained by the strong deterioration of their performances in the inclusive dimension (INGI) and in the smart growth one (SMGI), while at the same time their sustainable growth index (SUGI) was still improving.

This Index offers an opportunity to perform quantitative assessments of the Europe 2020 Strategy, and might be used to explore which factors are more decisive for its improvement. The next section compares this measure with the other main indices available in the literature, analysing different facets of development. We then study the correlation between this measure of the strategy and the main indicators of economic development or the main institutional dimensions of good governance, to assess their relative relevance.

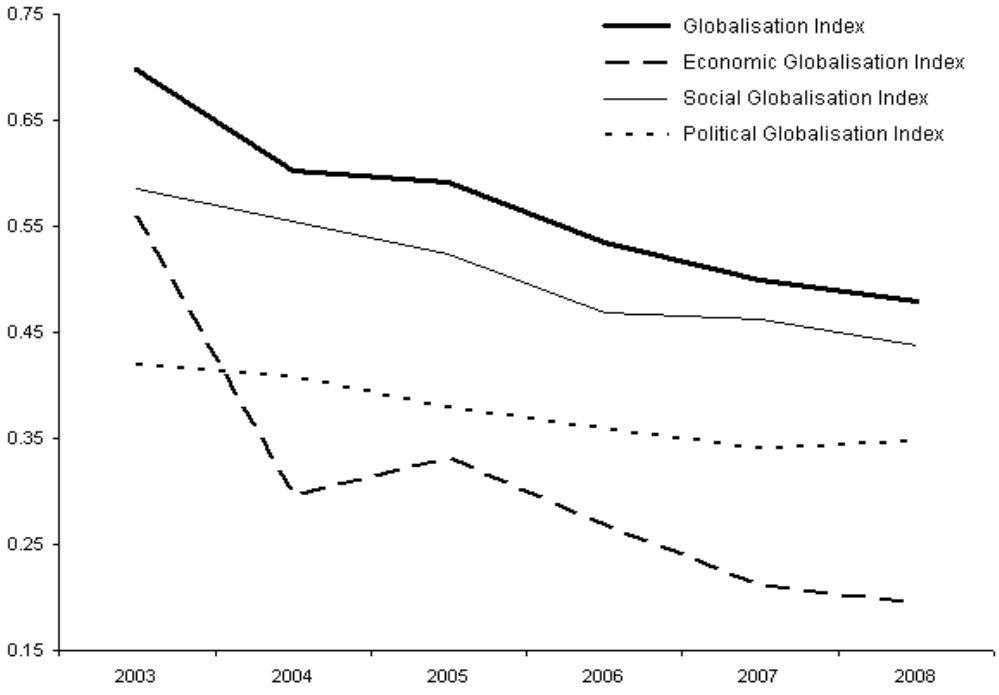
3. External validity of the index

In this section the index is compared to other selected indices available in the literature, which rank countries according to their performance in a certain dimension. In particular the section extends the analysis of globalisation and competitiveness in relation to the Europe 2020 Strategy, in order to understand to what extent these are positive factors for the strategy, and how this relation evolves over time.

The KOF Index of Globalisation (Dreher 2006, Dreher et al. 2008) is a composite index, based on the thematic sub-indices of economic, social and political globalisation, which aims to measure the levels of globalisation of more than 190 countries [5]. The data available for this composite index only cover the period until 2008, and we can observe that the correlation between the Europe 2020 Index and each of the three dimensions of globalisation is positive, but moderate.

What is extremely relevant in this comparison is that the correlation between the Europe 2020 performance, as measured by the Index, and the level of globalisation, as measured by the KOF one, is clearly decreasing every year. This holds true for each one of the specific sub-indices composing the Globalisation Index, as shown in Figure 2:

Figure 2: Evolution of correlations between Europe 2020 Index and Globalisation Indices (same years)



[5] It defines globalization as the process of creating networks of connections among actors at multi-continental distances, mediated through a variety of flows including people, information and ideas, capital and goods. Globalization is conceptualized as a process that erodes national boundaries, integrates national economies, cultures, technologies and governance and produces complex relations of mutual interdependence. More specifically, the three dimensions of the KOF index are defined as: economic globalization, characterized as long distance flows of goods, capital and services as well as information and perceptions that accompany market exchanges; political globalization, characterized by a diffusion of government policies; and social globalization, expressed as the spread of ideas, information, images and people. It uses a linear aggregation method.

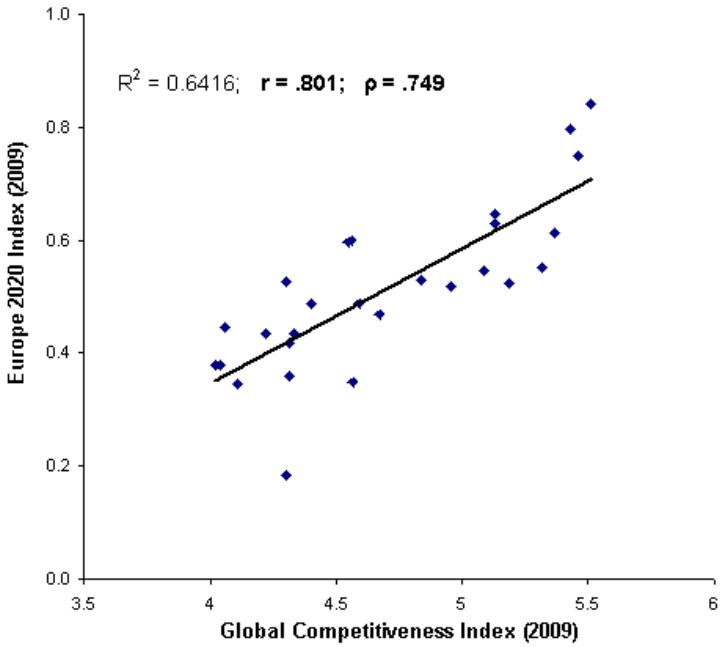
The graph shows that while in 2003 the two performances were highly correlated (r=.697; ρ=.769), implying that more "globalised" member states clearly had better performance in those dimensions which now form the Europe 2020 Strategy, this is less and less valid in 2008 (r=.479; ρ=.527). The explanation for this clear tendency might be that even though the twenty-seven member states of the EU constitute a quite homogeneous group of countries with very similar degrees of social, political and economic globalisation, for those which joined the EU only in 2004 (and 2007) this might have been taken some time.

The declining relevance of the differences in the degree of openness (as measured by the Globalisation Index) could reflect the process of integration within the EU. In other words, once the twenty-seven member states share the same broad economic, political and social *aquis* as members of the EU, they do not differ much from each other in terms of openness to the rest of the world. It will be interesting to see if this tendency continues over the following years.

The World Economic Forum publishes each year a Global Competitiveness Report, in which 133 economies are ranked according to a Global Competitiveness Index (GPI)[6], which tries to measure the set of institutions, policies and factors that set the sustainable current and medium-term levels of economic prosperity, in order to assess "the ability of countries to provide high levels of prosperity to their citizens. This in turn depends on how productively a country uses available resources" (Schwab et al. 2010).

The advantage of this index as a good test for the Europe 2020 Index is that it includes a very large number of indicators, classified by thematic areas (pillars), from institutions, infrastructures, education, to macroeconomic environment, health, markets functioning, technology and innovation, and aggregated with a linear method. Its comprehensiveness makes it a good benchmark for the Europe 2020 Index.

Figure 3: Europe 2020 and Global Competitiveness Index



[6] The index is built on 90 variables, of which two thirds come from the Executive Opinion Survey, and one third comes from publicly available sources such as the United Nations. The variables are organized into nine/twelve pillars, with each pillar representing an area considered as an important determinant of competitiveness. The GCI separates countries into three specific stages: factor-driven, efficiency-driven, and innovation-driven, each implying a growing degree of complexity in the operation of the economy. The GCI applies a linear aggregation method.

The Global Competitiveness Index is strongly correlated with the Europe 2020 one (ρ=.749), this correlation also has a very high degree of linearity (r=.801), and is robust (significance level = 99.9%). These results suggest that the Europe 2020 strategy, as it has been presented and according to the indicators chosen for its quantification, measurement and monitoring, is perfectly consistent with the overall concept of competitiveness, as defined by the Global Competitiveness Index, and that competitiveness is one of the key factors of success in the strategy.

4. Critical factors affecting the Europe 2020 strategy

This section tries to identify those factors which are more decisive for the Europe 2020 Strategy, factors that can explain the differences in performances of the member states, as measured by the Europe 2020 Index. In order to do this, the main macroeconomic indicators together with other institutional factors relevant for development, proposed in the literature, are compared to the Index.

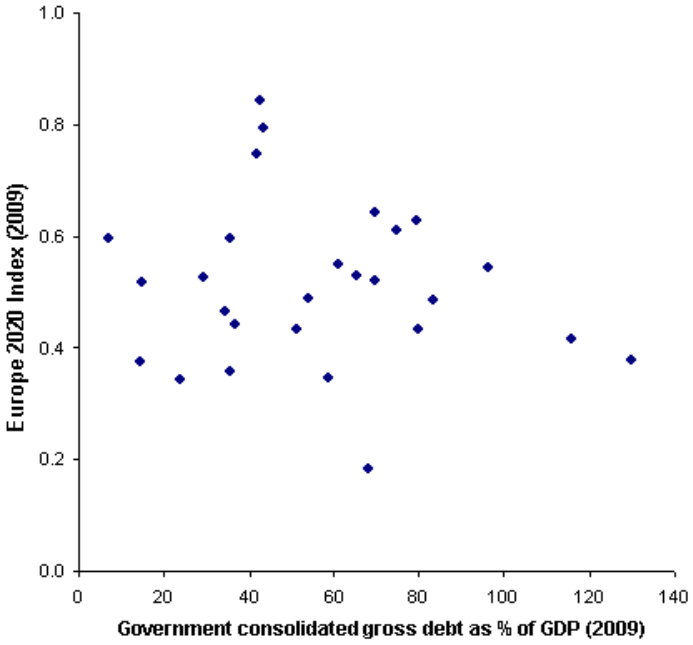
The main macroeconomic indicators of the public accounts are analysed to understand how relevant they are for the performance of the member states in the Europe 2020 Strategy. The analysis performed here will try to shed some light on whether having a sound macroeconomic and fiscal profile guarantees better performance in the Europe 2020 strategy.

The Europe 2020 index is positively related to good economic performance, as measured by GDP per capita. This correlation however is not very strong. Levels of GDP, measured in purchasing power standards, compared to the average for the twenty-seven member states of the EU, are positively correlated to the Europe 2020 Index (Pearson's = .352, Spearman's = .598). These values tell us that there is a positive correlation, but its linearity is not so strong. The analysis of the relationship between GDP growth and levels of the Europe 2020 Index show no correlation at all (r= -.168; ρ= -.252) and this is valid across the whole time series.

In the framework of the European Monetary Union, member states agreed to avoid excessive budgetary deficits. Under the provisions of the Stability and Growth Pact, they agreed to respect two criteria: a debt-to-GDP ratio of 60%, and a deficit-to-GDP ratio of 3%. If a country exceeds the deficit ceiling the excessive deficit procedure (EDP) is triggered at EU level. However, when the excess of the government deficit over the 3% threshold is considered temporary, no sanction is applied.

The first measure, the level of national public debt of member states, as measured by the general government consolidated gross debt as a percentage of GDP, is not at all correlated with the Europe 2020 strategy, and this is valid for all the available years, from 1995 to 2010, compared to all the values of the Europe 2020 Index for the years from 2003 to 2009. Pearson's and Spearman's coefficients values are comprised between + 0.150 and – 0.150. This suggests that keeping low debt is not necessarily conductive to good performance, in terms of the Europe 2020 strategy, and on the other side that increasing public debt, per se, does not facilitate any improvement.

Figure 4: Europe 2020 and Government Debt



The measure of government deficit is a measure of the difference between the revenue and the expenditure of the general government sector. This indicator shows a positive correlation with the Europe 2020 Index ($r = .379$; $\rho = .384$), which is, however, very limited.

Other factors, however, could better explain the differences in performances of the member states in the Europe 2020 Strategy, as measured by our Index. Institutions, in the sense of "humanly devised constraints that structure political, economic and social interactions" (North, 1991), are often recognised as important conditions for development. This applies to both formal and informal institutional settings. Being Europe 2020 a broad strategy for development, it seems reasonable to test whether and to what extent different measures of governance available in the economic literature can explain the critical factors for such a strategy to be successful.

In this section the main indicators and indices of good governance available in the literature, as measures of formal institution, are analysed to understand whether and to what extent they represent necessary preconditions for the Europe 2020 strategy to be successful. Then the role of social capital, as example of informal institutions, is also analysed.

The World Bank has developed the Worldwide Governance Indicators project (Kaufmann et al, 2010), aiming at synthesising different dimensions of good governance in six main indices: *Voice and accountability*, *Political stability and absence of violence or terrorism*, *Government effectiveness*, *Regulatory quality*, *Rule of law*, and *Control of corruption* [7]. They measure the quality of governance in over 200 countries, and are updated on an annual basis since 2002. These are "positive" indices, meaning that higher values correspond to better performances. The coefficients of correlations (Pearson's and Spearman's) between each of these indices and the Europe 2020 Index, in each year from 2003 to 2009, are presented in the following table:

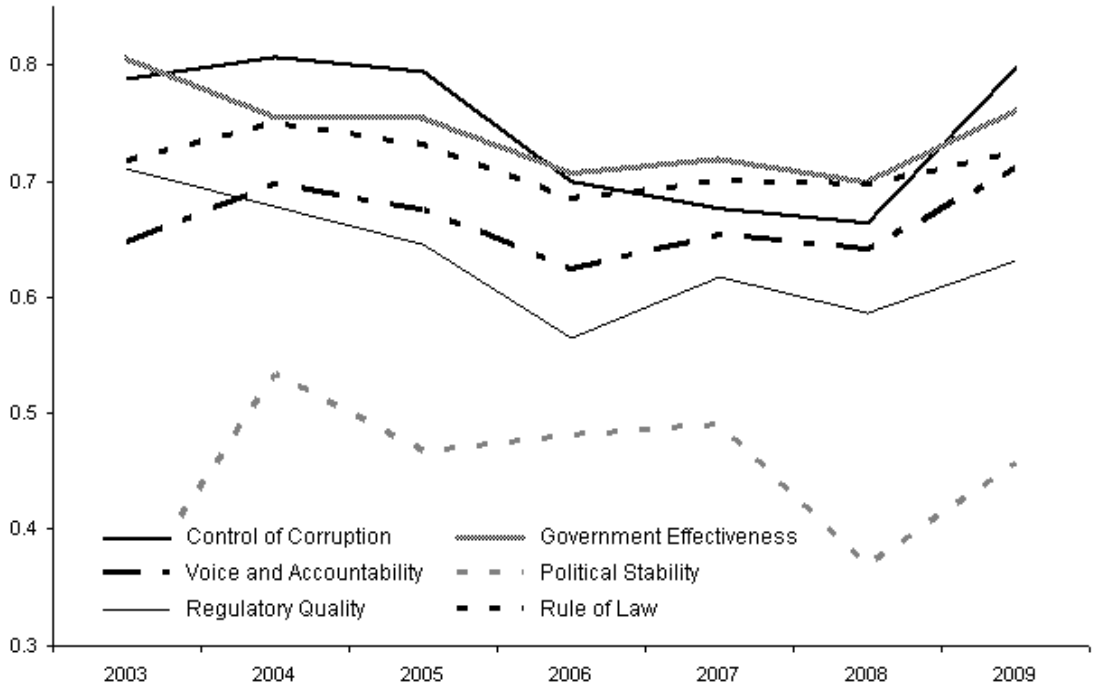
[7] The indicators are a compilation of the perceptions of different groups of respondents, collected in large number of surveys and cross-country assessments of governance. Some of these instruments capture the views of firms, individuals, and public officials in the countries being assessed. Others reflect the views of NGOs and aid donors with considerable experience in the countries being assessed, while others are based on the assessments of commercial risk-rating agencies.

Table 7: Matrix of correlations (Pearson's and Spearman's) between Europe 2020 Index and Quality of Governance indices

Indices	**Europe 2020 Index**						
	2003	2004	2005	2006	2007	2008	2009
Voice and accountability	r =.613	r =.705	r =.688	r =.631	r =.618	r =.610	r =.653
	ρ =.647	ρ =.696	ρ =.675	ρ =.624	ρ =.654	ρ =.641	ρ =.711
Political stability, absence of violence	r =.308	r =.547	r =.472	r =.478	r =.429	r =.313	r =.412
	ρ =.342	ρ =.534	ρ =.468	ρ =.482	ρ =.491	ρ =.369	ρ =.458
Government effectiveness	r =.761	r =.799	r =.762	r =.721	r =.687	r =.655	r =.735
	ρ =.806	ρ =.755	ρ =.755	ρ =.708	ρ =.720	ρ =.700	ρ =.761
Regulatory quality	r =.652	r =.665	r =.633	r =.546	r =.572	r =.557	r =.611
	ρ =.710	ρ =.678	ρ =.645	ρ =.565	ρ =.618	ρ =.587	ρ =.632
Rule of law	r =.648	r =.722	r =.689	r =.622	r =.623	r =.590	r =.641
	ρ =.716	ρ =.750	ρ =.731	ρ =.684	ρ =.699	ρ =.696	ρ =.724
Control of corruption	r =.759	r =.801	r =.777	r =.721	r =.708	r =.677	r =.747
	ρ =.788	ρ =.806	ρ =.794	ρ =.700	ρ =.676	ρ =.664	ρ =.798

All these measures of good governance are positively correlated with the Europe 2020 Index and this is valid each year from 2003 to 2009. We can observe in the following figure how important these factors are, and how this relevance is also increasing, in particular in the last year (2009) for which we are able to build our index.

Figure 5: Evolution of correlations Europe 2020 Index / WB Governance Indicators (same years)

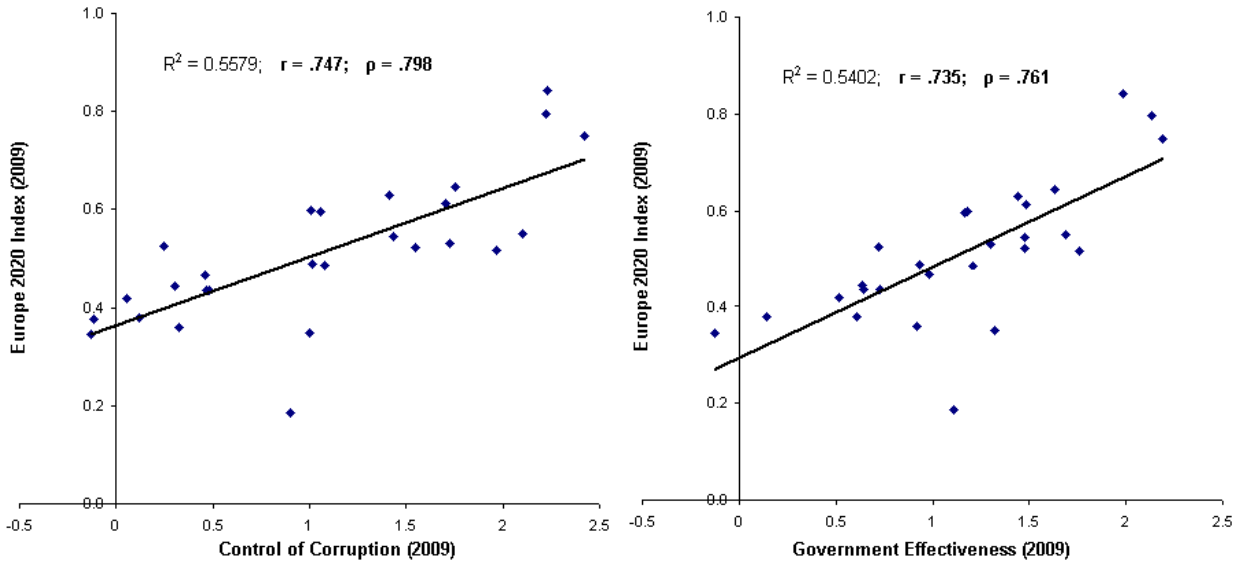


In some cases this correlation is extremely strong, linear and robust. *Government effectiveness*, *Control of corruption* and *Rule of Law* are the dimensions which best explain the Europe 2020 Index, much better than the public accounts indicators. The linear regressions show a strong correlation in both cases, even stronger if measured by the Spearman's coefficient, a non-parametric coefficient, which is less sensitive about the outliers (in these cases Malta and Cyprus). In all three cases the statistical tests of significance show a probability of type-one error below 0.1%, meaning a significance level of 99.9% for these correlations.

The first indicator has been built to measure perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, and to which the state mainly serves elites and private interests. The *Control of Corruption* one tries to capture the perception of the quality of public services, of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. The latter captures perceptions of the extent to which people have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

The strict correlation between these measures and the Europe 2020 Index is extremely interesting and very much in line with the hypothesis of good governance as the main pre-requisite for an effective implementation of the Europe 2020 strategy. This factor is often underestimated in developed countries, but these results show how it makes the difference when it comes to assessing a broad development strategy which goes beyond the simple measures of economic growth.

Figure 6: Control of Corruption and Government Effectiveness' correlations with Europe 2020

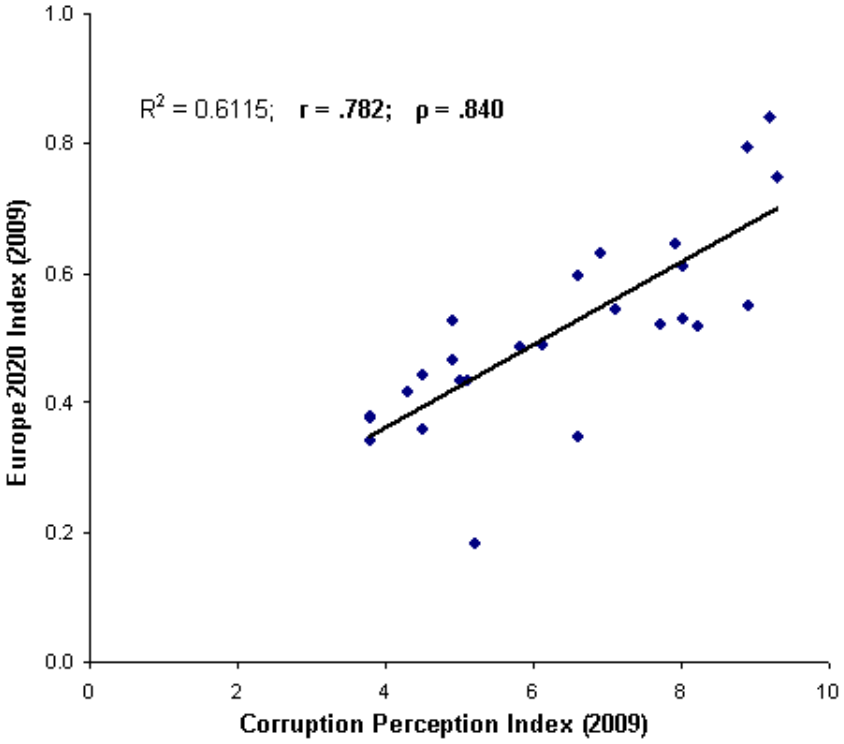


Another well-known measure of corruption can be tested in order to corroborate how relevant good governance is, and in particular the control of corruption, as a decisive factor in deploying successful public policies even in more developed countries. The Corruption Perception Index (CPI), published by Transparency International (2010) each year since 1995, ranks the countries of the world according to "the degree to which corruption is perceived to exist among public officials and politicians". This index is based on a linear aggregation method of several indicators. The organization defines corruption as "the abuse of entrusted power for private gain". It gives a

comprehensive picture of corruption in the countries analysed by combining a number of different indicators of corruption into one index, and is a "positive" index, i.e. a higher score means less corruption.

The analysis of correlations shows that countries with a higher Europe 2020 Index are precisely those with a higher CPI, i.e. with lower levels of corruption. Figure 7 shows this positive and very strong correlation (Pearson = .782; Spearman = .840; significance: 99.9%) of the Index with the CPI, suggesting that levels of corruption in a country is a good predictor of the capacity of this country to achieve the Europe 2020 objectives and is indeed a relevant threaten to the strategy.

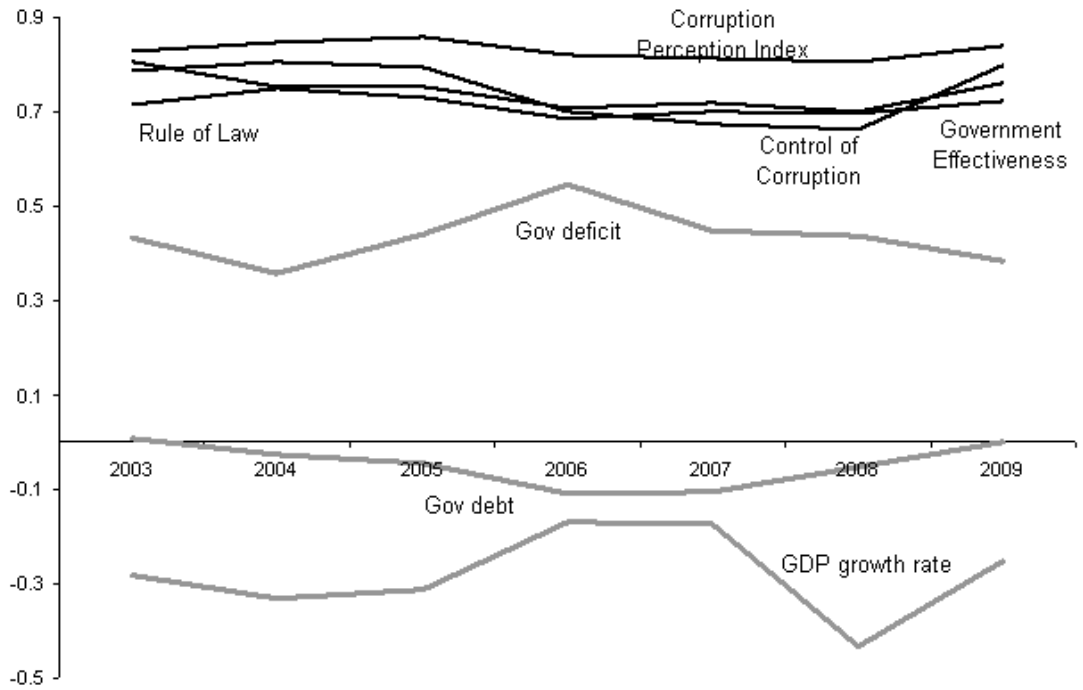
Figure 7: Europe 2020 and Corruption Perception Index



It had already been demonstrated that levels of corruption are negatively correlated with levels of investments and expenditures on education (Mauro, 1995) and that corruption opportunities may be less abundant on education than on other components of government expenditure (Shleifer and Vishny, 1993), but this strong correlation between the Europe 2020 Index and the CPI is particularly important, since it substantiates the idea that good governance may determine the overall success of such a broad development strategy.

These results suggest that EU countries must constantly keep under control the levels of corruption, not just for the seek of ethical and moral objectives, but also for the attainment of their development objectives. We can observe how institutional factors of good governance, like levels of corruption, rule of law and effectiveness of governments are more decisive than the traditional macroeconomic indicators of public finance to achieve the objectives of the Europe 2020 Strategy, as shown in Figure 8.

Figure 8: Europe 2020 Index correlation with Public Accounts & WB Governance Indicators (same years)



This result is quite relevant from a policy perspective, especially taking into account the current emphasis on public accounts as the main criteria to define structural reforms in the EU. If institutional factors are as relevant as fiscal consolidation for the pursuing of the objectives of the Europe 2020 Strategy, or even more as these results suggest, then the agenda for structural reforms might be enhanced, including a broader focus on institutions.

5. Institutions and the Europe 2020 strategy

The analysis presented in the previous section highlights the role of formal institutions, as measured by the indicators of good governance, for the achievement of the Europe 2020 objectives. Corruption, in particular, seems to be the single most important factor. This result has been corroborated by two different measures, namely the World Bank's *Control of Corruption* indicator, and the Transparency International's *Corruption Perception Index*.

The literature on corruption and on its relation with development (Rose-Ackerman, 1975) has emphasised several channels trough which it has adverse effects on economic growth (Bardhan, 1997), on investments (Mauro, 1995), on inequalities and poverty (Gupta et al, 2001), on education (Shleifer and Vishny, 1993), explaining the incentive structure that may favour the diffusion of corrupted actions in the society. Corruption has negative effects on the effectiveness and on the efficiency of the use of the resources deployed to foster economic development; it acts as a clamp on the whole economic system and may determine the success or failure of development strategies, such as the Europe 2020 one.

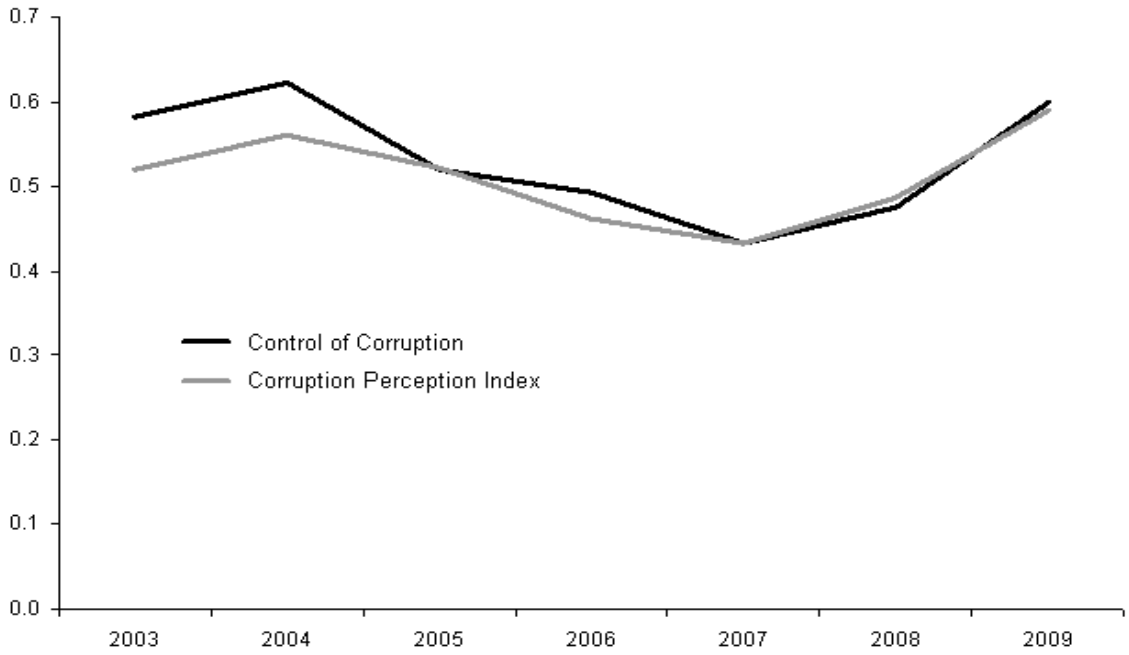
There is a certain current of thought among economists, called "free-market libertarians" by Rose-Ackerman (2010), which has tried to associate the levels of corruption with the size of governments (Becker and Stigler, 1974; Becker, 1995; Banerjee, 1997; Alesina and Angeletos,

2005). In Becker's (1995) words "if you want to cut corruption, cut governments", because bigger governments raise the opportunities for corruption. According to Alesina and Angeletos (2005) "the larger the resources controlled by the government, or the more extensive the regulation of the market, the larger the scope for corruption and rent seeking", and on this basis they claim that "government intervention fosters corruption and injustice". Also Banerjee (1997) explicitly models bureaucracy and corruption, reaching the conclusion that "a significant part of what we see as government failures may exist even when a government has the best of intentions and is subject to no special sociological constraints".

For the purposes of this analysis, it can be interesting to see whether the strict correlation between the Europe 2020 Index and the control of corruption also implies a negative correlation with the size of the government in the member states, as suggested by the "free-market libertarians" hypothesis. According to this hypothesis, control of corruption and the CPI, which are "positive" measures of corruption (the higher the value, the lower the corruption level) should have a negative correlation with the size of government, in the twenty-seven member states. Consequently, the Europe 2020 Index should also be negatively correlated with the same indicator of size of government.

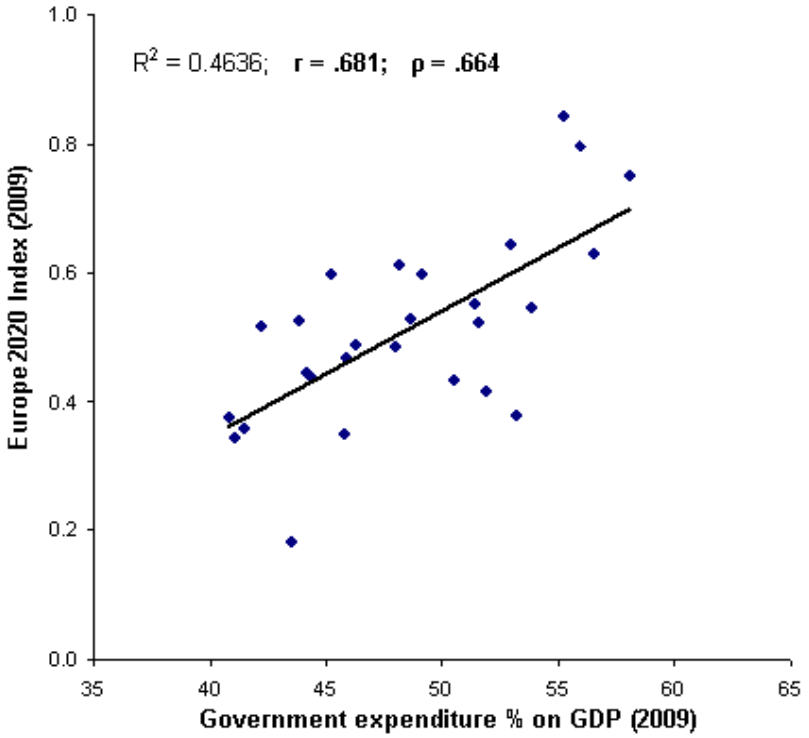
The OLS regression analyses seem to contradict this hypothesis, showing instead a positive correlation. This correlation is also moderately strong, both in the case of *Control of Corruption* ($r = .600$; $\rho = .585$), and for the *Corruption Perception Index* ($r = .589$; $\rho = .576$). This has also been valid over the previous years:

Figure 9: Correlations with Size of Government (same years)



These results suggest that in the European Union those countries where the size of the government is bigger, meaning that general government expenditures have a higher share on GDP, tend to be those with a better control over corruption. This should imply a positive correlation between the Europe 2020 Index and the size of government, which is in fact confirmed by the following Figure:

Figure 10: Europe 2020 and Size of Government



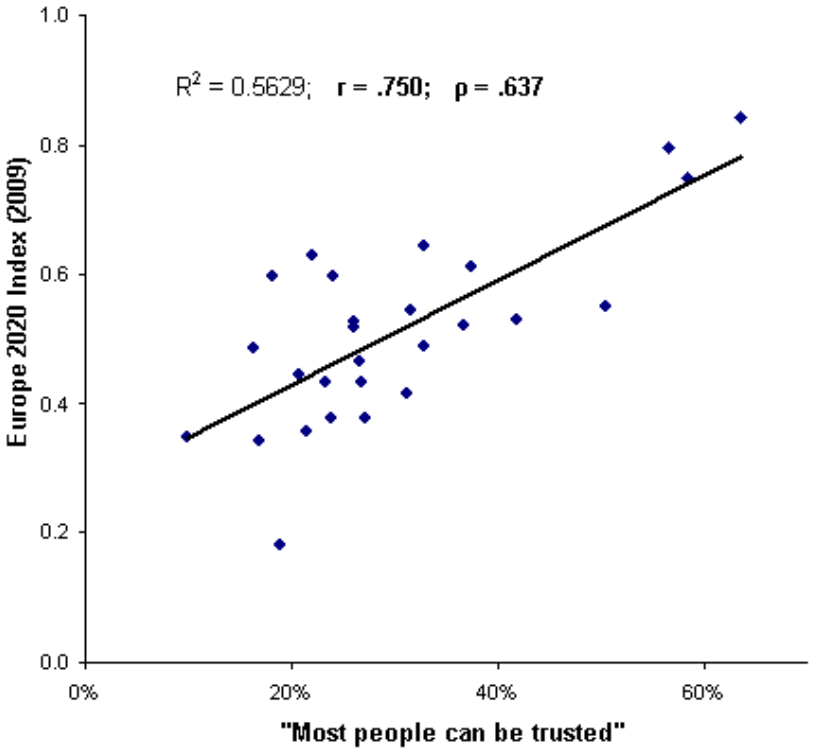
The Europe 2020 Index is not negatively correlated with the size of government; on the contrary the relation is quite positive. The hypothesis of size government being the main incentive for corruption seems not to hold true in the case of the EU, even though government expenditures are not exempt from mismanagement and misbehaviours. The point is that limiting the scope of the problem to a merely quantitative account of the opportunities for corruption, instead of focussing on the quality and capacity of the state intervention and on the necessary accountability mechanisms, might be superficial. The analysis of the impact of corruption on the economy and of its underlying causes should probably be more accurate.

Informal institutional factors can further contribute to shed some light on the performances of EU countries in the Europe 2020 Strategy, as measured by the Europe 2020 Index. The role of social capital has been considered for this analysis. In the most recent economic literature on economic development the notion of social capital is increasingly emphasised as a factor determining economic performances. Just like other forms of capital (physical, financial, human) it is considered a facilitator for the economic activities, contributing at both microeconomic level (with its ability to improve market functioning) and macroeconomic level (affecting the global organisation of production). To some extent, it has become a concept for defining 'the missing ingredient' in successful practice that economics cannot explain (Landabaso et al, 2007).

Most of the definitions of social capital highlight components like norms, values, voice, feelings of trust, solidarity and reciprocity, which enable better social interactions, coordination, networking and organisational capacity that in turn act as facilitators of the economic activity. It is a sociological and psychological concept having certain relevance for economic development. One of the most common proxies for social capital is a measure of generalised trust, provided by the World Value Survey indicator "most people can be trusted" (Inglehart et al, 2011). This indicator is available for the twenty-seven member states of the EU, across different periods.

The OLS regression shows one of the strongest linear correlation with the Europe 2020 Index (Pearson = .750; Spearman = .637; significance: 99.9%), as in Figure 11. The linear regression coefficient (Pearson) is one of the highest found in the analysis, highlighting the role of social capital as determinant for the Europe 2020 Strategy.

Figure 11: Europe 2020 and Social Capital



This substantiates the relevance of social capital for development, in particular for the objectives pursued by the Europe 2020 strategy in the EU. Even though this correlation does not automatically imply a causal relation between the two measures, the fact that the measure of social capital is a weighted aggregate covering several periods (from the 1980s to 2005), and that the Europe 2020 Index values are those of 2009, may justify a prudent inference of causal relations.

6. Conclusions

This paper has developed a study of the Europe 2020 Strategy by improving the Europe 2020 Index and applying it to the analysis of the critical factors of success for the strategy. The external analysis of the index confirms that competitiveness is an important element of the strategy, as the extremely strong correlation with the Global Competitiveness Index indicates. Levels of globalisation, instead, are decreasingly relevant in explaining the differences among the member states of the EU, suggesting that a certain convergence is taking place in the degree of openness.

The analysis shows that institutional factors are more decisive to achieve the objectives of the Europe 2020 Strategy than macroeconomic indicators of public accounts, such as GDP growth, levels of government debt and deficit. This is true for formal institutional factors of good governance, such as levels of corruption, rule of law and effectiveness of governments, as well as for informal institutions, such as social capital.

This result is relevant from a policy perspective, due to the present emphasis on public accounts as the main criteria to define structural reforms in the EU. If institutional factors are as relevant as fiscal consolidation for the pursuing of the objectives of the Europe 2020 Strategy, or even more relevant, as these results suggest, then the agenda for structural reforms could be enhanced, including a broader focus on institutions.

The costs of corruption are often underestimated in developed countries, but these results show that they must constantly be kept under control since they are determinant for the implementation of development policies in the member states of the EU. The analysis of the impact of corruption on the economy and of its underlying causes should probably be more accurate. Corruption has negative impacts on the effectiveness and on the efficiency of the use of the resources deployed to foster economic development; it acts as a clamp on the whole economic system and may determine the success or failure of development strategies, such as the Europe 2020 one.

The analysis of informal institutions suggests that social capital has indeed a relevant role for this strategy, substantiating what has often been argued in the recent economic literature, that it is a critical factor of success for development.

The paper also aims to create basis for further research. In particular, further analysis could be conducted, if we were able to gather data at regional level for the eight indicators composing the index. This could provide us with more meaningful and robust insights on the key success factors of the Europe 2020 Strategy.

References

Alesina, A. and G.M. Angeletos (2005). Corruption, Inequality and Fairness. *Journal of Monetary Economics* Vol. 52, Issue 7. 1227–1244.

Banerjee, A.V. (1997). A Theory of Misgovernance. *The Quarterly Journal of Economics*. 112 (4): 1289-1332.

Bardhan, P. (1997). Corruption and Development: A Review of Issues. *Journal of Economic Literature*, 35: 1320-46.

Becker, G.S. and G.J. Stigler (1974). Crime and punishment: An economic approach. *The Journal of Political Economy*, 76(2): 169-217.

Becker, G.S. (1995) If You Want to Cut Corruption, Cut Government. *Business Week*.

Dreher, A. (2006) 'Does Globalization Affect Growth? Evidence from a new Index of Globalization'. *Applied Economics*, Vol. 38, No. 10, pp. 1091-1110.

Dreher, Axel, Noel Gaston and Pim Martens (2008). *Measuring Globalisation – Gauging its Consequences* (New York: Springer).

Ebert, U., Welsch, H., (2004) Meaningful environmental indices: a social choice approach. *Journal of Environmental Economics and Management* 47, 270-283.

European Commission (2010). *Europe 2020: a strategy for smart, sustainable and inclusive growth*. COM(2010) 2020. Brussels: European Commission.

Gupta, Davoodi and Alonso-Terme (2001). Does corruption affect income inequality and poverty? *Economics of Governance*. Vol.3, Nº1, 23-45.

Huggins (2010) Regional Competitive Intelligence: Benchmarking and Policy-making. *Regional Studies*, 44:5, 639-658.

Inglehart, Ronald et al (2011) *World Value Survey*. Available at: www.worldvaluessurvey.org

Kaufmann, D, Kraay, D. and Mastruzzi, M. (2010). The Worldwide Governance Indicators: Methodology and Analytical Issues. *World Bank Policy Research Working Paper* No. 5430.

Landabaso, M, Kuklinski, A. and Román, C. (2007) *EUROPE - Reflections on Social Capital, Innovation and Regional Development: The Ostuni Consensus*, (Warsaw: REUPUS).

Mauro, P. (1995) Corruption and Growth. *Quarterly Journal of Economics*. 110: 681-712.

North, D.C. (1991). Institutions. *Journal of Economic Perspectives*. Vol.5(1), pages 97-112.

OECD (2008). *Handbook on constructing composite indicators: methodology and user guide*. OECD Publishing.

Pasimeni, P. (2011). The Europe 2020 Index. *Social Indicators Research*, doi: 10.1007/s11205-011-9948-9

Rose-Ackerman, S. (1975) The Economics of Corruption. *Journal of Public Economics*. 4:1-17.

Rose-Ackerman, S. (2010) Corruption: Greed, Culture and the State. *120 Yale Law Journal*, 125.

Saltelli, A., D'Hombres, B., Jesinghaus, J., Manca, A., Mascherini, M., Nardo, M., and Saisana, M. (2011) Indicators for EU Policies. Business as Usual? *Social Indicators Research*, doi:10.1007/s11205-010-9678-4.

Schwab, Klaus, Xavier Sala-i-Martin, Jennifer Blanke, Margareta Drzeniek Hanouz, Irene Mia, Thierry Geiger (2010). The Global Competitiveness Report 2009–2010. World Economic Forum.

Shleifer, R and R. W. Vishny (1993) Corruption. *Quarterly Journal of Economics*. 108 (3): 599--617.

Transparency International (2010). *Corruption Perception Index*. Available at: http://transparency.org/policy_research/surveys_indices/cpi/2010 .