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### The Relationship Between Government Debt and Economic Growth in North Macedonia

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# **The relationship between government debt and economic growth in North Macedonia**

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## **Abstract**

This paper empirically investigates the long run relation between domestic and external general government debt and economic growth in North Macedonia. We analyze how the government debt at a certain point in time is correlated with the GDP growth rate. The study employs a regression model in order to investigate the relationship between government debt and growth rate of GDP using annual data for the time period 2005 – 2019. Additionally in the estimation of growth equation are included control variables such as: gross savings as a percentage of GDP and growth rates of imports and exports. The limits of the study are that covers only the period 2005-2019 and is only related to the data for North Macedonia. We find strong evidence for a significantly negative relation between external general government debt and GDP growth and positive relation between internal general government debt and GDP growth.

**Keywords:** domestic general government debt, external general government debt, economic growth

**JEL Classification codes:** E62, H63

## **Introduction**

Government debt is a key economic concept that has been one of the main economic topics of interest in the past decade, following the recent global financial crisis. It represents how much a country owes to lenders outside of itself. These can include individuals, businesses and even other governments. The term "Government debt" is often used interchangeably with the term sovereign debt. Government debt usually refers only to national debt. Some countries also include debt owed to states, provinces and municipalities. Therefore, we must be careful when comparing government debt between countries to make sure the definitions are the same. Despite what it is called, government debt is the accumulation of the annual budget deficit. It is the result of government leaders spending for a period of time more than they receive through tax revenues (Amadeo, 2020). According to Irons & Bivens (2010) there are currently many warning conversations in policy-making circles about the risks to the sound economy in the future presented by crossing a specific threshold in the ratio between government debt and gross domestic product.

Today, policy discussions in the 1960s are usually accompanied by the idea of a long-term combination between inflation and unemployment given by a stable Phillips curve - a belief that was widely studied by Phelps (1967) and Friedman (1968). Adjusting the level of aggregate demand not only aimed to achieve the target of high growth rates, but also to balance the level of inflation against the unemployment rate (Fellner, 1960). These theories enable us to further investigate whether there is a correlation between government debt and economic growth, in fact what kind of correlation exists, positive or negative in public growth economic debt in North Macedonia.

Regardless of the importance of the topic there is limited empirical literature for the North Macedonia that examines the relationship between government debt and economic growth. This is in particular the motivation of this paper: we aim to investigate the average impact of government debt on GDP growth using data from North Macedonia for the period 2005 - 2019. Additionally in the estimation of growth equation are included control variables such as: gross savings as a percentage of GDP and growth rates of imports and exports of North Macedonia. The study has own limits that are covering only the period from 2005 until 2019 and is related only to the data for North Macedonia, so other countries are not taken into consideration. The incentive for this research is to find the relationship between government debt and economic growth of North Macedonia, because of the huge public debate that North Macedonia is highly indebted and that the effect is very low towards the economic growth. The findings of this research will play a substantial role to government regulatory authorities for considering the recommendations from this study to improve the economic growth of North Macedonia. The investigation provided below is spread across these points: literature review, methodology, definition of variables, hypotheses, empirical findings, conclusions and suggestions.

### **1. Literature review**

There are many questions raised by academics, economists, researchers and others about the factors that influence economic growth. Many research studies have been done to assess the factors influencing economic growth dedicated to different countries. Economic growth has continued to be the main goal of economic policy, from which it is assumed that other objectives will be derived (Ramos & Hynes, 2019).

The impact of rising public debt on economic growth in the European Union (EU) is also a sensitive issue that has been extensively studied by Mencinger et al. (2014) who examine and assess the direct effect of higher debt on economic growth for EU countries which are at the epicenter of the recent sovereign debt crisis which occurred in 2007-08. The empirical analysis mainly includes a summary of panel data with 25 sovereign EU member states. The results in all models show a statistically significant non-linear impact of public debt ratios on annual per capita growth rates. Further, the point of calculation of debt to GDP, where the positive effect of accumulated public debt turns into a negative effect, is approximately between 80% and 94% for the old "member" countries. However, for the new "member" countries, the debt-to-GDP ratio is lower, at between 53% and 54%, respectively. Therefore, the authors conclude that the threshold value for new "member" countries is lower than for "old" member countries.

Government debt has also been a concern for the Republic of Northern Macedonia for the past decade. Although compared to other countries, Northern Macedonia was considered to be recovering well from the global financial crisis; public debt had accumulated rapidly in recent years. Debt levels escalated, and more than doubled in less than ten years: from a debt-to-GDP ratio of 23% in 2008 to a debt-to-GDP ratio of 50.1% in the last quarter of 2016 (Ministry of Finance of the Republic of Macedonia, 2017). Although this relative level of debt to GDP may seem to be much lower compared to other debt countries within Europe, for a country and economy like Northern Macedonia, this can be considered to reach the highest level of stable debt. The rapid and continuous growth of debt sparked much discussion and diversity of opinion among Macedonian economic experts, and made government debt and its sustainability the main topic of interest in the country.

Empirical evidence shows that beyond a certain threshold higher government debt reduces potential growth, which may indicate a non-linear and concave (inverted U-shaped) relationship between government debt and economic growth (Cecchetti, Mohanty and Zampolli , 2010;

Checherita and Rother, 2010; Clements, Bhattacharya and Nguyen, 2003; Kumar and Woo 2010; Reinhart and Rogoff 2010a; etc). This means that low levels of government debt affect and at the same time increase economic growth. When debt reaches a certain level, an additional increase of its impact on economic growth may mean that it turns into negative. Pegkas (2018) investigates the relationship between economic growth and several factors (investment, private and government consumption, trade openness, population growth and government debt) in Greece, where imbalances persist several years after the financial crisis. The results reveal a long-run relationship between variables. Investment as private and government consumption and trade openness affect positively growth. On the other hand, there is a negative long-run effect of government debt and population growth on growth. Hsing (2020) examined the impact of the government debt ratio on the growth rate of real GDP for Bulgaria using an extended production function. The results show that the turning point is estimated to be 45.2631%. The growth rate and the debt ratio have a positive relationship when the debt ratio is up to 45.2631% whereas they have a negative relationship when the debt ratio is greater than 45.2631%. On the relationship between economic growth and government debt for Bulgaria 193 government debt ratio in 2019 was 19.156%, indicating that there would be room for the Bulgarian government to engage in fiscal expansion to raise the debt ratio slightly to stimulate its economy due to the worldwide pandemic crisis. The lower turning point for Bulgaria also indicates that a criterion which is applicable to advanced countries may not apply to emerging or developing countries. Hence, Bulgaria's efforts to maintain fiscal discipline are appropriate.

Another set of empirical studies that examine in more detail the impact of different levels of public debt on economic growth exist and find that this negative relationship exists only after a certain debt-to-GDP ratio. Pattillo, Poirson, and Ricci (2002) confirmed a nonlinear, Laffer-type relationship between external debt levels and economic growth using a large panel data set of 93 developing countries during the period 1969-1998. The findings suggest that the main channel through which excess debt depresses growth through reduced investment effectiveness rather than the level of investment. This is consistent with other empirical studies showing that total factor productivity explains most of the variations in output (Checherita and Rother, 2010; Clements, Bhattacharya and Nguyen, 2003). Moreover, Pattillo, Poirson and Ricci (2004) estimated that the critical value when external debt has a detrimental growth effect is between 35-40% of GDP for the considered panel of developing countries. Among recent studies, Clements, Bhattacharya, and Nguyen (2003) find support for a non-linear relationship between external debt and economic growth using a panel data set from 55 low-income countries during the period 1970-1999. The authors estimated that the point of return to the critical threshold in the net present value of external debt is in the range of 20% - 30% of GDP (given the nominal value of external debt, the critical value is higher at about 50%) Velichkov (2016) evaluates the effect of government debt on economic growth for Bulgaria. He reveals that more government debt promotes economic growth in the short run but has a negative impact on economic growth in the long run. He does not present the threshold for the debt ratio beyond which more debt would affect economic growth negatively. Lechtenberg (2017) studies the subject based on a sample for 10 individual countries. Australia, Canada, Chile, Germany and New Zealand have had low and declining debt ratios, and a higher debt ratio would not cause the growth rate of real GDP to decline. On the other hand, debt thresholds are found for France, Greece, Italy, the UK and the US. Beyond the debt thresholds, a higher debt ratio reduces the growth rate in Greece, Italy, the UK and the US but increases the growth rate for France. Shahor (2018) studies the relationship between growth and government debt for Israel during 1983-2013. The relationship exhibits an inverted U-shape. The threshold or

the turning point of the debt ratio is 130% and greater. Jacobs, Ogawa, Sterken and Tokutsu (2020) examine the relationship between economic growth and public debt for 27 EU members and 4 OECD countries during 1995-2013. They find that more public debt does not Granger cause economic growth. Instead, economic growth Granger causes public debt. Slow economic growth causes more public debt. In high-debt economies, slow economic growth increases public debt, which causes a higher long-term interest rate, dampens interest-rate sensitive private spending, and increases public debt. In addition, they show that the effect of economic growth on the debt ratio is greater for high-debt economies and that the effect of the debt ratio on economic growth is greater for low-debt countries.

## 2. Methodology, definition of variables and hypotheses

### 2.1 Methodology

In order to verify the validity of the hypotheses, the research is based on the source of data published by relevant government institutions of the North Macedonia as well as international financial institutions, including the Ministry of Finance of the North Macedonia, the National Bank of the North Macedonia, World Bank, UNCTAD, etc. The study used annual time series data for the period 2005-2019. In this study, the researcher has used a quantitative investigation. The conceptual framework is based on independent and dependent variables. The dependent variable is the growth rate of gross domestic product expressed on percentage, while independent variables are: The external and internal debts are expressed in euro amount, the gross savings are given in percentage of GDP, and the growth rate of imports and exports are given in percentage.

The data is mainly analyzed according to the autocorrelation method, but modern methods are also applied to study the presented variables in order to achieve the research objectives and to validate the hypotheses put forward. SPSS statistical software is used as an application part in order to access the output of the data and analyze the collected data, according to which the hypotheses presented in this research, are verified. The researcher analyzed that data through the following linear regression model:

$$Y_{it} = a + \sum B X_{it} + \varepsilon_{it}, \quad (1)$$

$$i = 1, \dots, n$$

$$t = 1, \dots, t$$

Where  $y_i$  is the real Growth Rate of GDP at time  $t$ ,  $X_{it}$  is the value of external and internal debt at time  $t$  and  $\varepsilon_{it}$  is the unobserved overall remainder. In the third chapter the data are analyzed and the data is discussed using the linear regression model. Certain models have their own explanations in order to be better commented and understood by readers.

### 2.2 Definition of variables

The growth rate of gross domestic product (GRGDP) - it measures how fast the economy is growing. The rate compares the most recent year of the country's economic output to the previous year. The external debt (ExDebt) - is the general government gross external debt owed to foreign lenders. The internal debt (DoDebt) - ExDt is the general government gross internal debt owed to lenders within the country. The gross savings as percentage of GDP (SAVINGS\_GDP) - expresses the highest amount that the economy disposes in order to invest without having to borrow, it represents GDP minus final consumption expenditure and it is expressed as a percentage of GDP. The growth rate of imports (GRIM) - is the annual growth rate of imports of goods and services

based on euro currency. The growth rate of exports (GREX) - is the annual growth rate of exports of goods and services based on euro currency.

### 2.3 Hypotheses

In order to research the aims of the paper the following hypotheses are investigated:

H1: there is no relationship between internal and external government gross debt and the growth rate of the GDP of North Macedonia

H2: there is no relationship between gross savings as percentage of GDP and the growth rate of the GDP of North Macedonia

H3: there is no relationship between growth rate of imports and exports and the growth rate of the GDP of North Macedonia

### 3. Empirical findings

In the table 1 is given a descriptive statistics of the variables that are used in our research. As we can see from this table, the average GRGDP is 3.14 with a standard deviation of 1.99. The average External Debt is 1708 million euro, a value that is higher than the average of Domestic Debt of 992 million euro. The average of SAVINGS\_GDP, GRIM and GREX have value of 25.47, 9.41 and 11.81 respectively (see Appendix).

Table 1. Descriptive statistics of variables

	GRGDP	ExDebt	DoDebt	SAVINGS_GDP	GRIM	GREX
Minimum	-0.5	877.2	465.9	16.20	-26.30	-32.13
Maximum	6.5	2763.5	1793.3	31.97	40.34	41.54
Mean	3.14	1707.63	991.97	25.47	9.41	11.81
Std. Deviation	1.99	657.62	479.61	5.4	16.91	18.50
N	15	15	15	15	15	15

The results of the estimation of equation (1) above are presented in Table 2. The model is significant to explain bearing in mind that the independent variables explain a high portion of the variability of the dependent variable (70%). The results show that the independent variables such as external and internal debt do represent important determinants of the growth rate of the gross domestic product. From testing ANOVA table the overall regression analysis was statistically significant. By taking the five predictors together as a group, they predict growth rate of the GDP of North Macedonia significantly.

$F(5, 9) = 4.177, p < .031, R^2 = .70$

The main question of our analysis of whether the growth rate of the gross domestic product is affected by the different levels of government debt is upheld by the data. The results also show that other independent variable such as gross savings as a percentage of GDP and growth rates of exports and imports have significant impact on the determination of the dependent variable. While the Durbin-Watson statistic always has a value between 0 and 4 and that values from 0 to less than 2 indicate positive autocorrelation and values from 2 to 4 indicate negative autocorrelation, the result in our model is 1.730 which means there is a positive correlation between dependent variable and independent variables.

The total domestic debt is 0.004, which means with the increase of the total domestic debt by one million Euros, since we have expressed the debt in the amount of one million Euros, the real GDP growth rate in North Macedonia can increase by an average of 0.004%. Also, the total external debt is -0.001, which means with the increase of the total external debt by one million Euros, the real GDP growth rate in North Macedonia can decrease by 0.001%. The p-value is 0.031 (less than alpha level of 0.05), by which we can reject the null hypotheses and confirm that there is significant relationship between growth rate of the GDP of North Macedonia and internal and external government gross debt and other control variables such as gross savings as percentage of GDP, growth rate of exports and imports of North Macedonia (see Appendix).

Table 2. Estimation of the model

Model	Coefficients
Constant	9.501
ExDebt	-0.001
DoDebt	0.004
SAVINGS_GDP	-0.416
GRIM	-0.024
GREX	0.086
R Square	0.699
p-value	0.031
F statistic	4.177
Durbin-Watson statistic	1.730

### Conclusions and suggestions

The objective of this paper is to investigate the average impact of government debt on GDP growth in the North Macedonia, by using data of about 15 years starting in 2005 until 2019. In our estimation of the growth equation we include as dependent variable the growth rate of GDP of North Macedonia and as independent variable the general government gross external and internal debt. The other control variables that we examined are gross savings as percentage of GDP, growth rate of exports and imports of North Macedonia.

The empirical results show that the model is highly significant bearing in mind that the independent variables explain a high portion of the variability of the dependent variable (70%). The results suggest that the independent variables such as External and Internal debt and other control variables do represent important determinants of the growth rate of the gross domestic product in North Macedonia. Additionally external debt represents negative relationship, while internal debt represents positive relationship with GDP growth rate of North Macedonia. The government of North Macedonia should decrease borrowing from external debt due to its negative impact to economic growth and increase the borrowing from internal debt due to its positive impact to economic growth of North Macedonia.

These empirical findings are consistent with the results of the previous empirical literature which examines the impact of public debt on GDP growth suggesting that debt develops the economic activity. The results support the existence of a positive and statistically significant relationship between government debt and GDP growth. In comparison, the findings in this paper are similar to some of previous studies, that the growth rate and debt ratio have positive relationship, whereas in this paper, there is a difference in internal and external debt, see for example, Mencinger et al. (2014), Cecchetti, Mohanty and Zampolli, (2011); Checherita and Rother, 2010; Clements,

Bhattacharya and Nguyen, 2003; Kumar and Woo 2010; Reinhart and Rogoff 2010a, Pattillo, Poirson dhe Ricci (2004); Pegkas (2018); Hsing (2020); Velichkov (2016); Lechtenberg (2017); Shahor (2018) and Jacobs, Ogawa, Sterken and Tokutsu (2020).

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## Appendix

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
real_growth_rates	15	-.5	6.5	3.147	1.9860
Domestic_general_government_debt_in_EUR_million	15	465.9	1793.3	991.967	479.6069
External_general_government_debt_in_EUR_million	15	877.2	2763.5	1707.627	657.6161
Gross_savings_percentage_GDP	15	16.20	31.97	25.4687	5.40686
Growth_rate_of_exports	15	-32.13	41.54	11.8067	18.49678
Growth_rate_of_imports	15	-26.30	40.34	9.4147	16.91108
Valid N (listwise)	15				

Coefficients<sup>a</sup>

### Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
real_growth_rates	15	-.5	6.5	3.147	1.9860
Domestic_general_government_debt_in_EUR_million	15	465.9	1793.3	991.967	479.6069
External_general_government_debt_in_EUR_million	15	877.2	2763.5	1707.627	657.6161
Gross_savings_percentage_GDP	15	16.20	31.97	25.4687	5.40686
Growth_rate_of_exports	15	-32.13	41.54	11.8067	18.49678
Growth_rate_of_imports	15	-26.30	40.34	9.4147	16.91108

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.501	2.957		3.213	.011
	Domestic_general_government_debt_in_EUR_million	.004	.002	1.081	1.842	.099
	External_general_government_debt_in_EUR_million	-.001	.002	-.193	-.262	.799
	Gross_savings_percentage_GDP	-.416	.207	-1.133	-2.010	.075
	Growth_rate_of_imports	-.024	.067	-.201	-.354	.731
	Growth_rate_of_exports	.086	.059	.805	1.463	.178

a. Dependent Variable: real\_growth\_rates

**ANOVA<sup>b</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.589	5	7.718	4.177	.031 <sup>a</sup>
	Residual	16.629	9	1.848		
	Total	55.217	14			

a. Predictors: (Constant), Growth\_rate\_of\_exports, External\_general\_government\_debt\_in\_EUR\_million, Gross\_savings\_percentage\_GDP, Growth\_rate\_of\_imports, Domestic\_general\_government\_debt\_in\_EUR\_million

b. Dependent Variable: real\_growth\_rates

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.836 <sup>a</sup>	.699	.532	1.3593	1.730

a. Predictors: (Constant), Growth\_rate\_of\_exports, External\_general\_government\_debt\_in\_EUR\_million, Gross\_savings\_percentage\_GDP, Growth\_rate\_of\_imports, Domestic\_general\_government\_debt\_in\_EUR\_million

b. Dependent Variable: real\_growth\_rates