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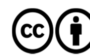

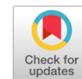

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National fiscal frameworks in the post-crisis European Union

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Abstract
Research background: The latest economic and financial crisis has seriously injured European Union Member States, affecting the condition of their public finances. In the face of the crisis, the EU made a special effort to increase the effectiveness of national fiscal frameworks, e.g. by improving the compliance with legislation. The post 2009 reforms were aimed at providing a solid economic foundation for the national fiscal frameworks, especially in the high-debt euro area countries.
Purpose of the article: The goal of this research is twofold. Firstly, it aims to provide an outline of the national fiscal governance in the EU. Secondly, the paper analyzes the changes in the core measures of fiscal governance in the EU between the crisis period and the year 2016 (due to the latest available data) and investigates the similarities in the progress made by the 28 EU countries in restoring balance in public finance.
Methods: To achieve the goal, the literature review and the analysis of core elements of national fiscal frameworks are provided. In the empirical section the grouping method for all 28 EU countries based on the Ward's agglomerative hierarchical clustering method is employed. The study uses data derived from the AMECO database (in the case of fiscal data) and the European Commission thematic data for quality indexes of particular elements of fiscal governance (numerical fiscal rules, medium-term budgetary frameworks and independent fiscal institutions).
Findings & Value added: This paper contributes to the literature by, on the one hand, attempting to analyze changes in main fiscal governance measures and, on the other hand, by assessing their link with public finance through employment of the agglomerative clustering method. Based on the results, the conclusion about the importance of the improve-

ment in fiscal frameworks is provided. The analysis shows that countries with better national fiscal framework achieved better results in public finances regardless the macroeconomic conditions.

Introduction

The consequences of the latest economic and financial crisis have negatively influenced the public finance in all European Union countries, especially in the Eurozone countries. In order to diminish the post-crisis imbalance and to improve the compliance with the legislation, the EU took actions aimed at improving the performance of national fiscal frameworks. As a result, a set of post-2009 reforms was provided to improve the situation in public finance and to counteract the potential weakening of the application of the EU procedures in the future. By these reforms, the EU has recently strengthened the importance of national fiscal governance on the national level, which quality is assessed by specially constructed indexes. However, in the light of weakness of established procedures and uncertainty of the positive effects of fiscal expansion introduced in turbulent times, there has been a great deal of discussion recently about creating a stronger form of cooperation, including e.g. fiscal union (see De Grauwe & Ji, 2016; EC, 2017a, among others).

The paper focuses on the core elements of national fiscal governance in the EU. The general aim of this study is to analyze the similarities among 28 EU countries from the point of view of the core elements of fiscal governance on the background on public finance between the year 2009 and the year 2016. Cluster analysis is employed in order to achieve this goal.

The paper is organized as follows. Firstly, the literature review is provided. Secondly, the characteristics of the research methodology is presented. Next, the similarities between EU28 countries in 2009 and 2016 are compared and the discussion section is included. The last section of the paper concludes.

Literature review

The general concept of national fiscal frameworks

According to the European Commission definition, national fiscal framework, also called a domestic (or national) fiscal governance, is a set of “specific rules, procedures, arrangements, and institutions for budgetary policy in place in each of the 28 EU Member States” (see EC, 2016, p. 1).

The aim of fiscal governance is to improve coordination of particular elements of fiscal policy. National fiscal governance undeniably supports fiscal responsibility, attains sound budgetary positions (in particular by containing the deficit bias), reduces the cyclicality of budget policy making, and improves the efficiency of public spending (see: EC, 2016).

The core element of fiscal governance in the EU Member States is the Stability and Growth Pact (1997). However, the important significance for fiscal governance in recent years has been provided by the Council Directive 2011/85/EU of 8 November 2011 on requirements for budgetary frameworks of the Member States. The coverage of the Directive includes a set of elements including: accounting and statistics, medium-term budgetary frameworks, country-specific numerical fiscal rules, transparency of general government finance, rules and procedures in budgetary planning process, and, in particular, independent monitoring and analysis.

The enforcement of the fiscal governance frameworks in the EU countries in the pre-crisis period was uneven (Eyraud & Wu, 2015, p. 5), especially due to the weakness of the SGP procedures. As a result, elements of fiscal governance in the EU were reformed several times (mainly in the area of secondary legislations), including the first reform of the SGP in 2005, the Six-Pack (2011) with the second reform of the SGP, Two-Pack (2013), or Fiscal Compact (2012). The primary objectives of fiscal governance reforms were aimed at providing stronger economic underpinnings to the framework, better arranging fiscal targets with debt objective, strengthening enforcement mechanism or implementing fiscal rules with more flexibility (see: Eyraud & Wu, 2015).

In recent times, a wider attention is paid to three elements of national fiscal governance: independent fiscal institutions, medium-term budgetary frameworks, and national numerical fiscal rules. The quality of these elements is measured by indexes constructed and calculated by the European Commission services. The European Commission publishes time series for three indexes: Fiscal Rule Index (FRI), Medium Term Budgetary Framework Index (MTBFI) and Scope Index of Fiscal Institutions (SIFI) (before 2015, time series were available only for FRI and MTBFI).

Numerical fiscal rules

Numerical fiscal rules, in terms of the well-known definition of Kopits and Symansky (1998), are permanent constraints on the fiscal policy, typically defined in terms of an indicator of overall fiscal performance. The rule is often expressed as a numerical target (ceiling) of selected fiscal aggregates in relation to GDP. According to Kennedy *et al.* (2001), fiscal rule

is a kind of statutory or constitutional restriction imposed on fiscal policy aggregate, which provides a specific limit on that aggregate (budget balance, debt, spending or revenues). However, the important element of the rule, regardless of its statutory instrument (international treaty, constitutional amendment, legal provision, or policy guideline), national or supranational level of implementation, or local terminology — is that it should be applied on a permanent basis by successive governments in a given country (Kopits & Symansky, 1998, p. 2). In order to be successful, a fiscal rule should be equipped with a set of core elements (see e.g.: Kopits & Symansky, 1998; Kilpatric, 2001; Buiter, 2003; Bohn & Inman, 1996; Ayuso-i-Casals *et al.*, 2009; Debrun *et al.*, 2008; Holm-Hadulla *et al.*, 2010; Kumar *et al.*, 2009).

The aim of the implementation of fiscal rules in the EU countries was to prevent domestic fiscal policies of each EU country from creating negative spillovers on other EU countries and to eliminate the negative impact of fiscal policy on monetary policy (EC, 2013a). The Council Directive 2011/85/EU in Article 5 emphasizes that "Each Member State shall have in place numerical fiscal rules which are specific to it […] and promote compliance with the reference values on deficit and debt set in accordance with the TFEU". The directive specifies main elements which should characterize national rules, in particular: the scope of the rule and the target definition, assurance of the effective and timely monitoring of rules' compliance based on independent analysis prepared by a special type of independent bodies, and in case of non-compliance — the consequences of breaking the rule.

All EU Member States are obliged to control the level of debt of GG to GDP ratio, the deficit of GG to GDP ratio and the expenditure benchmark. These three limitations are examples of debt rule, budget balance rule and expenditure rule, respectively, imposed on the supranational (EU) level on the basic of the primary and secondary legislations governing the Stability and Growth Pact. Besides the supranational level, the domestic (national or country-specific) numerical fiscal rules are implemented — Directive 2011/85/EU obliged each EU Member State to include country-specific numerical rules in their national fiscal frameworks.

The basic fiscal rules for all EU member states are as follows: gross public debt below 60% of GDP (if higher, the requirement to reduce it annually by 1/20 of the gap between actual debt to GDP level and the desired 60% reference value), budget deficit below 3% of GDP, structural budget balance higher than the country-specific medium term objective, the so-called expenditure benchmark, which restricts the real expenditure growth rate with respect to the growth rate of the medium-term potential GDP tak-

ing into account the MTO (see EC, 2017b for details). The deviations from the rules are possible and take into account the unusual events being outside the control of the state, the severe recession on other relevant factors, as presented in the corrective arm of the SGP.

In general, the EU, just as the IMF, recognizes between debt rule, budget balance rule, revenue rule and expenditure rule. In the case of the EU, the quality of these rules is measured by the FRI based on the calculation of Fiscal Rule Strength Index (FRSI) taking into account the methodology proposed by Deroose *et al*. (2005), next, based on the FRSI for each rule, a comprehensive time-varying FRI is calculated by summing up all FRSI weighted by coverage of the rule.

The European Commission's calculation of the index exhibits the growing trend of FRI in the EU. The index presents stronger rules in the case of EU15 countries than in the case of the "new" EU countries. Moreover, after 2011, the significant increase in the value of the index occurred, which mainly was a consequence of the 2011/85/EU Directive issued in 2011.

Independent fiscal institutions

The role of independent fiscal institution was increased by the Council Directive 2011/85/EU, by emphasizing their impact on compliance of fiscal rules. The independent fiscal institution is responsible for enhancing the transparency and accountability of fiscal policy, monitoring of fiscal policy development and preparing independent analysis. Both, fiscal rules and independent fiscal institutions, are aimed at reducing deficit bias and procyclicality of fiscal policy, thus promoting and increasing the sustainability of public finance.

In general, independent fiscal institutions are perceived as "independent public institutions with a mandate to critically assess, and in some cases provide non-partisan advice on, fiscal policy and performance" (von Trapp *et al.*, 2016, p. 11), and their role is "to promote sound fiscal policy and sustainable public finance" (von Trapp *et al.*, 2016, p. 11). These institutions are commonly named independent parliamentary budget offices or fiscal councils (von Trapp *et al.*, 2016, p. 11). They are "watchdogs" (Kopits, 2011) which increase the effectiveness in promoting transparency in public finance.

Debrun *et al.* (2009) emphasize two distinct models of independent public bodies (exactly, named by them "independent fiscal agencies"): Independent Fiscal Authority (IFA) and Fiscal Council (FC). The typology is based on the scope of mandate of independent fiscal agencies and their "modus operandi".

In the EU most independent fiscal institutions operate as Fiscal Councils. Fiscal Council is "a publicly funded entity staffed by non-elected professionals mandated to provide non-partisan oversight of fiscal performance and/or advice and guidance — from either a positive or normative perspective — on key aspects of fiscal policy" (Hagemann, 2010, p. 5). In some countries public audit institutions operate, however they are not strictly independent fiscal institutions due to their principal functions. In the case of audit institutions, although independent, their role is to prepare detailed ex-post analysis of each public sector entity, whereas the role of independent fiscal institution is to "maintain discipline and transparency in public finances during the policy-making process" (Kopits, 2011, p. 2) and increase the credibility of government by real-time analysis and forecast, [i.e.] thus by "forward-looking diagnostic task" (Kopits, 2011, p. 2). For example, in Poland, instead of a fiscal council, there is the Supreme Audit Office — an independent state audit body responsible for safeguarding public spending. A work by Jankovics and Sherwood (2017) presents an excellent overview of the IFIs and their role in the EU countries. The IFIs are an element of fiscal governance, however, e.g. a study by Dziemianowicz *et al.* (2016) shows that the mere establishment of a fiscal council does not guarantee stabilization of public finances. Thus, there is a need of cooperation between particular elements of fiscal governance — IFIs implementation can increase the effectiveness of fiscal rules (as argued by Wyplosz, 2012).

The DG ECFIN published the first calculations of a Scope Index of Fiscal Institutions (SIFI) for the year 2015. The construction of the index is aimed at measuring the breadth of tasks discharged by the IFIs. The index covers 6 separate tasks of the IFI: (1) monitoring of fiscal policy and rules; (2) macroeconomic/budgetary forecasting; (3) policy costing; (4) analysis of long-run sustainability of public finances; (5) promotion of fiscal transparency; and (6) normative recommendations on fiscal policy. The detailed information about its construction is published on the European Commission webpage[1]. The first available series for the year 2015 included 29 IFIs analyzed for the 26 EU countries (without data for the Czech Republic and Poland, due to the lack of strictly independent fiscal institutions in 2015). It was the first calculation of the index. The corrected analysis (based on a fine-tuned methodology), published in 2017, presents SIFI indexes for 30 IFIs from 27 EU countries calculated for 2015 and 2016 (including Su-

[1] see: Independent Fiscal Institutions. Retrieved from https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/fiscal-governance-eu-member-states/independent-fiscal-institutions_en (12.12.2017).

preme Audit Office in Poland). The new values for the indexes for 30 IFIs are presented in Figure 1.

The average value of the index for 30 institutions was nearly 47.6 in 2015 and 47.5 in 2016 (due to the reduction in the value of the index for the National Audit Office in Finland). The institutions in Spain and the UK demonstrated the highest quality of IFI in both years. In 2015 and 2016 more than one IFIs were in three countries (in the Netherlands, Belgium, and Austria), however, the quality of these institutions in particular countries measured by the index was quite different (see Figure 1).

Medium-term budgetary frameworks

The commonly used definition of medium-term budgetary frameworks explains them as an institutional device or instrument allowing fiscal authorities "to extend the horizon for fiscal policy-making beyond the annual budgetary calendar" (EC, 2007). Including MTBFs in budgetary process results in several benefits, like, for example, it increases transparency of the medium-term budgetary objectives, provides economic agents with information concerning outgoing trends in the public finance and thus reduces the deficit bias and enhances the sound public finance, contributes to better time consistency in the conduct of fiscal policy, copes with the common pool problem, improves quality and stability of the decision-making process and enhances structural reforms by better planning tool (see EC, 2007). The excellent survey for MTBFs in the EU member states has been prepared by Sherwood (2015), who emphasizes that MTBFs are not a result of recent crisis, but have a quite long history in many European countries — like Germany (beginnings in 1967), or in Finland, Sweden, and the Netherlands (beginnings in mind-1990). M. Sherwood (2015) emphasizes that the latest amplification of the MTBFs in national budgetary processes in many countries was a consequence of the adoption of the Budgetary Frameworks Directive, which obliged affiliated countries to introduce these frameworks in budgetary processes by the end of 2013, and subsequently by the entry into force of the Two-Pack regulations.

Although in EU countries the crucial decisions of fiscal policy are taken for annual budget/financial year, most measures have implications beyond yearly budget cycle (EC, 2010). As a result, the EU Member States adopted MTBFs for their budgetary process, particularly for fiscal planning, because a single-year perspective creates a poor basis for successful policy-making and management in fiscal policy.

The MTBF index captures the quality of MTBF through five criteria: (1) coverage of the targets/ceilings included in the national medium-term fiscal

plans, (2) connectedness between the targets/ceilings included in the national medium-term fiscal plans and the annual budgets, (3) involvement of national parliament or use of a coalition agreement in the preparation of the national medium-term fiscal plans, (4) involvement of independent fiscal institutions in the preparation of the national medium-term fiscal plans, (5) level of detail included in the national medium-term fiscal plans.

Figure 2 shows the changes between the year 2009 and 2016 for all 28 EU countries. In the case of France and the Netherlands, the MTBF index was nearly the same — it means that the quality of MTBFs in these countries did not change on average. The decline in the index was observed in Hungary, the Czech Republic, Croatia, Denmark and Belgium. The highest improvement in the quality of the MTBFs was observed in the case of Greece (by 0.72 units) and Luxembourg (by 0.52 units). The average value of the index in 2009 was 0.49 units and in 2016 it was 0.68 units (by 0.19 units higher). The highest value of the index in 2016 was in the UK, and Greece, the lowest in the Czech Republic.

Research methodology

The agglomerative method — cluster analysis is employed in order to investigate the similarities among the EU countries. The analysis includes four variables:

- MTBFI – Medium-Term Budgetary Framework Index, data source: European Commission,
- FRI – Fiscal Rule Index, data source: European Commission,
- DEBT – debt as a percentage of GDP at current prices, data source: AMECO,
- CAB – cyclically-adjusted balance as a percentage of trend GDP at current prices (adjustment based on trend GDP), data source: AMECO.

As presented, the analysis of the quality of fiscal governance does not take into account the SIFI data because of its shortages for the Czech Republic, and because of the examples of two independent fiscal institutions for Austria, Belgium and the Netherlands for which the EC prepares calculations. The set of variables includes the cyclically-adjusted balance (CAB). However, the structural budget balance seems to be better for the analysis. Due to the lack of data for all 28 EU countries in 2009 (no comparable data for Croatia), it was decided to replace the structural budget balance by the cyclically-adjusted balance. Thus, the fiscal data includes debt and CAB, both fiscal variables cover the level of general government.

The analysis is prepared for two years: 2009 (crisis period) and 2016 (2016 — the latest data available). In each year, all variables presented above were included. Next, the inputted data were standardized using the formula $(x_{il} - \mu_l)/\sigma_l$, where μ_l, σ_l are the average value and the standard deviation of the l-th feature (see e.g. Wierzchoń & Kłopotek, 2018).

The standardized data is employed in agglomerative algorithm. The employed cluster methodology is based on the Ward's agglomerative hierarchical clustering method (Ward, 1963). In general, the essence of the agglomerative method is to form clusters taking into account the similarity between countries. The method aims to minimize the error sum of squares, i.e. as a result a group of objects with the smallest diversification with respect to the features is created. The objective at each stage is to minimize the increase in the total within-cluster error sum of squares — it minimizes the total within-cluster variance. At each step the pair of clusters with minimum between-cluster distance are merged (see e.g. Mirkin, 2015; Everitt *et al*., 2011; Ward, 1963; Duran & Odell, 1974, among others).

The graphical results of the algorithm implementation are a dendrogram. If two small groupings are fairly similar, the hierarchical analysis links them together at the next step. The structure of the dendrogram allows for receiving separate clusters by dividing the observations into homogeneous and distinct groups.

Results

The analysis below is prepared in order to reflect the changes in the development of the core elements of fiscal governance over the period between 2009 and 2016. The aim is to compare the changes in public finance due to the implementation of better fiscal governance guidelines.

As presented in Figure 3, countries with relatively high value of FRI have relatively strong medium-term budgetary frameworks. The most visible progress in the value of both MTBFI and FRI took place in Ireland, Romania, Latvia, Italy, Portugal, Cyprus and Malta. In all those countries the quality of fiscal rules has improved, however in some countries the MTBF index has declined (the Czech Republic, Hungary, Belgium, Croatia, Denmark). The year 2009 was the first year of severe recessions in most EU countries which injured real economy and affected the situation in public finance. The growing instability of public finance forced the implementation of numerous reforms in subsequent years to improve the fiscal condition of the public sector.

As demonstrated in the research methodology section, the similarity of changes in the core elements of fiscal governance presented against the background of the situation in public finance was investigated by the employment of the Ward's agglomerative hierarchical clustering method. The result of the implementation of the agglomerative method is presented in the form of a dendrogram in Figure 4a (for the year 2009) and Figure 4b (for the year 2016). As presented, the structures of both dendrograms are different.

The goal was to avoid dividing the dendrograms into small groups of countries, which resulted from the need to take into account the essential relationships between the elements of fiscal governance and the condition of public finances. Then, it was decided to divide each dendrogram into four clusters. As a result, it was possible to compare the shifts of countries between the same number of clusters. The division of each of the dendrograms into the same number of clusters is based on our observation that in each year the proposed (and equal) number of clusters is sufficient to determine groups of similar countries with respect to the analysed features. Admittedly, in the year 2016 it is possible to determine more than four clusters. However, their aggregation to 4 clusters gives the same conclusions in terms of the relationship between fiscal governance features and public finance. Thereby, the adopted division of both dendrograms into four clusters was aimed at determining clusters according to an essential similarity between the analyzed features. The structure of the clusters is shown in Table 1.

In 2009 the countries with relatively high debt and CAB are included in the 1st cluster, which is similar in terms of the structure to the 4th cluster in 2016. In 2016 Greece created a separate cluster — that country was an outlier on the background of the rest of the EU. Countries with the best situation in public finance were grouped in the 2nd cluster in 2009 and also in the 2nd cluster in 2016.

Figure no. 5 presents the mean for variables within each cluster. Please, note that in order to keep the scale — debt value is divided by 100.

As shown, in 2009 countries grouped in the 1st cluster are distinguished by the relatively high level of fiscal aggregates (debt and CAB). This cluster mainly includes countries strongly affected by the crisis (Ireland, Portugal, Greece). The countries in the 2nd cluster are characterized by positive value of indexes constructed and calculated by the European Commission, with the highest mean value for FRI, resulting in the lowest mean for debt and CAB. As presented, these countries reflected the best situation in public finance. The 3rd cluster includes 7 countries with relatively high cyclically adjusted deficit and negative FRI (i.e. countries with very low number

of fiscal rules). The 4th cluster is quite heterogeneous from the point of view of debt (it includes countries like Italy where debt in 2009 was nearly 112.5% of GDP, as well Croatia with debt of 48.9% of GDP). However, the countries in the 4th cluster have relatively high value of MTBFI.

The grouping for 2016 shows different structure of clusters. Now, the 4th cluster is characterized by relatively bad situation in public finance, with the highest average for debt and cyclically adjusted deficit (Portugal, Italy, UK, Spain, Ireland, France, Belgium). However, the mean for FRI receives the highest value in the 4th cluster. The one exception is Greece, which creates the single cluster in 2016 (Greece was a country with very high debt, however positive CAB and observed improvement in the quality of fiscal governance). The cluster no 1 presents the countries with low and negative CAB and poor averaged quality of fiscal governance. The 2nd cluster includes 16 countries with positive, and relatively highest values for fiscal indexes, as well with the lowest value for debt and positive CAB.

As presented, between 2009 and 2016 important changes in the structure of clusters are observed: relatively high increase in CAB and relatively high increase in the value of FRI. The latter can result from the obligations imposed by the 2011/85/EU Directive. As shown, countries grouped in the first cluster in 2009 improved their situation in the public finance by stronger national fiscal framework, reflected in higher value of MTBF and FR indexes. The example of countries grouped in the 2nd cluster in 2009 and in 2016 shows that countries with better average quality of national frameworks achieved relative better outcomes regardless the macroeconomic situation.

Discussion

The study uses cluster analysis to identify countries that are similar in terms of situation in public finance. As presented, countries with debt and deficit lower than average are those with a good quality of national fiscal frameworks. The post-2009 reforms increased the quality of fiscal governance. However, the findings of Fyraud *et al.* (2017) suggest that the presence of national and supranational fiscal rules has not successfully alleviated a set of biases like procyclicality, excessive deficits and compositional distortions, which have continued to prevail following recent reforms of the fiscal framework. Reuter (2015) analyses the compliance with national numerical fiscal rules in 11 EU countries with 23 fiscal rules in place from 1994 to 2012. As presented, in the pre-crisis times, rules were only complied with in about half of the years he studied. A similar result was ob-

tained by Reuter in his later study (2018). The author claims, based on an analysis of 51 fiscal rules in force in EU countries from 1995 to 2015, that the average compliance across all rules and countries is around 50%. Moreover, he emphasizes that the presence of independent monitoring and enforcement bodies turns out to be significantly associated with a higher probability of the rules compliance.

The adoption of the ‘Six Pack’, the ‘Fiscal Compact’ and the ‘Two Pack’ was perceived as an ability of the EU to produce agreement aimed at strengthening the enforceability of the rules-based economic coordination system as well at building stronger national commitment to fiscal prudence (Laffan & Schlosser, 2016). As concluded by Koehler and König (2015), the SGP influenced the debt level in the Eurozone, however donor countries were able to control public spending (and reduce debt), while many recipient countries — including Greece or Italy — increased debt ever since. As argued by Savage and Verdun (2016), the present enhanced role of the European Commission in the area of surveillance is an important change in comparison to the period before the financial and Greek crises.

After the crisis, many EU countries, especially highly indebted Eurozone countries, have strengthened their fiscal governance. Spain is the example. The reform of the Spanish Constitution in September 2011 to strengthen the principle of budgetary stability was the first milestone. In April 2012, a new Budgetary Stability Law was passed — it introduced significant amendments to the definitions of, and the mechanisms for determining the deficit, debt and public spending limits. The national budgetary framework was also strengthened by the implementation of the IFI — an ‘Independent Fiscal Responsibility Authority’ (AIReF). To correct the fiscal imbalances, Spanish authorities provided a set of actions to improve the fiscal imbalance that were implemented between 2010 and 2014 (see Martí & Pérez, 2015 for details).

Conclusions

The presented paper includes an overview of fiscal governance and describes specific mechanisms for coordinating fiscal policies in the EU Member States. The study shows the increasing role of the core elements of national fiscal framework (fiscal rules, medium-term budgetary frameworks and independent fiscal institutions) whose quality is measured by indexes constructed and calculated by the European Commission services.

The empirical part of the article investigates the similarity among EU countries from the point of view of the quality of selected elements of na-

tional fiscal framework and situation in public finance. The clusters, obtained by employing the agglomerative clustering method, contain Member States with similar situation in public finance. To reflect the post-crisis role of fiscal framework, the comparison between 2009 and 2016 year was prepared. The evident change in the structure of clusters between 2009 and 2016 shows that countries with serious problems in public finance in 2009 increased the quality of national fiscal framework, especially the quality and number of fiscal rules reflected in the growing value of FRI, and, in result, achieved better situation in public finances in 2016.

The study shows that the countries with low debt and low deficit are those with a good quality of fiscal frameworks. As presented, the post-2009 reforms obliged EU members to increase the quality of national fiscal governance (especially reforms of SGP, the 2011/85/EU directive, Fiscal Compact, and Two-Pack). However, the launching of separate elements of fiscal governance is not sufficient to achieve sound public finance. It is very important to ensure the cooperation between the particular elements of fiscal governance, as well as to monitor their performance and quality, and ensure their permanent use and long-term durability.

Some limitations of the study should be pointed out. Firstly, the lack of comparable data for all EU Member States narrowed the set of fiscal data. Secondly, there is no one common approach to dendrogram fragmentations. In the study, the division into four separate clusters was used in each year. That decision was made in order to present changes in similarity of countries from the point of view of an essential analysis of the value of fiscal governance and public finance indicators. Moreover, the employed cluster analysis does not include data for the independent fiscal institutions while IFIs play an important role in determining the quality of fiscal governance. Thus, the areas of future analysis appeared, especially in the context of the impact of IFIs, as a collateral element of fiscal governance, on public finance or from the point of view of the growing importance of IFIs in conducting fiscal policy.

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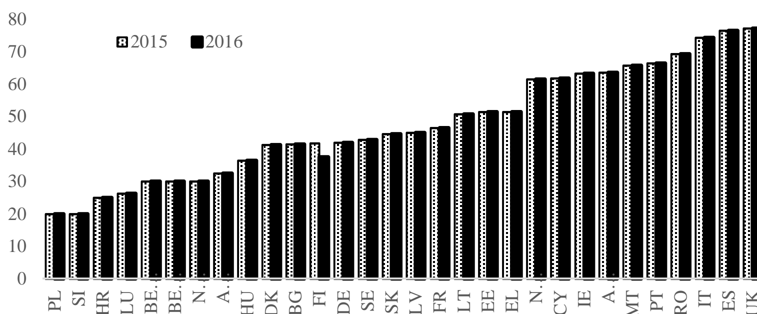
Annex

Table 1. Clusters in 2009 and clusters in 2016

	I cluster	II cluster	III cluster	IV cluster
	4 countries	**9 countries**	**7 countries**	**8 countries**
2009	Greece, Portugal, Ireland, Cyprus	Finland, Estonia, Sweden, Denmark, Germany, Luxembourg, Poland, Lithuania, Bulgaria	UK, Malta, Romania, Slovenia, Slovakia, Latvia, Czech Republic	Spain, Italy, Belgium, Netherlands, Croatia, France, Hungary, Austria
	4 countries	**16 countries**	**1 country**	**7 countries**
2016	Poland, Hungary, Germany, Czech Republic	Cyprus, Austria, Croatia, Slovenia, Finland, Malta, Sweden, Luxembourg, Estonia, Denmark, Slovakia, Romania, Netherlands, Lithuania, Latvia, Bulgaria	Greece	Portugal, Italy, UK, Spain, Ireland, France, Belgium

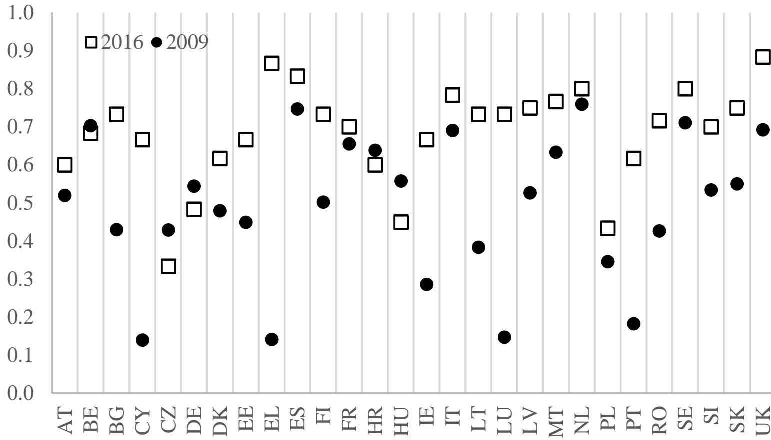
Figure 1. Scope Index of Fiscal Institutions (SIFI) in 2015 and 2016



The abbreviations for 30 IFIs from 27 countries are as follows: PL- Supreme Audit Office**, SI** - Institute of Macroeconomic Analysis and Development, **NL(1)** - The Council of State – Advisory Division, **AT(1)** - Austrian Institute of Economic Research, **BE(1)** - High Council of Finance - Section "Public sector borrowing requirement", **HU** - Fiscal Council of Hungary, **LV** - Fiscal Discipline Council, **BE(2)** - Federal Planning Bureau, **DK** - Danish Economic Council, **LU** - National Council of Public Finance, **LT** - National Audit Office (Budget Policy Monitoring Department), **EE** - Estonian Fiscal Council, **FR** - High Council of Public Finances, **HR** - Commission on Fiscal Policy, **CY** - Fiscal Council, **FI** - National Audit Office (Fiscal Policy Evaluation Function), **SE** - Swedish Fiscal Policy Council, **SK** - Council for Budget Responsibility, **DE** - Independent Advisory Board to the Stability Council, **IE** - Irish Fiscal Advisory Council, **NL(2)** - Netherlands Bureau for Economic Policy Analysis, **IT** - Parliamentary Budget Office, **AT(2)** - Austrian Fiscal Advisory Council, **BG** - Fiscal Council, **EL** - Hellenic Fiscal Council, **MT** - Malta Fiscal Council, **PT** - Public Finance Council, **RO** - Fiscal Council, **ES** - Independent Authority for Fiscal Responsibility, **UK** - Office of Budget Responsibility

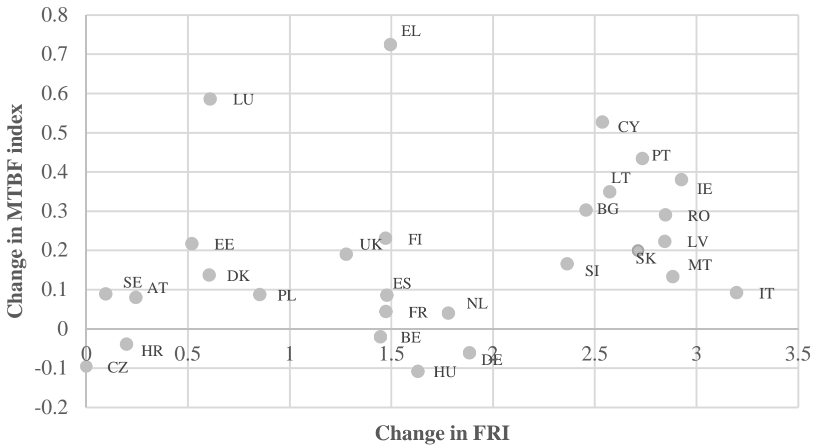
Source: own calculations based on the European Commission data.

Figure 2. MTBFs indexes in 2009 and 2016



Source: own calculations based on the European Commission data (MTBF database – "new" methodology).

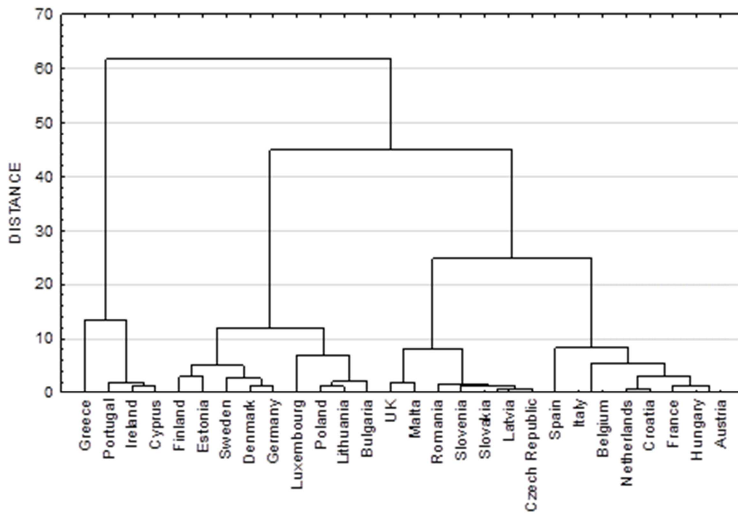
Figure 3. Changes in the MTBFI and FRI between 2009 and 2016



Source: own calculations based on the European Commission data (MTBF database and fiscal rules database – "new" methodology).

Figure 4. Dendograms for the years 2009 and 2016

a. year 2009



b. year 2016

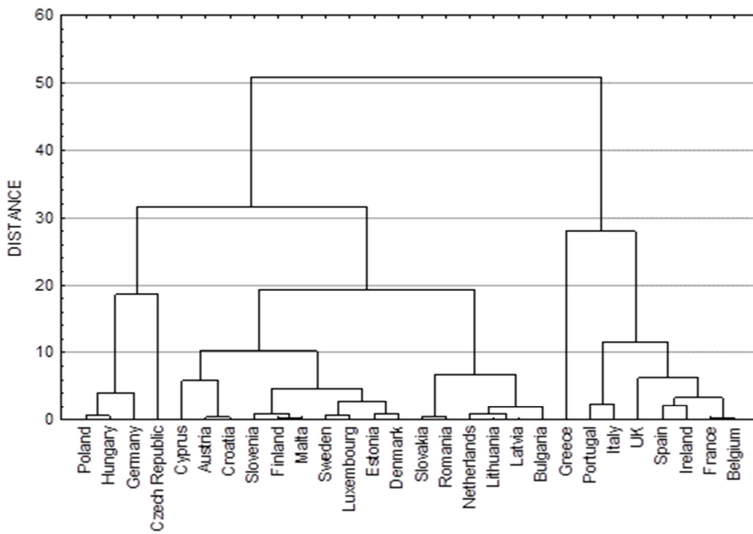


Figure 5. Average values for variables in clusters