ANNALS OF ECONOMICS AND FINANCE **21-1**, 131–151 (2020)

Does Eurozone Membership Strengthen the Significance of Fiscal Instruments?

Slawomir Franek and Marta Postula*

This paper investigates the relationship between fiscal instruments (such as numerical fiscal rules, independent fiscal institutions and medium-term budgetary frameworks) and fiscal performance of EU countries. An empirical analysis using panel data estimation method reveals a statistically significant and positive impact of the use of fiscal instruments on the fiscal stance. The results obtained warrant the conclusion that the use of multiannual budgetary framework has the strongest (among all fiscal instruments) impact on the budget balance. In addition, there is no clear evidence that an EU country's eurozone membership guarantees better fiscal performance and stronger fiscal instruments. This conclusion also proves justified upon excluding the impact of fiscal reform implemented in those EU member states that joined the eurozone in the period under analysis.

Key Words: Fiscal policy; Eurozone; Budgetary frameworks.
JEL Classification Numbers: E62, H11, H61.

1. INTRODUCTION

In the context of European integration, it is often emphasised that the effective functioning of the community requires not only labour mobility, cross-border fiscal transfers, the convergence of business cycles and concurrent economic crises, but also adequate fiscal tools (Jonung, Drea 2009). As the European community became an ever tighter union, it was believed that only strong fiscal discipline of national governments would ensure a successful functioning of the whole eurozone and help avoid excessive public expenditure leading to uncontrollable budget deficits in member states.

* Franek: Institute of Finance, University of Szczecin, Poland. Email: slawomir.franek@usz.edu.pl; Postula: Corresponding author. Faculty of Management, University of Warsaw. Email: mpostula@wz.uw.edu.pl. This research project was conducted under the VIII NBP open competition for research projects and was financed by Narodowy Bank Polski.

1529-7373/2020

Fiscal policy-making is left to the discretion of individual European Union member states, with the Treaty on the functioning of the European Union (TFEU) only providing for coordination of economic policy (including fiscal policy) within the EU. This means that EU institutions are unable to directly impact respective member states' fiscal policy. One can see this as one of the underlying causes of the trouble balancing public finance in EU countries, as demonstrated by the high prevalence of deficit bias. In eleven member states in the period between 2004 and 2016, the general government sector always generated a deficit, and only in three countries (Estonia, Sweden, Luxembourg) the number of years without deficit was higher than the number of years with deficit. If the acceptable deficit level were to be set as one not to exceed 3% of GDP, only in Luxembourg, Sweden and Estonia was it within those bounds throughout the period under examination. The fiscal imbalance was especially notable in the years between 2009 and 2013, where over 90% of member states generated a deficit (in 2009 all of them did), and the percentage of countries with a deficit exceeding 3% of GDP was significantly higher than 60%, except for 2013, where fewer than 40% of the countries had a deficit over 3% of GDP. The high prevalence of the fiscal imbalance is also manifested by the frequency of achievement of medium-term budgetary objectives. For eight EU countries, the objective was never successfully achieved, and only in four countries (Denmark, Sweden, Estonia, Luxembourg) more years could be observed where MTO was achieved compared to the years where MTO was exceeded. It was only in 2016 that more than half of EU countries were capable of achieving their MTOs, while in all the other years, structural balance of most member states was not compliant with the relevant MTO.

No wonder then that efforts have been made in EU member states to strengthen the role of fiscal instruments. The first time fiscal instruments were given any attention in European Union regulations was in Council Directive 2011/85/EU of 8 November 2011 on requirements for budgetary frameworks of the Member States (as part of the so called six-pack). It indicated that strong numerical fiscal rules controlled by mechanisms for effective and timely monitoring should be the cornerstone of the EU's strengthened budgetary surveillance framework.

Those provisions were supplemented by the solutions contained in the Regulation (EU) No 473/2013 of the European Parliament and of the Council of 21 May 2013 on common provisions for monitoring and assessing draft budgetary plans and ensuring the correction of excessive deficit of the Member States in the euro area (as part of the so called two-pack). The provisions of this regulation imposed on member states the duty to have in place independent bodies in charge of monitoring and evaluating the compliance of their respective fiscal policies with the applicable fiscal rules. It was likewise established that national medium-term budgetary

plans and draft budgets should be based on independent macroeconomic forecasts and indicate whether budgetary forecasts have been drafted or approved by an independent body. At the same time, the need to make such forecasts public was emphasised.

The above mentioned regulations laid a formal groundwork for implementing in member states the solutions intended to strengthen the institutional frameworks being part of the budget-making process. Based thereon and based on experiences of the member states that had made the effort of using fiscal instruments, basically all member states have greatly strengthened the role of those instruments over the recent years.

The purpose of the article is to show the relationship between the stage of implementation of fiscal instruments such as fiscal rules, medium-term budgetary frameworks and independent fiscal institutions, and the stance of public finance in the European Union (EU) member states. Fiscal rules, medium-term budgetary frameworks and independent institutions indices published by the European Commission are used here to evaluate the implementation progress of those fiscal instruments. The research conducted helps verify the following research hypotheses:

1) Of all the fiscal instruments implemented, medium-term budgetary frameworks have the highest impact on fiscal performance.

2) There is no sufficient evidence to prove the correlation between eurozone membership and the strength of respective fiscal instruments.

Panel data analysis and the Mann-Whitney U test are used to empirically verify the research hypotheses derived from the above research problem. Due to the use of pooled cross-sectional data involving Eurostat data for European Union countries for the years between 2004 and 2016, panel regression model with fixed effects is applied.

2. THE IMPACT OF FISCAL INSTRUMENTS ON THE CONDITION OF PUBLIC FINANCE — LITERATURE REVIEW

Empirical research provides evidence of the positive effect of the existence of fiscal rules on ensuring fiscal discipline. This is manifested, among other things, by papers by authors such as: Alesina and Bayoumi (1996), Debrun et al. (2008), Brzozowski and Siwińska-Gorzelak (2010), Tapsoba (2013). Many a publication also indicates that fiscal rules strengthen the procyclicality of the fiscal policy (Dessuss et al. 2013; Arezki, Ismail 2013), especially in connection with pressure to limit capital expenditures in times of economic slowdown. Heinemann et al. (2014) have pointed out that fiscal rules may significantly increase market confidence in countries with bad reputation.

A lot of studies yield arguments in support of the view that the introduction of fiscal rules contributes to an improved budget performance, for example they can contribute to a successful fiscal consolidation (Guichard et al. 2007), budget balance or debt rules contribute to limiting the budget deficit (Debrun et al. 2008) and to a lower cost of debt servicing (Thornton, Vasilakis 2018); expenditure rules are conducive to reducing primary expenditure (Deroose, Moulin, Wierts 2006), also by reducing pressure to increase expenditure in case of revenue windfall (Wierts 2008). In addition, one can find confirmation that their impact is greater if they are based on strong legal foundations, and compliance with them is strictly enforced (Hallerberg, Strauch and von Hagen 2007). Other studies reveal that an improvement of fiscal parameters is preceded by the adoption of fiscal rules (Caceres, Corbacho and Medina 2010) and that it is hard to observe an improvement in fiscal performance of the emerging economies which have adopted fiscal rules compared to those where no such rules are in effect. At the same time, it is pointed out that rules may not be effective unless they come with strong political commitment or strong institutions to support the budget-making process (Hallerberg, Strauch and von Hagen, 2007; Wyplosz 2012).

Meanwhile, it should be noted that even if fiscal rules in a given country are not complied with, upon their introduction, fiscal parameters may be seen to change along the lines of the limitation imposed by a rule (Grauwe, 2011). Research by Reuter (2015) conducted on a group of 11 EU countries between 1992 and 2014 reveals that only in half of the years the countries where the rules were in place could boast compliance with them. This means that rules represent a sort of point of reference for good fiscal policy for the government and the society, irrespective of whether they are actually complied with or not. Moreover, Reuter (2019) indicates that compliance with rules constraining stock (rather than flow) variables, set out in coalitional agreements, as well as rules covering larger parts of general government finances is significantly higher. Badinger and Reuter (2017) also found out, based on data from 74 countries from the years between 1985 and 2012, that countries with more rigorous fiscal rules show a better budgetary balance, lower interest rate spread for bonds and lower GDP volatility. Similar findings have been made with respect to the use of medium-term fiscal framework. Vlaicu et al. (2014) point out, based on examining 120 countries, that, on average, multiyear budgeting improves budget balance by about 2 percentage points.

The fiscal rules evolution, taking place over the recent years, towards greater flexibility and towards using corrective mechanisms adapted to the current phase of the business cycle, contributes to strengthening the counter-cyclical nature of fiscal rules, as evidenced by the results of research by Bergman and Hutchinson (2015), Bovy et al. (2014) and Guergil et al.

(2017). At the same time, it is worth noting that the increasing complexity of fiscal rules, their frequent modifications and numerous exceptions to their applicability are hardly conducive to the transparency of the fiscal policy in place (Bundesbank 2015).

Nerlich and Reuter (2013) point out that balanced budget rules and rules based on strong legal foundations are particularly effective. Their research reveals that the effectiveness of rules is higher when they are supported by independent fiscal councils. The existence of independent fiscal institutions favours compliance with fiscal rules, especially those relating to balanced budget and expenditure (Beetsma et al. 2017). The positive impact of independent monitoring and of real time warnings issued by independent bodies when there is a risk of non-compliance with fiscal rules is demonstrated by Reuter's research (2017).

Debrun and Kinda (2014) point out that the mere existence of fiscal councils is not by itself conducive to stronger fiscal balances. They suggest that only well-designed fiscal councils are associated with stronger fiscal performance as well as more accurate and less biased forecasts. Key features for effective fiscal councils include an operational independence from politics (Franek 2016), the provision or public assessment of budgetary forecasts, a strong presence in the public debate, and an explicit role in monitoring fiscal policy rules. Hence it can be concluded that independent fiscal institutions reduce the asymmetry of information between fiscal policy-makers and the public opinion.

The importance of the independent fiscal institutions' autonomy is also manifested by the fact that countries with fiscal councils whose independence is guaranteed by law or at the operating level by having an appropriate composition (i.e. involving professional economists and no politicians) are characterised by better fiscal performance measured at the level of primary balance. Though fiscal councils do not have a direct impact on the fiscal policy in place, one can see their effect on reputation-building by decision makers. This is reflected by better fiscal performance of the countries where fiscal councils have high media presence via publications addressing the public (Debrun, Kinda 2017).

The above is compatible with the view that strong fiscal rules (Abbas et al. 2011; Frankel and Schreger 2013) and the deep embedding of fiscal transparency and medium-term fiscal framework (Beetsma et al. 2011) are conducive to caution in budgetary forecasting. Hence the prevalent opinion in the subject matter literature that independent fiscal institutions ensure the existence of more realistic budgetary plans in the medium term, and minimise the risk of delay in fiscal consolidation. The outcomes of these activities are also impacted by the institutional finance management solutions. In particular, in countries where the ministry of finance is the body delegated to develop budgetary forecasts, one can observe a greater fore-

casting optimism, while in countries with strong fiscal rules a much greater forecasting caution is visible. At the same time Abbas (2013) emphasises that independent fiscal institutions are not a panacea to cure the excessive optimism of forecasts amid uncertainty as to short-term prospects for economic growth and fiscal parameters.

Jonung and Larch (2006) show that wrong forecasts in the EU countries stem from political pressure, and that forecasts made by independent fiscal institutions are more desirable than forecasts by the ministry of finance. Frankel and Schreger (2013) note an over-optimism of governmental forecasts, especially in eurozone countries. They can also see that an excessive optimism of the economic growth forecasts is especially notable in the midst of a booming economy. That is why they highlight the positive effect of independent fiscal institutions on developing more realistic forecasts, especially for countries which exceed the public deficit limit of 3% of GDP.

Beetsma et al. (2017) emphasise independent fiscal institutions' sensitivity to political circumstances. Therefore, strict guarantees of independence, including those with regard to the available financial resources, seem important to safeguard their long-term sustainability. It is for the same reason that adapting fiscal councils' institutional model to the country specificity may increase the likelihood of them being accepted across the political spectrum. Where fiscal councils are established as a result of external pressure, they may be susceptible to political changes or ignored by policymakers and the public.

In their attempt to assess the extent to which information asymmetries between the society and politicians can be decreased, Beetsma and Debrun (2018) developed an index that measures the signal enhancement capacity of independent fiscal institutions (SEC). Its value is driven by the following features of independent fiscal institutions: the scope of mandate, the ability to communicate with the public, the ability to directly influence the budget-making process participants and political independence. The scope of mandate should be understood as the capacity for limiting the sources of information asymmetries caused by inaccurate forecasts, underestimated costs of the proposed political initiatives and the complexity of fiscal relationships between respective subsectors of public finance. As for the ability to communicate with the public, it means publishing reports produced by the fiscal council to enable their wide use in the public debate on fiscal policy. The ability to directly influence the budget-making process participants involves taking account of council forecasts when structuring the budget, requiring the government to account for adopting budget assumptions different to those recommended by the council and allowing for regular meetings between council members and policymakers. Las but not least, political independence refers to the fiscal council composition, long-

lasting council members' term in office, and provision of sufficient funding and staff to enable operations of the independent fiscal institution.

In their research, Guttenberg and Hemker (2018) claim a common fiscal instrument is needed to enhance the policy mix in the eurozone.

The results of this research provide a case for emphasising the role of independent functioning of fiscal councils and for strengthening the relationship between medium-term budgetary frameworks and annual budget.

Another aspect worthy of attention is the differences in the progress of fiscal reforms in European Union member countries depending on whether they are EMU members or have their own currency. There is a shortage of studies indicating the role of EMU membership in strengthening fiscal frameworks. Whereas eurozone monetary integration involves monetary integration, fiscal policy of EMU countries shows heterogeneity. The Treaty on Stability, Coordination and Governance in the Economic and Monetary Union (known as Fiscal Compact) effective as of 1 January 2013, which provided for increasing fiscal governance coordination in EMU countries, was an attempt at strengthening fiscal integration in EMU countries. Hence two questions seem warranted: 1) Does eurozone membership favour better fiscal outcomes? 2) Are eurozone countries characterised by a greater strength of fiscal instruments than other European Union member states? There is a widely held view that better institutions are connected with lower risk premia and furthermore deficits matter less in countries with better institutions (Hallerberg and Wolff 2009; Postula 2015). It turns out, however, that eurozone membership does not guarantee better fiscal institutions. This is suggested by research by Frankel and Schreger (2013), which reveals that euro area countries appear to have responded to the 3 % limit imposed by the SGP by offering over-optimistic forecasts when they are most in danger of breaching the limit. Also Gilbert and de Jong (2014) point out that for members of EMU the fiscal forecasts are more optimistic when the 3% threshold is expected to bind. For EU member states that are not part of the EMU, such an effect cannot be established. Qualitatively, this result does not seem driven by crisis countries, financial sector support, small or large countries or extreme forecast errors. The results of those studies indicate that there is a case for implementing instruments that restrict the tendency for fiscal expansion in EMU countries.

3. INVESTIGATING THE RELATIONSHIP BETWEEN THE STRENGTH OF FISCAL INSTRUMENTS AND FISCAL PERFORMANCE

In many of the studies highlighting the role of fiscal instruments in enhancing fiscal performance, respective instruments are taken into account separately. Sometimes, however, the object of the analysis is the relation-

ship between the independent fiscal instruments and fiscal rules, on the one hand, and fiscal performance, on the other. Meanwhile, there is a shortage of studies also taking account of the importance of multiyear budgetary frameworks. Hence, this paper attempts to examine the relations between independent fiscal institutions, fiscal rules and multiyear budgetary framework on the one hand, and fiscal performance, on the other. As SIFI (Scope Index of Fiscal Institutions) has been published since 2015, an assumption is made here that a dummy variable will be used as explanatory variable for independent fiscal institutions, i.e. value 1 in a given year means there exists in a given country an institution meeting the criteria of an independent fiscal institution, while value 0 means there is no such institution in a given country. As regards explanatory variables for the strength of fiscal rules and strength of multiyear budgetary frameworks, FRI (fiscal rule index) and MTBF (medium-term budgetary frameworks index) are used, respectively.

FRI is a measure of strength of fiscal rules, annually updated and published by European Commission, using information on: legal base, binding character, monitoring bodies, correction mechanisms, and resilience to shocks. A comprehensive index for each EU country was constructed by summing up all fiscal rule strength indices in force in the respective Member State weighted by a given rule's coverage of the general government sector (i.e. public expenditure of the government sub sector(s) concerned by the rule total general government expenditure). In the presence of more than one rule covering the same government sub-sector, the second, third and fourth rules obtain weights 1/2, 1/3, and 1/4, to reflect decreasing marginal benefit of multiple rules applying to the same sub-sector. The assigned weights are mainly determined by the fiscal strength of the rule and its coverage.

Index of the quality of medium-term budgetary frameworks published by European Commission captures the quality of the national medium-term budgetary framework through five criteria: coverage of the targets/ceilings included in the national medium-term fiscal plans; connectedness between the targets/ceilings included in the national medium-term fiscal plans and the annual budgets; involvement of national parliament in the preparation of the national medium-term fiscal plans; involvement of independent fiscal institutions in the preparation of the national medium-term fiscal plans; and the level of detail included in the national medium-term fiscal plans.

The assumed control variables are GDP growth rate, public debt to GDP ratio and a dummy variable indicating whether a given country is an EMU member or not. It is, likewise, assumed that the dependent variable will be the general government balance to GDP ratio. Before this parameter was adopted as a dependent variable, other model specifications were tested where another dependent variable reflecting respective countries' fis-

cal performance was the structural balance or its deviation from the MTO. However, models for these dependent variables did not show the stability displayed by the models where general government balance was adopted as the dependent variable. Due to the use of pooled cross-sectional data involving data for European Union countries for the years between 2004 and 2016, panel regression model with fixed effects is applied. Table 1 presents descriptive statistics for main variables used in the model.

TABLE 1.

Descriptive statistics for main variables (full sample: EU countries)

Variable	Obs.	Mean	Std. Dev.	Min	Max
GGbalance/GDP	364	−2.92198	3.682257	−32.1	5.1
GDP growth	364	2.007143	3.882425	−14.8	25.6
GGdebt/GDP	364	58.86291	33.99829	3.7	180.8
MTBF	364	0.551882	0.204388	0.076824	0.883333
FRI	364	0.290467	0.221927	0.000858	0.914977

Notes: GGbalance/GDP is the relation of general government balance to GDP; GDP growth is the yearly change in the level of real GDP; GGdebt/GDP is the relation of general government debt to GDP; MTBF is the medium-term budgetary frameworks index; FRI is the fiscal rule index
Source: own compilation.

The choice of the model with fixed effects is determined by the Hausman test results. Likewise, a time effect is assumed to exist, showing, in respective years, the impact of common factors on all the countries. Table 2 presents estimation results of the model showing a relationship between the strength of fiscal instruments and fiscal performance measured with general government balance to GDP ratio.

Several conclusions may be drawn from specifications estimated this way. Firstly, that the GDP growth and the general government debt to GDP ratio show a relationship that corresponds to the theory (i.e. that a higher economic growth entails improved budgetary balance, and a higher public debt negatively impacts the budgetary balance). These parameters also show statistical significance (except public debt in specifications 1 and 3).

Secondly, depending on the model specification, one can see statistically significant and positive impact of the use of fiscal instruments on fiscal outcomes measured with general government balance to GDP ratio.

Thirdly, what has the strongest effect on the budget is the use of multiyear budgetary frameworks, while the relation between fiscal rules and independent fiscal institutions is noticeably weaker. The differences observable in respective specifications as regards the strength of relation between respective fiscal instruments and fiscal outcomes may serve as a point of departure for further research where it will be reasonable to demonstrate the strength of fiscal instruments in the form of a synthetic index com-

TABLE 2.
Panel regression results for the dependent variable: general government balance to GDP ratio

Variables	(1)	(2)	(3)	(4)	(5)
GDP growth	0.1803588***	0.1817492***	0.1797176***	0.1998929***	0.1727153***
	(0.0327449)	(0.0353997)	(0.0335223)	(0.0336783)	(0.0346646)
GGdebt/GDP	−0.0462122	−0.041919***	−0.0485983	−0.0558947*	−0.0509367***
	(0.0323888)	(0.0318473)	(0.0335464)	(0.0283435)	(0.014133)
Euro (dummy)	0.15756	0.0760011	−0.0167327	−0.1483791	0.2854706
	(0.5944918)	(0.5763385)	(0.5587312)	(0.7271339)	(0.449299)
FRI		3.141624**	2.548226		1.877695
		(1.601916)	(1.537631)		(1.347093)
IFI (dummy)	1.313489**		1.042707*		0.3868035
	(0.6097511)		(0.5971959)		(0.5506374)
MTBF				7.408539***	4.683769**
				(2.238173)	(1.88192)
Constant	−1.013395	1.574298	−1.249458	−3.730001	−3.218552***
	(1.767808)	(1.652673)	(1.744653)	(1.356366)	(0.9660283)
Time effect	Yes	Yes	Yes	Yes	Yes
R^2	0.4505	0.4488	0.4651	0.4126	0.44679
Number of observations	364	364	364	364	364

Standard error (robust) in brackets, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: own compilation.

bining the strength of fiscal rules and independent fiscal institutions with that of medium-term budgetary frameworks. Such an approach is compatible with the concept of quality of public finance presented in works by Barrios and Schachter (2008, 2009) and that of indicator of budget institutions proposed in the paper by Gleich (2003) where various areas of the budget-making process are measured with synthetic indicators.

Fourthly, in none of the model specifications has a country's eurozone membership proven to be a statistically significant variable that drives the budgetary balance. This can be seen as a sign of heterogeneity of the eurozone fiscal policy. Such a result is consistent with prior results of research on the relationship between EU countries' eurozone membership and their fiscal outcomes. Nerlich and Reuter (2013) point to the negative effect of the membership in the euro area and a positive effect of deficits above 3% of GDP in the run-up to EMU on fiscal performance. This suggests that the disciplinary device for countries that wish to join the euro area is considerably stronger than for those already in the euro area.

It is worth pointing out here that the lack of statistical significance of the dummy variable relating to eurozone membership provided the basis for checking how the values under examination would develop upon removing from the panel the countries that had adopted euro in the period under examination. By excluding these countries from research, it is possible to eliminate the impact of the "run-up to EMU" effect on fiscal performance. However, limiting the model to countries which did or did not belong to eurozone throughout the whole period under examination did not yield satisfactory results. Specifications structured the same way as those indicated in table 2 for a limited panel only demonstrated the statistical significance of the MTBF variable. The latter conclusion provides a starting point for verifying further the hypothesis of no relation between eurozone membership and the "strength" of respective fiscal instruments.

Here it is worth discussing the endogeneity bias. The structure of the proposed model is based on the assumption that what determines the general government balance is the use of fiscal instruments. However, Poterba (1996) already pointed out that there are difficulties interpreting relations between budgetary institutions (including fiscal rules) and fiscal outcomes, pointing out to the concerns as to the actual causality between fiscal rules and the fiscal stance. Similar doubts are voiced by Krogstrup and W?lti (2008), who also note that the use of relevant fiscal instruments may be treated as a reflection of electorate's preferences for a change of fiscal policy, which warrants the conclusion, in the light of their research, that fiscal rules favour an enhanced budget balance. Nerlich and Reuter (2013) observe that the problem of endogeneity bias is of little significance when studying the impact of fiscal instruments such as fiscal rules and medium-term budgetary frameworks on fiscal outcomes. As a matter of fact, they point out that introducing or strengthening of such instruments as a response to a worsened fiscal situation requires a lengthy process. The research by Debrun et al. (2008) is in agreement with those conclusions. Heinemann et al. (2018) emphasise that most studies into the effectiveness of fiscal rules overlook the endogeneity bias. However, when analysing the existing literature about relations between fiscal rules and fiscal outcomes, they indicate that in models showing such a relation, the dependent variables are fiscal parameters such as: budgetary balance, public debt, public expenditure, public revenue, emphasising that most publications refer to various measures of budgetary balance. Their research also reveals that there are no reasons to see fiscal rules as an endogenous variable. Caselli and Reynaud (2019) assess the effect of having a fiscal rule on the fiscal balance in a wide panel of countries (over 140) over a long period (1985-2015), and controlling for endogeneity using newly developed instrumental variables capturing the diffusion of fiscal rules across countries. They observe that fiscal rules per se do not have a statistically significant impact on the fiscal

balance, once endogeneity is adequately controlled for. They also find that better designed rules have a strong and significant positive impact on the fiscal balance. In contrast, they do not find a statistically significant effect of poorly-designed fiscal rules on the fiscal balance.

In the light of the findings presented, it is concluded that there is a case for structuring the model in the proposed way.

The non-endogeneity of MTBF and FRI is formally confirmed by estimation results (table 3) of the model where the sample is limited to EU countries which have not experienced major fiscal shocks in the recent years. Hence a subsample was created, from which PIIGS (Portugal, Ireland, Italy, Greece, Spain) were excluded. Public finance of those countries were hardest hit by the consequences of the last crisis, which contributed to a sharp deterioration of their fiscal balance. Table 4 presents descriptive statistics for main variables in subsample.

TABLE 3.

Panel regression results for the dependent variable: general government balance to GDP ratio (subsample: UE countries excluding PIIGS)

Variables	(1)	(2)	(3)	(4)	(5)
GDP growth	0.1991292^{***}	0.2109835^{***}	0.2090383^{***}	0.210225	0.2155039^{***}
	0.0428936	(0.0448523)	0.0444407	$(0.0467201)^{***}$	(0.046458)
GGdebt/GDP	-0.0297841^{*}	-0.0300711^{*}	-0.0319389^{**}	-0.0331823^{*}	-0.0352554^{**}
	(0.0158762)	(0.0166742)	(0.0153321)	(0.0181169)	(0.0171518)
Euro (dummy)	0.2088683	0.028854	−0.0140965	−0.013176	−0.1757437
	(0.6444669)	(0.6058348)	(0.5936811)	(0.6617132)	(0.6064922)
FRI		3.0558^{***}	2.763967^{**}		2.006076
		1.443529	(1.426793)		(1.387421)
IFI (dummy)	0.7768289		0.5027475		0.1248099
	(0.5258246)		(0.5506601)		(0.5031581)
MTBF				4.697206^{**}	4.063112^{**}
				(1.85019)	(1.893382)
Constant	-1.694096^{*}	-2.113995^{*}	-2.044953^{*}	-3.574799^{***}	-3.560786^{***}
	(0.8649705)	(0.8230836)	(0.7948888)	(1.018575)	(1.002074)
Time effect	Yes	Yes	Yes	Yes	Yes
R^2	0.4170	0.4244	0.4405	0.3665	0.4042
Number of observations	299	299	299	299	299

Standard error (robust) in brackets, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: own compilation.

Model estimation results for the subsample reveal, as is the case for all EU countries, a statistically significant and positive impact of the use of medium-term budgetary frameworks and fiscal rules on fiscal outcomes

TABLE 4.

Descriptive statistics for main variables in subsample (EU countries excluding PIIGS)

Variable	Obs.	Mean	Std. Dev.	Min	Max
GGbalance/GDP	299	−2.33211	2.914999	−14.7	5.1
GDP growth	299	2.233445	3.675233	−14.8	11.9
GGdebt/GDP	299	50.32876	25.53018	3.7	107.5
MTBF	299	0.543999	0.199084	0.076824	0.883333
FRI	299	0.289093	0.215527	0.000858	0.914977

Source: own compilation.

measured with general government balance to GDP ratio. Hence, in spite of excluding from the sample the countries characterised by the greatest fiscal imbalance in the recent years, a positive relationship between the strength of fiscal instruments and fiscal outcomes can be still observed. In such a situation, it's hard to conclude there is empirical evidence for the impact of the fiscal balance amount on the strength of fiscal instruments. This can be seen as an argument in favour of non-endogeneity of fiscal instruments.

To strengthen the assumption of non-endogeneity of fiscal instruments, the Authors additionally conducted an estimation for a model where a one-year lag is applied to MTBF, IFI and FRI. Also in this case the results obtained were similar to those presented in table 2.

4. DOES EUROZONE MEMBERSHIP DETERMINE THE STRENGTH OF FISCAL INSTRUMENTS?

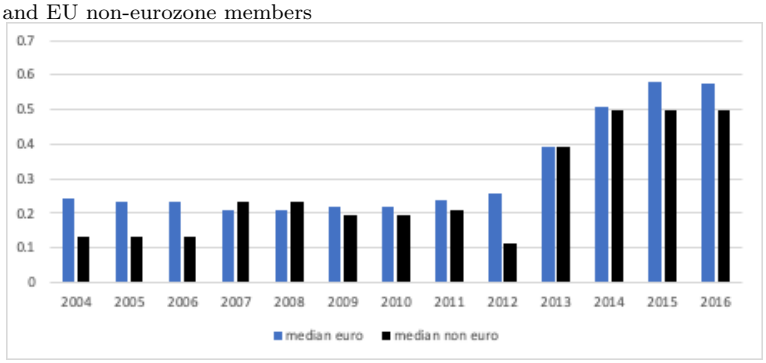
The solutions arising out of the Stability and Growth Pact as well as six-pack and two-pack regulations on the use of fiscal rules, medium-term budgetary frameworks and independent fiscal institutions provide for equal treatment of all EU member countries, whether or not EMU members. Admittedly, the European Fiscal Compact imposed more rigorous requirements on eurozone member countries; still, the fact that most non-EMU members fully adopted it on a voluntary basis warrants the conclusion that these regulations should have a similar effect on the implementation of respective fiscal instruments, whether or not a given country is an EMU member state. Considering the above, a comparison can be made of the strength of respective fiscal instruments between eurozone member countries and EU member states with a national currency.

A decision was made to compare countries which did not change their eurozone membership status throughout the period examined. These can be referred to as countries participating in the eurozone on a non-stop basis and countries that remain outside the eurozone during the sample period.

Therefore, the analyses did not include Slovenia (in eurozone since 2007), Malta and Cyprus (in eurozone since 2008), Slovakia (in eurozone since 2009), Estonia (in eurozone since 2011), Latvia (in eurozone since 2014) and Lithuania (in eurozone since 2015). This way it became possible to disregard the impact of structural changes related to the EMU accession, which could have disrupted the use of fiscal instruments under examination. This helps eliminate the impact of fiscal reforms implemented in EU countries in the run-up to EMU. It is only in its subsequent part that the analysis of each fiscal instrument includes countries which adopted euro in the period examined.

Figure 1 shows a comparison of the average values of fiscal rule index between EU non-stop eurozone members and non-eurozone members in sample period.

FIG. 1. Comparison of the median fiscal rules index (FRI) between eurozone members and EU non-eurozone members



Source: own compilation based on Fiscal rules database.

It should be pointed out that the years between 2004 and 2006 and since 2009 mark a period where average values of the fiscal rules index for eurozone countries were higher than average FRI for non-eurozone members, while the years between 2007 and 2008 showed the opposite relationship. The reasons for changes in the period between 2007 and 2008 include both a lower index in Italy and Finland, and a significant improvement of the index in Hungary.

While in the latter period a greater strength of fiscal rules can be observed in both groups of countries (except in 2012 for non-eurozone members due to fiscal reforms in Hungary, resulting in a temporary abolition of the existing fiscal rules), it should be emphasised that this was mainly the effect of greater strength of fiscal rules in countries such as: the Netherlands, Portugal, Ireland, France, Italy, Belgium and Germany (when it comes to eurozone countries) as well as Bulgaria and Romania (when it comes to non-eurozone countries).

Meanwhile it should be pointed out that the differences outlined here are not statistically significant. The results of the Mann-Whitney U test give no grounds to reject the null hypothesis that the distribution of FRI values in the group of non-stop eurozone members is the same as in the group of countries that were outside the eurozone during the sample period. Table 5 presents the values of the test statistics for the years between 2004 and 2016.

TABLE 5.
Mann-Whitney U test statistics for FRI values in non-stop eurozone members and in countries that are outside eurozone in the sample period of 2004-2016

	mean euro	**mean non euro**	**median euro**	**median non euro**	**U**	**Z**	**p**
2004	0.2136	0.1899	0.2421	0.1305	51.0000	0.1777	0.8590
2005	0.2119	0.1906	0.2316	0.1305	53.0000	0.0355	0.9717
2006	0.2134	0.2181	0.2316	0.1305	54.0000	−0.0355	0.9717
2007	0.2105	0.2403	0.2104	0.2354	48.0000	−0.3909	0.6959
2008	0.2065	0.2235	0.2071	0.2354	48.0000	−0.3909	0.6959
2009	0.2221	0.2339	0.2168	0.1938	51.0000	−0.1777	0.8590
2010	0.2086	0.2490	0.2193	0.1938	46.5000	−0.4975	0.6189
2011	0.2386	0.2740	0.2403	0.2072	50.5000	−0.2132	0.8312
2012	0.2771	0.2424	0.2585	0.1142	47.0000	0.4619	0.6441
2013	0.4323	0.2892	0.3942	0.3930	34.0000	1.3858	0.1658
2014	0.5708	0.4511	0.5054	0.4959	44.0000	0.6751	0.4996
2015	0.5869	0.4478	0.5785	0.4959	41.0000	0.8883	0.3744
2016	0.5728	0.4585	0.5738	0.4959	38.0000	1.1015	0.2707

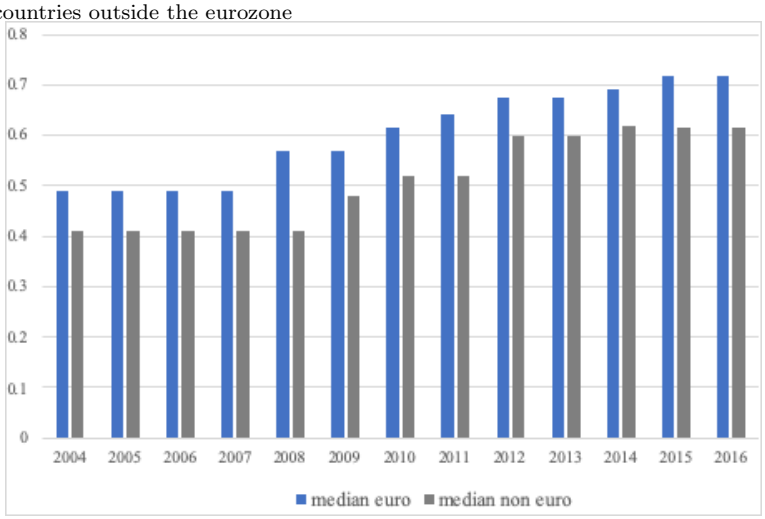
Source: own compilation.

What certainly requires additional attention is the FRI developments among the countries which joined the eurozone in the period examined. In only two of them (Latvia and Lithuania) the euro adoption year overlapped with the period of strengthened fiscal rules. For the other countries that joined the EMU, the FRI value did not change. Attention should be particularly given to Malta and Slovakia, which did not start to use the rules in their fiscal policy until many years after adopting the euro. Hence it can be pointed out that the eurozone accession of countries such as Estonia, Latvia and Lithuania contributed to improving the average FRI value in the eurozone group compared to non-eurozone countries, while the time of eurozone accession of Cyprus, Malta, Slovenia and Slovakia saw an improvement of the average FRI value in the countries outside the EMU area compared to eurozone member states.

The results of the Mann-Whitney U test taking account of the countries that joined the eurozone in the period examined do not change the conclusion about statistical insignificance of differences between FRI values in eurozone countries and the values of that index in countries using national currencies.

For medium-term budgetary frameworks index, a difference is observable, as well, between the median for non-stop eurozone members and EU members that are outside of eurozone, as shown in figure 2. In none of the years under examination did the median MTBF index for countries in sample period exceed the average for countries that were eurozone members throughout the period examined. It should be likewise noted that the difference between the median index value for both groups of countries remains at a similar level in the period examined, which is a testament to a similar pace of MTBF evolution in the countries under examination.

FIG. 2. Comparison of median MTBF index between eurozone member states and EU countries outside the eurozone



Source: own compilation based on MTBF database.

Despite the differences visible in the figure, the results of the Mann-Whitney U test give no grounds to reject the null hypothesis that the distribution of MTBF index values in the group of eurozone members is the same as in the group of non-euro members. This way it may be concluded that in the years analysed there are no statistically significant differences in MTBF index values between non-stop eurozone members and countries that were non-EMU members throughout the period examined.

Extending this analysis to include countries that joined the eurozone in the period examined indicates that in none of them did the MTBF index

improve at the time of EMU accession. Changes in this respect would only take place after several years and they can be seen as the result of the ongoing evolution of budgetary frameworks across all of the European Union. Another aspect worth emphasising is that the eurozone accession of respective countries over the subsequent years was conducive to an improvement of the average MTBF index value in the eurozone group due to eurozone expansion, while contributing to weakening the dynamics of the average MTBF index value in the non-EMU countries. This stemmed from the fact that, except for Cyprus, in all of the countries joining the eurozone, the value of MTBF index was above the average both for eurozone and non-eurozone group.

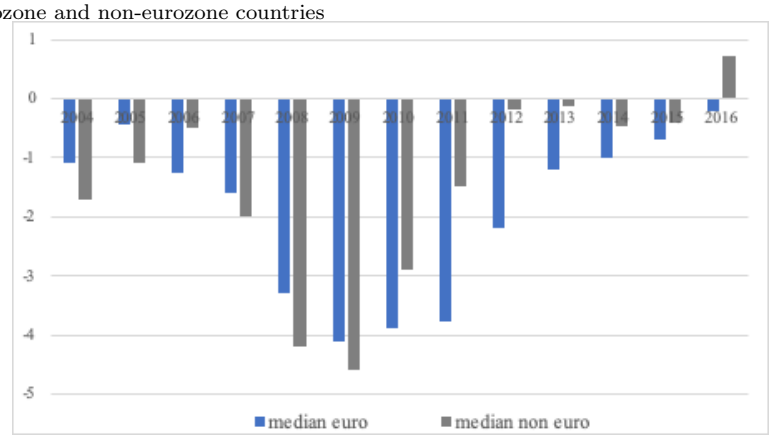
The results of the Mann-Whitney U test taking account of the countries that joined the eurozone in the period examined do not change the conclusion about statistical insignificance of differences between MTBF values in eurozone countries and the values of that index in countries using national currencies.

As regards the SIFI index, measured from 2015, its median for non-stop eurozone members stands at 0.56 compared to 0.41 for non-stop non-eurozone members. Adding to the group of countries examined those that joined the eurozone in the period analysed indicates that these include both countries showing high SIFI index values (Malta, Cyprus) and countries where its value is low (Slovenia, Slovakia, Latvia). Including these countries in the eurozone group lowers the median value of the SIFI index to 0.51. Also in this case the results of the Mann-Whitney U test give no grounds to reject the null hypothesis that the distribution of SIFI index values in the group of eurozone members is the same as in the group of non-euro members.

In addition, the relationship was examined between eurozone membership and the fiscal performance of EU member states. To that end, the structural balance deviation from the MTO was compared between eurozone countries and non-EMU countries, as presented in figure 3.

It follows from the above-presented data that in terms of structural balance deviation from the MTO, the position of non-stop eurozone members and countries that were non-eurozone members throughout the period examined changed after 2009. Until that year the deviation was lower for eurozone countries (except 2006), whereas from this year onward this relation has been reversed. It is in non-eurozone countries that structural balance deviation from the MTO is, on average, lower than in the EMU member states. This means that it is difficult to clearly determine that eurozone membership is a factor that enhances fiscal discipline. If, in addition, account is taken of the countries that introduced the euro in the period examined, it can be observed that in most of them there was no improvement in the structural balance deviation from the MTO in the period

FIG. 3. Comparison of the median structural balance deviation from MTO between eurozone and non-eurozone countries



Source: own compilation.

immediately following the EMU accession. Such improvement can only be noted for Estonia, Latvia and Lithuania.

It should be likewise pointed out that also for this variable the results of the Mann-Whitney U test give no grounds to reject the null hypothesis that the distribution of the values of deviation from the MTO in the group of eurozone members is the same as in the group of non-euro members. This warrants the conclusion that in the years under analysis there are no statistically significant differences in fiscal discipline measured with structural balance deviation from the MTO between eurozone and non-eurozone countries.

In view of the above-presented results, it is hard to clearly establish that the eurozone membership determines the strength of fiscal instruments. Hence, this is another argument in support of the claim that the fiscal policy in the eurozone is not homogenous, not only in terms of budgetary balance meeting the medium-term fiscal objective, but also with regard to the use of respective fiscal instruments intended to strengthen the institutional fiscal policy framework.

5. CONCLUSION

The research conducted has demonstrated a great heterogeneity in the use of fiscal instruments in respective European Union countries. Especially those with a public debt exceeding 60% of GDP have made great progress in using those instruments. As a matter of fact, it should be noted that the implementation of fiscal instruments, which picked up speed after six-

pack, two-pack and the fiscal compact were passed, was a response to the unstable situation of public finance in EU member states.

Likewise, the research conducted provides no clear evidence to prove that an EU country's eurozone membership guarantees better fiscal performance. Analyses in that respect yield no statistically significant relations. This is also true for the level of implementation of respective fiscal instruments; even though for most years under examination one could observe a higher level of indices demonstrating the strength of fiscal rules, medium-term budgetary frameworks and independent fiscal institutions for eurozone countries, at the same time the differences between these countries and non-EMU countries show no statistical significance. Interestingly enough, the use of multiannual budgetary frameworks has the strongest impact on the budgetary balance, with the relationship between fiscal rules and independent fiscal institutions, on the one hand, and financial performance, on the other, being observably less strong.

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