

ARE THE TENDENCIES OF THE RACE TO THE BOTTOM REAL IN THE EUROPEAN UNION?

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Abstract

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The increasing globalization and integration of markets are one of the causes of tax competition. Even though tax competition may be beneficial for some countries, on the other hand for others states it may mean an erosion of their public budgets. The Member States are therefore forced to compete for a capital by a reducing of the tax burden (especially a cutting of the corporate effective tax rates) to don't lose their tax bases. At present time of the debt crisis, when most of the Member States look for a solution to a balance of their deficit budgets, there a question arises whether a tendency towards a cutting of corporate effective tax rates does not lead to a race to the bottom and the erosion of their public budgets. In this context, the aim of this paper is to answer whether the race to the bottom is real in the European Union. This paper empirically evaluates the level of the race to the bottom in the European Union and using panel analysis it verifies on a sample of 27 Member States over the period 1998 to 2010 whether the tendencies of the race to the bottom are real. According to the panel analysis this paper concludes that the tendencies of the race to the bottom are particularly evident in the new Member States, i.e. in the EU-12 countries, while for the old Member States, i.e. for the EU-15 countries, the race to the bottom cannot be statistically confirmed.

tax competition, race to the bottom, corporate effective tax rates, foreign direct investment, panel analysis

In an ideal world, in which international double taxation would not occur, all countries would likely confine their fiscal policies to domestic income resources. The 21st century is however somewhat different and the existence of tax competition becomes ever more apparent.

Although the tax competition is generally considered beneficial because it increases efficiency, it may have undesirable effects in the opposite case. Differences existing in taxation can namely distort competition, which may impact financial plans of some countries. States themselves contribute to tax competition by their effort aimed at attracting economic activities through tax incentives or discounted tax rates as compared with other countries. This may have undesirable consequences, which may show as a race for pressing taxes down to the bottom (a so-called race to the bottom).

The paper aims to verify, based on a panel regression analysis for the period from 1998 to 2010, whether the tax competition concerning the corporate income tax in member countries of the European Union is actually harmful, i.e. whether the race to the bottom occurs in the EU member countries.

MATERIALS AND METHODS

In the paper, the author made use of standard scientific methods such as description, analysis, comparison, modelling, explanation and synthesis as well as statistical methods – specifically the panel analysis. The panel analysis provided for a greater informative capacity of results as it made it possible, by contrast to simple time series, to test complicated structures and relations between them. The aim of the specification of panel models was to explore

dependences between explanatory and explained variables in selected groups of countries. The model estimates themselves were realized in the *Gretl* econometric programme.

The panel analysis was constructed on models with fixed effects because the entities were not randomly selected. A test of unit roots was made to enhance the informative capacity of the models and to eliminate the apparent dependence of time series. Specifically, I used the IPS test, which provides according to Baltagi (2005) generally more satisfactory results than other tests, e.g. the LLC test. The IPS test was formulated according to Asteriou and Hall (2007).

As some time series exhibited apparent dependence according to the IPS test, it was necessary to find a suitable method for purging the time series from a possible apparent dependence. For this purpose we used the method of first differences.

The panels of selected countries then included data on the size of the collection of corporate income tax, effective tax rate, economic growth expressed by GDP growth rate, inflation, average inflow and outflow of foreign direct investment, inflow and outflow of foreign direct investment for a sample of EU-27 member countries. Variables in the models were marked as follows:

<i>CIT</i>	a collection of corporate income tax,
ΔCIT	a changes of collection of the corporate income tax towards a previous year,
<i>EATR</i>	an average effective tax rate,
$\Delta EATR$	a changes of average effective tax rate between a current year and a previous year,
<i>GDP</i>	an economic growth expressed by the GDP growth rate,
ΔGDP	a changes of an economic growth towards a previous year,
<i>I</i>	inflation,
<i>FDI</i>	capital intensity,
ΔFDI	a change of foreign direct investment towards a previous year,
<i>FDI in</i>	inflows of foreign direct investment,
<i>FDI out</i>	outflows of foreign direct investment.

The functional relation between these factors could be in a simplified manner formulated as: $CIT = f(EATR, GDP, I, FDI, FDI\ in, FDI\ out)$, which indicates that the size of the collection of corporate income tax depends on the effective tax rate, economic growth, inflation, average inflow and outflow of forest direct investment and/or only on the inflow or outflow of investments.

All data used were of the quantitative, secondary character and were acquired from the *Eurostat* database and from *The Taxation Trends in the European Union* published in 2011 and 2012. The data were collected for the sample of 27 member countries of the European Union and for the period from 1998–2010.

RESULTS AND DISCUSSION

Current research trends are focused rather on the empirical investigation about the fairness and honesty of tax competition with a verification whether the tax competition leads to the race to the bottom or not. For example, Devereux and Freeman (1995) studied bilateral flows of direct foreign investment among seven countries by means of panel data analysis. For the econometric assessment they used the marginal effective tax rate, which according to them takes into account a relevant tax load both in the domestic and host countries. They observed a significant impact of this tax rate on the flows of direct foreign investments that are relatively small in systems using the credit method while having a more significant impact in systems using the exemption method.

Chennels and Griffith (1997) conducted an empirical test into the influence of marginal effective tax rate onto the profit of corporations in OECD countries including six EU member countries in the period from 1979–1994. Results of their research showed that marginal effective tax rates imposed on domestic investments were approximating in time and their evasion occurred. Nevertheless, they informed too that the evasion of marginal effective tax rates was much lower than in the statutory tax rates, which demonstrates that the tax bases were sufficiently extended to preserve the tax revenues.

On the other hand, Hines (1999) arrived at a conclusion in his study that the division of real resources is very sensitive to tax policies. Devereux and Griffith (2002) added that while the tax rates affect the localization of firms and decision-making on investments, it is not entirely clear to what measure they do so. The authors state that the tax policy is important but they cannot confirm how much the international investments respond to changes in taxes.

The study by Quéré, Fontagné and Révil (2003) was focused on tax competition with respect to foreign direct investments in eleven OECD countries in the period from 1984–2000. It was dealing with the agglomeration effect in line with tax competition and the authors concluded that tax competition does not lead to the race in tax cuts. The work of Ali Abbas, Klemm, Bedi and Parke (2012) dealt with the empirical testing of the race in tax cuts, namely corporate income tax, between emerging and developing countries in the period from 1996–2007. The authors concluded that a tendency towards the race to the bottom can be observed in the monitored countries.

The trend towards the race to the bottom could be expected to exist in the countries of the European Union, too, because the last 14 years showed a decreasing tax burden on corporations in the individual EU member countries. However, the trend was more intensive in the new member countries than in the old ones because to become competitive the new member countries took the

road of reducing the tax burden. Regarding the fact that the individual groups of EU-15 and EU-12 countries considerably differ in the overall level of tax burden, size and intensity of capital outflow as well as in economic power, the panel model is estimated for both groups of these countries with the models serving to study the statistical dependence of the time series of EART effective tax rate, economic growth measured by means of GDP growth rate and flows of direct foreign investments on the collection of corporate income tax. Both the model for the panel of EU-15 countries and the model for the panel of EU-12 countries have four levels and are estimated in the following variants:

$$A: \Delta CIT = \alpha + \beta_1 \Delta EATR_{it} + \beta_2 GDP_{it} + \beta_3 FDI_{it} + \delta_i + \varepsilon_{it} \quad (1)$$

$$B: \Delta CIT = \alpha + \beta_1 \Delta EATR_{it} + \beta_2 GDP_{it} + \beta_3 FDI_{in_{it}} + \beta_4 FDI_{out_{it}} + \delta_i + \varepsilon_{it} \quad (2)$$

$$C: \Delta CIT = \alpha + \beta_1 \Delta EATR_{it} + \beta_2 GDP_{it} + \beta_3 FDI_{in_{it}} + \delta_i + \varepsilon_{it} \quad (3)$$

$$D: \Delta CIT = \alpha + \beta_1 \Delta EATR_{it} + \beta_2 GDP_{it} + \beta_3 FDI_{out_{it}} + \delta_i + \varepsilon_{it} \quad (4)$$

where ΔCIT is the rate of change in the collection of corporate income tax, which depends on the change in the effective corporate income tax rate $\Delta EATR_{it}$, growth of gross domestic product GDP_{it} , average inflow and outflow of foreign direct investments FDI_{it} and/or only on capital inflow $FDI_{in_{it}}$ or capital outflow $FDI_{out_{it}}$, β -constants are constants of the respective variables specific of the country (i) and time (t), α -constant is a constant of the entire regression model and δ_i parameter represents fixed effects in the i_{th} observation. The ε_{it} represents the

residual component in time t and country i . Results of the selected models are presented in Tables I and II.

Results of the panel analysis indicate that for the group of EU-15 member countries the EATR parameter of effective tax rate is in all model variants statistically non-significant and does not show dependence on the time series of the collection of corporate income tax. By contrast, for the panel of EU-12 new member countries, the EATR parameter of effective tax rate exhibits a statistically significant dependence on the collection of corporate income tax in the B and C model variants while the A and D model variants does not come out as statistically significant and no impact on the collection of corporate income tax can therefore be observed.

The statistical results demonstrate that changes in effective tax rates do not impact tax revenues in the old member countries but in the new member countries a change in the effective tax rate plays a certain role in tax collection. Variants B and C in the model of EU-12 new member countries namely show a plus sign in the parameter of effective tax rate. This means that an increase in the effective tax rate should bring an increase in tax revenues. If the effective tax rate is increased by 1 percentage point, tax revenues will increase by 0.037 in the B model, which would come out as statistically significant. In the model variant C, an increase of the effective tax rate by 1 percentage point would result in an increase of tax revenues by 0.04 percentage points in the state budgets of individual countries. The other two models for the panel of EU-12 member countries, i.e. the variants A and D, cannot be considered as statistically significant because the coefficient of determination is negative and these variants are therefore not further interpreted.

Thus, from the statistical point of view, the theory of the race to the bottom in reducing taxation can

I: The estimate for the panel of EU-15

	A	B	C	D
Constant	-0,287*** (0,058)	-0,282*** (0,058)	-0,278*** (0,058)	-0,286*** (0,057)
$\Delta EATR$	0,024 (0,024)	0,023 (0,024)	0,023 (0,024)	0,024 (0,024)
GDP	0,078*** (0,014)	0,080*** (0,014)	0,079*** (0,014)	0,079*** (0,014)
FDI	0,003** (0,001)			
FDI in		-0,001 (0,003)	0,002* (0,001)	
FDI out		0,004 (0,003)		0,002** (0,001)
Number of observations	180	180	180	180
Number of countries	15	15	15	15
Adjusted R²	0,125	0,122	0,120	0,127
Durbin-Watson statistics	2,140	2,124	2,150	2,128

Significant coefficient on the level of statistical significance: * 10 %, ** 5 %, *** 1 %.

Note: The standard errors are in the brackets.

Source: Own processing.

II: The estimate for the panel of EU-12

	A	B	C	D
Constant	-0,016 (0,051)	-0,302*** (0,089)	-0,334*** (0,081)	-0,006 (0,068)
ΔEATR	0,038* (0,022)	0,037* (0,021)	0,040* (0,021)	0,027 (0,023)
GDP	0,001 (0,009)	0,002 (0,008)	0,004 (0,008)	0,004 (0,009)
FDI	0,061** (0,025)			
FDI in		0,056*** (0,012)	0,056*** (0,012)	
FDI out		-0,018 (0,020)		-0,013 (0,022)
Number of observations	120	120	120	120
Number of countries	10	10	10	10
Adjusted R²	-0,015	0,101	0,104	-0,071
Durbin-Watson statistics	1,882	2,014	1,982	1,774

Significant coefficient on the level of statistical significance: * 10 %, ** 5 %, *** 1 %.

Note: The standard errors are in the brackets.

Source: Own processing.

be confirmed for the EU-12 group of new member countries. In the EU-15 group of old member countries, however, it is impossible to consider a manifested race to the bottom because the parameter of effective tax rate comes out as non-significant in statistical terms, which indicates that it has no influence on the collection of corporate income tax.

I believe, therefore, that the race to the bottom theory manifests itself consistent with other factors on the market and with the development of economy. If the individual countries exhibit economic growth, the drop of effective tax rates to a certain minimum limit should not adversely affect the collection of corporate income tax. The new member states also represent countries that depend on the collection of corporate income tax much more than the original EU member countries. The corporate income tax plays for them an important role in tax revenues from total direct taxes and this is why they can afford their regulation through changes in effective tax rates. This could however represent a risk at the times of economic recession when the tax revenues of those countries could decrease, likely due to the decreasing effective tax rates, more significantly than in the old member countries.

We can also see that in the original EU-15 countries, all model variants demonstrate a positive dependence of real economic growth on the collection of corporate income tax while this beneficial influence cannot be demonstrated in the new EU-12 countries. In the new member countries, the real economic growth has no statistically significant impact on the collection of corporate income tax and it can be expected therefore that instead of real economic growth, it is exactly the tax burden that plays a considerable role in the tax

collection in these new member countries. The EU-12 group of countries namely represents coming up economies, which markedly lag behind the old member countries so far in terms of economic power and this is why their economic level cannot be fully competitive. By contrast, the original member countries positively affect the collection of income tax by their economic growth (higher profits of enterprises at the time of economic growth and hence higher taxation in these countries represent for public budgets a reward for economic stability and reputation of the state). It is also a well-known fact that in countries with a high economic standard, companies usually pay taxes without problems while the tax payment behaviour in less developed countries is often distorted and firms often resort to various tax frauds. This negative influence was nevertheless not statistically verified.

Testing the dependence of the flows of foreign direct investments on the collection of corporate income tax demonstrated in the model variant A for the panel of EU-15 countries that average inflows and outflows of foreign direct investments have a statistically significant positive influence on the collection of corporate income tax. With regard to the fact that the indicator does not clearly show whether the positive influence of the inflow of foreign direct investments predominates over the outflow, the two indicators are tested together in the model variant B. However, if the two parameters are used in one model together, they act as statistically non-significant. This is why the parameters are studied separately in the C and D models as well.

In the model C for the panel of EU-15 countries, only the effect of the inflow of foreign direct investments on the collection of corporate income tax is tested, which appears as statistically significant and as expected positively affecting, too.

In the model D, the second of the two parameters is tested – the outflow of direct foreign investments, which exhibits a statistically significant influence on the collection of corporate income tax as compared with the expectations. If the capital outflow from the country would increase by 1 percentage point, the tax revenues would increase too – by 0.002 percentage points. In terms of economic theory, however, this hypothesis cannot be fully accepted. It is nevertheless possible to consider that the result is influenced also by other factors affecting the capital flows. We can assume that the outflow of capital, which concentrates in tax havens, does not negatively affect the collection of income tax since tax revenues from the outflow of capital are returned into the countries through the adoption of specific measures such as CFC rules.

I also presume that although the outflow of direct foreign investment slightly predominates over the inflow in the original EU member countries, the statistically demonstrated positive influence of capital outflow results from the fact that approximately a half of the capital is concentrated exactly in the old member countries and only a negligible part is localized in the new member countries. Thus, the capital remains largely in the old member countries, which may distort the results of the model.

However, the A and D models for the panel of EU-12 countries do not come out as statistically significant. This is why the interpretation focuses on the remaining two models B and C which explain

for ca 10% of model variability. As it is obvious from the B model variant, the testing of the dependence of the parameter of inflow and at the same time outflow of direct foreign investments on the collection of corporate income tax demonstrated positive dependence. This is however statistically significant only for the inflow of direct foreign investment since for the capital outflow it was not demonstrated (the parameter coming out as statistically non-significant).

It can be therefore assumed that the size of the collection of corporate income tax in the new member countries is affected by the inflow rather than outflow of direct foreign investments. I presume, however, that the trend might be distorted in the near future due to economic crisis and if a more distinct exodus of companies from the countries occurs, the trend is likely to show in the decreased collection of corporate income tax. The competitive advantage of low taxation is namely not sustainable for a long time and it can be used to support economy only temporarily as the decrease of taxes cannot reach as low as the bottom.

On the other hand, in the C model for the EU-12 countries, only the inflow of direct foreign investments into the country is tested and its dependence on the collection of corporate income tax. Its positive influence is demonstrated once again since with the inflow of direct foreign investments by 1 percentage point, the collection of corporate income tax increases by 0.056 percentage points.

CONCLUSION AND SUMMARY

Based on the panel regression analysis for the period from 1998–2010, the study was conducted to verify whether tax competition in corporate income tax is harmful in the member countries of the European Union, i.e. whether a trend towards the race to the bottom occurs in the EU countries.

All data used for the panel analysis were of the quantitative, secondary character and were acquired from the *Eurostat* database and from *The Taxation Trends in the European Union* published in 2011 and 2012. The data were collected for a sample of 27 member countries of the European Union and for the period from 1998–2010.

In order to achieve the set-up goal, standard scientific methods were employed such as the method of description, which made it possible to describe the investigated facts and the method of analysis and comparison based on which the current development in the given field was identified. Other necessary methods included the method of induction, deduction, explanation and classification as well as the method of modelling and synthesis.

Results of the study did not demonstrate that the trend towards the evasion of effective corporate income tax rates would lead to the race to the bottom in all countries of the European Union. Such tendencies were detected only in the EU-12 group of new member countries while in the EU-15 group of old member countries the race to the bottom was not statistically demonstrated.

Regarding the fact that a considerable dependence exists between the collection of corporate income tax and the economic cycle, I assume that the theory of the race to the bottom could manifest in line with other factors in economy. If some countries show economic growth, the drop of tax rates to a certain minimum should not have a negative influence on the collection of corporate income tax. It should be also born in mind that the new EU members represent countries that are much more dependent on the collection of corporate income tax than the original member states and this is why their tax revenues are much more sensitive to changes in economy than in the original member states.

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