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Differences in Institutional Quality across Euro Area Countries: Which Factors Contribute Most to Inequality?

Summary: In recent years the differences in the institutional structure across the Euro area countries have become a cause of concern, both for some individual Member States and for the functioning of the Economic and Monetary Union (EMU). In this paper we analyse the inequality in institutional quality across Euro area countries and estimate which factors of public and private institutions contribute most to overall inequality in institutional quality. To this end, we consider the institutional indicators of the Global Competitiveness Index (GCI) from the World Economic Forum (WEF) during the period 2007-2017, with the most disaggregated data possible. Our findings support the call for structural reforms, particularly in the areas of ethics and corruption (in the public sphere but also in the business environment), undue influence on the judiciary and government decisions, and protection of property rights, as the major sources of inequality in institutional quality.

Key words: Institutional quality, Inequality, Euro area.

JEL: O43, O47, O52.

A vast literature shows how institutions matter for economic performance, focusing on aspects such as the relationship between institutions and economic development (see e.g. Dani Rodrik, Arvind Subramanian, and Francesco Trebbi 2004; Daron Acemoglu and James A. Robinson 2012; Augustin K. Fosu 2016) or the effects of institutions on income inequality and welfare (see e.g. Alberto Chong and Mark Gradstein 2007; Philip Arestis and Ana R. Gonzalez-Martinez 2016; Kosta Josifidis, Novica Supić, and Emilija Beker Pucar 2017). In general terms, there is a consensus in the argument that good institutions lead to good economic outcomes, and *vice versa*. This way, it is frequently pointed out that the institutional inequalities among countries would be a relevant element behind the differences in the economic performances among countries, even though institutional convergence has not necessarily come with a process of economic convergence (see e.g. Jesus Ferreiro et al. 2017).

In the context of the Economic and Monetary Union (EMU), nowadays the substantial differences in institutional quality across Euro area countries, apart from being a cause of concern for individual Member States, are increasingly regarded as a risk for the smooth functioning of the Eurozone. Thus, institutional convergence tends to

be considered as a prerequisite to achieve an effective EMU, drawing the attention of academics and policy makers in recent years (see, for example, European Central Bank 2015, 2016; Klaus Masuch, Edmund Moshammer, and Beatrice Pierluigi 2016; Juan Luis Diaz del Hoyo et al. 2017; Salvador Pérez-Moreno, Elena Bárcena-Martín, and Jo Ritzen 2017; Ritzen 2017). Although from diverse perspective, these studies underline the importance of sound institutions for the resilience and the long-term prosperity of the Euro area, highlighting the desirability of reducing institutional disparities across euro area countries, as said disparities endanger the sustainability of the EMU. For instance, Diaz del Hoyo et al. (2017) calculate the relative positions of the 28 EU Member States for diverse institutional indicators between 2008-09 and 2016 and highlights that, even though some countries attempted to enact reforms after the crisis, a number of stressed economies' overall institutional quality positions in the EU remained unchanged (Spain), worsened marginally (Greece, Italy), or even deteriorated significantly (Cyprus). This way, Pérez-Moreno, Bárcena-Martín, and Ritzen (2017) find that the institutional characteristics of the 19 Euro countries diverged and the institutional gap between "central" and "periphery" countries widened over the last decade. This increasing cross-country differences would imply that the euro area is moving further away from an optimal currency area, making the euro area as a whole more susceptible to adverse shocks. Moreover, from a political perspective, expanding disparities matter because many European policies are based on the idea of increasingly deeper integration, which itself frequently requires a degree of convergence of countries' institutional structures.

Although the concept of institutions is widely discussed among scholars and policymakers, there is no strong consensus around a single definition of this term. In line with the definition provided by Douglass C. North (1990, 1994), we may construe institutions as "the rules of the game of a society", or more formally, "the humanly devised constraints that structure human interaction" (North 1990, p. 3), so that they define the incentive structure of a society and, in consequence, the underlying determinants of economic performance. From this perspective, institutions consist of formal rules and informal constraints. While formal rules refer to legally binding constraints – such as laws or constitutions – along with their associated enforcement mechanisms, informal constraints include aspects such as norms of behaviour, conventions or self-imposed codes of conduct.

Under this conception, in this paper we examine the institutional indicators included in the first pillar of the Global Competitiveness Index (GCI) provided by the World Economic Forum (WEF), which comprise indicators of both public and private institutions (WEF 2017)[1]. In particular, we calculate the inequality in institutional quality across the EMU countries during the period 2007-2017, as measured by the Gini coefficient, and estimate the contribution of each factor (institutional components and subcomponents) to overall inequality in order to identify the main sources of inequality and suggest possible routes to reduce institutional differences across Euro area countries.

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[1] **World Economic Forum.** 2017. Global Competitiveness Index Dataset 2007-2017. http://reports.wefo-rum.org/global-competitiveness-index-2017-2018/downloads/ (accessed September 30, 2017).

The remainder of the paper proceeds as follows: Section 1 describes data and methodology; Section 2 discusses the results; and finally, some concluding remarks and policy recommendations are drawn.

1. Data and Methodology

1.1 Data

The GCI is based on a weighted average of 12 pillars, which represent different dimensions of competitiveness. The first one is dedicated to institutions (P1), distinguishing between public institutions (A) and private institutions (B) (first level of disaggregation). Each indicator is rated on a scale of 1 to 7, where 1 represents the worst possible situation and 7 the best, according essentially to the views of business leaders[2] (Klaus Schwab 2017).

The WEF assess five components of public institutions (second level of disaggregation), each one including various subcomponents (third level of disaggregation) (see Table A1 of the Appendix summarising components, subcomponents and weights):

1) *Property rights* (A1), which rates the level of protection of property rights, including financial assets (A1.1), and intellectual property protection (A1.2);

2) *Ethics and corruption* (A2), which deals with three questions: (a) diversion of public funds to companies, individuals, or groups due to corruption (A2.1); (b) the ethical standards of politicians (A2.2); and (c) undocumented extra payments or bribes connected with imports and exports, public utilities, annual tax payments, awarding public contracts and licenses, and obtaining favourable judicial decisions (A2.3);

3) *Undue influence* (A3), which captures the extent to which the judiciary is independent from influences of members of government, citizens, or firms (A3.1.), and the extent to which government officials show favouritism to well-connected firms and individuals when deciding upon policies and contracts (A3.2);

4) *Government efficiency* (A4), which assesses five points: (i) the extent to which the composition of public spending is extremely wasteful or highly efficient in providing necessary goods and services (A4.1); (ii) how burdensome it is for businesses to comply with governmental administrative requirements (A4.2); (iii) how efficient the legal framework is for private businesses in settling disputes (A4.3); (iv) how easy it is for private businesses to challenge government actions and/or regulations through the legal system (A4.4); and (v) how easy it is for businesses to obtain information about changes in government policies and regulations affecting their activities (A4.5);

5) *Security* (A5), which addresses the extent to which the threat of terrorism (A5.1), the incidence of crime and violence (A5.2), and organized crime (mafia-oriented racketeering, extortion) (A5.3) impose costs on businesses, as well as the extent to which police services can be relied upon to enforce law and order (A5.4).

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[2] Institutions are multifaceted and often not easily quantifiable. It is common practice to measure institutional quality based on perceptions. Despite their relative subjectivity, how stakeholders perceive institutions matters as it determines their structure of incentives and their decision-making.

As regards private institutions, two components (second level of disaggregation) and several subcomponents (third level of disaggregation) are provided, as follows:

1) *Corporate ethics* (B1), which refers to ethical behaviour of companies in interactions with public officials, politicians, and other firms (B1.1);

2) *Accountability* (B2), which jointly rates four aspects: (a) auditing and reporting standards (B2.1.); (b) efficacy of corporate boards (whether management is accountable to investors and boards or not) (B2.2); (c) protection of minority shareholders' interests by the legal system (B2.3); and (d) strength of investor protection (it rates transparency of transactions, liability for self-dealing, and shareholders' ability to sue officers and directors for misconduct) (B2.4).

Whereas other studies such as European Central Bank (2015) focused on disparities in indicators of governance in the Euro area, our analysis adopts a broader perspective, considering a wide range of indicator or public and private institutions. Thus, Figure 1 shows the evolution of the mean overall institutional quality in the Eurozone, discriminating between public and private institutions, while Figure 2 displays the evolution for the respective institutional components examined. In addition, Tables A2 and A3 of the Appendix show the percentage change in institutional quality between 2007 and 2017 for each of the indicators, including institutional components and subcomponents.
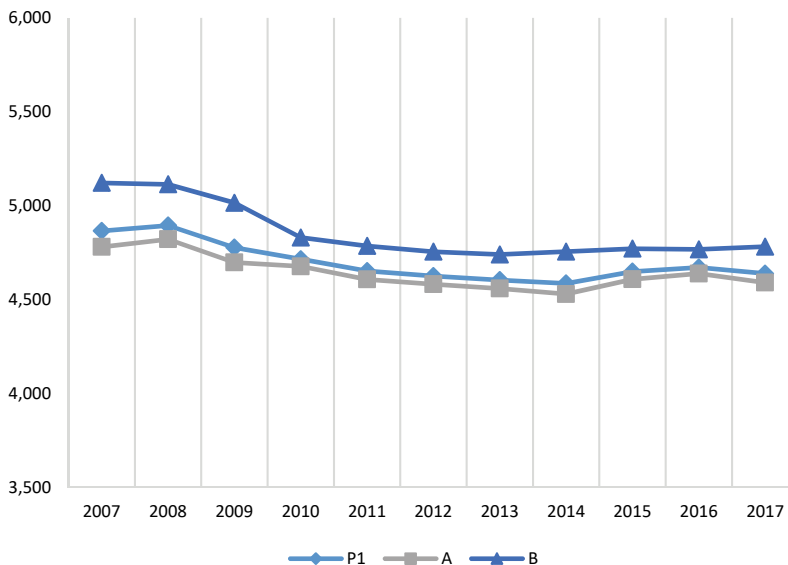
Source: Own construction based on WEF (2017).

Figure 1 Mean Values of Institutional Quality (Public and Private Institutions)

In general terms, there is a decreasing pattern in the assessment of institutional quality, particularly between 2008 and 2014, coinciding with the period of economic downturn. In fact, it is widely known that the state of institutions can be (negatively) affected by economic downturns, as was the case during the Great Recession (Klaus Armingeon and Kai Guthmann 2014; Marcos Álvarez-Díaz et al. 2015; Ritzen 2017).
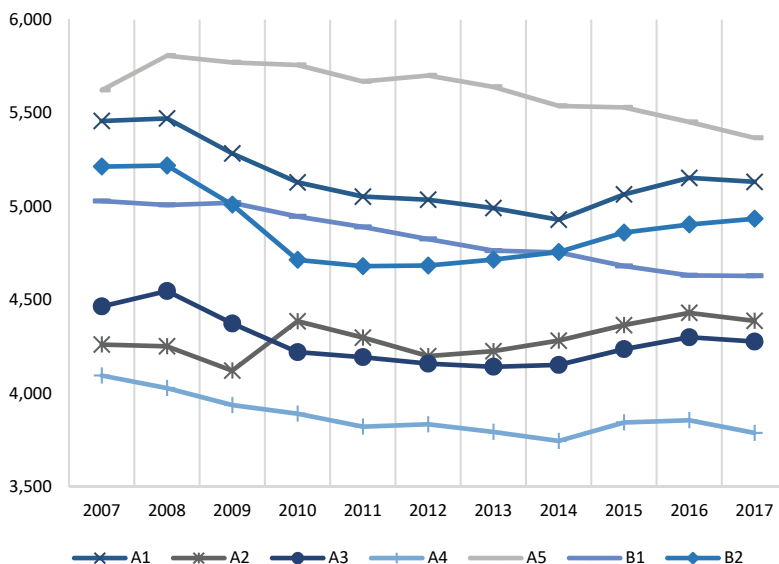
Source: Own construction based on WEF (2017).

Figure 2 Mean Values of Institutional Quality of Each Component

Figure 2 shows a more marked decreasing pattern in the *Corporate ethics* (B1) component, while it is less pronounced for *Ethics and corruption* (A2). *Security* (A5) is the best rated component during the period analysed, while *Government efficiency* (A4) is the worst rated.

This study goes further and focuses on institutional differences across Euro area countries. The objective is to examine the extent to which national institutional changes in recent years have increased or decreased cross-country inequality in institutional quality in the Eurozone, and which institutional components and subcomponents contribute most to overall inequality, in order to provide specific policy recommendations to reduce large institutional differences in the EMU.

1.2 Methodology

The mean value of the institutional quality can be used to summarize its distribution across Euro area countries, but it is not a complete description, since institutional quality differs from one country to another. In this paper we measure the inequality in institutional quality through the well-known Gini coefficient. We consider a fixed

homogeneous population N {$l, 2, \ldots, n$} of n ($n \geq 2$) countries. They are identical, but generally differ in their institutional quality. A feasible distribution Y_t is given by a vector $(y_{1t}, y_{2t}, \ldots, y_{nt}) \in \mathbf{R}^n$ where y_{it} is country i's institutional quality index at period t, $i = 1, 2, \ldots, n$, $y_{1t} \leq y_{2t} \leq \ldots \leq y_{nt}$ and μ_t the mean value of the institutional quality at time t. The Gini coefficient (Corrado Gini 1912) at time t is:

$$G_t = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |y_{it} - y_{jt}|}{2n^2 \mu_t}. \tag{1}$$

G_t is always between 0 (no inequality) and 1 (maximum inequality). Alternatively, the Gini coefficient can be written as:

$$G_t = \frac{2}{n^2 \mu_t} \sum_{i=1}^{n} \left(i - \frac{n+1}{2}\right) y_{it}. \tag{2}$$

This expression shows that the Gini coefficient is a linear function, in line with Farhad Mehran (1976). The Gini coefficient can be decomposed to assess the contribution of each component or subcomponent to inequality. Let y_{it}^k denote the value of country i for component or subcomponent k of the institutional quality and let $y_{it} = \sum_{k=1}^{n} w_k y_{it}^k$ represent the overall institutional quality with $\sum_{k=1}^{n} w_k = 1$. Table 1 shows how the so-called first pillar of the GCI "institutions" is simply the sum total of weighted components or subcomponents; therefore, Expression (2) may be alternatively written following Anthony F. Shorrocks (1982) as:

$$G = \frac{2}{n^2 \mu_t} \sum_{i=1}^{n} \left(i - \frac{n+1}{2}\right) \sum_{k=1}^{n} w_k y_{it}^k = \sum_{k=1}^{n} \frac{w_k \mu_{kt}}{\mu_t} PG_t^k, \tag{3}$$

where μ_{kt} is the mean of y_{it}^k and

$$PG_t^k = \frac{2}{n^2 \mu_{kt}} \sum_{i=1}^{n} \left(i - \frac{n+1}{2}\right) y_{it}^k, \tag{4}$$

is known as the pseudo-Gini for factor k. This expression seems to have been introduced by John C. H. Fei, Gustav Ranis, and Shirley W. Y. Kuo (1978) and was subsequently used by Jacques Silber (1989), among others. Note that the pseudo-Gini is not the Gini of the component or subcomponent k, as y_{it}^k is arranged in ascending order of y_{it}, which does not necessarily agree with the ascending order of y_{it}^k.

We can evaluate the contribution of component or subcomponent k to overall institutional inequality as:

$$C_t^k = \frac{w_k \mu_{kt}}{\mu_t} PG_t^k, \tag{5}$$

a combination of the weight attached to each component or subcomponent, the mean quality of such component or subcomponent, the mean overall institutional quality and the pseudo-Gini.

2. Results

The mean value of each institutional indicator gives partial information on the evolution of institutional quality across Euro area countries that can be complemented with a measure of cross-national disparity. We report the Gini coefficient in Table 1, highlighting that the heterogeneity in the assessment of institutional quality across countries increased from 2007 to 2017 in all the components of public and private institutions. This increasing pattern of heterogeneity shows a steeper slope for *Government efficiency* (A4), precisely the subcomponent worst mean rated (Figure 2), and the least pronounced slope for *Accountability* (B2). This component, together with *Security* (A5), is the most homogeneously assessed component during the period, while the most heterogeneous are *Ethics and corruption* (A2) and *Undue influence* (A3). By comparing Figure 2 and Table 1, we can verify that there is a negative correlation (-0.79) between the mean value of the institutional components and their inequality, so that those with better assessments are also the components with less heterogeneity.

Table 1   Inequality in Institutional Quality: Gini Coefficient

	P1	A	B	A1	A2	A3	A4	A5	B1	B2
2007	0.080	0.082	0.073	0.070	0.126	0.119	0.086	0.048	0.092	0.059
2008	0.082	0.086	0.073	0.069	0.140	0.126	0.093	0.044	0.097	0.053
2009	0.089	0.094	0.078	0.077	0.148	0.129	0.105	0.050	0.107	0.053
2010	0.089	0.093	0.079	0.085	0.132	0.130	0.112	0.047	0.116	0.048
2011	0.092	0.096	0.083	0.089	0.135	0.133	0.116	0.047	0.122	0.048
2012	0.094	0.098	0.083	0.088	0.141	0.136	0.119	0.048	0.116	0.054
2013	0.095	0.101	0.079	0.090	0.143	0.140	0.129	0.050	0.107	0.054
2014	0.099	0.106	0.080	0.094	0.145	0.147	0.132	0.056	0.108	0.054
2015	0.097	0.103	0.080	0.090	0.140	0.143	0.129	0.055	0.109	0.054
2016	0.096	0.102	0.080	0.091	0.139	0.141	0.133	0.054	0.108	0.058
2017	0.097	0.104	0.081	0.091	0.137	0.144	0.141	0.053	0.110	0.059

Note: P1: Overall state of institutions; A: Public institutions; B: Private institutions; A1: Property rights; A2: Ethics and corruption; A3: Undue influence; A4: Government efficiency; A5: Security; B1: Corporate ethics; B2: Accountability.

Source: Own construction based on WEF (2017).

In order to know the contribution of each institutional component and subcomponent to overall inequality in the quality of institutions, we apply the methodological approach described above. This computation may provide relevant policy findings, as it allows identifying the main sources of inequality in institutional quality across Euro area countries, and can therefore shed some light on which factors require more attention for reducing cross-country disparities in institutional quality.

Table 2 displays the contribution of public and private institutions and each of their components to the overall inequality in institutional quality. The theoretical

weights of each indicator are shown in the first line of Table 2, and its contribution for each year is shown below[3].

Table 2 Contribution of Each Component of Public and Private Institutions (First and Second Levels of Disaggregation) to Overall Inequality in Institutional Quality (%)

	A	B	A1	A2	A3	A4	A5	B1	B2
Weight (%)	75.000	25.000	15.000	15.000	15.000	15.000	15.000	12.500	12.500
2007	76.037	23.960	14.304	20.277	20.172	12.718	8.579	14.524	9.441
2008	77.063	22.939	13.542	21.748	20.969	13.075	7.737	14.638	8.302
2009	77.466	22.512	13.859	21.274	19.688	13.871	8.787	15.304	7.213
2010	77.761	22.229	15.174	20.542	19.146	14.633	8.267	16.689	5.541
2011	77.287	22.710	15.311	20.274	19.126	14.498	8.071	17.136	5.580
2012	77.385	22.607	15.102	20.202	19.088	14.748	8.762	15.995	6.608
2013	78.912	21.106	14.973	20.342	19.532	15.954	8.103	14.315	6.789
2014	79.136	20.858	15.149	20.287	20.059	15.611	8.036	14.055	6.800
2015	79.148	20.853	15.102	20.157	19.775	16.291	7.823	13.951	6.905
2016	79.062	20.944	15.480	20.279	19.726	16.357	7.222	13.778	7.167
2017	78.935	21.044	15.191	19.857	20.021	17.287	6.604	13.884	7.159

Note: P1: Institutions; A: Public institutions; B: Private institutions; A1: Property rights; A2: Ethics and corruption; A3: Undue influence; A4: Government efficiency; A5: Security; B1: Corporate ethics; B2: Accountability.
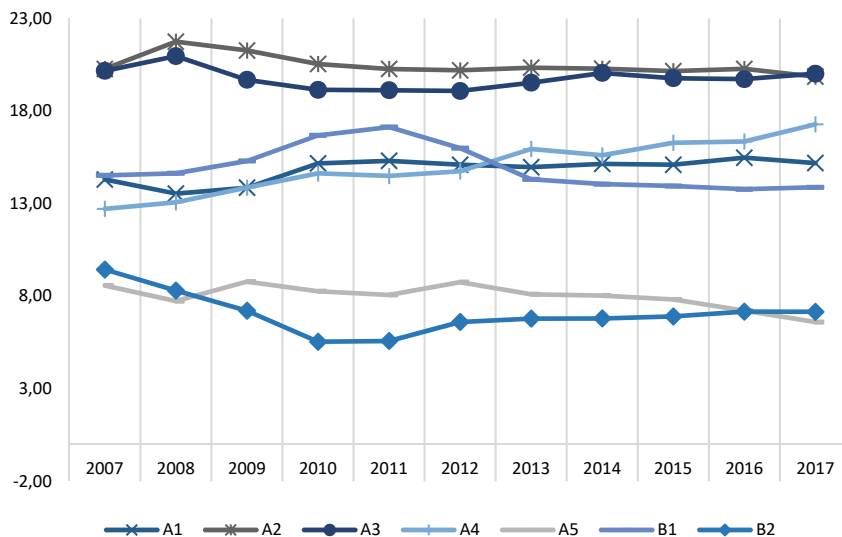
Source: Own construction based on WEF (2017).

The contribution of public institutions to overall inequality is greater than the expected contribution imposed by its definition (75%) in all years, reaching its highest value in 2015. By contrast, the contribution of private institutions to the overall inequality is obviously always lower than the expected contribution (25%)

As shown in Figure 3, the components *Ethics and corruption* (A2) and *Undue influence* (A3) are the main sources of inequality. Their contribution slightly decreases during the period examined, although they continue to be the main sources of inequality in overall institutional quality. While the countries with the greatest decreases in institutional quality are Spain, Malta and Greece for A2 and Slovakia, Malta and Slovenia for A3, for both indicators the countries that improve the most are Estonia, Ireland and Lithuania (see Table A2 of the Appendix). On the other hand, *Security* (A5) and *Accountability* (B2) are the components that contribute least to inequality, showing a lower contribution at the end of the period. Finally, A4 (*Government efficiency*) and A1 (*Property rights*) increase their contribution to inequality during the period, even though they remain in intermediate positions. In this sense, Greece, Slovakia and Latvia for A4, and Greece and Germany for A1, are the countries that to a greater extent get worse over the period examined (see Table A2 of the Appendix).

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[3] The calculations of pseudo-Gini coefficients are available from the authors upon request.

Figure 3 Evolution of the Contribution of Each Component to Overall Inequality
in Institutional Quality (%)

Given that each component comprises a variety of institutional aspects, we go a step further and estimate the contribution of each subcomponent (third level of disaggregation) to overall inequality. As shown in Table 3, by subcomponents the main source of inequality in institutional quality is *Ethical behaviour of firms* (B1.1) (Spain and Slovakia are the countries with the greatest declines in this subcomponent according to Table A3 of the Appendix), followed by *Judicial independence* (A3.1) until 2015, when the second highest contribution to inequality becomes *Property rights* (A1.1) (in this case, Greece, Italy and Latvia are the countries showing the worst evolution). On the contrary, the smallest source of inequality in almost all years is *Strength of investor protection* (B2.4) (Slovenia and Italy are the countries with the highest increase), followed by *Business cost of terrorism* (A5.1) (Spain being the country with the greatest improvement), both reducing their contribution during the period analysed. We report the evolution of the contribution of these selected subcomponents in Figure 4.
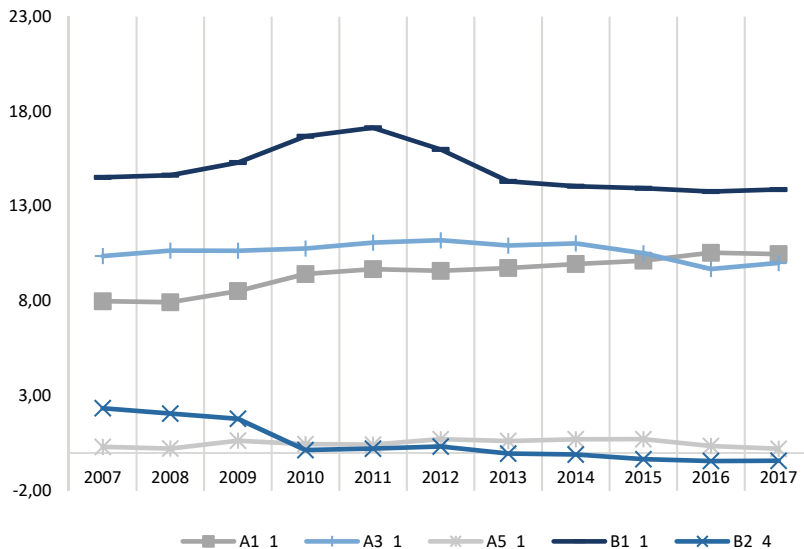
A useful way to summarize the ranking of sources of inequality during the years analysed, that is, the contributions of the components and subcomponents to overall inequality in institutional quality, is with a dominance diagram (Figure 5 for institutional components and Figure 6 for institutional subcomponents).

Table 3   Contribution of Each Institutional Subcomponent (Third Level of Disaggregation) to Overall Inequality in Institutional Quality (%)

|	A1.1	A1.2	A2.1	A2.2	A2.3	A3.1	A3.2	A4.1	A4.2	A4.3	A4.4	A4.5	A5.1	A5.2	A5.3	A5.4	B1.1	B2.1	B2.2	B2.3	B2.4
2007	7.999	6.305	6.418	7.099	6.759	10.380	9.792	2.270	1.197	3.500	3.215	2.535	0.322	1.614	2.724	3.920	14.524	2.401	1.758	2.922	2.360
2008	7.944	5.595	6.769	7.730	7.249	10.666	10.301	2.721	1.133	3.592	3.281	2.347	0.233	1.166	2.158	4.181	14.638	2.245	1.490	2.492	2.075
2009	8.534	5.324	6.963	7.221	7.091	10.659	9.029	2.988	1.442	3.590	3.744	2.105	0.646	1.733	2.504	3.901	15.304	2.061	1.317	2.031	1.803
2010	9.431	5.744	7.756	7.109	5.679	10.777	8.368	3.114	1.494	3.890	4.010	2.124	0.465	1.562	2.481	3.762	16.689	1.880	1.496	2.011	0.152
2011	9.688	5.625	7.774	6.799	5.704	11.088	8.038	2.878	1.573	4.049	3.839	2.157	0.439	1.416	2.577	3.637	17.136	1.732	1.725	1.891	0.231
2012	9.599	5.502	7.568	6.886	5.747	11.209	7.876	2.858	2.047	3.998	3.668	2.176	0.726	1.799	2.782	3.457	15.995	2.118	1.846	2.305	0.341
2013	9.745	5.229	7.512	7.375	5.457	10.933	8.601	3.244	2.388	4.220	3.858	2.242	0.629	1.646	2.470	3.355	14.315	2.227	1.990	2.607	-0.033
2014	9.957	5.194	7.543	7.394	5.352	11.045	9.013	3.027	2.218	4.186	3.752	2.427	0.722	1.671	2.487	3.158	14.055	2.004	2.297	2.583	-0.083
2015	10.133	4.967	7.426	7.522	5.208	10.528	9.249	3.065	2.330	4.218	3.831	2.847	0.729	1.531	2.441	3.122	13.951	2.153	2.447	2.630	-0.326
2016	10.551	4.931	7.069	7.904	5.305	9.695	10.030	2.850	2.458	4.183	3.782	3.085	0.371	1.200	2.139	3.512	13.778	2.475	2.394	2.725	-0.425
2017	10.481	4.710	6.853	7.881	5.122	10.013	10.007	3.186	2.815	4.199	3.875	3.210	0.221	1.130	2.057	3.199	13.884	2.526	2.189	2.857	-0.413

Note: A1.1: Property rights; A1.2: Intellectual property protection; A2.1: Diversion of public funds; A2.2: Public trust in politicians; A2.3: Irregular payments and bribes; A3.1: Judicial independence; A3.2: Favouritism in decisions of government officials; A4.1: Wastefulness of government spending; A4.2: Burden of government regulation; A4.3: Efficiency of legal framework in settling disputes; A4.4: Efficiency of legal framework in challenging regulations; A4.5: Transparency of government policymaking; A5.1: Business costs of terrorism; A5.2: Business costs of crime and violence; A5.3: Organized crime; A5.4: Reliability of police services; B1.1: Ethical behaviour of firms; B2.1: Strength of auditing and reporting standards; B2.2: Efficacy of corporate boards; B2.3: Protection of minority shareholders' interests; B2.4: Strength of investor protection.

Source: Own construction based on WEF (2017).

Source: Own construction based on WEF (2017).

Figure 4   Evolution of the Contribution of Some Institutional Subcomponent to the Overall Inequality in Institutional Quality (%)
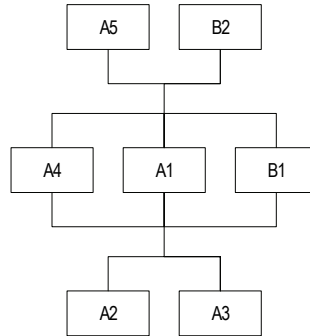
Source: Own construction based on WEF (2017).

Figure 5 Dominance Based on the Contribution of Institutional Components to Overall Inequality in Institutional Quality (from Lowest to Highest Contribution)
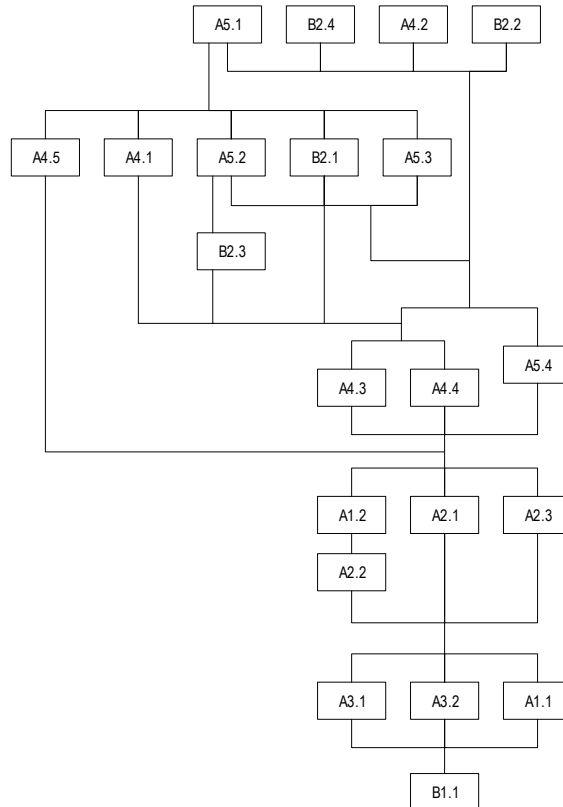

Source: Own construction based on WEF (2017).

Figure 6 Dominance Based on the Contribution of Institutional Subcomponents to Overall Inequality in Institutional Quality (from Lowest to Highest Contribution)

In Figure 5 we can identify three substantial groups of institutional components during the period 2007-2017 in accordance with their contribution to overall inequality in the quality of institutions. *Security* (A5) and *Accountability* (B2) are the institutional components that contribute least to overall inequality, while *Ethics and corruption* (A2) and *Undue influence* (A3) are the ones that contribute most to inequality. *Government efficiency* (A4), *Property rights* (A1) and *Corporate ethics* (B1) are in the middle ground, with intermediate contributions.

If we take into account a higher level of disaggregation (third level), Figure 6 shows that it is not easy to rank the contributions of the respective institutional subcomponents consistently during the period analysed, especially those in the upper part of the ranking (those with a lower contribution to inequality).

In any event, we can identify with some clarity four groups of subcomponents. First, *Ethical behaviour of firms* (B1.1) is at the bottom of the dominance diagram, showing that this subcomponent is the one that contributes most to overall inequality in institutional quality, irrespective of the year examined. Then, *Judicial independence* (A3.1), *Favouritism in decisions of government officials* (A3.2) and *Property rights* (A1.1) form the second group of great contributors to inequality, followed by a third group of subcomponents comprising *Intellectual property protection* (A1.2), *Diversion of public funds* (A2.1), *Public trust in politicians* (A2.2) and *Irregular payments and bribes* (A2.3).

The remaining subcomponents constitute the group of lowest contributors. We observe that there is not a clear dominance in this group, so that only *Business costs of terrorism* (A5.1) can be highlighted by its dominance over most of the other elements of this group.

3. Concluding Remarks

This study highlights that institutional quality not only decreased on average across the Euro area countries during the period 2007-2017, but that its inequality also increased considerably, as measured by the Gini coefficient, particularly in the case of public institutions.

In order to identify the institutional factors that contribute most to overall inequality in institutional quality, we disaggregate institutions into public and private institutions and their respective components and subcomponents (three levels of disaggregation). Our analysis reveals the significant contribution to overall inequality of the components of public institutions related to ethics and corruption and undue influence, both highly distorting and detrimental practices for economic performance. Specifically, seven countries worsen their institutional quality in both indicators simultaneously between 2007 and 2017, namely: Austria, Cyprus, Greece, Malta, Portugal, Slovakia and Slovenia; whereas other countries such as France, Germany, Italy, Latvia and Spain worsen in only one of these institutional components, although in some cases (Germany, Latvia or Spain) significantly.

Conversely, security and accountability are more homogeneous across Eurozone countries, showing lower contributions. Going a step further in the components of institutional quality, we disaggregate at a third level and conclude that both judicial independence and favouritism in government decisions (undue influence) and the

threesome public trust in politicians, diversion of public funds and irregular payments and bribes (ethics and corruption) act as major sources of inequality, jointly with other factors such as ethical behaviour of firms, property rights and intellectual property protection. In general, most countries have worsened their overall institutional quality, except six countries that have improved it, namely: Estonia, Finland, Ireland, Lithuania, Luxembourg and Netherlands.

These empirical findings tend to support the call for structural reforms to reduce the institutional gap among Euro area countries, as large differences in institutional quality endangers the sustainability of the EMU and puts its long-term prosperity at risk. In particular, the decline in institutional quality of the countries with the lowest levels such as Greece, Italy, Latvia or Slovakia should not be only a concern for these countries, but also for the Eurozone as a whole. Nevertheless, in line with Diaz del Hoyo et al. (2017), this does not imply the need of converging towards a single institutional model for all countries; rather, it points to a need to find solutions that are tailored to country-specific situations (e.g. differing political or cultural preferences of citizens, pre-existing institutional settings, etc.).

Although much of the focus in the reform debates usually is on the product and labour market, reforms enhancing institutional quality, particularly in the areas of ethics and corruption (not only in the public sphere avoiding diversion of public funds or irregular payments and bribes, but also in the business environment), undue influence on the judiciary and government decisions, and protection of physical and intellectual property rights, should be a priority for both EU-wide and domestic policies. The Eurozone countries need to strive for convergence towards high institutional quality particularly in these areas in order to achieve a less vulnerable and more resilient EMU.

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Appendix

Table A1 Components, Subcomponents and Weights (%) of Institutional Quality

A. Public institutions (75%)	B. Private institutions (25%)

A1. Property rights (20%)
  A1.1. Property rights
  A1.2 Intellectual property protection ½
	B1. Corporate ethics 50%
	  B1.1 Ethical behaviour of firms

A2. Ethics and corruption (20%)
  A2.1 Diversion of public funds
  A2.2 Public trust in politicians
  A2.3 Irregular payments and bribes
	B2. Accountability (50%)
	  B2.1 Strength of auditing and reporting standards
	  B2.2 Efficacy of corporate boards
	  B2.3 Protection of minority shareholders' interests
	  B2.4 Strength of investor protection

A3. Undue influence (20%)
  A3.1 Judicial independence
  A3.2 Favouritism in decisions of government officials	

A4. Government efficiency (20%)
  A4.1 Wastefulness of government spending
  A4.2 Burden of government regulation
  A4.3 Efficiency of legal framework in settling disputes
  A4.4 Efficiency of legal framework in challenging regulations
  A4.5 Transparency of government policymaking	

A5. Security (20%)
  A5.1 Business costs of terrorism
  A5.2 Business costs of crime and violence
  A5.3 Organized crime
  A5.4 Reliability of police services	

Note: All subcomponents of each component have the same weight.
½ this indicator enters the GCI in two different pillars (Institutions and Innovation) and, in order to avoid double counting, a half-weight is assigned in this pillar.

Source: WEF (2017).

Table A2 Percentage Change in Institutional Quality (%) (2007-2017)

	P1	A	B	A1	A2	A3	A4	A5	B1	B2
Austria	-9.9	-10.4	-8.5	-7.0	-7.0	-11.6	-17.3	-10.5	-10.7	-6.2
Belgium	-0.9	0.0	-3.5	-1.5	11.3	3.5	1.2	-11.0	-1.1	-5.8
Cyprus	-10.1	-10.4	-9.3	-11.2	-9.7	-9.9	-10.5	-10.4	-9.9	-8.8
Estonia	6.3	7.9	1.9	1.7	26.1	12.5	-6.4	9.0	6.0	-1.7
Finland	0.1	1.4	-3.6	2.6	3.5	2.3	-0.6	-0.9	-5.8	-1.2
France	-4.8	-4.4	-5.8	-8.1	9.4	-3.5	-7.8	-9.6	-8.8	-2.9
Germany	-9.0	-7.6	-13.0	-14.9	1.4	-9.3	9.2	-18.6	-13.2	-12.8
Greece	-15.3	-17.0	-10.4	-16.8	-10.6	-15.5	-31.5	-13.1	-8.8	-11.8
Ireland	1.9	4.2	-4.4	-2.0	23.6	8.4	-1.4	-3.7	1.1	-9.6
Italy	-7.0	-6.6	-8.0	-13.0	9.6	-5.3	-15.1	-6.0	-14.7	-1.6
Latvia	-6.3	-6.2	-6.5	-9.8	11.2	-9.1	-21.5	-0.7	-5.2	-7.5
Lithuania	1.3	2.2	-0.9	-7.1	20.4	10.5	-10.6	3.3	-4.5	2.5
Luxembourg	4.5	6.5	-1.5	7.6	7.2	7.4	10.8	0.5	-0.5	-2.5
Malta	-6.5	-7.1	-5.0	1.9	-11.3	-18.2	3.5	-10.0	-8.3	-2.1

Netherlands	0.5	1.9	-3.4	-1.2	3.6	0.5	5.5	2.0	-3.2	-3.6
Portugal	-9.7	-8.2	-13.9	-10.6	-1.3	-14.1	-16.0	-1.1	-10.9	-16.8
Slovakia	-12.0	-13.2	-9.1	-9.8	-4.7	-23.3	-22.8	-8.5	-17.4	-1.9
Slovenia	-9.0	-9.6	-7.1	-5.8	-8.1	-17.8	-19.3	-1.5	-14.0	-0.1
Spain	-8.2	-5.3	-15.5	-13.5	-13.6	4.0	-12.2	8.1	-26.3	-5.0

Note: P1: Overall state of institutions; A: Public institutions; B: Private institutions; A1: Property rights; A2: Ethics and corruption; A3: Undue influence; A4: Government efficiency; A5: Security; B1: Corporate ethics; B2: Accountability.

Source: Own construction based on WEF (2017).

Table A3 Percentage Change in Institutional Quality by Subcomponents (%) (2007-2017)

	A1.1	A1.2	A2.1	A2.2	A2.3	A3.1	A3.2	A4.1	A4.2	A4.3	A4.4	A4.5	A5.1	A5.2	A5.3	A5.4	B1.1	B2.1	B2.2	B2.3	B2.4
Austria	-10.4	0.6	-20.1	-11.2	11.3	-7.8	-16.7	-37.6	-5.2	-16.5	-26.5	-0.6	-9.7	-17.2	-12.7	-1.9	-10.7	-3.0	8.7	-13.1	-17.1
Belgium	-5.0	5.9	-6.0	15.8	27.9	4.6	2.2	-12.0	9.8	-1.0	-1.7	12.0	-21.7	-12.9	-12.6	3.4	-1.1	-3.8	10.5	-8.2	-21.1
Cyprus	-17.0	3.3	-18.1	-21.0	9.6	-9.9	-9.9	-9.0	3.7	-25.4	-19.3	0.5	-6.4	-10.6	-17.8	-5.9	-9.9	-24.5	7.0	-17.5	5.2
Estonia	-4.3	16.3	4.0	18.3	58.4	8.4	18.8	-10.6	-5.3	-7.4	-9.4	-0.1	2.5	4.3	4.6	28.3	6.0	1.5	12.7	-10.8	-10.7
Finland	2.7	2.4	-2.1	1.7	11.0	6.1	-2.0	-5.5	2.1	2.6	-1.4	-1.1	-1.7	-4.6	0.8	1.7	-5.8	5.8	9.6	5.3	-25.4
France	-11.3	-1.5	-4.5	5.8	29.0	0.4	-8.3	-14.6	6.5	-3.3	-9.9	-12.1	-22.2	-2.8	-12.0	-1.4	-8.8	-6.1	11.2	-4.7	-11.3
Germany	-16.6	-11.4	-10.9	12.9	5.2	-15.5	-1.4	28.3	56.4	-5.5	-7.3	-0.5	-10.2	-22.4	-22.1	-18.8	-13.2	-10.8	-1.3	-14.4	-24.1
Greece	-25.0	3.5	-20.5	-26.0	13.9	-13.6	-18.1	-48.6	-11.3	-40.4	-34.6	-18.6	-9.3	-15.6	-18.7	-7.3	-8.8	-23.1	4.3	-24.8	0.0
Ireland	-5.5	6.2	0.8	42.7	38.4	4.7	13.9	1.9	13.6	-14.4	-11.4	7.5	-5.2	-5.0	-8.3	4.0	1.1	-17.8	7.4	-18.9	-7.6
Italy	-19.9	3.0	-8.9	-14.0	50.6	5.7	-20.3	-16.6	-5.3	-23.0	-23.1	-6.7	-4.3	-11.6	-0.7	-6.3	-14.7	-3.9	-2.1	-13.6	12.4
Latvia	-19.4	18.1	-16.5	12.2	46.2	-5.8	-13.4	-37.0	-9.0	-23.8	-29.8	-7.8	6.0	-3.2	-4.2	-2.1	-5.2	-14.7	3.6	-24.0	3.3
Lithuania	-15.4	16.3	1.6	2.3	57.6	17.0	2.4	-16.6	-12.1	-2.4	-21.2	-3.2	-6.3	1.3	3.7	19.4	-4.5	-3.4	17.5	-6.8	1.9
Luxembourg	5.3	12.7	1.6	5.1	15.1	11.4	2.7	13.6	13.3	7.4	5.2	15.4	-7.2	-0.1	2.4	7.2	-0.5	1.8	13.5	7.5	-32.1
Malta	-3.9	16.2	-20.0	-20.3	6.3	-17.4	-19.5	7.4	34.6	-15.9	-8.8	11.5	-7.9	-8.5	-11.1	-12.7	-8.3	-0.9	9.5	-8.0	-7.8
Netherlands	-3.0	2.8	-1.8	4.8	8.2	0.6	0.3	0.5	34.4	-0.7	-3.9	8.6	3.3	2.4	-1.1	3.6	-3.2	4.2	8.9	-4.7	-23.0
Portugal	-15.9	1.3	-18.8	-3.7	21.7	-13.4	-14.9	-7.2	-5.0	-26.3	-26.7	-12.2	-1.2	-0.4	-7.5	6.0	-10.9	-26.3	0.7	-25.5	-14.1
Slovakia	-18.1	12.1	-33.7	3.0	27.0	-22.7	-24.2	-9.0	-19.0	-35.7	-34.0	-16.3	-8.9	-11.5	-1.1	-12.8	-17.4	10.0	-2.6	-4.1	-12.0
Slovenia	-10.8	5.2	-25.1	-23.7	24.7	-17.2	-18.7	-19.8	-17.6	-20.9	-32.0	-7.7	-8.5	-2.4	-5.6	13.7	-14.0	-10.8	-2.2	-7.7	20.3
Spain	-16.1	-7.6	-34.7	-28.5	23.6	10.8	-4.4	-21.6	-11.5	-11.7	-20.5	4.2	13.8	5.9	2.8	10.3	-26.3	-9.4	2.8	-12.6	-1.0

Note: A1.1: Property rights; A1.2: Intellectual property protection; A2.1: Diversion of public funds; A2.2: Public trust in politicians; A2.3: Irregular payments and bribes; A3.1: Judicial independence; A3.2: Favouritism in decisions of government officials; A4.1: Wastefulness of government spending; A4.2: Burden of government regulation; A4.3: Efficiency of legal framework in settling disputes; A4.4: Efficiency of legal framework in challenging regulations; A4.5: Transparency of government policymaking; A5.1: Business costs of terrorism; A5.2: Business costs of crime and violence; A5.3: Organized crime; A5.4: Reliability of police services; B1.1: Ethical behaviour of firms; B2.1: Strength of auditing and reporting standards; B2.2: Efficacy of corporate boards; B2.3: Protection of minority shareholders' interests; B2.4: Strength of investor protection.

Source: Own construction based on WEF (2017).

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