DE GRUYTER OPEN

„Journal of Management and Business Administration. Central Europe"
Vol. 26, No. 3/2018, p. 49–70, ISSN 2450-7814; e-ISSN 2450-8829

The Impact of *Standardised fiscal rules index* on the Yield on Ten-Year Government Bonds in the Visegrád Group Countries in 2005–2016

Marta Postuła[1], Jarosław Klepacki[2], Agnieszka Alińska[3]

Submitted: 13.03.18. Final acceptance: 6.08.18

Abstract

Purpose: The article analyzes the possible methods of public debt management, which not only aim to meet regulatory requirements but also obtain a market premium in the form of an optimal level of the yield on government bond yields that will be profitable for the issuer. The study analyzes the situation in the public finance sector in the countries that form the Visegrád Group (V4). The authors evaluate the main regulatory requirements of EU law in the area of numerical fiscal rules and their impact on the yield on basic securities such as ten-year government bonds, which directly influences the cost of servicing long-term public debt.

Methodology: The study uses desk research method for theoretical reasoning to verify the research hypothesis. The study seeks to answer the question of whether the application of national and EU fiscal rules in V4 budgetary frameworks contributes to lower yields on ten-year bonds and thereby reduces the cost of public debt. The authors utilize time series and cause-effect analysis as well as quantitative research for the systematization of statistical information and regression analysis for the examination of statistical dependencies.

Findings: The basic parameters subject to financial assessment within the fiscal rules index are (1) the deficit of public finance sector and (2) public debt with its servicing costs. In 2005–2016, the ratio of the public finance sector deficit to GDP was shaped in such a way that most V4 countries required the institution of excessive deficit procedures and further disciplinary regulations. The assessment of the situation in the public finance sector in the area of budget deficit and public debt does not translate into the yield on government bonds of non-Eurozone countries. Model-based testing indicates that the financial markets – when deciding to evaluate or purchase government bonds of non-Eurozone countries – failed to acknowledge the implementation of fiscal rules in these countries and its possible effects.

Originality: The study focuses on a unique comprehensive analysis of national fiscal rules employed in individual V4 countries and their impact on the yield on government bonds throughout the entire EU membership of the V4. What holds the greatest cognitive value in this article is the answer to the question of whether Eurozone membership impacts the valuation of a country's public debt.

Keywords: yield on bonds, fiscal rule index, public debt

JEL: H3, H62, H63

[1] University of Warsaw
Correspondence address: University of Warsaw, Faculty of Management, 1/3 Szturmowa St., 02-678 Warsaw, Poland, e-mail: mpostula@wz.uw.edu.pl

[2] University of Social Sciences
Correspondence address: 9 Sienkiewicza St. 90-113 Łódź, Poland, e-mail: jaroslawklepacki@poczta.onet.pl

[3] Warsaw School of Economics
Correspondence address: Al. Niepodległości 162, 02-554 Warsaw; e-mail: aalin@sgh.waw.pl

 DOI: 10.7206/jmba.ce.2450-7814.325

Introduction

The everyday economic life in the second half of the twentieth century and the early twenty-first century reveals the long-term weaknesses of fiscal policy, which effects in excessive deficit and debt of the public sector even in economically favorable periods. One of the reasons for this situation is the democratic system itself. Partly due to the election cycle, there is an excessive propensity to a procyclical fiscal policy which limits the potential effectiveness of automatic stabilizers of economy such as fiscal rules. The issuance of government bonds remains the main source of capital acquisition in many countries, also those of the Visegrád Group (V4). What mainly determines the effectiveness and attractiveness of the government bond market is the level of yield on debt securities. The long period of low and ultra-low interest rates means that changes in this area mostly result from the attractiveness rating of this type of assets on the basis of the financial-economic situation of a country. The improvement in the quality of fiscal policy and public finances necessitates the implementation of new, promising, and well-suited management tools in the public finance sector.

The article analyzes the possible methods of public debt management, which not only aim to meet regulatory requirements but also obtain a market premium in the form of an optimal level of yield on government bond yields that will be profitable for the issuer. From a theoretical point of view, the increase in debt supply should cause a fall in prices of treasury securities, which implies an increase in the profitability of securities. This is due to the fact that higher borrowing needs determine more bond issuance and thus force the issuer to offer better prices (and more attractive profit margins) in order to place increased supply. In practice, however, we often observe the phenomenon of a negative correlation between the size of supply and profitability.

The study analyzes the situation in the public finance sector in the countries that form the Visegrád Group (V4). The author evaluates the main regulatory requirements of EU law in the area of numerical fiscal rules and their impact on the yield on basic securities such as ten-year government bonds, which directly influences the cost of servicing long-term public debt. The article verifies the research hypothesis that

> the application of fiscal rules in non-Eurozone countries remains without significant impact on the yield on ten-year government bonds.

The paper will point out solutions applied in relation to fiscal rules measured by the *Standardised fiscal rules index*[4] in the countries of the Visegrád Group (V4): the Czech Republic, Slovakia, Hungary, and Poland. The author decided to analyze the impact of fiscal rules on the socio-economic policy of the V4 countries, which reveal many common traits but, at the same time, significantly differ. For instance, they share a post-communist background, but Slovakia is already a member of the Eurozone.

The principles and fiscal rules applied in the European Union (EU) member states result from the provisions of the EU's treaties that concern the fulfillment of the convergence criteria. These terms explicitly point that the fulfillment of the nominal convergence criteria is necessary, even if it does not decide about the final shape and purpose of economic policy pursued by individual countries (Postuła, 2017; Schick, 2010). Therefore, it is important to look for the elements that distinguish individual countries in the financial market by valuating the securities they issue.

Fiscal Policy and the Yield on Government Securities

Article 126 of the Treaty on the Functioning of the European Union obligates EU member states to avoid an excessive deficit of the general and local government sectors. The Council of the EU declared that the main objective of the Stability and Growth Pact (SGP) are the efficient finances of the state, which are to serve maintaining price stability, sustainable economic growth, and jobs creation. The SGP consists of two regulations and a European Council resolution of 17 June 1997 regarding the SGP (Official Journal of the European Union). The first regulation concerns the strengthening of the supervision of budgetary positions and the supervision and coordination of economic policies (Regulation (EU) No 1175/2011 of the European Parliament and of the Council of November 16, 2011). The second regulation deals with the acceleration and clarification of the excessive deficit procedure (Council Regulation (EU) No 1177/2011 of 8 November 2011 amending Regulation (EC) No 1467/97). The main intention of the SGP is to improve the financial and economic standing of EU countries and eliminate possible abuses in macroeconomic policy. The macroeconomic stability of the Eurozone countries rests on fiscal policy. The experiences of the functioning of the Eurozone and the entire EU indicate that the quality of fiscal policy and the condition of public finances, especially

[4] *Standardised fiscal rules index* is created and monitored by the European Commission. This index is created on the basis of information on the advancement in the implementation of fiscal rules in a given EU country. The basis for its calculation is the fiscal rule strength index (FRSI), which takes into account five basic criteria: (1) statutory basis of the rule; (2) space for changing objectives; (3) mechanisms to monitor compliance and enforcement; (4) existence of a pre-determined mechanism of implementation; and (5) media visibility of the rule. This methodology was inspired by Deroose, Moulin, and Wierts (2005). For the above criteria, the results receive an aggregated calculation of the composite Fiscal Rule Strength indicator for each rule.

 DOI: 10.7206/jmba.ce.2450-7814.325

during the financial crisis of 2008, was characterized by the use of non-standard solutions and decisions that could affect the rating of government bonds. Fiscal policy was where countries avoided both the objectives of the SGP and its provisions which limit the possibility of expansionary fiscal policy and increase public spending.

The analysis of data on debt, deficit, and budget expenditures structure allows us to formulate the following thesis. The first decade of the Eurozone saw some member countries and other EU member states use "additional" funds from the reduction of debt servicing costs for new expenses, instead of decreasing the deficit and limiting public debt. As a consequence, these governments fell into a spiral of debt that led to the crisis of public finances in their own countries and seriously threatened the stability of the entire European Union (Shiller, 2016). Their actions contradicted the essence and aim of the Stability and Growth Pact but not necessarily its literal meaning, which testifies to the imperfection of its construction and pragmatics of the use of its regulations by EU institutions and member states. The fiscal authorities of some countries used the mechanism of "moral hazard" to consciously exploit the possibility of increasing public spending to the point of excess. However, the temptation to incur additional budgetary expenditure, alternative to the prudential fiscal policy tightening, turned out much stronger than anticipated. This can be seen when analyzing the evolution of cyclically adjusted public expenditure without debt-servicing costs. To overcome the temptation and limit the use of moral hazard by fiscal authorities in some countries, the quality of political life needs improvement both in moral respect and in the legislative realm. The defense against moral hazard lies in legal solutions and their effective enforcement.

The above thesis directly concerns the cost of servicing the debt because it constitutes a significant position in budget expenditures, besides social insurance. Specialists expect and recommend the reduction of expenses on debt servicing costs not only due to financial reasons but also because it does not incite negative social reactions and protests from its potential beneficiaries of such expenditures as in the case of other expenditure items. At the same time, financial markets positively evaluate such actions and decisions which may contribute to the decline in the yield on government securities. The level of debt servicing costs directly depends on the size and structure of public debt and the average interest rate. The analysis of parameters related to the value of public debt requires considering the impact of time in the assessment of values and trends related to the valuation of money over time. Both cost accounting parameters in stabilized economies are relatively easy to predict because the size and structure of debt do not change stepwise. Moreover, current changes in market rates demanded by creditors mainly concern newly issued debt and affect the average interest rate on the entire debt insignificantly. However, in the event of a crisis, instability of financial markets,

and high volatility, these parameters may undergo considerable fluctuations. Then appear discussions about the priority of the parameter of debt structure over its size. A perfect example is the case of Japan, which has no major problems with servicing its large debt (about 250% of GDP) due to its structure. The Eurozone crisis proved that the amount of debt is not as important as the resulting credibility and confidence of financial market participants. Therefore, one of the key factors in the relationship credibility-state-indebtedness is the yield on government bonds; especially the ten-year bonds, because the state uses them as the basic financial instrument to raise capital.

Enormous public aid to sustain the financial sector and the national economy financed from the deficit may radically increase the debt from year to year, as in the case of Ireland in 2008–2011. As a consequence, the country's creditworthiness is reduced and, in an extreme situation, its loss means a significant increase in current interest rates on bonds that seriously raise debt servicing costs or limit the possibility of financing them (an example of a change in the size of the debt and Greek bond rates).

Characteristics and Significance of the EU Bond Market

The elementary source of capital acquisition to finance deficits and a rollover of the existing obligations are ten-year government bonds. The state bonds market today is undoubtedly the most important strategic market for most economies, particularly for the broadly-understood EU and Eurozone economy. An important component of long-term demand consists in the so-called convergence strategies that involve investing in high-interest assets in emerging countries in order to obtain a significant surplus of profitability in relation to investments in mature domestic markets. The convergence strategy counts on a twofold source of profit: one resulting from a favorable interest rate difference, while the other comes from the expected appreciation of the local currency (Mielus, 2011; Prasad, 2009).

Eurozone countries currently issue Eurozone bonds in a decentralized manner, via a variety of procedures. Recent years exposed their risks, which not only result from the assessment of the situation in the public finance sector but also are a reflection of the macroeconomic condition of the economy. The state or, specifically, the state's treasury is the guarantor.

The debt issue in the form of securities creates its supply, which forms one of the most important valuation elements of the financial market. The sum of issued and still non-overdue government bonds is an essential component of public debt and remains deci-

 DOI: 10.7206/jmba.ce.2450-7814.325

sive for its servicing costs. The incurrence of obligations on the financial market implies the need to service debt, i.e. to pay interest and to buy-back matured issues. This means that it is necessary to place subsequent bond issuance, which is used both to roll over existing debt and to handle coupon payments. Therefore, the crucial elements of public debt are its structure, maturity (duration), and methods of calculating interest and liquidity of trade in these securities. High liquidity is one of the factors with which government bonds attract interest from institutional investors (Galbraith, 2015). In theory, scholars assumed that bonds issued by the state are the safest, hence their yield is the lowest. Nonetheless, the case of Greece revealed that this is not a rule without exceptions. The fiscal problems of the EU countries after the collapse of the financial markets in 2008 showed that the market of state-issued bonds does not have to be a safe haven and an unlimited guarantee of capital acquisition. Moreover, in an extremely negative environment and long-term perspective, this market may transform into an effective tool to create a spiral of debt. After 2009, even an EU member state ceased to guarantee investment security. The investors saw that and began to move assets in search of not profit but security improvement (James and Poterba, 1994). The most liquid segment of the debt market became satisfied their needs best: ten-year state bonds of those countries that investors traditionally identified as financial safe havens (Klepacki, 2017). After 2008, a marked change in the valuation of Eurozone countries debt occurred that significantly restored the diversities noted several years earlier (Grauwe and Foresti, 2015). From the viewpoint of the current debt servicing costs, we must note that the stabilization of existing yields on long-term bonds in 2001–2007 resulted in a systematic reduction in the average interest rate of all serviced debt along with the evolving refinancing of old debt with new bonds (Klepacki, 2017).

The intensification of the Eurozone public debt crisis motivated a wider debate on the possibilities of improving the security and stability of this source of financing. On July 6th, 2011, the European Parliament asked the European Commission to examine the feasibility of the concept of joint issuance of bonds as part of its effort to adopt the legislative package on the Eurozone's economic governance. The Parliament stressed that the joint issuance of stability bonds would also require a further step toward a common budgetary and economic policy. These processes perfectly prove that deeper integration is only a matter of time, and the government bond market becomes an integral point of reference for the concept of a fiscal union. It is therefore obvious that, regardless of the nature and character of the actions, they will appear along with a significant strengthening of budgetary surveillance and policy coordination to ensure a significant counterbalance to the risk of moral hazard and sustainability of public finances. The purpose of such measures is also to support competitiveness and help to reduce harmful macroeconomic imbalances.

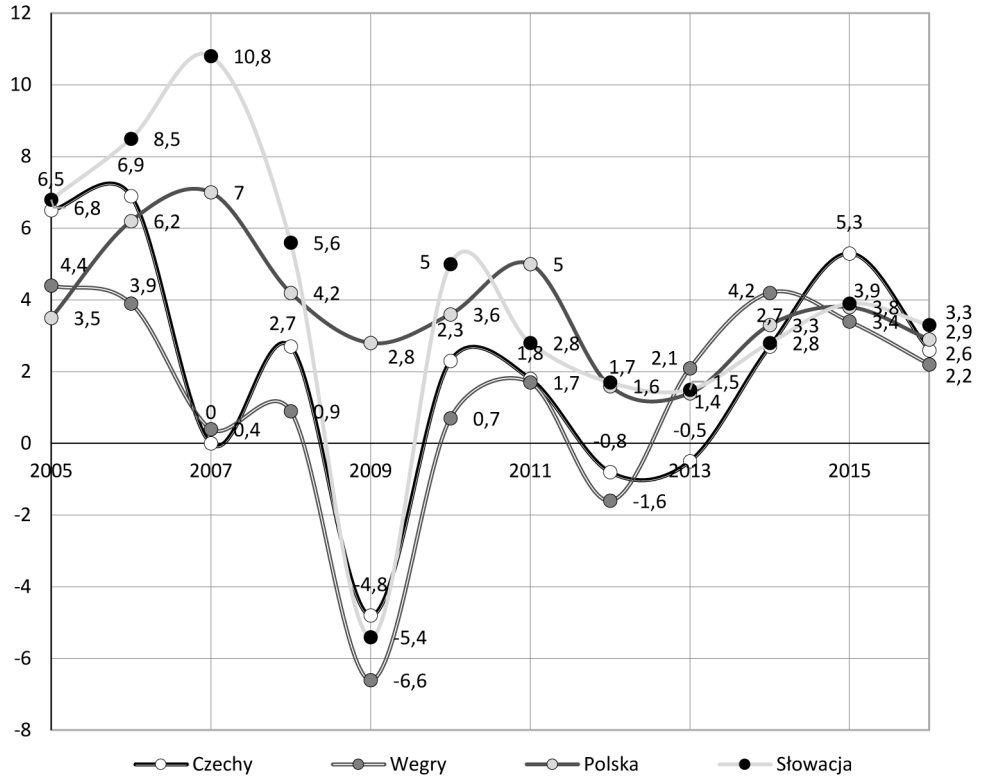
Assessment of the Economic and Social Situation of the Visegrád Group Countries in 2005–2016

The output parameter to analyze the situation in the Visegrád Group countries (V4) is the scale of economic growth that affects the shaping of its component aggregates and fiscal situation (Gadomski, 2016). The scale of the V4's Gross Domestic Product (GDP) growth in 2005–2016 (see Figure 1) covers two distinct periods. In the years 2005–2009, after a short period of a positive impulse from the accession to the European Union, the V4 began to gradually lose economic growth which intensified in the crisis of 2008. Such global developments caused a negative balance of GDP growth in three V4 countries, with only Poland noting an economic growth of 2.8% in 2009. The second period of 2010–2016 saw a very gradual and even recovery from the crisis and the establishment of steady economic growth mostly based on public sector expenditure in the V4. In these years, Poland and Slovakia had the steadiest growth, while Hungary and the Czech Republic operated through short-term development impulses, visible in their GDP growth results.

When conducting analyzes that reach beyond the mere rate of economic growth, one must remember the importance of its components, which affect the standard of living of citizens and the condition of public finances. For this purpose, the authors used the index on consumption, investments, and productivity for 2010, the year in which the world slowly began to achieve a post-crisis equilibrium. The data clearly shows that the 2008 crisis mostly affected the level of investment in the Visegrád Group countries, which undoubtedly referred to the situation in the financial market. *Gross capital formation index* for all V4 countries (2010=100%) dropped from about 115–120% in 2005–2008 to only 90% in 2009. Only the next few years saw its recuperation to its pre-crisis state. The crisis had a definitely lesser impact on the level of the *Final consumption expenditure index* (2010=100%) which retained its growth in the V4 countries after a slight decrease in 2011–2012. Extraordinary external factors that occurred since 2008 – the global financial crisis, economic downturn, and debt problems in some European countries – have strengthened the importance of responsible and effective fiscal policy in most OECD countries, including V4. The consolidation packages supported the pursuit of responsible and effective fiscal policy oriented toward economic goals. In the analyzed period, and directly before it, the V4 authorities acted in this fashion several times (see Table 1), which translated into their state of public finances as defined in the OECD Economic Outlook (2007).

 DOI: 10.7206/jmba.ce.2450-7814.325

Figure 1. GDP growth in 2005-2016 in the Visegrad Group countries



Source: own elaboration based on Eurostat data.

Table 1. Consolidation episodes in selected countries

1.	Czech Republic	2004–2004, 2010–2013
2.	Hungary	2003–2004, 2007–2009, 2012–2012
3.	Poland	2005–2005, 2011–2013
4.	Slovakia	2011–2013

Source: own study based on: OECD Economic Outlook 100 database, International Monetary Fund (2016), European Commission (2015), OECD (2007).

The Impact of the *Standardised fiscal rules index* on the Level of Public Debt and Its Servicing Costs

The initial parameters for the assessment of the fiscal policy pursued by the Visegrád Group countries are the size of the debt, public sector deficit, and public debt servicing costs, the yield on government securities, and, in the case of this particular study, the fiscal rules index (see Table 2).

The available data and information offer several basic conclusions for each country. The Polish fiscal rules receive a relatively high appraisal in comparison to other EU countries, which is reflected in the level of fiscal rules indices published by the European Commission (Alińska and Kosycarz, 2017). However, the ultimate verifier of the "quality" of the rules is the general and local government institution sector, measured by its financial balance and level of debt. Since the mid-1990s, the Polish deficit of the sector has remained at an average level of ca. 4.5% of GDP, and its temporary limitation was primarily the result of economic prosperity but very rarely of consolidation measures. Even in the period of the largest economic boom, the government did not balance its general and local institutions, which means that the structural deficit in the analyzed period was clearly higher than the level of the medium-term budgetary objective (MTO), which for Poland is -1.0% of GDP. At the same time, the debt-to-GDP ratio has permanently fallen below the constitutional and EU treaty norm of 60%, regardless of the methodology used (European or national). Despite this decrease, the yield on ten-year Polish bonds remained high in comparison with other V4 countries.

Hungary is the only V4 country whose level of public debt to GDP in the analyzed period constantly exceeded 60% and systematically increased by several percent each year. Its level fluctuated around 70% of GDP and always remained below the EU average; for instance, in 2016, Hungary's debt to GDP was 73.9% while the EU average was 83.2%. The European Commission assessed this state of affairs in the *Standardised fiscal rules index*, which assumed negative values for several years and thereby proved the ineffectiveness of fiscal rules applied by the Hungarian authorities. In Hungary, the effective numerical rule is the public debt rule that was in force in 1996–2011 at the level of local administration. During this period, the debt rule with regard to the government and social security sectors was in force since 2009. The rule requires a budget act to determine the original balance sheet goal for the second year following the subject year in such a way that (a) the original balance target was not the primary deficit, (b) the actual public debt would not increase in the year following the last, and (c) the expected public debt at the end of the second year after the target year would not be higher than the debt at the end of the second year preceding the year in question. One must deter-

 DOI: 10.7206/jmba.ce.2450-7814.325

Table 2. Basic indicators of public finances in 2005-2016 in the Visegrad Group countries

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Czech Republic												
Public debt % of GDP	27.9	27.7	27.5	28.3	33.6	37.4	39.8	44.5	44.9	42.2	40	36.8
The cost of servicing debt in the total expenditure (in %)	2.7	2.7	2.8	2.5	2.9	3.1	3.1	3.2	3.2	3.1	2.6	2.4
Standardised fiscal rules index	0.33	0.33	0.33	0.33	0.99	0.62	1.06	1.06	2.90	2.90	2.90	2.9
Interest on 10-year government bonds	3.5750	3.7590	4.2295	4.8000	4.9760	3.9200	3.6795	2.9740	2.1100	1.6490	0.8315	0.4870
Poland												
Public debt % of GDP	46.4	46.9	44.2	46.3	49.4	53.1	54.1	53.7	55.7	50.2	51.1	54.1
The cost of servicing debt in the total expenditure (in %)	5.8	5.5	5.2	4.9	5.6	5.6	5.9	6.4	6.1	4.8	4.4	4.4
Standardised fiscal rules index	0.73	0.73	1.41	1.41	0.73	1.09	1.09	1.41	1.38	1.23	1.52	1.58
Interest on 10-year government bonds	5.3115	5.1335	5.5955	6.4165	5.8665	5.7820	5.9755	4.6730	3.8185	3.5765	2.6930	3.2450
Slovakia												
Public debt % of GDP	34.1	31	30.1	28.5	36.3	41.2	43.7	52.2	54.7	53.5	52.3	51.8

DOI: 10.7206/jmba.ce.2450-7814.325

The cost of servicing debt in the total expenditure (in %)	4.7	4.2	4.1	3.8	3.5	3.3	4	4.5	4.7	4.7	4	3.9
Standardised fiscal rules index	0.00	0.00	0.00	0.00	-0.03	-0.03	-0.03	1.81	1.81	2.52	2.52	2.52
Interest on 10-year government bonds	4.4500	4.57	4.7500	4.7000	4.9050	4.2100	4.6050	3.9700	2.7250	1.7300	0.9700	0.7400
Hungary												
Public debt % of GDP	60	64.1	65	71	77.2	79.7	79.9	77.6	76	75.2	74.7	73.9
The cost of servicing debt in the total expenditure (in %)	8.2	7.4	8.2	8.4	9	8.5	8.5	9.5	9.2	8.1	7	6.9
Standardised fiscal rules index	-0.75	-0.75	0.33	0.33	0.10	0.10	0.10	-0.96	-0.23	1.82	1.91	1.91
Interest on 10-year government bonds	6.5050	7.4700	7.0200	9.1100	10.0200	7.5450	8.5050	8.5250	5.9350	4.9300	3.5650	3.2900

Source: own study based on Eurostat.

DOI: 10.7206/jmba.ce.2450-7814.325

mine the change in the planned primary government expenditure between the first and second year after the target year in real terms (European Commission, 2016). In subsequent years, this rule was clarified so that the changes in 2015 state that, as long as public debt exceeds half of Gross Domestic Product (GDP), the National Assembly can only adopt such a budget act which includes public debt reduction in the proportion of GDP.

Slovakia is the only V4 country that joined the Eurozone. The country has never had a problem with meeting the 60% of GDP criterion because it was always well below this referential value. However, the implementation of obligations resulting from the signage of the European Fiscal Compact in 2012 led to the introduction of a new debt rule, the scope of which covered the entire public finance sector. This principle was introduced by the constitutional law on fiscal responsibility. The solution is similar to the appliance of prudence and recovery procedures in Poland since 1998. Slovakia introduced four debt thresholds: (1) 50–53% of GDP; (2) 53–55% of GDP; (3) 55–57% of GDP; (4) 57–60% of GDP (Moździerz, 2015). The yield on long-term securities in the period of Slovakia's membership in the EU decreased from 4.4500 in 2005 to 0.7400 in 2016.

The situation of the Czech Republic unfolded similarly to that of Poland. Throughout the whole analyzed period, the Czech public debt was at a low level of, e.g., 36.9% of GDP in 2016. The Czech Republic is a country with the lowest yield on long-term government securities and receives the highest rating from the European Commission with regard to the fiscal rules index from among the V4 countries. Despite the good results of the public finance sector and high ratings of the European Commission, in 2016 the Czech Republic created a new framework that included the following elements: a spending rule that aims to limit the growth of expenditure through cyclically adjusted revenues and a debt brake at the level of 55% debt-to-GDP ratio in order to avoid unbalanced levels of debt. Moreover, the institution of a Budget Council supplements this set of rules (Baxa and Paulus, 2016).

Model Analysis of the Impact of Fiscal Rules on the Yield on Securities in the Visegrád Group in 2005–2016

To examine whether there is a relationship between the assessment of fiscal rules by the European Commission and the interest rate on long-term government bonds, the authors performed Pearson's *r* correlation analysis. It is a parametric method that examines the relationship between two variables measured on a quantitative scale. Statis-

tically significant results indicate the existence of a relationship between variables. Relationships between variables may be positive or negative; in both cases, an increase of one variable is related to the decrease of the second variable. Then, the authors conducted a series of regression analyzes for variables with statistically significant results to examine the impact of *Standardised fiscal rules index* on other indicators. Regression analysis concerns the effect of the predictor on the quantitative dependent variable. The statistic *t* and its corresponding level of statistical significance examine the significance of the impact. The standardized coefficient β corresponds to the Pearson *r* ratio. In the description of the results, one may also present a non-standardized coefficient *B* and its *SE*. This coefficient expresses how much the tested dependent variable will increase when the level of *Standardised fiscal rules index* increases by one unit. There is also the *R2* coefficient of determination, which tells what percentage of the dependent variable is explained by the *Standardised fiscal rules index*. The higher the *R2*, the better the *Standardised fiscal rules index* describes the variability of the tested indicator.

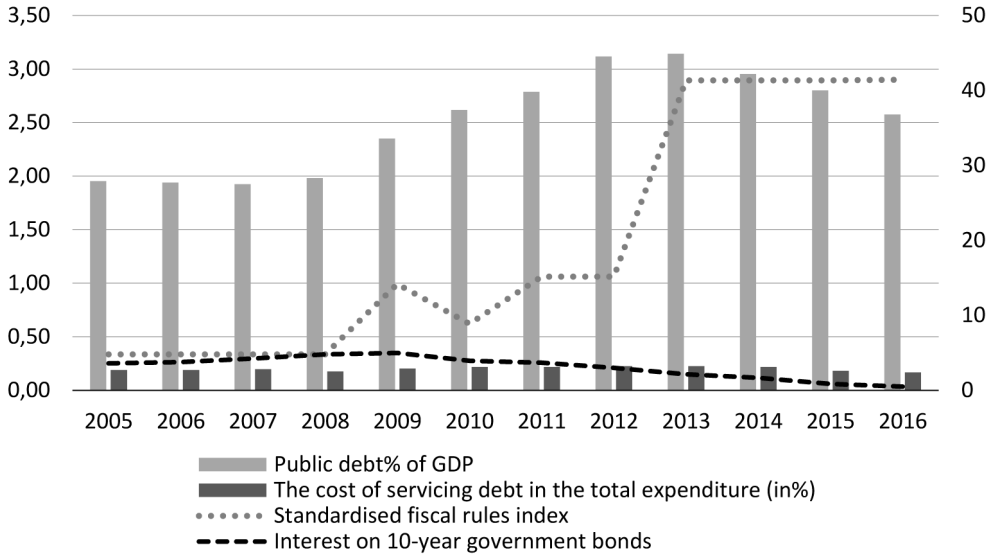
Because the analyzed variables recorded constant trends, the author conducted a regression analysis with the consideration of time. In the case of the Czech Republic, Poland, and Hungary, the author performed a series of regression analyzes that limited the results to the β and *t* ratio and the level of statistical significance of dependence. Unfortunately, accounting for the impact of volatility over time in the analyzed period, the *Standardised fiscal rules index* did not significantly affect the yield on long-term securities for V4 countries other than Slovakia.

The author considered the results to be insufficient and therefore examined the correlation between the *Standardised fiscal rules index*, the yield on long-term government securities, the share of debt servicing costs in total expenditure, and the size of the public debt in relation to GDP (Figure 2).

A reverse correlation with small deviations between the *Standardised fiscal rules index* and the yield on ten-year government bonds is clearly visible in the example of the Czech Republic. This case is especially interesting because the miscorrelation has been already present since 2008 – the collapse of global financial markets – and we observe its significant reinforcement at the end of 2012 and beginning of 2013, that is, during the peak of the second wave of the crisis, the so-called fiscal crisis. The preservation of a positive correlation of the increase in volatility in the time between *Standardised fiscal rules index* and public debt as the percentage of GDP – with the simultaneous lack of adequate changes in the yield on government bonds – may be related to the liquidity of the debt securities market in the period.

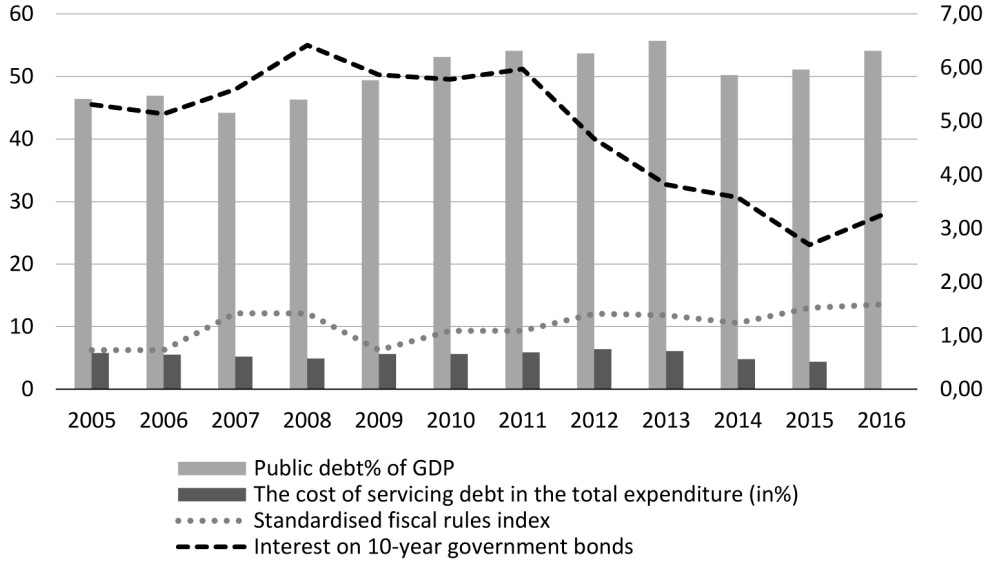
 DOI: 10.7206/jmba.ce.2450-7814.325

Figure 2. Public debt ratio, standardized fiscal rules index, debt servicing costs in total expenditure and 10-year government bonds in the Czech Republic



Source: own elaboration based on Eurostat data.

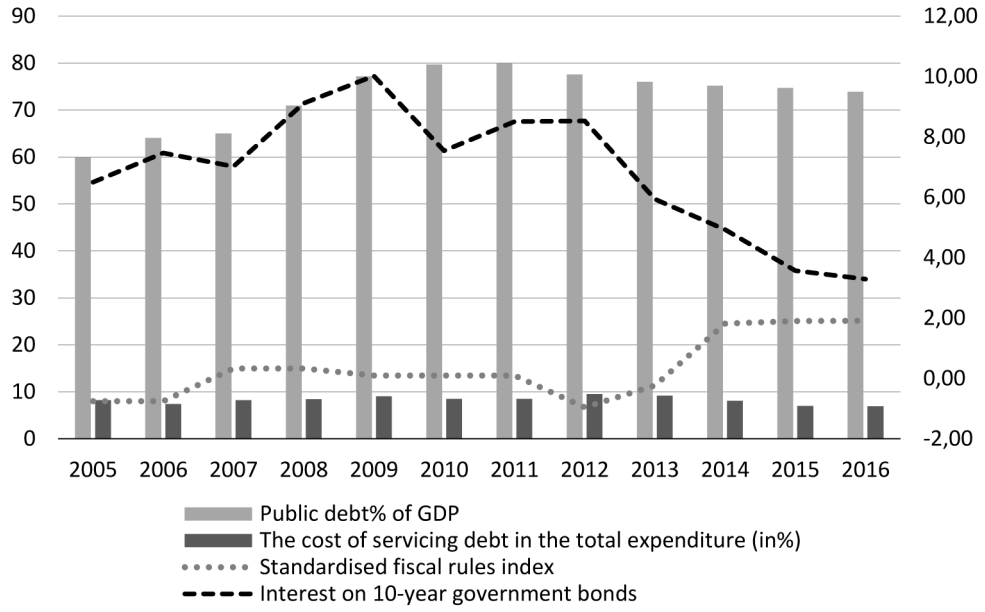
Figure 3. Public debt ratio, standardized fiscal rules index, debt servicing costs in total expenditure and 10-year government bonds in Poland



Source: own elaboration based on Eurostat data.

In the case of Poland, there is no correlation between the *Standardised fiscal rules index* and other variables. From the beginning of its EU membership, the European Commission assessed Polish fiscal rules fairly high, which results, among other things, from the regulation of the debt rule at the constitutional level; until 2017, besides Poland, only Germany and Austria had fiscal rules defined in the constitution. At the same time, such a strong legal anchoring of the debt rule and never exceeding the level of 60% in relation to GDP in the analyzed period did not affect the yield on ten-year bonds and the share of debt servicing costs in the entire expenditure of the Polish public sector.

Figure 4. Public debt ratio, standardized fiscal rules index, total debt servicing costs in total expenditure and 10-year government bonds in Hungary

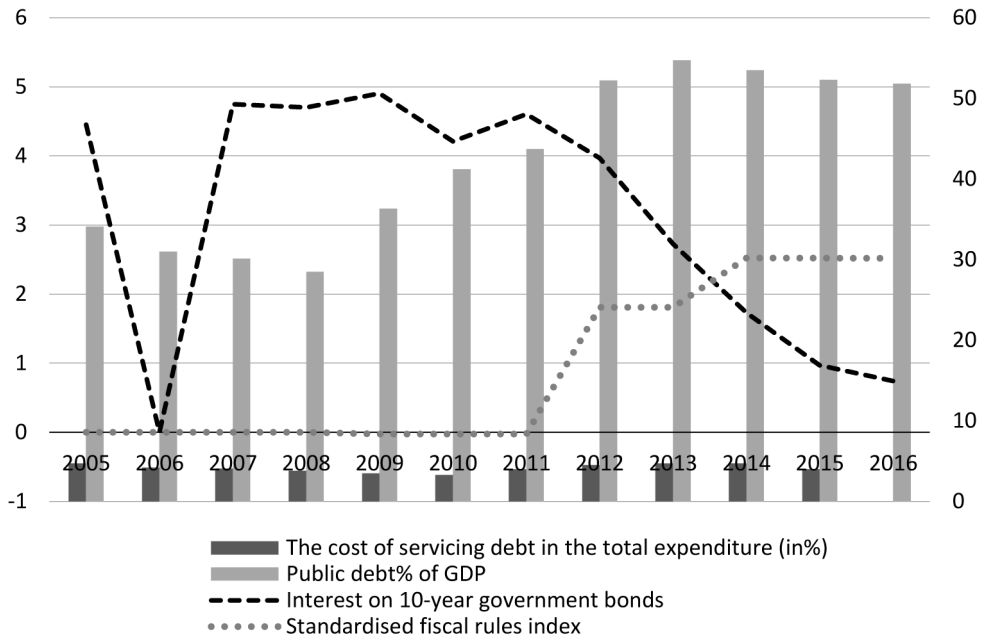


Source: own elaboration based on Eurostat data.

Hungary is a very interesting case in which the relation between the *Standardised fiscal rules index* and other variables is similar to the situation in Slovakia five years earlier. One may observe a strengthening of regulations, which was reflected in the assessments of the European Commission and the financial market.

 DOI: 10.7206/jmba.ce.2450-7814.325

Figure 5. Public debt ratio, standardized fiscal rules index, total debt servicing costs in total expenditure and 10-year government bonds in Slovakia



Source: own elaboration based on Eurostat data.

A different situation occurred in Slovakia. Table 3 contains only variables directly impacted by the *Standardised fiscal rules index* after accounting for the trend over time.

Table 3. Results of regression analysis for Slovakia

Slovakia	B	SE	β	t	p
Government bond 10 year yield	-0,98	0,34	-0,74	-2,86	p<0,05*

Source: own study based on Eurostat.

When considering the impact of volatility in time for Slovakia, the *Standardised fiscal rules index* turns out to have a significant negative impact on the yield on ten-year government bonds.

Moreover, there is a clear inverse relationship between the fiscal rule index and the yield on the long-term government bonds since Slovakia's accession to the Eurozone.

The years 2013–2014 witnessed direct dependency of long-term securities on the *Standardised fiscal rules index*. In this instance, there appears a so-called premium from the financial markets for Slovakia's accession to the Eurozone.

Recommendations for the Principles of Fiscal Rules Creation

Countries require the application of appropriate rules, principles, or forms of behavior at the level of the fiscal authorities to overcome moral hazard and limit the use of pro-cyclical solutions in the public finance sector while meeting EU requirements and decisions. The method of defense against the temptation of abuse should rely on the use of suitably prepared legal solutions. These solutions will, on the one hand, exert a positive influence on the balance in the public finance sector and, on the other, constitute the basis for a market premium in the rating of the yield on government securities. It is also important to indicate the main areas of EU and national legislation that are to limit the negative consequences of market imbalances and fraud in fiscal policy. Based on a large variety of legislative solutions, applied in the national law of individual EU countries, many attempted to organize rules and principles at the level of the European Union. As a result, in November 2011, a non-legislative act was adopted; that is, the Council of the EU Directive on the requirements for the budgetary framework of member states (Council Directive 2011/85 / EU). The budgetary framework, in this case, means a set of arrangements, procedures, rules, and institutions that form the basis for conducting budgetary policy of the general and local government sector. The directive indicates its utilitarian purpose as ensuring compliance with the obligations of EU member states with regard to the avoidance of excessive public deficits. However, the structure and content of the document indicate indirect consequences of its implementation to the law of individual EU countries in the form of ordering national rules and fiscal procedures according to uniform, transparent, and understandable criteria. The purpose of the directive is to achieve compliance with the accepted commitments and, thus, to prevent the use of moral hazard in the area of autonomous fiscal policy. Of course, there remains the moral dilemma that even the most pragmatic and adequate rules may not be respected. Another area of change that limits the negative mechanism concerns the effective implementation of the medium-term horizon of fiscal policy. The introduction to the directive states that budgetary planning at the national level may agree with both the preventive and corrective parts of the Stability and Growth Pact only when this planning adopts a multi-annual perspective while prioritizing medium-term budgetary targets. Moreover, the basis of the planned and annually adopted budgetary act should involve multi-annual budgetary planning that results from a medium-term budgetary framework.

 DOI: 10.7206/jmba.ce.2450-7814.325

The final direction of the changes to eliminate the discussed problem concerns the restoration of the significance of the debt component in the fiscal convergence criterion. Previously, the lawmakers pragmatically considered the supremacy and higher functionality of fiscal rules related to the sector's result, income, or expenses. They treated rules regarding public debt as secondary because the view prevailed that the size of public debt indirectly resulted from the formation of expenditures, revenues, and the sector's result. Leaving the debt of many countries clearly above the limit of 60% of debt--to-GDP indicated the fictitiousness of this norm and the extraordinary privilege of countries that did not abide by it or at least sufficiently strive to achieve it. In practice, even by the end of 2010, there was a tendency to underestimate the debt component in the fiscal criterion, which was one of the reasons for the ineffectiveness of the excessive deficit procedure. Options of the debt management strategy determined by the cost of money should have their source in fiscal rules or refer to them. The main denominator of fiscal rules and long-term interest rates is the present and future level of debt servicing costs. The increase in interest rates, or even the very prospect of their growth, should determine the direction of the policy of managing the costs of debt servicing, including dedicated financial instruments (Floyd, 2009). The new form of the Stability and Growth Pact, adopted in November 2011, precisely defines the numerical principles of debt reduction in countries whose debt exceeds the 60% limit, so that a country that exceeds the limit must repair the situation. Unfortunately, no EU regulation refers to debt servicing costs.

It is important to use fiscal rules despite there being no direct correlations with macroeconomic indicators, as they limit the room for decision-making influenced by the lobbying of specific interest groups as part of given coalition or government. Research confirms that the likelihood of the expenditure and deficit increase rises when the government is free to take unrestricted allocative decisions (Egger and Koethenbuerger, 2010; Roubini and Sachs, 1989; and Alesina and Perotti, 1995). The use of fiscal rules in fiscal policy also creates an opportunity to alleviate the information asymmetry between decision-makers and voters. Rules show the available latitude for action after gaining power in election (by definition, not all electoral promises can be fulfilled; see, e.g. Brender and Drazen, 2005; Shi and Svensson, 2006), partly reduce impatience and short-sightedness (see, e.g. Van der Ploeg, 1984; Rogoff and Bertelsmann, 2010). Practitioners and theorists unanimously indicate that the use of fiscal rules decreases the level of external pressure on conducting inefficient fiscal policy (Dixit and Lambertini, 2003; Combes et al., 2014). Research on fiscal rules also demonstrates quite clearly that there is no single most effective model of fiscal rules. Their choice should be adapted to a given country's specificity, the structure of macroeconomic aggregates and public management instruments used by them.

Conclusions

However, the fulfillment of the nominal convergence criteria, which results from the treaty provisions of the European Union, is not the ultimate goal of economic policy but it is a rational method that one may apply to ensure a stable and balanced economic development with sound public finances in the medium and long-term. The reduction of a country's credit and, in an extreme situation, its loss means a significant increase in the cost of servicing public debt by an increase of the yield on government bonds. Government securities act as a barometer used to assess the situation not only in the area of public finances but also in the macroeconomic approach. However, the costs of servicing public debt to a high degree depending on the level of interest rates are also created by market factors, investor sentiments, the macroeconomic environment, the security perspective, and risk indicators. Thus, the level of interest rates is the predominant determinant of public debt servicing costs, but not the only one. Therefore, creating a public debt management cost policy requires long-term forecasting.

The results of the quantitative and qualitative research indicate that – regardless of the introduced regulatory solutions at the EU level – the basic parameters subject to financial evaluation of the fiscal rules index remain (1) the general government deficit and (2) public debt and its servicing costs. In the years 2005–2016, the relation of the general government deficit to GDP shaped in such a way that, in the case of all V4 countries, there was a need to introduce the excessive deficit procedure and additional disciplinary regulations at the national level. The analyzes presented in this article indicate that, apart from the Eurozone countries, the rating of the situation in the public finance sector in the area of budget deficit and public debt does not translate into the yield on government securities of such countries. The results of the model research show that, when evaluating or deciding to purchase government securities of non-Eurozone countries, the financial markets take into account the application of fiscal rules and the resulting possible consequences to a negligible extent. This means that investors, in evaluating the basic parameters characterizing the state of public finances, are examined through the prism of many other factors that determine the level of solvency of the country and the possibility of its development, which is reflected in the value of market interest rates.

This course of events clearly indicates the ineffectiveness of the principles of supervision and prevention of excessive deficit adopted by the European Union in 1997. The weakness of these solutions was related to non-compliance with national fiscal rules, or their lack, as well as the debatable effectiveness of medium-term financial planning in individual countries (Kołodko, 2014). There were significant discrepancies between

 DOI: 10.7206/jmba.ce.2450-7814.325

the earlier predictions and actual financial flows within the public sector. Financial markets decided to purchase government securities of non-Eurozone countries in a negligible way take into account the fiscal rules, as demonstrated by the results of model research.

This means that the comparison of basic changes in the fiscal aggregates in subsequent editions of convergence programs of individual countries – as well as differences between predictions and performance – requires a more in-depth analysis and necessitates the elimination of imperfections in the field of forecasting and planning.

Further reforms are needed to provide the EU with enough fiscal effectiveness and flexibility to build a solid framework for sustainable growth. Those can include fiscal responsibility laws comprising medium- and long-term fiscal frameworks, fiscal rules, and independent fiscal councils (Annett, 2006; Darvas, 2009). Regardless of the introduced regulatory details at the EU level, within the framework of the modified Stability and Growth Pact, the deficit of the public finance sector and public debt will remain the basic parameters subject to fiscal assessment. However, the financial market participants who trade government securities use a broader set of parameters for their decisions, which the European Parliament should include in their regulatory requirements.

References

Alińska, A. and Kosycarz, E. (2017). Implementacja i przestrzeganie reguł fiskalnych w wybranych państwach Europy Środkowo-Wschodniej. *Studia Prawno-ekonomiczne, CIII*: 173–191, https://doi.org/10.26485/SPE/2017/103/10

Annett, A. (2006). *Enforcement and the Stability and Growth Pact: How Fiscal Policy Did and Did Not Change Under Europe's Fiscal Framework.* IMF Working Paper 2006/116, https://doi.org/10.5089/9781451863765.001

Alesina, A. and Perotti, P. (1995). *Fiscal Expansions and Fiscal Adjustments in OECD Countries*. NBER Working Paper No. 5214, Issued in August 1995, NBER Program(s): Monetary Economics, http://www.nber.org/papers/w5214.

Baxa, J. and Paulus, M. (2016). *New Fiscal Rules for the Czech Republic*. Occasional Paper: 1/2016, https://www.econstor.eu/bitstream/10419/147516/1/861490215.pdf

Brender, A. and Drazen, A. (2004). *Political Budget Cycles in New versus Established Democracies*, NBER Working Paper No. 10539, Issued in June 2004, http://www.nber.org/papers/w10539

Darvas, Z. (2009). *The impact of the crisis on budget policy in Central and Eastern Europe*. Bruegel Working Paper 2009/05.

Dixit, A. and Lambertini, L. (2001). Monetary-Fiscal Policy Interactions and Commitment Versus Discretion in a Monetary Union. *European Economic Review, 45*(4): 977–987, https://doi.org/10.1016/S0014-2921(01)00134-9

Council Directive 2011/85/EU of 8 November 2011 on requirements for budgetary frameworks of the Member States https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32011L0085

Egger, P. and Koethenbuerger, M. (2010). Government Spending and Legislative Organization: Quasi--experimental evidence from Germany. *EPRU Working Paper Series 2010-09*, Economic Policy Research Unit (EPRU), University of Copenhagen. Department of Economics, https://ideas.repec.org/p/kud/epruwp/10-09.html

Fatas, A. and Mihov, I. (2003). On Constraining Fiscal Policy Discretion in EMU, *Oxford Review of Economic Policy*, *19*(1): 112–131, https://doi.org/10.1093/oxrep/19.1.112

European Commission (2010). *Public Finances in EMU – 2010*. Luxembourg: Publications Office of the European Union.

European Commission (2015). *Report on Public Finances in EMU*. Luxembourg: Publications Office of the European Union.

Fiscal Rules Database, European Comission, http://ec.europa.eu/economy_finance/db_indicators/fiscal_governance/fiscal_rules/index_en.htm (5.11. 2017).

Fiscal developments (2015). *Economic Bulletin*, *4*, European Commission, EU economic governance, https://www.ecb.europa.eu/pub/pdf/ecbu/eb201504.en.pdf (12.02.2018).

Floyd, J.E. (2009). *Interest Rates, Exchange Rates and World Monetary Policy*. Springer.

Gadomski, W. (2016). *Kraje Wyszehradzkie bliższe politycznie niż gospodarczo*, https://www.obserwatorfinansowy.pl/tematyka/makroekonomia/kraje-wyszehradzkie-blizsze-politycznie-niz-gospodarczo

Galbraith, J.K. (2015). *The End of Normal: The Great Crisis and the Future of Growth*, Free Press, Simon & Schuster, 2015, New York, https://www.amazon.com/End-Normal-Crisis-Future-Growth/dp/1451644930

Grauwe, P. de and Foresti, P. (2015), Fiscal Rules, Financial Stability and Optimal Currency Areas, *CESIFO Working Paper*, No. 5390, https://econpapers.repec.org/paper/cesceswps/_5f5390.htm

International Monetary Fund (IMF) (2010). *From Stimulus to Consolidation: Revenue and Expenditure Policies in Advanced and Emerging Economies*. Washington.

International Monetary Fund (IMF) (2016). *Fiscal Monitor: Debt – Use It Wisely.* Washington.

Klepacki, J. (2017). Rynek obligacji państwowych w dobie ujemnych stóp procentowych. *Finanse, Rynki Finansowe, Ubezpieczenia*, *1*(85): 541–553, https://doi.org/10.18276/frfu.2017.1.85-43

Kołodko, G.W. (2014). Nowy pragmatyzm, czyli ekonomia i polityka dla przyszłości, *Ekonomista*, *2*, http://www.pte.pl/pliki/2/12/Nowypragmatyzm.pdf

Mączyńska, E. (2016). Inkluzywność jako cecha przyszłego ładu społeczno-gospodarczego. W: M. Bałtowski (ed.), *Ekonomia przyszłości. Wokół nowego pragmatyzmu Grzegorza W. Kołodko*. Warszawa: Wydawnictwo Naukowe PWN, http://dx.doi.org/10.17951/h.2017.51.5.241

Mielus, P. (2011). Przekształcenia na rynku papierów skarbowych w dobie kryzysu finansowego. W: A. Alińska (ed.), *Sektor finansów publicznych w warunkach światowego kryzysu finansowego*. Warszawa: CeDeWu.

Moździerz, A. (2015). Strengthening the Post-crisis Fiscal Rules – the Case of Spain, Slovakia and Sweden. *EQUILIBRIUM Quarterly Journal of Economics and Economic Policy*, *10*(2), http://dx.doi.org/10.12775/EQUIL.2015.012

OECD (2007). *Economic Outlook, June 2007, Chapter IV. Fiscal Consolidation: Lessons from past experience*. Paris: OECD.

OECD (2009). *Economic Outlook, March 2009, Chapter III. The Effectiveness and Scope of Fiscal Stimulus*. Paris: OECD, http://www.oecd-ilibrary.org/economics/oecd-economic-outlook_16097408

OECD Economic Outlook 100 database, https://stats.oecd.org/index.aspx?DataSetCode=EO

 DOI: 10.7206/jmba.ce.2450-7814.325

OECD, *The state of public finances 2015: strategies for budgetary consolidation and reform in OECD country*, http://www.oecd.org/gov/the-state-of-public-finances-2015-9789264244290-en.htm

Postuła, M. (2017). *Finanse publiczne w architekturze współczesnej gospodarki. Teoria a polska praktyka gospodarcza*. Warszawa: Difin.

Poterba, J.M. (1994). State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics. *Journal of Political Economy*, *102*(4): 799–821, https://doi.org/10.1086/261955

Prasad, E. and Sorkin, I. (2009). *Assessing the G–20 Stimulus Plans: A Deeper Look*, https://www.brookings.edu/articles/assessing–the–g–20–stimulus–plans–a–deeper–look/ (5.03.2017).

Rogoff, C. and Reinhart, K. (2010). Growth in a Time of Debt. *American Economic Review: Papers & Proceedings*, *100*: 573–578, https://scholar.harvard.edu/files/rogoff/files/growth_in_time_debt_aer.pdf, https://doi.org/10.1257/aer.100.2.573

Schick, A. (2010). Post-Crisis Fiscal Rules: Stabilising Public Finance while Responding to Economic Aftershocks, *OECD Journal on Budgeting 2010/2*, https://www.oecd.org/gov/budgeting/48170224.pdf

Roubini, N. and Sachs, J. (1989). Political and economic determinants of budget deficits in the industrial democracies, *European Economic Review*, *33*(5): 903–933, https://econpapers.repec.org/article/eeeeecrev/v_3a33_3ay_3a1989_3ai_3a5_3ap_3a903-933.htm, https://doi.org/10.1016/0014-2921(89)90002-0

Shiller, R.J. (2016). *Finanse a dobrobyt społeczny*. Warszawa: PTE, http://www.pte.pl/pliki/2/1/Shiller_spis_tresci_wstep.pdf

Shi, M. and Svensson, J. (2006). Political budget cycles: Do they differ across countries and why?, *Journal of Public Economics*, https://www.jakobsvensson.com/uploads/9/9/1/0/99107788/pbc_jpubec.pdf

Van der Ploeg, LH, Liu, AY and Borst, P. (1984). Structure of the growing telomeres of Trypanosomes, https://www.ncbi.nlm.nih.gov/pubmed/6319026

Veblen, T. (2008). *Teoria klasy próżniaczej*. Warszawa: Muza.

World Economic Outlook Database https://www.imf.org/external/pubs/ft/weo/2017/02/weodata/index.aspx, (12.02.2018).

http://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX:52011DC0818 (12.02.2018).