

ELECTIONS AND THE TAX STRUCTURE IN THE POST-SOCIALIST EU MEMBER STATES

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Abstract: *The article deals with the political business cycle theory, especially with effects of the term of parliamentary elections on the tax composition (direct versus indirect taxes). It includes a traditional political business cycle analysis evaluating the effects of elections on overall revenues. We use panel data regression analysis, namely fixed effects method with robust option and GMM dynamic panel data estimator to analyse the relationship between tax structure and elections. The analysis includes panel data of tax revenues divided to GDP from 11 post-socialist EU member States in time-period from 1996 to 2014, our models contain 209 observations. Using this data, we found out that political business cycle does not have any effect on direct tax revenues, however there is a minimal impact on indirect tax revenues (0.25% GDP). In election years, there is a decrease of indirect revenues by less than 2 per cent. Furthermore, our models did not identify the influence of post-election effects in observed timeline.*

Keywords: *Direct taxes, Indirect taxes, Tax structure, Parliamentary elections.*

JEL Classification: *D72, E62, H20.*

Introduction

The contribution deals with the issue of the tax structure (direct vs indirect taxes) in the post-socialist EU member States during election periods. Based on the fact that the representatives of the legislative power are responsible for the implementation of the tax policy, their behaviour and activities can be focused on the implementation such measurements which may increase their popularity among voters or get higher chances for their re-election in the democratic electoral systems. In this context, we deal with the political business cycle (PBC) in a detail. This model was firstly introduced by Nordhaus [19]. He focused on the identification of the impact of electoral cycle on fiscal policy implementation. His model assumes opportunistic parties and irrational voters. In his research he used the development of macroeconomics indicators, such as the inflation rate or the unemployment rate prior election and post-election year. Štiková [28] the opportunistic motives, explains as a politicians' behaviour which is based on using such economic instruments in order to maximize their popularity and chances of re-election in following parliamentary election. The author states that the political affiliation is not important because the behaviour of each politician is influenced by the term of parliamentary election. Sjahrir [26] adds that the existence of political business cycle can arise only in the systems of direct elections.

The PBC theory predicts that politicians should manipulate fiscal policy just before elections by increasing public expenditures or decreasing tax burden of taxpayers. These steps can be considered as the efforts to determine the growth of economy and employment or rather as the effort to improve the living standard of voters. The post-election period should be linked with fiscal restriction, especially by a decrease of public expenditures or an increase of tax burden of citizens [27]. It means that the fiscal policy in tax field could be deformed especially in election year or in a period prior and after the election year.

Janků [14] adds that due to the assumption of the irrational voters, all next intentional pre-election fiscal expansion must be successful. The assumption of irrational voters became the object of critique. Therefore Rogoff and Sibert [23] introduced the model political business cycle which is based on the temporary information asymmetries between voters and political representatives. It is clear that the governments receive information about its competency more quickly than the voters can. Therefore the public sees the government's competency with a lag. As a consequence of that fact it is obvious that the incumbent party can have an incentive to lower taxes in election years to show their competency [23].

There are some studies which dealt with the impact of political business cycle on fiscal policy setting, for example Shi and Svensson [25], Doležalová [6], Štiková [28], Brender and Drazen [5], or Andrikopoulos [1]. The researches of above mentioned authors are oriented especially on macroeconomics indicators, as Nordhaus [19]. Mainly, they use indicators as GDP, the inflation rate or the unemployment rate. Related to the topic of this contribution (tax field of fiscal policy), it is necessary to modify the above described approaches while respecting the basic theoretical aspects (principles) of political business cycle. The realization of tax policy depending on political business cycle has been examined by many researches, for example by Foremmy and Riedel [11], Ehrhart [9], Mikesell [17], Petterson-Lidbom [20], Morozumi, Veiga and Veiga [18], Andrikopoulos et al [2] or Formanová, David and Křápek [12]. Within their analysis the authors are using various indicators, such as total tax collection or development of nominal or effective tax rates of different types of taxes.

The objective of this paper is to analyse the tax structure in the post-socialist EU member States and find out whether the tax policy determination is influenced by political business cycle. To fulfil the aim of the contribution we are going to use panel data regression analysis. The article is divided into 3 parts – statement of a problem, description of used method and discussion of received results.

1 Statement of a problem

Above mentioned authors analysed the existence of political business cycle on the basis of individual indicators. In addition to this, the existence of political business cycle can be analysed via composition of public expenditures or tax structure. Rogoff [22] states that there are some theoretical models predicting changes in the composition of expenditures rather than in total value of expenditures. The research of Drazen and Eslava [7] was focused on the identification of the existence of electoral cycle in the composition of public expenditures. Based on the fact that the political representatives cannot change the total value of public expenditures, the authors predict changes in their structure. Namely they expected an increase in expenditures which are positively accepted by citizens, whereas in other expenditures they expected a decline. Within their analysis they used data of Colombian municipalities, all in all they confirmed their assumption about manipulation in expenditure structure in pre-election years. They found out that the most significant components is infrastructure spending, e.g. road construction. Moreover, Ehrhart [9] focuses on the revenue side of state budget. She points out to the issue that no significant changes in overall tax revenue may mask a considerable electoral manipulation in the tax policy determination. She states that the representatives of the legislative power can change the tax structure according to the citizens' preferences. The objective of her research was to analyse the impact of electoral cycle calendar on the composition of tax revenues (direct versus

indirect taxes). For testing she used the indicator of total tax collection and data of 56 developing countries in timeline 1980-2006. She revealed significant pre-electoral political budget cycle. She found out that the political representatives are using especially indirect taxes (e.g. value added tax) to increase their popularity prior parliamentary election. The author gives several examples, as the most visible one is in case of Ghana where there was a radical decrease of a tax on petrol prior election year 2008. Morozmi, Veiga and Veiga [18] combined both approaches and examined the effects on central governments' fiscal policy conduct. In their research they included panel data from 107 countries over the 1975-2010 period. They concluded their research with the statement that in all democracies there is an increase in current spending and a reduction in taxes in election year. In established democracies, there is a reallocation of expenditure and revenue components in election years. In case of expenditure there is a shift from capital spending to grants to other governments units, in case of taxes there is a significant decrease in income taxes and an increase of consumption taxes.

On the basis of Ehrhart [9], we formulate our assumption that the electoral cycle can influence the tax structure in the post-socialist EU member States. As a consequence of described trends in behavior of representatives of legislative power, we expect to observe the changes in the tax structure in the election year and in the post-election year.

2 Methods

Regression models test the influence of elections on the tax structure. The models are based on Ehrhart [9]. Within the tax structure, we distinguish two types of taxes, direct and indirect. Both dependant proxies, Direct tax revenues (current taxes on income, wealth, etc., ESA2010 classification) and Indirect tax revenues (taxes on production and imports, ESA2010 classification), are divided to GDP in the manner of Brender and Drazen [5], Ehrhart [9], Katsimi and Sarantides [16] and Prichard [21]. Ehrhart [9] states six socio-economic indicators, the lagged dependent variable, GDP per capita, the degree of urbanization, the share of imports (indirect taxes), the rate of inflation and the share of population ages 14 and under. The first four proxies are used in the same way. The lagged dependent variables represent the persistence in tax revenues over time. The inclusion of the lagged dependent proxy may lead to biased coefficient estimates in case of fixed effect method (static panel data model), therefore it is necessary to execute the comparison with GMM system estimator (dynamic panel data model). The proxy GDP per capita (current euro) is expressed in the logarithmic functional forms and represents the economic development (e.g. [5], [9], [16] and [21]), whereas variable Urbanization (share of population living in urban areas) depicts the structure of the economy. The fourth, Import (the share of imports to GDP), is an important component of indirect taxes. The remaining two indicators, Inflation and Population, are included in the models, but in the different forms. Compare to Ehrhart [9], we do not use the logarithmic functional form for the Inflation with regard to the other proxies. The higher inflation (the annual change in the consumer price index) has negative effect on the real tax revenues (the Olivera-Tanzi effect). Ehrhart [9] as an indicator of the demographic pressures in the developing countries used share of population under 14, but in the context of the post-socialist EU member States we prefer share of population ages 15 to 64 (Population15-64). For evaluation of the importance of elections, we state four dummy proxies. The first, Election, is a variable coded 1 for year in which there is a legislative election. The other two dummy proxies take into the account of the parliamentary election term, it means, if the elections are held in the first half of a year (Election1st) or in the second half of a year (Election2st). Last one,

Post-election, represents “the Post-election effect”, which follows the PBC theory introduced in the beginning of this paper.

We employ data by Eurostat (Tax revenues, GDP per capita, Import; [10]), the World Bank Group (Urbanization, Inflation and Population15-64; [31]) and the International Foundation for Electoral Systems (proxies of Elections; [13]). We assume that all variables, with the exception of Inflation, are positively associated with the tax revenues. The regression model is following:

$$TaxRev_{it} = \beta_1 TaxRev_{i,t-1} + \beta_2 X_{it} + \beta_3 Elections_{it} + \mu_i + \lambda_t + \mu_{it} \quad (1)$$

Where i and t are country and year indicators, $TaxRev_{it}$ are tax revenues, direct or indirect to GDP, $TaxRev_{i,t-1}$ is lagged dependent variable (direct or indirect), X_{it} are socio-economic proxies (log GDP per capita, Urbanization, Import, Inflation and Population15-64), μ_i are country fixed effects, λ_t are year fixed effects and μ_{it} is an unobserved error term.

For evaluation of the influence of elections on the tax structure, we use panel data analysis, the static and the dynamic methods. There are two basic methods in the static panel data, fixed and random effects. We chose the Hausman test for the determination of a suitable method (random effects are preferred under null hypothesis while preference for fixed effects is an alternative hypothesis). Econometric verification is verified by testing the occurrence of the unit root (the Fisher-type test and the Im-Pesaran-Shin test), homoscedasticity (the Wald test) and serial autocorrelation (the Wooldridge test). The tests are selected according to Drukker [8], and Wooldridge [30]. Within the dynamic methods, we use the GMM system estimator according to Arellano and Bover [3] and Blundell and Bond [4]. On the basis of the mentioned literature, we use two-step estimations. Economic verification is extended by the Hansen test of over-identification (the null hypothesis is that used instruments are valid) and the Arellano-Bond test for AR(1) and AR(2) processes in the first differences (the presence of first-order serial correlation and the absence of second-order serial correlation). In more detail, Roodman [24].

As the post-socialist EU member States, we consider the European countries, which has become the Members of the EU since 2004. It means Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The reference period focuses on the period of 1996–2014 due to the data availability.

3 Problem solving

For evaluation of the influence of term of parliamentary elections on the tax structure, we use panel data analysis, namely fixed effects method on the basis of the Hausman test¹ and GMM dynamic panel data estimator. The models contain 11 cross-sectional units and 19 time series units, the sum is 209 observations.

First of all, the cointegration of unit roots was verified by the Fisher-type test and the Im-Pesaran-Shin test.² The model of fixed effects incorporates heteroscedasticity (Wald test) and serial autocorrelation (the Wooldridge test). Therefore the models are supplemented by the robust variance estimator. The estimated regression coefficients remain

¹ We reject a null hypothesis about the preference of random effects in favour of an alternative hypothesis about the preference of fixed effects. A Chi-square is 24.58 (p-value 0.00; the Direct tax revenues) and 46.33 (p-value 0.00; the Indirect tax revenues).

² Compare to the Levin-Lin-Chu test, both tests do not require strongly balanced panel data. Tests include the time trend and lags structure (1).

the same and heteroscedasticity and serial autocorrelation also persist in the model, but standard errors are calculated to be robust. Regarding the other tests, the paper states the adjusted coefficient of determination (within), nevertheless, its values have limited information capability in the panel data regression.

First of all, we start analysis with socio-economic factors. There are only two statistical significant proxies, the lagged dependent variable (“the persistence in tax revenues over time”) and Urbanization (share of population in the urban areas). In more detailed view on the tax structure, urbanization has a positive effect on the Indirect tax revenues, whereas the Direct tax revenues are influenced negatively.

Out of the others, Inflation has significant and negative impact (the Olivera-Tanzi effect), but only in case of the Indirect tax revenues. If we focus on the relations between PBC and tax revenues, the first model indicates significant and negative influence of PBC on the Indirect tax revenues. In years, in which the parliamentary elections are held, the Indirect tax revenues decrease by 0.25 % GDP. It means, if there are the average indirect tax revenues circa 13.3 % of GDP, then the indirect tax revenues are lower by 2 %. Except for holding the parliamentary elections, there is a significant influence of the term of election, the parliamentary election in the first half of year affects the Indirect tax revenues, whereas election in the second half of year influences the Direct tax revenues. The more significant influence on the Indirect tax revenues can be explained by the fact that the Indirect taxes (e.g. value added tax) are levied on all citizens of the country, simply because they are included in prices of all products and services. The first model does not identify any “the Post-election effect”.

Tab. 1: Elections and tax structure, OLS-Fixed effects, robust option

Proxies	Direct tax revenues				Indirect tax revenues			
	Election	Election 1st	Election 2nd	Post-election	Election	Election 1st	Election 2nd	Post-election
Const.	11.74** (2.77)	11.67** (2.84)	11.28** (2.64)	11.74** (2.79)	0.9 (0.19)	0.55 (0.12)	1.55 (0.32)	0.97 (0.2)
Y _{t-1}	0.74*** (19.28)	0.74*** (18.97)	0.74*** (19.08)	0.74*** (19.3)	0.64*** (18.08)	0.63*** (19.88)	0.64*** (17.74)	0.63*** (20.35)
GDPpc (log)	-0.14 (-1.8)	-0.14 (-1.72)	-0.15* (-1.82)	-0.14 (-1.77)	-0.18 (-0.83)	-0.18 (-0.78)	-0.18 (-0.82)	-0.18 (-0.78)
Urban	-0.11** (-3.02)	-0.1** (-2.93)	-0.11** (-3.00)	-0.1** (-2.92)	0.14** (2.27)	0.14** (2.2)	0.14** (2.17)	0.41** (2.18)
Import	-	-	-	-	0.01 (1.17)	0.01 (1.11)	0.01 (1.11)	0.01 (1.04)
Inflation	-0.001 (-0.04)	-0.001 (0.51)	0.001 (0.26)	0.001 (0.22)	-0.002*** (-13.12)	-0.002*** (-17.79)	-0.003*** (-18.75)	-0.003*** (-18.45)
Population 15-64	-0.01 (-0.68)	-0.03 (-0.73)	-0.02 (-0.53)	-0.03 (-0.73)	-0.06 (-1.08)	-0.05 (-0.98)	-0.07 (-1.18)	-0.06 (-0.98)
Elections	0.077 (1.19)	-0.1 (-1.4)	0.17** (2.89)	0.023 (0.23)	-0.24** (-2.12)	-0.26** (-2.42)	-0.21 (-1.13)	-0.02 (-0.23)
R ² (within)	0.73	0.73	0.73	0.73	0.67	0.66	0.67	0.67
Fisher-type test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IPS test	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Wald test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.001

Source: Authors

Notes: (.) denotes t-statistic, **/** means a significance level at 10 %/5 %/1 %; R² means an adjusted (within) R-squared; Fisher-type, Im-Pesaran-Shin, Wald and Wooldridge tests (p-value).

The second model uses GMM system estimator with Windmeijer robust standard errors [29]. The estimator ([3]; [4]) is designed for dynamic "small T, large N" panels, but on the other hand Judson and Owen [15] state, that GMM is eligible, if T is about 20, which is in our case. In accordance with Ehrhart [9], we consider proxies Urban and Population to be exogenous, whereas Elections, Import, Inflation, GDP per capita and the lagged dependant variables are endogenous. Endogenous variables are instrumented only with the first-order lag values since our sample of panel data enables to use a limited amount of instruments. The matrix of instruments has been collapsed. On the basis of the mentioned literature, we use two-step estimations. The Hansen, AR(1) and AR(2) tests confirm that the estimates are reliable. It means that the used instruments are valid and the model incorporates only the first-order serial autocorrelation.

Compare to the first model, Urbanization is not important, in the other words, the lagged tax revenues and inflation, in case of the Indirect tax revenues, are only two significant socio-economic factors. Simultaneously the impact of (holding) elections is hardly any. Only in case of Indirect tax, there is a decrease in the tax revenue in parliamentary election years. However the effect is smaller than in the first model (about 0.2 % GDP or decrease by circa 1.5 %).

Tab. 2: Elections and tax structure, GMM-System, Windmeijer robust option

Proxies	Direct tax revenues				Indirect tax revenues			
	Election	Election 1st	Election 2nd	Post-election	Election	Election 1st	Election 2nd	Post-election
Y_{t-1}	0.74*** (5.9)	0.82*** (6.94)	0.82*** (7.03)	0.82*** (9.31)	0.96*** (10.61)	0.95*** (6.49)	0.94*** (6.63)	0.9*** (5.72)
GDPpc (log)	0.09 (0.28)	0.08 (0.29)	0.12 (0.33)	0.07 (0.28)	0.19 (0.58)	0.22 (0.67)	0.17 (0.62)	0.17 (0.43)
Urban	0.14 (0.83)	0.02 (0.13)	0.005 (0.09)	0.19** (2.59)	0.003 (0.64)	0.002 (0.05)	0.01 (0.52)	-0.005 (-0.07)
Import	-	-	-	-	-0.001 (-0.07)	-0.001 (-0.05)	-0.003 (-0.15)	0.002 (0.07)
Inflation	0.001 (1.34)	0.001 (1.19)	0.002 (1.31)	-0.001 (1.45)	-0.004*** (-8.41)	-0.004*** (-10.61)	-0.004*** (-7.84)	-0.004*** (-7.61)
Population 15-64	-0.11 (-0.69)	-0.008 (-0.06)	0.001 (0.01)	-0.16 (-1.83)	-0.04 (-0.64)	-0.02 (-0.22)	-0.02 (-0.51)	0.002 (0.02)
Elections	-0.04 (-0.28)	-0.14 (-0.46)	0.13 (0.99)	0.05 (0.27)	-0.21** (-2.28)	-0.22 (-0.98)	-0.16 (-1.08)	-0.11 (-0.95)
Number of instruments	8	8	8	8	10	10	10	10
Hansen test	0.134	0.064	0.049	0.671	0.728	0.621	0.902	0.569
AR(1) test	0.041	0.025	0.021	0.032	0.012	0.009	0.007	0.006
AR(2) test	0.98	0.978	0.92	0.9	0.674	0.703	0.616	0.833

Source: Authors.

Notes: (.) denotes t-statistic, */**/** means a significance level at 10 %/5 %/1 %, Hansen, AR(1), AR(2) tests (p-value).

Conclusion

The aim of this paper was to identify the effects of the term of parliamentary elections on the tax structure of selected 11 EU member States. We verified the political business cycle theory describing that the tax policy determination can be influenced by politicians' behaviour which is based on using such economic instruments in order to maximize their chances of re-election in following parliamentary election. Those steps in tax policy determination are not desirable and subsequently they can distort the stated objectives of the economic policy.

For the purpose of qualification and evaluation of the influence of PBC on the tax structure in the post-socialist EU member States we used the panel data regression analysis. Furthermore, we constructed regression model and used two methods, fixed effects with robust option and GMM system estimator with Windmeijer robust standard errors. The results show, especially GMM system estimator, that PBC does not have an effect on the Direct tax revenues, whereas we identified a minimal impact on the Indirect tax revenues. The influence of PBC on the Indirect tax revenues is about 0.25 % of GDP, or we can say, the holding the parliamentary elections leads to a decrease by less than two per cents. Based on the PBC theory, we tested the importance of the parliamentary election term and the Post-election effects. On the basis of the results of the first model, the term of the elections may have significant impact, but the GMM system estimator does not bear it out. Moreover, both models did not indicate the influence of the Post-election effect. The insignificant impact of PBC is significantly influenced by the legislation of the European Union, which can be shown by example of the Indirect tax revenues. In that case, the Directives of the European Union regulates the minimal rates, moreover it enables to implement to the Tax Act only 2 tax rates, standard and reduced one.

As a possible extension, we propose a comparison of the post-socialist EU member States with the old ones. Also the PBC theory deals with the other topics, e.g. pre-determined and endogenous elections or quality of the political environment.

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