EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

IMPACT OF THE CONSTITUTIONAL LAW ON BUDGET RESPONSIBILITY ON THE FISCAL POSITION OF THE SLOVAK GOVERNMENT

JAKUB KURILA[1] ─ GABRIEL PROCHÁZKA[2]

Abstract: *The paper evaluates the effect of the Constitutional Act on Budget Responsibility no. 493/2011 Coll. on the public debt of the Slovak Republic, by comparing the synthetic and real Slovakia, employing the synthetic control method. We examine the behavioral effect of the implementation of the fiscal rule on the government as well as the parliament. Based on the model we have estimated, we construct a contrafactual indebtedness of the Slovak government and we compare it with the observed indebtedness after the law of Budget Responsibility has been implemented. We are contributing to the literature by employing a similar approach as Salvi, Schaltegger, and Schmid (2020) did for Switzerland with the empirical evidence for the Slovak republic. Our analysis indicates that the effect of the Constitutional Act on the budget responsibility in Slovakia, measured by the public debt, was observed in our analysis, but remained statistically insignificant in the contrafactual period.*

Keywords: *public debt, budget responsibility rule, Slovakia, synthetic control method*

JEL Classification: K30, H50, H60

[1] Jakub Kurila, University of Economics in Bratislava, Slovak Republic,
e-mail: jkurila1@student.euba, https://orcid.org/0000-0001-6317-6722

[2] Gabriel Procházka, University of Economics in Bratislava, Slovak Republic,
e-mail: gprochazka1@student.euba, https://orcid.org/0000-0002-7459-8661

1 Introduction

The trend of rising debts correlates with important political and economic consequences extensively discussed in Reinhart and Rogoff (2010) and Alesina and Passalacqua (2016). The increasing debt levels of some EU countries in the periphery pose a lot of spillovers that threaten the price stability of the common currency some countries share. To avoid such a dramatic consequence of fiscal dominance the EU established strict fiscal regulation in primary EU law. The still ongoing debate on how countries can reduce their debt is also at the center of the research interest because literature has shown that high debt episodes also coincide with periods of low growth rates (Reinhart et al., 2012). The adaptation of the Stability and Growth Pact (henceforth S&G Pact) caused many of the EU member states to implement their own fiscal rules, usually with even stricter measures. It became a standard among the EU countries to prevent excessive debt accumulation by implementing and enforcing national as well as EU fiscal rules. The general effects of fiscal rules on fiscal policy are well empirically researched at the current period (Alesina and Bayoumi, 1996; Bohn and Inman, 1996; Fatás and Mihov, 2006; Guichard et al., 2007; Grembi, Nannicini and Troiano, 2016). We are contributing to the literature by employing a similar approach as Salvi and Schaltegger and Schmid (2020) done for Switzerland with the empirical evidence from the Slovak republic.

We mainly tried to compare the situations, not make assumptions about the fiscal rules. Our paper presents the effects of the Slovak national fiscal rule with stricter limits, in comparison with the S&G Pact, on the public debt. We analyze the consequences of the imposed fiscal rule (also referred to as the Budget Responsibility rule) on the public debt in Slovakia. Using the synthetic control method and public debt data for the period of 2000 to 2020, we find that this rule did not significantly affect the general debt by 0.83% after eight years – although this equals an annual reduction of 1.78 percentage points – compared to its synthetic counterpart. The effect was, however, limited and almost cancelled in the most recent years due to many reasons, we discuss in this paper.

The first part of the paper defines constitutional law on Fiscal responsibility, also known as the Budget Responsibility rule, the established Council for Budget Responsibility, its meaning, and functions, in the Slovak context. The next part shortly reviews the data and the synthetic control method used to construct a contrafactual scenario of Slovak budget conditions. The last part discusses the most interesting results of our quasi-casual inference.

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

2 Budget responsibility rule in Slovakia

This constitutional law was drafted in the year 2011 or the 5th electoral term of the Slovak Republic under the government of the parties SDKÚ-DS, SaS, KDH, and MOST-Híd. The Minister of Finance was Ivan Mikloš from the SDKÚ-DS. The proposal was submitted by a group of Members of the Slovak Parliament (P. Kažimír, J. Kollár, A. Marcinčin, O. Matej, J. Mikolaj, I. Švejna). For the vote, there were 147 members present (of the 150 in total) of the Slovak National Council, and 146 of these 147 voted in favor of the proposal. This Constitutional Law entered into force on March 1st. 2012.

The importance of keeping debt under certain levels is well researched by Ghosh et al. (2011). They state, that:*" ... governments in advanced economies usually behave responsibly, increasing primary surpluses in response to rising debt service so as to stabilize the public debt-to-GDP ratio at a reasonable level... Large shocks—such as wars or the fiscal fallout of financial crises—may cause temporary deviations from this primary balance "rule." As long as the subsequent increase in the primary balance is sufficient to offset the higher interest bill, however, the debt ratio will again converge to its long-run value... it cannot literally be true that, the primary balance would not always increase enough to offset the interest bill, because at sufficiently high levels of debt this would require primary balances that exceed GDP. If the primary balance does not keep pace with higher interest payments as debt rises, then even assuming a constant interest rate so as to abstract from the endogeneity of the risk premium on government debt, there will be a debt level above which the debt dynamics become explosive and the government will necessarily default. In fact, default will occur before this point because the rising risk premium, as default becomes imminent, exacerbates the debt dynamics. In particular, as the probability of default rises, so will the risk premium, making it less likely that the primary surplus will suffice to meet the interest bill, and raising the probability of default further. Eventually, the "fixed point" problem of a higher probability of default leading to a larger risk premium, in turn leading to a higher probability of default, has no solution at a finite interest rate. At this point (which we term the debt limit) the government loses market access, is unable to rollover its debt, and is forced to default."* The negative effects of debts exceeding certain levels were also hinted at by Baum, Checherita-Westphal and Rother (2013).

To sum this up, if the country gets dependent on the constant rise of debt but the price of borrowing increases, the country can lose its independence or ability to provide some services. Debts can become unaffordable, and countries can lose fiscal space and possibly lead to special administration, like Greece in 2011-2012. In theory, this can lead to default of the state, but even without counting on the default, high debts are still a problematic situation and countries with high debt tend to lose some of their sovereignty (as they are forced to accept certain restrictions if they want to get support from the European Monetary Institute). Therefore, to prevent such situations, most countries have established debt limits in their legal systems. At this moment some countries have their own debt rules, but we also have such rules at the intergovernmental level. In the European Union, the limit for public debt was set for all the countries at a 60% debt to GDP ratio. The debts among the countries in the European Union are rising in most recent years.

Slovakia has implemented its own rule with even stricter limits than the S&G pact. The constitutional law on Budget Responsibility consists of 14 articles. It begins with the description of the objective of the rule itself, which is to increase the efficiency and transparency of public spending. Generally, it is intended to achieve long-term stable growth and solidarity with future generations of the Slovak population. Article 2 defines the basic terms used in the law, in particular long-term sustainability. According to the Act, *"long-term sustainability is the achievement of the condition of the Slovak Republic's economy in which the government budget balance and government debt ensure that even the expected change in government revenue and government expenditure under the baseline scenario over the next 50 years will not cause the government debt to rise above the upper limit of government debt."* Subsequently, the law establishes and regulates the Council for Budget Responsibility as an independent authority, its functions, and scope, also the Macroeconomic Forecasting Committee and the Fiscal Forecasting Committee. Part of the rule is about the public debt levels that should not be breached. Every level, when reached, evokes the subsequent correction procedure. We describe these more in chapter 2.2.

2.1 The Council for Budget Responsibility

The Council for Budget Responsibility is an independent authority. Mainly, the Council monitors and rates the implementation of the rules on fiscal

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

responsibility. Council consists of 3 members, elected and recalled by the Parliament of the Slovak Republic. Each member must have expertise and experience in this area and is nominated by various authorities as follows (Council for Budget Responsibility, 2021b):

1. one member is proposed by the Government of the Slovak Republic,
2. one member is proposed by the President of the Slovak Republic,
3. one member is proposed by the Governor of the National Bank of Slovakia.

Current members are Mgr. Ján Tóth, M.A. (chairman), Prof. Ing. Anetta Čaplánová, PhD. and Mgr. Juraj Kotian. The term of the office of each member shall be seven years.

Pursuant to Article 4 of this Act, the Board shall perform the following tasks:

a. *"prepare and publish a report on long-term sustainability, including a baseline scenario and the determination of the long-term sustainability indicator, annually by 30 April and always within 30 days after the discussion of the Government's program statement and the vote of confidence in the Government,*

b. *prepare and submit to the Parliament a report on the assessment of the implementation of the rules of budgetary responsibility and the rules of budgetary transparency pursuant to this Act for the previous financial year by 31 August each year,*

c. *draw up and publish, on its own initiative, an opinion on legislative proposals submitted to the National Council, in particular about the implications for the general government budget and long-term sustainability; it may also draw up such an opinion on the initiative of a parliamentary caucus,*

d. *carry out other activities related to the monitoring and evaluation of the development of the economy of the Slovak Republic and the assessment of the fulfillment of the rules of budgetary responsibility, carry out other activities provided for by law."* (Act. No. 493/2011 Coll. on the Budget responsibility rule)

These tasks are rooted in the legal system. They should help to increase the probability of having a healthier economy. The Council is helping the state with improving its financial condition but does not directly indicate what

government spending should be. Apart from the mentioned tasks, the Council should inform the public and educate them in the field of public finance.

As written in Article 4(a), the Council analyzes the long-term sustainability indicator. The calculation method is published on the Council's website. In the determination, the Council considers:

a. *"the value of the structural primary balance,*
b. *demographic projections published by Eurostat,*
c. *the macroeconomic forecasts of the Committee for Macroeconomic Forecasts and the long-term macroeconomic forecasts of the European Commission,*
d. *long-term age-sensitive expenditure projections calculated by the European Commission,*
e. *long-term capital revenue projections calculated by the European Commission,*
f. *implicit commitments and contingent liabilities,*
g. *other indicators affecting long-term sustainability."* (Act. No. 493/2011 Coll. on the Budget responsibility rule)

2.2 Gross debt level and so-called ’debt brake’

From a policy perspective, the Slovak Budget Responsibility rule = government debt rule is a constitutional law. It was implemented in 2012, by the Slovak parliament. Among other things, the rule consists of a mechanism of self-imposing restrictions on the government when the debt reaches certain levels. There are 5 levels of sanctions. If the government debt to GDP ratio would reach:

1. **47 (inclusive) - 50% of GDP:** the Ministry of Finance (MoF SR) sends a written justification of the debt level to the National Council (NC SR), including a proposal for measures to reduce it;
2. **50 (inclusive) - 52 % of GDP:** the government submits to the NC a proposal for measures to ensure debt reduction and to reduce the salaries of the government members to the previous year's level;

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

3. **52 (inclusive) - 54 % of GDP:** the MoF SR commits 3 % of the current state budget expenditure, and the government and local governments approve budgets for the next year without a year-on-year increase in expenditure;
4. **54 (inclusive) - 57% of GDP:** the government may not submit a deficit budget to the NC and local governments are also obliged to approve only a balanced or surplus budget;
5. **57% of GDP and above:** the government of the SR requests a vote of confidence from the NC.

Table 1: Sanctions applied in the year 2021

47 – 50 % GDP + PROPOSAL FOR DEBT REDUCTION MEASURES
50 – 52 % GDP + FREEZING OF WAGES OF GOVERNMENT
52 – 54 % GDP + FREEZING OF / DECREASE IN BUDGET EXPENDITURE
54 – 57 % GDP + BALANCED / SURPLUS BUDGET
≥ 57 % GDP + GOVERNMENT'S TRUST VOTE

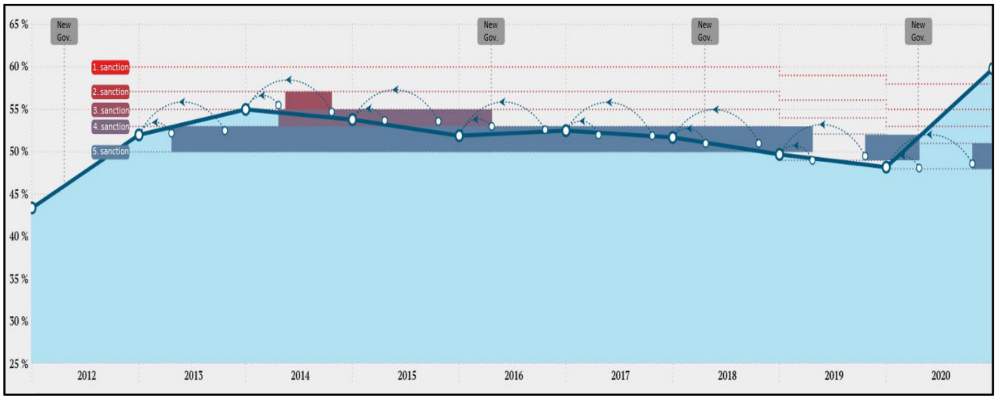
Source: The Council for Budget Responsibility (2021a)

Based on this, we recognize five penalty zones related to specific amount of debt. The individual penalties are cumulative. Everything is defined in the constitutional law on the Budget Responsibility rule. The law also defines exceptions, so-called escape clauses. When the sanctions will not be applied. Firstly, there is an exception applied in the state of war. The other exceptions are:

1. in the period of 2 years after the approval of the government's program statement or after the vote for confidence;
2. in the period of 3 years after the annual GDP growth decreases by at least 12 percentage points;
3. in the period of 3 years after the government expenditures exceed 3%

of GDP to recover the banking sector, eliminate the consequences of natural disasters and natural catastrophes, and expenditures resulting from the implementation of international treaties.

Figure 1: Evolution of public debt and sanctions applied



Source: The Council for Budget Responsibility (2021a)

2.3 Effects of the rule on budgetary expenditure

In this part of the paper, we wanted to look at the budgetary expenditure and see if the implementation of the budget responsibility rule caused any changes in the spending. The sole use of debt to GDP ratio can make an incentive for an actual decrease in absolute terms of debt to GDP ratio, but also foster a change in government spending from the sectors of high importance in a long run to the more politically attractive in the short run, which is not a socially desirable outcome of the debt limits.

Table 2: Growth rate of government expenditure by different categories

	Average annual growth rate (in %)			
	2004-2012	2012	2013-2019	2019
General public services	6,45%	11,90%	3,45%	12,52%
Defense	6,47%	2,14%	8,36%	2,61%
Public order and safety	8,82%	5,55%	2,72%	5,46%
Economic area	5,72%	11,73%	7,35%	11,97%
Environmental protection	6,23%	2,11%	3,27%	1,88%
Housing and amenities	5,20%	1,45%	5,11%	1,22%

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

Healthcare system	10,24%	16,87%	5,69%	18,02%
Recreation, culture and religion	6,27%	2,43%	9,69%	2,88%
Education	7,14%	9,77%	4,44%	9,85%
Social security	6,69%	36,06%	2,96%	33,61%
Total expenditure	6,95%	100%	4,17%	100%

Source: Ministry of Finance of Slovak Republic (2021)

Table 2 presents the average nominal growth rates of the most important budgetary chapters before the implementation of the rule in 2012 and after the implementation. We also present the respective share of the total expenditure of each chapter in the year 2012 and 2019.

Based on the data in Table 2, we can see that the growth of 6 chapters (from a total of 10): General public services, public order and safety, Environmental protection, Healthcare system, Education, Social security, and the Total expenditure was significantly lower. This may be due to reforms that took place between 2004-2012 in certain fields like the healthcare system, which may have increased the spending in the period but were beneficial and enabled to save the resources in the future. On the other hand, we can see the growth increased significantly for the Defense, Economic area and Recreation, culture and religion. However, when we focus on the year-to-year comparison between the year 2012 and the year 2019, we can see that the distribution of the budget is very similar. The only major difference is the social security, which was lower in the year 2019 than in the year 2012. Based on all the presented data, we can assume that the implementation of the rule did cause the decrease in the annual growth rate, while not significantly shifting towards more politically attractive fields. If the main goal of the rule is to slow the rate of Total expenditure growth, we can see that the rate of growth diminished after the implementation of the rule. Such an observation may indicate some behavioral change in the expenditure policy.

3 Methodology

The main goal of our paper is to estimate the short- and long-term effects of a centrally imposed debt containment rule in Slovakia, called the debt limitation rule. We apply the synthetic control method (henceforth SCM), to evaluate policy effects for comparative case studies proposed by Abadie and

Gardeazabal (2003). It is a statistical method that evaluates treatment effects in comparative case studies, to enable make quasi causal inferences about policy measures. With its assistance, we can create a synthetic version (in our case synthetic Slovakia) of treated units by weighting variables and observations in the control group. The main goal is to create a counterfactual outcome for the units with no treatment. Compared to the Difference in Differences method, the SCM enables all effects of monitored and unmonitored variables to change over time. The causal effect of an intervention compares the actual outcome of the treated unit with the counterfactual outcome of the treated unit if the treatment were not imposed (Kreif et al., 2016). Formally, it is:

$$a_{i,t} = Y_{i,t}^{1} - Y_{i,t}^{0}$$

$Y^{1}_{i,t}$ – outcome under influence of the rule

$Y^{0}_{i,t}$ – modeled outcome in absence of the rule

$a_{i,t}$ – observed gap in the model time series

It is very important to focus on and think about control variables and donor pool units, because we want to obtain the most accurate conclusions possible. The wrong choice can lead to faulty conclusions and the whole study may not have relevance (Opatrny, 2017). All chosen variables have an impact not only on systematizing comparative case studies but also on all our inferences and conclusions (Abadie et al., 2010, 2015). We can argue that the main barrier between successful quantitative inference is the absence of an explicit mechanism that determines how comparison variables are selected.

The selection of the control units requires the following steps. First, we have to exclude all countries that have similar interventions at the same time. Secondly, to boost the results, we should consider countries with similar economic and institutional performance. Therefore, we consider only European countries. Finally, we have to exclude all countries which may be affected by the intervention in the "treated" country (Abadie et al., 2015). The main function of the synthetic control method is to use a weighted average of countries in the control group to recreate Slovakia's macroeconomic indicators, such as debt to GDP as well as control variables. The target is to choose variables so that Slovakia and synthetic Slovakia are as similar as possible in the pre-treatment period (Abadie et al., 2010). The weighted average is represented by the weighted sum of outcomes of the control units:

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

$$\sum_{i=1}^{J} w_i * Y_{i,t}$$

w_i – weight of a certain control country in the donor pool

The weights minimize the size of the prediction error. Based on this, weights should best reflect the preintervention features of the affected unit (Opatrny, 2017). Along with the large size of periods when no significant shocks took place, we can construct a good model which can give us the right and exact inferences.

This estimate of $Y^{o}_{i,t}$ can then be referred to as synthetic Slovakia. The estimated treatment effect can be defined as the difference between the central government debt ratio of Slovakia and Synthetic Slovakia. The synthetic control method is based on a comparison of the cases and because of that, we must focus on exact inferential techniques with a small sample. Abadie proposes to use placebo experiments based on permutation techniques and after that, we can make inferences about the impact and the justification of the examined rule (Abadie et al., 2010). The synthetic control method works best with a smaller sample. In other words, the synthetic control method compares the actual treatment effect in real Slovakia with the placebo treatment effect in synthetic Slovakia. It creates synthetic control for all countries, that did not experience a significant shock or intervention for the examined period (Opatrny, 2017). To evaluate the size of the treatment effect and the placebo treatment effect we use square prediction error (RMSE). It can measure the similarity between the outcome variables for the country and its synthetic version (Abadie et al., 2015). We applied this function to all chosen countries. It helps our study compare more accurately the estimated effect of the Slovak debt limitation rule to the split of placebo effects obtained for control countries with no debt limitation rule, which means that debt limitation had no power (Ernst, 2004).

4 Data

This section represents our choice of the control group as well as the variables included in the synthetic control estimation. Mainly, our empirical analysis is focused on the evolution of the central government debt ratio. We are trying to choose variables that in our opinion affect debt by including several

predictor variables in the synthetic control estimation. Government influences its debt accumulation through discrete fiscal policy. Fiscal changes in the legal system of a specific country significantly depend on economic and political developments. Focusing on constructing a synthetic Slovakia we apply several variables which we can divide into two groups, economic and political variables.

To construct the counterfactual outcome of the debt ratio for Slovakia without the Budget Responsibility rule, we select a control group based on several criteria. First, it is crucial to constrain the donor pool of countries expected to be driven by a similar structural process as Slovakia. Thus, we consider the 44 European countries (excluding Slovakia) to be potential donors. Due to the availability of comprehensive debt data, the observation period is restricted to last from 2000 until 2020. We have to exclude Russia, Ukraine, Belarus, and Serbia because their political system is either not similar or in the examined period, they suffered military conflicts. In addition, we omit Norway, Albania, Andorra, Luxembourg, Moldova, Bosnia, and Herzegovina because of missing data. Secondly, Switzerland, United Kingdom, Holy See, Malta, Lichtenstein, North Macedonia, Iceland, Montenegro, San Marino, and Monaco we exclude due to the lack of data or for different reasons (i.e., political system, size of the country, population, dependency on other countries). Therefore, they are hard to compare to Slovakia. Our final donor pool includes a total of 23 European countries.

For the first group of variables, we use economic factors that influence the public debt. Past debts can influence the ability to raise debt in the future. Because of that, the first variable we choose is the lagged debt (Alesina and Tabellini, 1990). The other variable we choose is the real GDP per capita, as it helps us to estimate the level of economy and ability to issue debt (Reinhart and Rogoff, 2010). Then we choose the unemployment rate, to focus on possible benefit payments that might influence deficits and hence debt. To better grasp this, we include the labor force, which is a proxy for government spending on social transfers (Roubini and Sachs, 1989). In the same sense, we choose health care expenditure as a percentage of GDP. We must consider that the central bank prints money and that is the way how it finances the current debt level (Reinhart and Rogoff, 2010). Therefore, we include the inflation rate. Finally, we choose trade openness as a predictor of the ability to raise debt abroad (Edwards, 1998).

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

For the second group, we use political variables. Political institutions and governments have a strong and direct impact on the development of public debt, as they are the ones creating it. They also have the power to influence and change the economic development of the country. Firstly, we choose the number of years left in the current government's term as a predictor variable. Government spending usually changes as the government nears the end of its term. According to political business cycle theory, the government is spending more right before the elections, so they have a bigger chance to win and to be re-elected again (Rogoff and Sibert, 1988; Rogoff, 1990). We can expect that debt ratio, government expenditures, and economic condition depend on the political ideology and government's political background (Persson and Svensson, 1989). Therefore, we choose party orientation with respect to economic policy. To account for this, we include a variable measuring party orientation concerning economic policy. We recognize three basic positions (left, central, and right). Finally, we choose membership in the eurozone. Based on the membership in the European Monetary Union, we can divide the countries into two groups. Being a member of the eurozone means that the country has to meet certain conditions related to its monetary policy (Hallerberg, Strauch and Von Hagen, 2009). All chosen variables are presented in Table 3 along with a description.

As a result, we use annual country-level panel data for the period from 2000 to 2020. We divide the period into a pre-treatment period from 2000 to 2011 and a post-intervention period from 2012 to 2020. Accordingly, these averaged values of the previously discussed predictor variables serve as the input for the synthetic control method. Thereby, we have obtained economic data on central government debt as well as other economic variables from Eurostat (2021). We have retrieved the political variables from the database of political institutions (DPI) provided by the World Bank (2020).

Table 3: Description of variables

Variable	**Description**
Lagged government debt ratio (% of GDP)	Lagged by one period
Labor force (%)	Population between 15 and 64
Health expenditure (% of GDP)	Government health expenditure as a share of GDP

GDP per capita (EUR)	GDP per capita
Inflation (%)	Inflation measured by the consumer price index
Trade openness (% of GDP)	Sum of exports and imports of goods and services
Unemployment (%)	Percentage of unemployed persons
Years in the current term	Years left in the current term where (n) is the length of the term, (n-1) is the year after, and (0) election year
Party orientation	Party orientation concerning economic policy. (1) right, (2) center, (3) left.
Euro membership	Membership in the eurozone. (1) if applicable, otherwise (0).

Source: Own elaboration

5 Results and robustness

Our results of the synthetic control estimation show that pre-treatment debt trends and variables of Slovakia are best reproduced by a combination of five countries–Bulgaria (48%), Spain (33%), Latvia (10%), Ireland (8%), and Estonia (1%). Table 4 shows how synthetic Slovakia compares to real (also referred to as treated) Slovakia and the equal weight average of the control group for the outcome and all predictor variables.

Table 4: Comparison of predictor variables

Variable	**Slovakia**	**synthetic Slovakia**	**Donor pool**
	Average of annual data from 2000 until 2011		
Government debt ratio (% of GDP)	44.6857	44.7236	29.6700
Labor force (%)	70.10952	69.50755	69.91666
Health expenditures (% of GDP)	6.546997	7.102343	6.754399
GDP per capita (EUR)	10448.33	13588.03	16616.83
Inflation (%)	80.92917	79.79438	79.78833

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

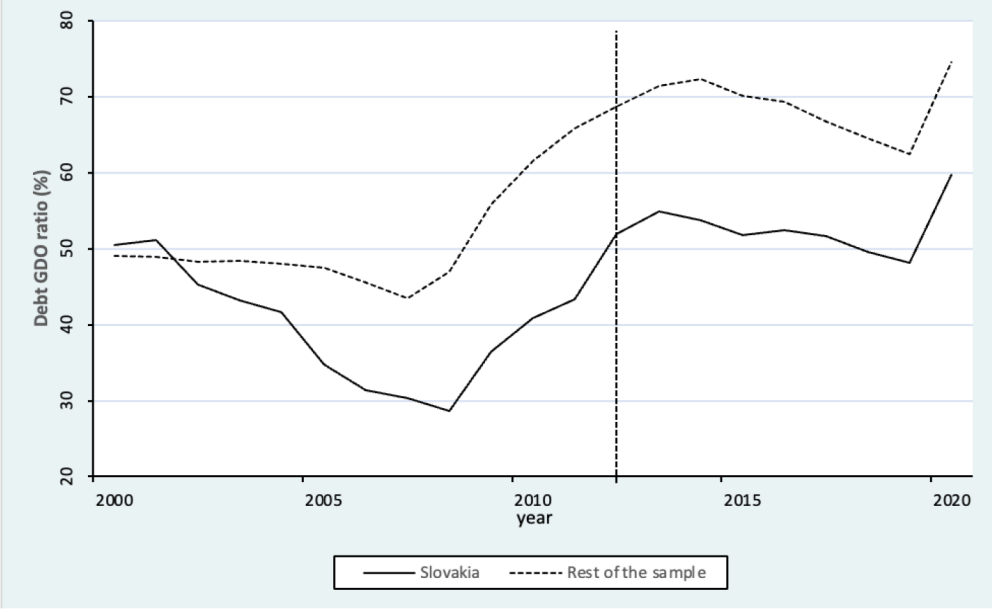
Trade openness (% of GDP)	1.342734	0.877456	1.038508
Unemployment (%)	0.130333	0.120764	0.110290
Years in the current term	1.5	1.6	1.8
Party orientation	1.25	1.18	1.22
Euro membership	0.416666	0.411083	0.416667

Source: Authors' calculations

The average pretreatment period values of synthetic Slovakia are similar compared to Slovakia for most variables. We can argue that the average synthetic debt ratio is close to the observed value, therefore the unweighted average of the sample is less than one-third of Slovakia's average debt ratio. For three variables, including GDP per capita, unemployment, and health expenditures, synthetic Slovakia yields a prediction that is better than the equal weight control mean. On the other hand, for two variables, including labor force and trade openness, synthetic Slovakia yields a worse prediction. The key reason for this is the lack of predictive power of these variables. A very small weight is assigned to the respective predictors: GDP per capita (2%), unemployment (2%), health expenditures (1%), the labor force (1%), and trade openness (0.05%). In contrast, the government debt ratio (89%) has the highest predictive power. Consequently, the average predictor values suggest that the estimates obtained from using the synthetic control method are better in explaining the counterfactual debt ratio in Slovakia than simply using the equal weight sample mean in the donor pool.

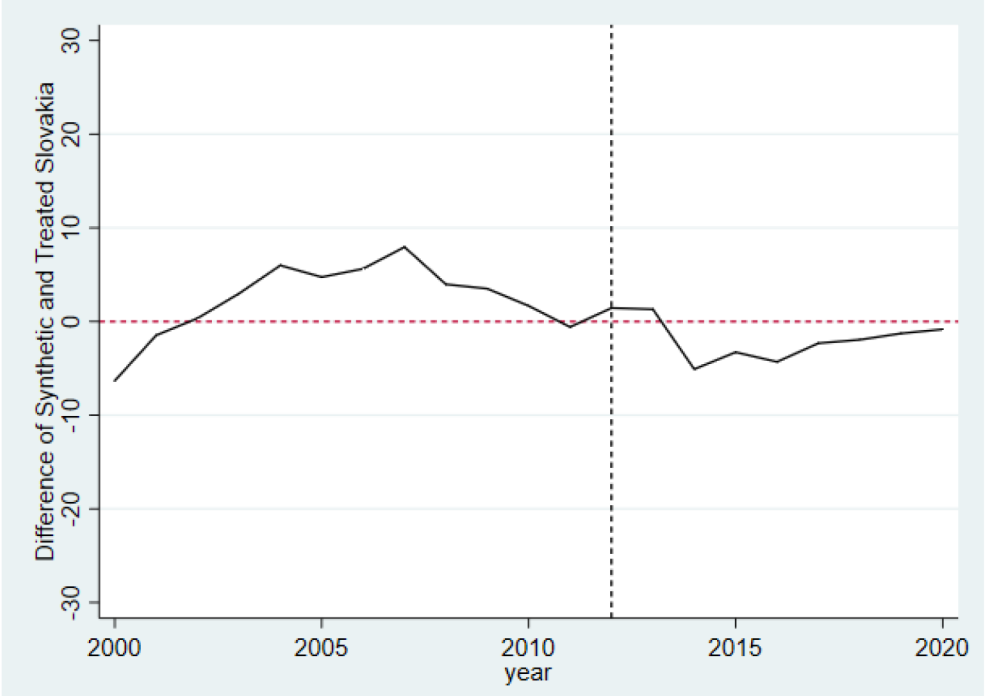
Graph 1 pictures the trend in debt ratio for Slovakia and the equal weight donor pool. It suggests that the equal weight donor pool is not a valid comparison group for Slovakia to study the effects of the Budget Responsibility rule. There are substantial differences in the level of the debt ratio before the establishment of the rule. Between 2003 and 2012, the difference in the level of debt is well above 20 percentage points. Accordingly, the resulting difference in 2020–approximately 16 percentage points–may be driven by the very different characteristics of Slovakia and the equal weight donors before 2012. However, we should point out that Slovakia, especially since 2010, follows the trends on this graph. This may be firstly for the simple reason that all EU countries are very closely related and affect each other. This is even enhanced for Slovakia as it is a small and dependent country, due to its high trade openness.

Graph 1: Trends in Debt ratio for Slovakia and the Donor pool



Source: Authors' calculations

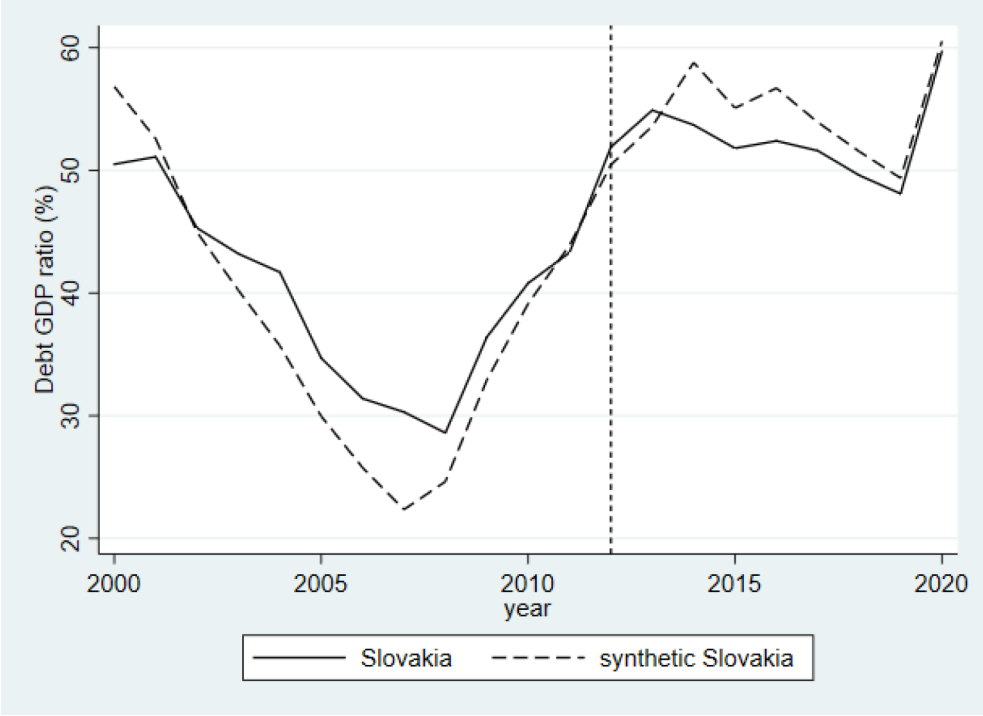
Graph 2: Gap in percentage points between Slovakia and synthetic Slovakia



Source: Authors' calculations

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

Graph 3: Comparison of Debt to GDP ratio for Slovakia and synthetic Slovakia

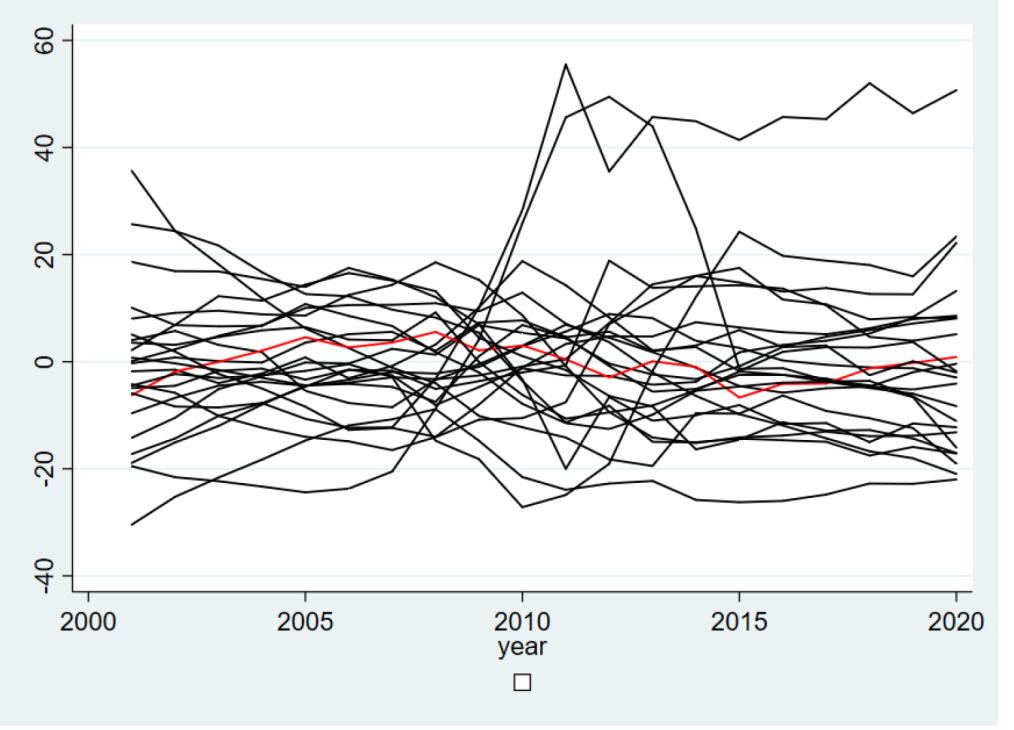


Source: Authors' calculations

Graph 2 displays the difference between the debt ratio for treated Slovakia and its synthetic version. A notable feature of the graphs is that synthetic Slovakia's debt ratio is very close to the trajectory of Slovakia in the period before the Budget Responsibility rule, but also after implementing the rule. Together with the evidence of a reasonable balance on the majority of central government debt ratio predictors (Table 4), these results suggest that synthetic Slovakia provides a valid counterfactual to the debt ratio in Slovakia from 2012 until 2020 in the absence of the Budget Responsibility rule. The estimated effect of the Budget Responsibility rule on the central government debt ratio is the difference between the debt ratio of synthetic Slovakia and treated Slovakia after the rule was put in place as presented in Graph 3. In 2012, the two debt ratio curves do not start to diverge. The same can be spotted in Graph 2. Where the synthetic counterpart is oscillating around the observed curve for the most of period and the differences between the two lines are not significantly changing over time. If anything, the minor difference is furthermore decreasing. While

the debt ratio in synthetic Slovakia for the period right after the implantation of the rule increases above the real Slovakia, the lines are closing even this small gap in the coming years. Thus, based on the synthetic control method, it appears that the introduction of this rule at first led to a small decrease in the debt ratio in Slovakia, but the detachment did not last long. Graph 2 illustrates the development of the difference between treated and synthetic Slovakia's debt ratio. For the peak difference of the post-intervention period from 2012 to 2020, 2014 has the highest difference of 5.01 p.p. Although on average, for the whole period the results amount to an annual reduction of –1.78 p.p. percentage points. By the end of the period, the debt level of real Slovakia and synthetic Slovakia reached almost the same value with a difference of only 0.83 p.p.

Graph 4: Difference in Debt Ratio for Slovakia Compared to Placebo Gaps for Comparison Countries



Source: Authors' calculations

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

To assess the statistical significance of our estimates, we investigate whether the results may be driven by chance. In particular, we address the question of how often the results would have been obtained in this magnitude for countries that arguably were not affected by the treatment. This placebo test follows randomization inference tests by generating an estimate to form the null hypothesis, that the placebo treatment has zero effect in all countries except for the country where the treatment happened. The alternative hypothesis states that the placebo has a significant effect at least, in the one country where the policy has not taken place. Graph 4 shows the result of the placebo test across all countries. The black lines represent differences associated with each of the 23 placebo studies and the red line shows the relevant difference estimated for Slovakia. The results suggest that the null hypothesis should be rejected compared to the estimates of placebo gaps in the donor pool after the period of treatment., the estimated difference for Slovakia is not significant in the period from 2012 until 2020.

6 Discussion and Conclusion

The findings of our work suggest that the Budget Responsibility rule did not significantly affect the level of public debt in Slovakia after it came to force.

It should be mentioned that the effect of this rule may have been also limited simply because, for most of the period it was active, Slovakia kept a rather low level of debt. The debt to GDP ratio, before 2020, never got past the 56%. The sanctions of 4. and 5. levels have not been yet evoked for the whole existence of the rule. This may have been caused by a period of solid years of economic growth (2012-2019). The financial crisis and the eurozone crisis preceded the implementation of the rule. The product of a country tends to grow rapidly after such events. The situation has however drastically changed in the most recent years. The debt reached 59.7% in 2020. It is estimated that in 2021 the debt has reached 61%. Additionally, the prognosis for 2022 estimates the debt to reach 61.4%. It is worth mentioning that this prognosis was done before the start of the war in Ukraine. Both the corona crisis and the war in Ukraine will affect the debt of Slovakia but it is difficult to estimate how severe the final effects will be.

The constitutional law on the Budget Responsibility rule, expected from its beginning, the implementation of fiscal limits for expenditure. However, until

this day the fiscal limits have not been implemented. The government of the Slovak Republic approved a law that defines all limits which must be considered when drawing up the general government budget. At this stage, the proposition of the act is submitted to the National Council of the Slovak Republic. We believe that all limits will be applied to the general government budget in 2023 and further. We are directly mentioning the general government budget because the limits will be binding neither to local government expenditures, European union budget funds nor expenditures used for common programs of the Slovak Republic and the European Union.

We can argue that governments sometimes behave irrationally. Politicians in Slovakia tend to lead the country for small specific groups rather than for the nation as a whole. As we described in chapter DATA, the government and politicians are the ones who decide what and how much will be spent on. They also do this with the purpose of re-election. We faced political populism in our last governments. Alongside the mentioned, we should consider the country's social culture. It is crucial whether the population supports irrational government expenditures or rather supports debt reduction and right investments. Thus, Slovakia is a country with a fairly short history of direct democracy. By adding weak institutions' status, and high corruption, we have a lot of factors that make it difficult for the fiscal rules to be truly effective.

Until now all the European Union members have implemented an institution similar to our Council for Budget Responsibility. This can help us understand why the gap between the synthetic and real Slovakia for the most recent period reduces, as the data from the donor pool was influenced by it. According to European Union’s Stability and Growth Pact, public finance can be healthy and effective only when it is supported by policymakers.

Finally, Slovakia is a small country with big trade openness and is highly dependent on the outcomes of its business partners and the whole European Union. We can see how Slovakia’s debt follows the trends, or in this case, average moves of debts among the EU countries.

We were bound to conclude, that our paper leads to different results than we expected. Our model shows us that the debt limitation rule does not have significant power and does not lead to significant changes. Even though the model has a good fit in the pretreatment period, the real situation is also affected by exogenous factors that cannot be predicted or are hard to be quantified. In

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

our paper, we mainly tried to compare the situations, not make assumptions about the fiscal rules. Based on the data, we can argue that at least we observed that non-zero treatment effect can possibly change in the longer period of a time in a positive way.

REFERENCES

[1] Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American Economic Review,* 93(1), 113 ─ 132. https://doi.org/10.1257/000282803321455188

[2] Abadie, A., Diamond, A., & Hainmueller, J. (2010). Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. *Journal of the American statistical Association,* 105(490), 493 ─ 505. https://doi.org/10.1198/jasa.2009.ap08746

[3] Abadie, A., Diamond, A., & Hainmueller, J. (2015). Comparative politics and the synthetic control method. *American Journal of Political Science,* 59(2), 495 ─ 510. https://doi.org/10.1111/ajps.12116

[4] Act No. 493/2011 Coll. on the Budget responsibility rule

[5] Alesina, A. F., & Bayoumi, T. (1996). *The Costs and Benefits of Fiscal Rules: Evidence from U.S. States.* NBER Working Paper No. 5614.

[6] Alesina, A., & Passalacqua, A. (2016). The Political Economy of Government Debt, p. 2599 – 2651. In, ed. Taylor, J. B., & Uhlig, H. (eds). *Handbook of Macroeconomics.* Amsterdam: Elsevier. https://doi.org/10.1016/bs.hesmac.2016.03.014

[7] Alesina, A., & Tabellini, G. (1990). A positive theory of fiscal deficits and government debt. *The Review of Economic Studies,* 57(3), 403 ─ 414. https://doi.org/10.2307/2298021

[8] Baum, A., Checherita-Westphal, C., & Rother, P. (2013). Debt and growth: New evidence for the euro area. *Journal of International Money and Finance,* 32, 809 ─ 821. https://doi.org/10.1016/j.jimonfin.2012.07.004

[9] Bohn, H., & Inman, R. P. (1996). Balanced-budget rules and public deficits: evidence from the US states. In *Carnegie-Rochester conference series on public policy* (Vol. 45, pp. 13 ─ 76). North-Holland. https://doi.org/10.1016/S0167-2231(96)00017-6

[10] Council for Budget Responsibility. (2021a). *Debt brake.* Available at: https://www.rrz.sk/dlhovabrzda/

[11] Council for Budget responsibility. (2021b). *Who are we?* Available at: https://www.rrz.sk/en/who-are-we/

[12] Edwards, S. (1998). Openness, productivity and growth: what do we really know?. *The Economic Journal,* 108(447), 383 ─ 398. https://doi.org/10.1111/1468-0297.00293

[13] Ernst, M. D. (2004). Permutation methods: a basis for exact inference. *Statistical Science,* 19(4): 676 ─ 685. https://doi.org/10.1214/088342304000000396

[14] Eurostat. (2021). Eurostat database. Available at: https://ec.europa.eu/eurostat/data/database

[15] Fatás, A., & Mihov, I. (2006). The macroeconomic effects of fiscal rules in the US states. *Journal of Public Economics,* 90(1-2), 101 ─ 117. https://doi.org/10.1016/j.jpubeco.2005.02.005

[16] Ghosh, A. R., Kim, J. I., Mendoza, E. G., Ostry, J. D., & Qureshi, M. S. (2013). Fiscal fatigue, fiscal space and debt sustainability in advanced economies. *The Economic Journal,* 123(566), F4-F30. https://doi.org/10.1111/ecoj.12010

[17] Grembi, V., Nannicini, T., & Troiano, U. (2016). Do fiscal rules matter?. American Economic Journal: Applied Economics, 1 ─ 30. https://doi.org/10.1257/app.20150076

[18] Guichard, S., Kennedy, M., Wurzel, E., & André, C. (2007). *What promotes fiscal consolidation: OECD country experiences.* OECD Economics Departments Working Paper No. 553. https://doi.org/10.1787/180833424370

[19] Hallerberg, M., Strauch, R. R., & Von Hagen, J. (2009). *Fiscal governance in Europe.* Cambridge University Press. https://doi.org/10.1017/CBO9780511759505

[20] Kreif, N., Grieve, R., Hangartner, D., Turner, A. J., Nikolova, S., & Sutton, M. (2016). Examination of the synthetic control method for evaluating health policies with multiple treated units. *Health Economics,* 25(12), 1514 ─ 1528. https://doi.org/10.1002/hec.3258

[21] Ministry of Finance of Slovak Republic. (2021). *Fiškálne indikátory.* Available at: https://www.mfsr.sk/sk/financie/institut-financnej-politiky/ekonomicke-statistiky/fiskalne-indikatory/

[22] Opatrný, M. (2017). Quantifying the effects of the CNB's exchange rate commitment: a synthetic control method approach. *Czech Journal of Economics and Finance,* 67(6), 539 ─ 577.

[23] Persson, T., & Svensson, L. E. (1989). Why a stubborn conservative would run a deficit: Policy with time-inconsistent preferences. *The Quarterly Journal of Economics,* 104(2), 325 ─ 345. https://doi.org/10.2307/2937850

[24] Reinhart, C. M., Reinhart, V. R., & Rogoff, K. S. (2012). Public debt overhangs: advanced-economy episodes since 1800. *Journal of Economic Perspectives,* 26(3), 69 ─ 86. https://doi.org/10.1257/jep.26.3.69

[25] Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a Time of Debt. *American Economic Review,* 100(2): 573 – 578. https://doi.org/10.1257/aer.100.2.573

EKONOMICKÉ ROZHĽADY – ECONOMIC REVIEW, 2022, 51(4), 300 ─ 322
https://doi.org/10.53465/ER.2644-7185.2022.4.300-322

[26] Rogoff, K. (1990). Equilibrium Political Budget Cycles. *The American Economic Review,* 80(1), 21 – 36.

[27] Rogoff, K., & Sibert, A. (1988). Elections and macroeconomic policy cycles. *The Review of Economic Studies,* 55(1), 1 ─ 16. https://doi.org/10.2307/2297526

[28] Roubini, N., & Sachs, J. (1989). Government spending and budget deficits in the industrial countries. *Economic Policy,* 4(8), 99 ─ 132. https://doi.org/10.2307/1344465

[29] Salvi, M., Schaltegger, C. A., & Schmid, L. (2020). Fiscal Rules Cause Lower Debt: Evidence from Switzerland's Federal Debt Containment Rule. *Kyklos*, 73(4), 605 ─ 642. https://doi.org/10.1111/kykl.12251

[30] The World Bank. (2020). Synthetic Control Method. Available at: https://dimewiki.worldbank.org/Synthetic_Control_Method