

The Correlation between Fiscal Policy and Economic Growth

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***Abstract.** The analysis of the correlation between fiscal policy and economic growth represents an important and very debated topic in the theoretical and empirical literature. In this study we test the correlation between fiscal policy and economic growth in Romania, for the period 1990-2007. The correlation pattern between the real growth rate of the GDP and the categories of budgetary revenues reveals a link of negative causality between the economic growth and fiscal revenues.*

Key words: fiscal policy; economic growth; budgetary revenues; taxes.

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JEL Codes: E62, H22, O11.

REL Codes: 8E, 8K, 18G.

1. Introduction

In order to stimulate the economic growth by means of the fiscal policy, the state has more instruments: (a) the financing of direct investments, which the private sector would not provide in adequate quantities; (b) the efficient supply of certain public services which are necessary to ensure the basic conditions to display the economic activity and the long-term investments; (c) the financing of public activities so as to minimize the distortions to come up with the decisions to spend and invest proper to the private sector.

In this paper we study the impact of the financing of public activities through fiscal revenues on the economic growth for Romania, in the period 1990-2007. This topic represents a very debated subject in the finance literature. There are many empirical studies that test this correlation in an empirical context. In the following table we present the most relevant studies regarding the effects of taxation on economic growth – not even one study concludes that higher taxation stimulates economic growth; most of the studies demonstrate that taxation has a significant negative effects on economic growth.

The impact of taxation on economic growth – empirical studies

Table 1

Authors	Econometrical methods	Results
Canto, Webb (1987)	pooled cross-section/time-series regression	Significant negative effect
Cashin (1995)	cross-section regression	Significant negative effect
Dowrick (1992)	cross-section regression	Significant negative effect
Easterly, Rebelo (1993)	cross-section regression	Non-concludent/no effect/complex effect
Easterly, Rebelo (1993)	pooled cross-section/time-series regression	Non-concludent/no effect/complex effect
Engen, Skinner (1992)	cross-section regression	Significant negative effect
Garrison, Lee (1995)	cross-section regression	Significant negative effect
Helms (1985)	pooled cross-section/time-series regression	Significant negative effect
Kocherlakota, Yi (1996)	time-series regression	Non-concludent/no effect/complex effect
Kocherlakota, Yi (1997)	time-series regression	Significant negative effect
Koester, Kormendi (1989)	cross-section regression	Non-concludent/no effect/complex effect
Koester, Kormendi (1989)	cross-section regression	Non-concludent/no effect/complex effect
Marsden (1983)	pairs comparison	Significant negative effect
Mendoza, Milesi-Ferretti, Asea (1996)	pooled cross-section/time-series regression	Non-concludent/no effect/complex effect
Skinner (1987)	cross-section regression	Significant negative effect
Yi, Kocherlakota (1996)	time-series regression	Significant negative effect
Yu, Wallace, Nardinelli (1991)	pooled cross-section/time-series regression	Significant negative effect

Empirical studies show that taxation has a negative effects on economic growth, but it is difficult to measure the effects of budgetary spending financed by fiscal

revenues – the overall effect of the distortionary revenues and the positive consequences of the budgetary spending could generate a better functioning of the private sector. The fiscal revenues are not necessary used for financing those spendings that lead to economic growth, perhaps because of the inefficiency of the political system or because of the redistribution policies, not reflected in the growth rate of GDP (Atkinson, 1995).

The budgetary revenues can be classified according to their effects over the

decisions of the private agents as regarding the distortionary fiscal income, non-distortionary fiscal income and other incomes. The correlation pattern between the real rate of growth of the GDP and the three categories of income reveals a link of positive causality between the economic growth and non-distorted taxes and negative between the distorted taxes and other incomes.

In order to test the impact of fiscal policy on economic growth, Barro, Sala-i-Martin (1995) suggest to analyze separately the categories of budgetary revenues:

Classification for budgetary revenues

Table 2

Budgetary revenues	Classification
Distortionary fiscal revenues	Personal Income taxes Corporate Income Taxes Social Security Contributions
Non-distortionary fiscal revenues	Property Taxes Value Added Tax Excise Duties
Other revenues	Other fiscal revenues Other non-fiscal revenues

This classification is very important because it allows to identify the influence of each category on economic growth, because the finance literature offers models that argue that distortionary fiscal revenues have a negative impact on economic growth, while non-distortionary fiscal revenues and other revenues have not significant effects.

2. Empirical study

For testing the impact of fiscal policy, measured by overall tax burden, on the economic growth we use:

- regression technique
- interval analysis.

The variables used in our study are:

(1) rate of real GDP growth, noted ECONOMIC_GROWTH, measuring economic growth;

(2) fiscal revenues on GDP, noted FISCAL_REVENUES, measuring fiscal policy;

(3) distortionary fiscal revenues, noted DISTORTIONARY_FISCAL_REVENUES, which contain personal income taxes, corporate income taxes, social security contributions, property taxes;

(4) non-distortionary fiscal revenues, noted NONDISTORTIONARY_FISCAL_REVENUES, which contain value added tax, excise duties;

(5) other revenues, noted OTHER_REVENUES, which contain other fiscal revenues and other non-fiscal revenues.

The data base contains annual values of the indicators in the period 1990-2007, for Romania.

Descriptive statistics for the variables

Table 3

	ECONOMIC_GR OWTH	FISCAL_ REVENUES	DISTORTIONARY_ FISCAL_ REVENUES	NONDISTORTIONARY_FIS CAL_REVENUES	OTHER_ REVENUES
Mean	1.022222	29.33944	17.13889	8.727778	6.494444
Median	3.900000	28.25500	16.50000	8.750000	6.550000
Maximum	8.400000	35.49000	23.20000	11.80000	10.70000
Minimum	-12.90000	26.49000	13.30000	6.200000	4.600000
Std. Dev.	6.120799	2.491377	2.991584	1.851170	1.455000
Skewness	-0.894812	1.191139	0.802036	0.109500	1.174762
Kurtosis	2.613983	3.418103	2.594797	1.757680	4.852636
Jarque-Bera	2.513824	4.387544	2.052927	1.193490	6.714395
Probability	0.284531	0.111495	0.358272	0.550601	0.034833
Sum	18.40000	528.1100	308.5000	157.1000	116.9000
Sum Sq. Dev.	636.8911	105.5183	152.1428	58.25611	35.98944

Source: authors' calculation.

In order to analyze the correlation between fiscal policy and macroeconomic variables we apply regression technique and interval analysis for the economic growth and fiscal policy variables.

We estimate the following regression:

$$ECONOMIC_GROWTH = c(1) + c(2) \times FISCAL_REVENUES \quad (1)$$

Using OLS for estimating the regression's coefficients for the period 1990-2007 we obtain the equation:

$$ECONOMIC_GROWTH = 46.645 - 1.5533 \times FISCAL_REVENUES$$

According to this equation, the relation between overall tax burden and economic growth rate is indirect: 1% change of fiscal revenues corresponds to a change of economic growth in the opposite direction by 1.5533%.

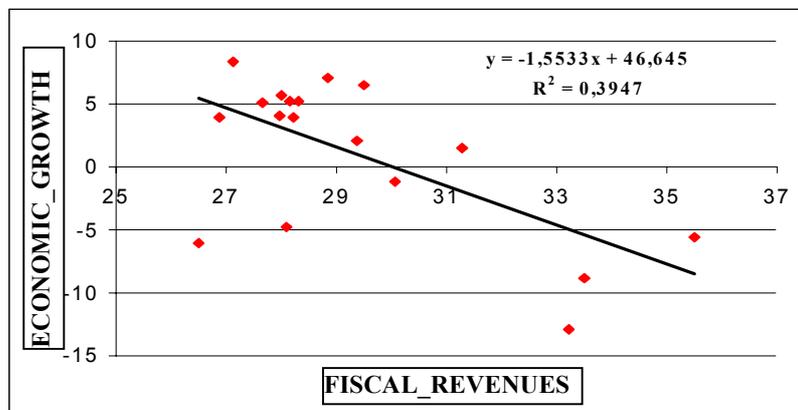


Figure 1. The regression equation between economic growth and overall tax burden

The R-squared measures the success of the regression in predicting the values of the dependent variable within the sample; it may be interpreted as the fraction of the variance of the dependent variable explained by the

independent variables. Our regression has $R^2=39.47\%$, so that 39.47% of the variance of economic growth rate's change is explained by the change of overall tax burden.

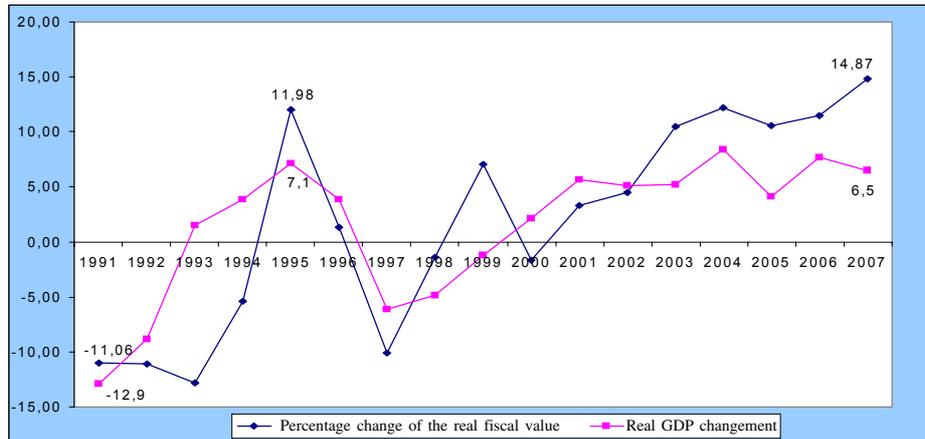


Figure 2. The correlation between relative changes of real fiscal revenues and changes of GDP

Using interval analysis we group into 3 intervals the annual values of both indicators. This technique shows that for the period 1990-1992 and for the year 1999, characterized by high level of tax burden,

the economic growth rate was negative. Notice that the highest rate of economic growth was obtained in 2004, a year with low level of tax burden.

Interval analysis for economic growth rate and overall tax burden

Table 4

		Economic growth rate		
		1 [-12.9; -1.2]	2 [1.5; 5.1]	3 [5.2; 8.4]
Tax burden	1 [26.49; 27.99]	1997	1996, 2002, 2005	2001, 2004
	2 [28.11; 29.37]	1998	1994, 2000	1995, 2003, 2006
	3 [29.5; 35.49]	1990, 1991, 1992, 1999	1993	2007

Source: authors' calculation.

In order to explore the effects of fiscal policy on economic growth, we group the budgetary revenues according to Barro, Sala-i-Martin (1995), depending on the theoretical impact of these revenues on economic growth, in: distorsionary fiscal revenues

(personal income taxes, corporate income taxes, social security contributions, property taxes), non-distorsionary fiscal revenues (value added tax, excise duties), and other revenues (other fiscal revenues and other non-fiscal revenues).

Correlation matrix – period: 1990-2007

Table 5

	ECONOMIC_GROWTH	DISTORTIONARY_FISCAL_REVENUES	NONDISTORTIONARY_FISCAL_REVENUES	OTHER_REVENUES
ECONOMIC_GROWTH	1.000000	-0.724916	0.205424	-0.734671
DISTORTIONARY_FISCAL_REVENUES	-0.724916	1.000000	-0.378029	0.686974
NONDISTORTIONARY_FISCAL_REVENUES	0.205424	-0.378029	1.000000	-0.578903
OTHER_REVENUES	-0.734671	0.686974	-0.578903	1.000000

The correlation matrix shows a negative relation between distortionary fiscal revenues and economic growth, while the nondistortionary fiscal revenues are directly correlated with real growth rate of GDP. The other revenues are negatively correlated with the economic growth.

We estimate the effect on economic growth of these categories of budgetary revenues by applying OLS regression for the following equation:

$$ECONOMIC_GROWTH = C(1) + C(2) \times DISTORTIONARY_FISCAL_REVENUES + C(3) \times NONDISTORTIONARY_FISCAL_REVENUES + C(4) \times OTHER_REVENUES \quad (2)$$

Regression results: economic growth depending on distortionary fiscal revenues, nondistortionary fiscal revenues and other revenues

Table 6

Dependent variable	ECONOMIC_GROWTH	
	Coefficient (ecuația 2)	Coefficient (ecuația 3)
CONSTANT	41.93573	27.89033
DISTORTIONARY_FISCAL_REVENUES	-0.828950	-0.853232
NONDISTORTIONARY_FISCAL_REVENUES	-1.053860	-----
OTHER_REVENUES	-2.695899	-1.885405
R ²	0.699046	0.631577

In the first regression, pvalue for nondistortionary fiscal revenues is greater than 5%, so that we estimate following regression:

$$ECONOMIC_GROWTH = C(1) + C(3) \times NONDISTORTIONARY_FISCAL_REVENUES + C(4) \times OTHER_REVENUES \quad (3)$$

In both regressions, the distortionary fiscal revenues have a negative impact on economic growth. The estimation of the impact of taxation on the economic growth ignores the interdependences between budgetary revenues, budgetary spending, deficit and economic growth. The theory of economic growth suggests that the changes in the budgetary revenues from the point of view of the forms of the distortionary taxes to the non-distortionary taxes have stimulating effects over the growth process, while the changes from the point of view of budgetary spending from productive categories to categories considered to be unproductive, they hinder the economic growth. A better approach is to estimate the effect on economic growth of budgetary revenues, budgetary expenses and fiscal deficit.

The impact of budgetary revenues and expenses on economic growth

Table 7

Financed by:		Budgetary expenses		Deficit
		Productive	Unproductive	
Taxes	Distortionary	Positive/negative (for high/low level)	Negative	?
	Nondistortionary	Positive	0	Negative
	Deficit	?	negative	-

In conclusion, even if all budgetary expenses are productive, financing them by distortionary fiscal revenues could have a negative effect on economic growth. If the Ricardian equivalence is not valid, the budgetary deficit has a negative impact on economic growth, because of the reducing effect on savings; Tanzi, Zee (1997) argue that if budgetary deficit is perceived as unsustainable, the changes of fiscal, budgetary and monetary policies were anticipated, leading to a decline in economic growth.

1. Concluding remarks

In order to analyze the impact of fiscal policy over the economic growth, we classified the budgetary revenues according to their effects over the decisions of the private agents as regarding the distortionary fiscal revenue, non-distortionary fiscal revenues and other incomes. The correlation pattern between the real growth rate of the GDP and the three categories of budgetary revenues reveals a link of negative causality between the economic growth and fiscal revenues.

Testing the effects of the fiscal policy on the economic growth using the regressive method leads us to the following conclusions: both the distortionary and nondistortionary fiscal revenues have a negative impact on the real growth rate of GDP.

But it is important to be sceptical regarding these equations - the estimation of the impact of taxation on the economic growth ignores the interdependences between budgetary revenues, budgetary spending, deficit and economic growth. The theory of economic growth suggests that the changes in the budgetary revenues from the point of view of the forms of the distortionary taxes to the non-distortionary taxes have stimulating effects over the growth process, while the changes from the point of view of budgetary spending from productive categories to categories considered to be unproductive, they hinder the economic growth.

Applying the regression technique for the period 1990-2007, we can conclude that in Romania the effects of the distortionary and nondistortionary taxes on economic growth are negative.

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