THE IMPACT OF FISCAL POLICY ON ECONOMIC GROWTH IN THE FOUNDING COUNTRIES OF THE EUROPEAN UNION

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Abstract:

Changes in fiscal policy have an impact on aggregate demand, the allocation of resources and income distribution. The present study highlights the impact of fiscal policy on the founding countries of the European Union in the period 2000-2011. The evolution of GDP / capita was explained using the structure of tax revenues, inflation, budget deficit and also qualitative variables like the economic crisis and weather conditions. The results of the analysis indicate that fiscal policy has a significant negative impact on the founding countries of the European Union, in particular through measures taken in respect of value added tax, excise duties, income taxes for households and corporations and quotas on contributions. The budget deficit has no significant influence on economic growth in these developed countries.

Keywords: fiscal policy, economic growth, budget deficit, tax revenues

1. Introduction

Fiscal policy is a major component of a country's economic policy. To counteract the negative effects of economic factors or extra-economic, the state can use a series of countercyclical policies. Fiscal policy is one of the

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most important short-term policies that can be applied at the macroeconomic level. Therefore, fiscal policy can affect a country's economic development.

The cause-effect ratio between fiscal policy and growth impact analysis began by trying to quantify the effect, namely economic growth being the indicator "gross domestic product" (GDP). The causes which determine the desired effect include factors that influence a greater or lesser extent the variable "growth" symbolized by GDP, namely: tax revenue (value added tax, excise tax, social security contributions, income taxes, duties and other taxes and), the budget deficit, inflation and qualitative factors (psychological) like the financial crisis and weather. This issue is one of great interest because it is important to know how the fiscal policy measures adopted by the governments of the founding states of the European Union (Germany, France, Italy, the Netherlands, Belgium and Luxembourg) influenced economic activity.

To analyze this problem (the impact of fiscal policy on economic growth), first we carried out a theoretical research. The literature used for the study case is presented in the second section it which is debated the importance of the studied theme and the articles by other specialists. Therefore, the paper highlights the composition of the fiscal stimulus and reviews specific fiscal stimulus plans adopted so far by the founding states of the European Union and their goals.

After the documentation, in the third, fourth and fifth sections we began the proper analysis aimed at measuring the fiscal policy adopted by the governments of the founding states of the European Union. The same sections present the analysis model used in the study namely the linear regression with fixed effects and robust error dummy variables. We conducted also validation tests such as Hausman, Wald and Parm. The last chapter is the conclusion of the article.

2. Literature review

In theory, economic growth can be addressed in several ways. The main indicators used for economic growth is gross domestic product (GDP), gross national product and GDP per capita. Closely related to the concept of "economic growth", there is the notion of "economic development". The relationship between economic growth and economic development is a relation of part to whole. Economic growth turns into economic development when growth implies structural and qualitative changes in the national economy and positive changes in quality of life [1]. Fiscal policy can stimulate

economic growth and human development through a number of channels. Fiscal policy is how the government uses income and expenses (for example taxation) to influence economic activity [9].

The influence of fiscal policy is manifested both at the macroeconomic level (for example, through the influence on growth deficit) and at the microeconomic level (e.g. through its influence on resource efficiency) [4].

At the macroeconomic level, the government can influence aggregate demand through public spending and tax rates. In a situation where there is a budget surplus (ie, public expenditure is lower than government revenue), then it means that the state spends less than it receives in taxes. If the budget deficit (eg, public spending is greater than government revenues), then it means that the state spends more than it collects in taxes [5].

Other studies have shown that the relationship between growth and fiscal policy could also depend significantly on how the revenue is collected and how it is spent. In this regard, Miller and Russek [8] found that for developed countries, the increase in debt does not seem to affect economic growth, while taxes are reduced.

One of the most important aspects of fiscal policy is managing the budget deficit – the excess of expenditure over income in the government sector. The budget deficit itself does not automatically induce macroeconomic problems. If the government revenues are effectively used, future revenues can be generated to pay for the cost of the public deficit [7].

Countries with high rates of domestic saving and well-developed capital markets more easily absorb budget deficits. A relatively large budget deficit can cause a huge savings economy. By contrast, even a small budget deficit may be destabilizing in a low savings economy. Sound fiscal policies keep the budget deficit to a level that is consistent with the objective of macroeconomic stability [3]

One way to assess the soundness of fiscal policy is to determine whether the budget deficit is consistent with other macroeconomic objectives assumed by the government. The starting point of the assessment may be that the sum of all investment in the economy must be equal to the savings available for both residents and foreigners [2].

The impact of fiscal policy on economic growth is analyzed by Luis-Raul Boroacă [2] in his article in 2012, which highlights the impact of the main economic forces in Europe, namely Germany and France. The author

argues that fiscal policy is expansionary, stimulating economic growth, when public spending is greater than government revenues. Expansionary fiscal policy is that an increase in public spending leads to increased aggregate demand, thus increasing production. Fiscal policy can be transformed into an expansionary policy by reducing taxes. Thus, where taxes are lower than transfers, there will be an increase in production. Lower taxes lead to an increase in disposable income, boosting the availability of the population to consume and the availability of investment for companies, increased consumption and investment that will lead to increase aggregate demand and, ultimately, to stimulate growth production.

Raising taxes turns into restrictive policies that inhibit growth. By increasing taxes, the state will lower disposable income, which results in reduced consumption and, ultimately, lower aggregate demand. There are situations (expansionary or restrictive) that fiscal policy has the desired effect in the economy, due to the action of economic or extra-economic factors. In this regard the study of Körmendi and Koester of 1987 [6], agree that there is sufficient evidence to claim a negative relationship between the level of fees as a percentage of GDP and economic growth.

3. Data used

The research will focuses on analyzing the impact of fiscal policy on economic growth in the European Union for the 6 founding countries, namely Germany, France, Italy, the Netherlands (Holland), Belgium and Luxembourg.

The interval included in the analysis ranges from 2000 to 2011. The range was chosen because it captures two important periods of time. The period from 2000 to 2008 throughout Europe and even worldwide was a time of growth from year to year; and since 2008, when the financial crisis hit, till 2011 when the economic recession was still in play.

The dependent variable is economic growth measured by the GDP/capita. We will use the logarithm to smooth the variation. The independent variables that explain the evolution of the dependent factor analyzed in the paper are presented as shares in total GDP of each country and they are: fiscal revenue structured as in Figure 1 (value added tax, excise duties and taxes on goods and services and other taxes on products, income tax for companies, tax on revenues for households, social security contributions), total expenses, inflation, budget deficit, and qualitative factors (psychological) like the financial crisis and weather conditions. Data were

collected from the World Bank website and the website of the European Union Eurostat publications.

Figure 1: Averages of VAT, excise duties, taxes on individual or household income, taxes on the income or profit of corporations and social contributions as percentage of total taxes and social contributions from 2000 to 2011 for the 6 countries
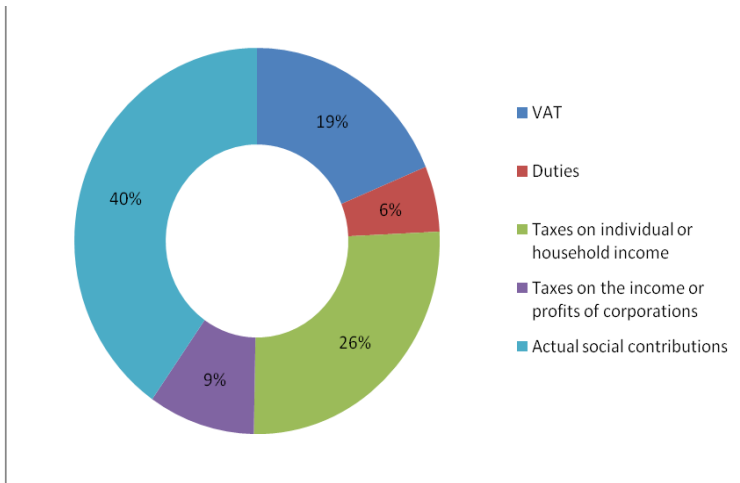
Source: (Eurostat adaptation)

From Figure 1 it is easy to see that a significant share of the tax revenues of a country are represented by social security contributions with 40%, followed by 26% taxes on individual or household income and 19% VAT. In the opposite direction, the lowest share is represented by income taxes for corporations and duties.

4. Model and tests of validation

The model used is a multiple linear regression with a fixed effects, and robust error with dummy variables. It can be seen in the general equation below:

$$y_{it} = \beta_0 + \beta_1 VAT_{it} + \beta_2 E_{it} + \beta_3 TGS_{it} + \beta_4 OTP_{it} + \beta_5 HI_{it} + \beta_6 IC_{it} + \beta_7 SC_{it} + \beta_8 EXP_{it} + \beta_9 PD_{it} + \beta_{10} D_{it} + u_{it} \tag{1}$$

where:

y - ln GDP/capita – real gross domestic product per capita in its logarithmic form
VAT – Value Added Tax (% GDP)
E – Excise duties (% GDP)
TGS – Taxes on goods and services (% GDP)
OTP – Other taxes on products (% GDP)
HI– Taxes on individual or household income (% GDP)
IC– Taxes on the income or profits of corporations (% GDP)
SC – Social contributions (% GDP)
EXP – Total expenditures (% GDP)
PD – Public deficit (% GDP)
D – a vector of dummy variables (economic crisis and the weather conditions)
uit - two-component vector for statistical errors

Index i tracks the cross-sectional dimension of the dataset from 1 to 6 (6 countries), while t is the time index running from 2000 to 2011.

$$u_{it} = \mu_i + \varepsilon_{it} \qquad (2)$$

μ_i = individual fixed effects, by a normal distribution law $(0, \sigma_\mu^2)$

ε_{it} - error term, by a normal distribution law $(0, \sigma_\varepsilon^2)$

For the dummy variables - financial crisis and weather conditions - were given values of "0" and "1". For situations where it was considered that for a country in a given year, these variables had an impact on economic growth they received the value "1". But on the other hand, if it was considered that the variables did not have an influence, the value "0" was given.

Until we find the correlation between the independent variables and GDP/capita we have to see if the model is correctly chosen by conducting first of all the Hausman test. Thus, the result of this test is shown below:
Hausman Test: H0: difference in coefficients not systematic
chi2 (12)   = (b-B)'[(V_b-V_B)^(-1)] (b-B)
     = 27.00
Prob>chi2   = 0.0077
From the result of the Hausman test we will have to use a fixed effects model. Also the results of the Wald test demonstrate the presence of heteroskedastic errors.

Modified Wald test for groupwise in fixed effect regression model
H0: sigma (i)^2 = sigma^2 for all
chi2 (6) = 59.21
    Prob>chi2 = 0.0000

In general, the failure of the homoskedasticity hypothesis is base on two categories of factors: the wrong specification of the regression model or the nature of the phenomenon studied. In the presence of heteroskedasticity, standard errors of the estimators are misplaced and we should use robust errors to correct the phenomenon. The most likely deviation from homoskedastic errors in the context of panel data is due to specific individual variance. When errors are homoskedastic in cross-sectional units, but their variance is different between units we are dealing with heteroscedasticity between groups.

Because the available data forms a micro panel we consider that testing for stationarity it not necessary and also cross-sectional dependencies.

These tests are suited for macro-panel data with variables analyzed over a longer period (20-30 years).

Next we analyzed if it is necessary to include time fixed effects or dummy variables. This was revealed by using the Parm test.
Parm test: F (11, 43) = 5.35
Prob > F = 0.0000

The results show that the H0 is rejected; therefore we can conclude that it is necessary to use time dummy variables.

5. Results

We run the regression with fixed effects and robust error dummy variables to capture the relationship between the endogenous variable -ln GDP/capita and the exogenous variables.

Tabel 1: Table regression with fixed effects and robust error

Variable	Estimated coefficient	Standard error
VAT***	0.162	0.338
E**	0.001	0.0004
TGS	-0.540	0.433
OTP	-1.111	0.527

HI**	0.329	0.441
IC**	-1.529	0.486
SC**	0.954	0.326
EXP	-0.007	0.004
PD	0.003	0.001
Crisis (d1)**	-0.060	0.020
Meteo (d2)**	-0.075	0.031
Constant	17.346	2.441
N	72	
□2	0.8901	

Legend: *1%, ** 5%, *** 10%

Source: (Stata v12)

The coefficient of determination (R2) shows the percentage of total variation in the dependent variable explained by the independent variables chosen. Thus, approximately 89.01% of the variation of this ratio is explained by exogenous variables included in the model.

Fisher test examines the hypothesis that all slope coefficients of the regression equation to be simultaneously zero, the independent variables do not affect in any way the dependent variable. Prob> F is in this case 0.

Therefore, we can reject the null hypothesis and conclude that at least one of 11 variables is statistically significant.

Next we analyzed the significance threshold of p regression table. This shows whether the variables have or not have an effect on the dependent variable.

Also, it should be noted that, although in theory the threshold is considered to be 0.05 to 5%, we consider a threshold of 10%, ie 0.1.

From the above table we can see that only value added tax, excise duties, taxes on individual or household income, taxes on the income or profits of corporations and the two dummy variables were significant. We will run the regression again using only these variables.

Tabel 2: Table regression with fixed effects and robust error

Variable	Estimated coefficient	Standard error

VAT**	-0.144	0.274
E***	0.001	0.0005
HI*	-0.180	0.332
IC**	-0.212	0.748
SC**	0.408	0.291
Crisis (d1)***	-0.027	0.029
Meteo (d2)**	-0.081	0.043
Constant	10.076	4.036
N	72	
□2	0.8158	

Legend: *1%, ** 5%, *** 10%

Source: (Stata v12)

Thus the final equation, eliminating the variables that have an insignificant impact on the explained variable – GDP/capita, can be viewed below:

$$y_{it} = 10.07 - 0.144\,VAT_{it} + 0.001\,E_{it} - 0.180\,HI_{it} - 0.212\,IC_{it} + 0.408\,SC_{it} - 0.027\,Crisis - 0.081\,Meteo$$

(3)

For the founding countries of the European Union VAT, taxes on individual or household income and from corporations had a negative impact on economic growth between 2000 and 2011. Also the results show that the economic crisis and the weather (with significant variations due to climate change) had also negative effects. The financial crisis has brought negative contribution to the founding countries of the European Union, resulting in a decrease of 0.02% of GDP/capita. Weather conditions also had a negative impact on economic growth, reducing GDP/capita by 0.08% rate.

Overall it can be said that taxes have a negative influence on growth, and regarding this article, are inversely related; when one variable increases the other decreases and vice versa. Another issue that was observed was that the budget deficit in developed countries has an insignificant impact on economic growth. This assumption was demonstrated by conducting this study and confirms the theory of Lucian Croitoru [3].

6. Conclusions

According to the statistics, from 2000-2011, the European Union's major economic powers have adopted predominantly expansionary fiscal

policies. However, the effects of expansionary fiscal policy orientation were different in those countries.

In France and Belgium, expansionary fiscal policy increased the GDP during 1996-2007. In Germany, GDP increased each year during 1996-2009, except for 2003 and 2009. In 2008 marked the beginning of the economic downturn.

Regarding the crisis period between 2008 and 2011, we can state the following idea: crises can have long-term negative effects on human and physical capital, with negative implications for productivity and potential output growth. Therefore, early recovery from a crisis it is important to minimize short-term production losses and enhance growth prospects over the medium term. Many agree with the view that this requires timely fiscal responses, targeted and well designed in times of recession.

According to the findings, the impact of fiscal policy on economic growth depends on the size of fiscal multipliers, the credibility and sustainability of fiscal stimulus, the uncertainty surrounding current and future economic environment and the intensity and effectiveness of international cooperation.

In conclusion, fiscal policy has had a significant impact on the founding countries of the European Union, in particular through VAT, excise duties and quotas on social security contributions which are a part of the tax revenues. In general, taxation adversely affected the economy of the founding countries of the EU and has been also found that the high budget deficit, even if it had increased, had no significantly influence on economic growth for the developed states such as those in the study.

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