

# INTERNAL TAX COMPETITION: DOES THIS RESULT IN ECONOMIC AND INVESTMENT GROWTH?

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**Abstract:** The purpose of the article is to assess the impact of tax competition at national level on economic growth and capital formation. The internal tax competition was considered from the point of view of fiscal decentralisation. The tax revenue decentralization ratio and revenue decentralization ratio are used in this paper as independent variables in panel regression analysis. As dependent variables, GDP per capita growth and capital formation growth were used. Analysis was conducted on a sample of 26 countries. The results of the analysis showed that international tax competition between countries has a greater effect on GDP per capita and capital formation than tax competition within the country. However, this is not due to the nature of tax competition, but to the fact that not all countries use the potential of tax competition within the country. The direction for further research is to analyze the impact of fiscal decentralization on the effectiveness of governments and economic growth in different groups of countries.

**Keywords:** tax competition, fiscal decentralization, GDP per capita growth, capital formation.

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## 1. Introduction

The globalization of the world economy forces each country to engage in international competition, not only for leadership in the spheres of production and export, but also in attracting investment. At the same time, competition of taxation regimes is not the

only factor. The competition of tax regimes between countries determines the direction of movement of capital at macro level. Similarly, tax competition works inside of a country if local governments are allowed to change tax rates or use tax preferences.

Some economists (Albouy, 2010; Blöchliger and Petzold, 2009; Büttner, 2003; Francois, 2010) argue that fiscal decentralization is a key factor in the development of a country. This is explained by the fact that in conditions of decentralization, funds are spent more rationally and decisions on financing are made closer to taxpayers. However, fiscal decentralization is not always effective. A major role is played by the balance of decentralization processes, especially the presence of decentralization in the field of taxation.

Tax attractiveness to business is a competitive advantage to a nation. Tax competition allows not only to attract foreign investment, but also encourages residents to maintain their assets within the country, and not transferring them abroad. The purpose of the article is to assess the impact of tax competition at national level on economic growth and capital formation.

The paper is organized as follows. The second section presents a brief literature review of publications on tax competition and fiscal decentralization, and their impact on economic growth. The third section describes the research methodology. The fourth section presents the results of the study. The fifth section contains the conclusions and prospects for further research.

## 2. Literature review

The source of tax competition is social competition. Von Mises (1998) defines social competition as “the desire of individuals to occupy the most favorable position in the system of social cooperation” which is “present in any representable way of social organization”. A variety of social competition is tax competition, which, on the one hand, represents competition between regions for tax powers (the so-called vertical tax competition), and on the other hand, competition between nations for the taxpayer (the so-called horizontal tax competition).

Economists estimate the impact of tax competition in different ways. Proponents of setting a minimum threshold for tax rates, such as Kanbur and Keen (1993), pointed out that the differences in the size of states are too large and, therefore, their economic systems. They initially recognized that “bringing the tax laws of different countries to a common denominator casts doubt on their ability to build independent tax systems”.

The influence of tax competition between countries on the level of employment is analyzed in the work of Daveri and Tabellini (2002). In this regard, the growth of unemployment in the European Union countries is one of the consequences of aggravated international tax competition, since residents of countries with high unemployment are not ready to forget about the high standards of social security, while businessmen prefer to create new jobs to minimize taxes and labor costs in countries with lower taxes and social charges.

One of the well-known researchers of international tax competition, Tiebout (1956), clearly showed that the choice of residence jurisdiction for a taxpayer is a matter of the reasonable tax ratio he/she is willing to pay and the level of public goods and services he/she receives in exchange from this government. This statement, in the author's opinion, is true for subnational territories. Tax competition within a country is manifested through fiscal decentralization processes. Yet this is only possible if fiscal centralization involves the redistribution of the tax base, and not just the redistribution of powers and government spending.

One of the first fundamental studies in the field of fiscal decentralization is the publication by Oates (1972), who proved that fiscal decentralization has a positive effect on a country's economic growth. However, the degree of positive influence will be different for different countries. The effect of fiscal decentralization depends on the institutional environment (Boadway, 2001), the optimal distribution of the tax burden between the territories (Keen and Konrad, 2013), the elasticity of the reaction of capital to the tax burden (Agrawal and Foremny, 2018).

Besley and Coate (2003) argued that complete centralization is never optimal, while Eberts and Gronberg (1988), Rodden (2002), Cassette, Paty, (2010) proved that revenue decentralization favours a smaller size of government revenue and shifts government revenue from taxes to user charges.

Recently published articles are devoted to the influence of fiscal decentralization on economic growth (Acosta Ormaechea and Yoo, 2012; Asatryan and Feld, 2015). Research opinions are not shared in this field, some argue that fiscal decentralization has a positive impact on economic growth, while some hold that positive impact is limited. Filippetti and Sacchi (2016) proved that decentralization by itself is not the only key factor for economic growth, while Martinez-Vazquez, Lago-Peñas and Sacchi (2017) stated that a leading role also belongs to local institutions. In the author's opinion, such a variation in the results is due to the fact that some studies were conducted on the limited basis of information about individual countries, so such results cannot be considered generalized.

### 3. Methodology

There are two types of tax competition depending on its distribution: external (or international) and internal. Indicators of the first type of competition can be the share of state tax revenues dynamically, as well as ratings of state competitiveness as conducted by various international organizations and institutions.

Indicators of the second type of competition are the dynamics of investments in individual regions, regional competitiveness ratings, differences between tax benefits provided regionally, as well as special tax regimes in specially designated areas.

One of the indicators of tax competition is tax burden as calculated by the Heritage Foundation. This indicator allows to understand the general competitive positions of a number of countries around the world using the so-called 'fiscal

freedoms', which compare tax burden, the size of government spending, the maximum value of individual income tax and corporate income taxes, the nature of the social charges and indirect taxes, as well as the favourable tax conditions for doing business.

Scientists use different indicators to assess fiscal decentralization. Since fiscal decentralization is considered from the point of view of tax competition, the tax revenue decentralization ratio (ratio taxes to general government taxes) and the revenue decentralization ratio (ratio of own revenues to general government revenues) were used in this paper. The same indicators are used by economists to evaluate the impact of fiscal decentralization on public debt (Baskaran, 2010), the impact of fiscal decentralization on economic growth, etc. (Davoodi and Zou, 1998; Dziobek, Gutierrez-Mangas, and Kufa, 2011; Martinez-Vazquez, Lago-Peñas, and Sacchi, 2017). These ratios are used as independent variables in economic models. As dependent variables, per capita GDP growth and capital formation growth were used. Per capita GDP growth was included in the analysis because it is one of the general indicators of economic growth. Capital formation growth was used as an indicator of investment accumulation. This indicator was chosen because other indicators that describe internal investment activity are not accessible for many countries. Capital formation is also affected by foreign investment, which is why tax burden form was used additionally as an independent variable in the index of economic freedom.

The initial sample consisted of twenty-six geographically diverse countries in different stages of development, with data spanning the period 1995 to 2016. The data was collected primarily from the IMF's Government Finance Statistics (n.d.), the World Bank's World Development Indicators (n.d.), the Heritage Foundation (n.d.), and the OECD database (n.d.). The dataset was organised as panel data.

There are three hypotheses stated:

*Hypothesis 1:* Internal tax competition exerts a positive impact on GDP per capita growth.

*Hypothesis 2:* Internal tax competition exerts a positive impact on capital formation growth.

*Hypothesis 3:* Internal tax competition exerts a stronger influence on per capita GDP growth and capital formation compared to tax competition between countries.

Panel linear regression was used for testing the hypotheses. All calculations were carried out using software R. Four models were used (1-4):

$$m.pooled < -plm(gdpgr \sim fiscdec + rd\_lg + taxburd, data = h1, model = "pooling"), \quad (1)$$

$$m.re < -plm(gdpgr \sim fiscdec + rd_{lg} + taxburd, data = h1, model = random), \quad (2)$$

$$m.fe < -plm(gdpgr \sim fiscdec + rd_{lg} + taxburd, data = h1, model = within), \quad (3)$$

$$m.be < -plm(gdpgr \sim fiscdec + rd_{lg} + taxburd, data = h1, model = between), \quad (4)$$

*gdpgr* – per capita GDP growth;

*fiscdec* – tax revenue decentralization (ratio taxes to general government taxes);

*rd<sub>lg</sub>* – revenue decentralization (ratio of local government own revenues to general government revenues).

The same models were used for analyzing capital formation (capform).

All three models can be written as follows (5):

$$yit = \alpha + x'it\beta + z'iy + ci + uityit = \alpha + xit'\beta + zi'\gamma + ci + uit \quad (5)$$

$z'iy$  is the vector of characteristics that are not changing in time,

$ci$  and  $uit$  are random components;

$$E(ci) = 0, E(uit) = 0, E(uit) = 0, E(uit) = 0.$$

In the model with random effects (Random Effects, RE), it is assumed that

$$E(ci|zi, Xi) = 0, E(uit|zi, Xi) = 0.$$

In the fixed effects model (Fixed Effects, FE), it is assumed that  $E(ci | Xi)$  depends on  $Xi$ . The model with fixed effects does not allow to estimate  $\alpha$  and  $\gamma$ .

In the pooling model, it is assumed that  $ci = 0, uit = 0$ .

The models were tested with the F-test, the Lagrange Multiplier Test (Breusch-Pagan), and the Hausman test.

## 4. Main results

Tax competition is often viewed as a “procedure for discovering new facts”, which implies the differentiation of the tax systems of countries included in the international tax competition process and the ability of potential investors to choose the most appropriate tax systems. The idea of identifying competition with the discovery procedure was first put forward by the Nobel laureate, Hayek (1978).

There is a certain dilemma arising from the nature of tax competition. On the one hand, it is conducted to attract taxable income in a certain jurisdiction, and on the other, to enable an inflow of investments and capital. Reducing taxes to the minimum acceptable level, according to theory, should entail an influx of capital into the national economy (or certain territory), but to attract capital, the country needs to have good infrastructure and highly skilled labour resources, which is a consequence of the development of the public sector (financed by high taxes). Tax cuts below the

optimal allowable level thus result in the undermining of the tax base and deterioration of infrastructure, and, therefore, in the long run, is fraught with an outflow of previously attracted capital.

Economists believe that tax competition between nations can stimulate economic growth, as proved in the case of tax competition between countries (Filippetti and Sacchi, 2016). Internal tax competition can have the same potential to stimulate economic growth as international tax competition, but in a more confined area.

*Hypothesis 1.* Internal tax competition exerts a positive impact on GDP per capita growth.

To test this hypothesis a panel data set was created consisting of data from twenty-six countries; the total number of observations was 496. The data set created was unbalanced because some observations were missing. To balance the data, the function “make.pbalanced” was used with arguments “fill” and “shared.individuals”. As a result, two data sets were created. The absent data in the first data set was filled with “NA”. The total number of observations in that data set was 660. In the second data set, rows with missing values were deleted and the total number of observations in this data set amounted to 198.

Calculations were conducted in R using the package “plm” for panel data regression analysis. Three tests were made to compare models:

1. the F-test – to check fixed effects against pooling regression.
2. the Hausman test – to check fixed effects against random effects.
3. the Lagrange Multiplier Test (Breusch-Pagan) – to check random effects against pooling regression.

The regression results for the first hypothesis is presented in Table 1.

The calculations were done for the first data set, and variables with dimension “NA” were omitted. The coefficient of determination is very low for each model, meaning that there is a very low correlation between selected variables. It means that the level of decentralization (ratio of local taxes to general government taxes) does not impact on GDP per capita growth.

The same calculations were carried out for the balanced panel data set with 198 observations. The results are shown in Table 2.

The coefficient of determination is very low for each model, meaning that there is a very low correlation between selected variables. The standard error for the variables “rd\_lg” and “taxburd” is very high, showing the probability of multicollinearity between independent variables. The test for multicollinearity showed that there is a high correlation between variables “rd\_lg” and “fiscdec”. The variable “rd\_lg” was excluded from further calculations. The variable “fiscdec” was not excluded, because it better describes the level of tax freedom of local governments.

**Table 1.** Regression Results for Hypothesis 1 (unbalanced panel)

	Dependent variable “gdpr”			
	Pooling	Random	Within	Between
Fiscdec	0.6 (5.8)	0.2 (6.9)	-21.5 (16.0)	0.7 (8.6)
rd_lg	-0.2 (7.6)	0.1 (9.0)	32.3 (21.9)	0.7 (11.5)
Taxburd	0.05*** (0.01)	0.04*** (0.01)	-0.1*** (0.03)	(0.1)*** (0.02)
Constant	-0.8 (0.9)	-0.1 (1.1)		-2.5 (1.4)
Observations	487	487	487	30
R <sup>2</sup>	0.04	0.03	0.05	0.5
Adjusted R <sup>2</sup>	0.04	0.02	-0.02	0.4
F statistic	7.4***(df=3;483)	13.1***	7.2***(df=3;454)	7.5***(df=3;26)

Note \* $p < 0$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Source: own work based on Government Finance Statistics (n.d.), the World Bank’s World Development Indicators (n.d.), OECD Data (n.d.).

**Table 2.** Regression Results for Hypothesis 1 (balanced panel)

	Dependent variable “gdpr”			
	Pooling	Random	Within	Between
Fiscdec	-10.6 (7.9)	-7.6 (9.8)	58.3** (28.2)	-15.7 (9.9)
rd_lg	11.7 (9.7)	6.4 (12.1)	-77.2** (37.5)	22.8 (12.2)
Taxburd	0.04** (0.01)	0.02 (0.02)	-0.1*** (0.04)	(0.1)** (0.03)
Constant	-0.4 (1.4)	1.2 (1.7)		-4.6* (2.1)
Observations	198	198	198	9
R <sup>2</sup>	0.03	0.01	0.1	0.7
Adjusted R <sup>2</sup>	0.02	-0.05	0.05	0.6
F statistic	2.2*(df=3;194)	2.0	4.0***(df=3;186)	4.7*(df=3;5)

Note \* $p < 0$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Source: own work based on Government Finance Statistics (n.d.), the World Bank’s World Development Indicators (n.d.), OECD Data (n.d.).

The other possible reason for the low correlation between per capita GDP growth and tax competition indicators is lag influence. For example, if a government (central or local) changes the tax rules, taxpayers need some time to understand how new rules can affect their welfare.

To test this assumption, the variable “gdpgr” was lagged and calculations were made for both balanced data sets. Time series length allows to lag the variable only for one year. This might not be enough, because some changes in tax regimes may require a longer time to get response from taxpayers.

The regression results with lagged variable “gdpgr” are presented in Table 3 and Table 4.

**Table 3.** Regression Results for Hypothesis 1 with time lag (unbalanced panel)

	Dependent variable “gdpgr”			
	Pooling	Random	Within	Between
Fiscdec	0.3 (1.7)	0.1 (2.0)	-9.1 (8.3)	1.6 (2.4)
Taxburd	0.1*** (0.01)	0.05*** (0.01)	-0.1*** (0.03)	(0.1)*** (0.02)
Constant	-1.2 (0.8)	-0.6 (0.9)		-2.8 (1.2)
Observations	456	456	456	30
R <sup>2</sup>	0.1	0.03	0.03	0.5
Adjusted R <sup>2</sup>	0.05	0.03	-0.04	0.4
F statistic	12.4***(df=3:453)	16.2***	7.3***(df=3:424)	7.5***(df=2:27)

Note \* $p < 0$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Source: own work based on Government Finance Statistics (n.d.), the World Bank’s World Development Indicators (n.d.), OECD Data (n.d.).

As can be seen from Table 3, F Statistics results confirm the significance of a correlation between the investigated variables. The Lagrange Multiplier Test (Breusch-Pagan) and the Wald test showed that only pooling regression can be used to explain the relationships between variables. The coefficients in the model show that cross-country tax competition had a positive impact on economic growth: the increase of tax burden indicator by 1% caused a per capita GDP growth of 0.1%. It should be noted that the tax burden indicator is part of the economic freedom index, with a higher indicator being better, and such countries rank higher in the economic freedom index.

The same calculations were conducted for the second data set, with results shown in Table 4. The meaning of that regression coefficient shows that correlation was not significant. The tests for robustness showed that none of the models can be used in the research because of the small number of observations, therefore this data set was not used to test the second and third hypothesis.



**Table 4.** Regression Results for Hypothesis 1 with time lag (balanced panel)

	Dependent variable “gdpgr”			
	Pooling	Random	Within	Between
Fiscdec	-1.0 (2.6)	-2.4 (3.7)	8.6 (12.2)	13 (4.1)
Taxburd	0.04** (0.02)	0.01 (0.02)	-0.1** (0.04)	(0.1)* (0.03)
Constant	0.02 (1.3)	1.7 (1.7)		-2.5 (2.2)
Observations	189	189	189	9
R <sup>2</sup>	0.03	0.01	0.03	0.5
Adjusted R <sup>2</sup>	0.02	-0.01	-0.03	0.4
F statistic	3.0*(df=2;186)	1.0	2.4*(df=2;178)	3.2 (df=2;6)

Note \* $p < 0$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Source: own work based on Government Finance Statistics (n.d.), the World Bank’s World Development Indicators (n.d.), OECD Data (n.d.).

The results of the research show that Hypothesis 1 was not confirmed.

The next step in the research was to test Hypothesis 2.

*Hypothesis 2:* Internal tax competition exerts a positive impact on capital formation growth.

The results of the calculations are presented in Table 5.

**Table 5.** Regression Results for Hypothesis 2 (unbalanced panel)

	Dependent variable “capform”			
	Pooling	Random	Within	Between
Fiscdec	-32.5 (26.3)	-32.5 (26.3)	-32.5 (26.3)	-32.5 (26.3)
Taxburd	-0.3*** (0.1)	-0.3*** (0.1)	-0.3*** (0.1)	-0.3*** (0.1)
Observations	487	487	487	487
R <sup>2</sup>	0.03	0.03	0.03	0.03
Adjusted R <sup>2</sup>	-0.04	-0.04	-0.04	-0.04
F statistic (df=2;455)	6.6***	6.6***	6.6***	6.6***

Note \* $p < 0$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Source: own work based on Government Finance Statistics (n.d.), the World Bank’s World Development Indicators (n.d.), OECD Data (n.d.).

The results of the calculation show that the correlation between the investigated variables is very low. The possible reason could be a time lag, which is why the variable “capform” (capital formation) was lagged in the next stage of the research. The regression statistic with lagged variables is presented in Table 6.

**Table 6.** Regression Results for Hypothesis 2 with time lag (unbalanced panel)

	Dependent variable “capform”			
	Pooling	Random	Within	Between
Fiscdec	–41.5 (29.2)	–41.5 (29.2)	–41.5 (29.2)	–41.5 (29.2)
Taxburd	–0.3*** (0.1)	–0.3*** (0.1)	–0.3*** (0.1)	–0.3*** (0.1)
Observations	456	456	456	456
R <sup>2</sup>	0.03	0.03	0.03	0.03
Adjusted R <sup>2</sup>	–0.04	–0.04	–0.04	–0.04
F statistic (df=2;424)	5.9***	5.9***	5.9***	5.9***

Note \* $p < 0$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Source: own work based on Government Finance Statistics (n.d.), the World Bank’s World Development Indicators (n.d.), OECD Data (n.d.).

The results of the calculation show that the correlation between investigated variables is very low. The models are not significant; the second hypothesis was not confirmed.

When the results of the calculations for Hypotheses 1 and 2 are considered, it can be seen that Hypothesis 3 was not confirmed either. Internal tax competition does not have an influence on economic growth and capital formation (internal investments). International tax competition has more influence on economic growth (per capita GDP growth) in countries that were included in the sample.

The fact that the hypotheses were not confirmed does not mean that internal tax competition cannot influence economic growth. The degree of influence depends on the degree of tax decentralization, as well as on the existence of fiscal imbalances (Asatryan and Feld, 2015; Filippetti and Sacchi, 2016), for example, when local government spending is highly decentralized, and revenues are not decentralized enough.

## 5. Conclusion

During the study, the author tested three hypotheses:

*Hypothesis 1:* Internal tax competition exerts a positive impact on GDP per capita growth.

*Hypothesis 2:* Internal tax competition exerts a positive impact on capital formation growth.

*Hypothesis 3:* Internal tax competition exerts a stronger influence on per capita GDP growth and capital formation compared to tax competition between countries.

Testing was conducted on a sample of twenty-six countries. The results of the analysis show that none of the three hypotheses was confirmed. Tax competition between countries has a greater effect on per capita GDP growth and capital formation than tax competition within the country. However, this is not due to the nature of tax competition, but to the fact that not all countries use the potential of internal tax competition. One of the possible reasons is the imbalance of fiscal decentralization. One example of unbalanced fiscal decentralization can be the delegation of responsibilities to local authorities without delegating the necessary authorities to generate revenues, while another possible reason may be the institutional immaturity of local government and society. In other words, the problem of tax competition has not only an economic but also a political component. The approach for further research is to analyse the impact of fiscal decentralization on the effectiveness of governments and economic growth in different groups of countries.

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## **WEWNĘTRZNA KONKURENCJA PODATKOWA: WZROST GOSPODARCZY I INWESTYCYJNY**

**Streszczenie:** Celem tego artykułu jest ocena wpływu konkurencji podatkowej na poziomie krajowym na wzrost gospodarczy i akumulację kapitału. Wewnętrzna konkurencja podatkowa została rozpatrzona z punktu widzenia decentralizacji fiskalnej. Współczynnik decentralizacji dochodów podatkowych oraz współczynnik decentralizacji dochodów są wykorzystywane w artykule jako niezależne zmienne w analizie regresji panelowej. Jako zmienne zależne stosuje się wzrost PKB na mieszkańca i wzrost nakładów inwestycyjnych. Testy przeprowadzono na próbie 26 krajów. Wyniki analizy wykazały, że międzynarodowa konkurencja podatkowa między krajami ma większy wpływ na PKB na mieszkańca i nakłady inwestycyjne niż konkurencja podatkowa w kraju. Nie wynika to jednak z charakteru konkurencji podatkowej, ale z tego, że nie wszystkie kraje wykorzystują potencjał konkurencji podatkowej w tym kraju. Perspektywą dla dalszych badań jest analiza wpływu decentralizacji fiskalnej na efektywność rządów i wzrost gospodarczy w różnych grupach krajów.

**Słowa kluczowe:** konkurencja podatkowa, decentralizacja fiskalna, wzrost PKB na mieszkańca, akumulacja kapitału.