

Impact of Public Debt on Private Consumption in Developing European Countries

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Abstract This study will investigate the relationship between public debt and private consumption. In the last decade, public debt and its impact on the economy has become a very current and vital topic for many scholars in developed and developing countries.

Therefore, the primary purpose of this study is to show the effect of public debt on the growth of private consumption in developing countries, where about 20 countries will be analyzed. The source of data for the realization of this study will be based on international financial institutions such as World Bank, International Monetary Fund, and European Bank for Reconstruction and Development, while the analysis period includes data from 1995 to 2020. Drafting and the research will be organized by applying a diverse methodology, which includes advanced econometric methods and techniques such as OLS, Fixed Effects, Random Effects, and GMM.

The main findings of this study show a non-linear relationship between public debt and private consumption in developing European countries. More specifically, the increase in public debt negatively affects private consumption expenditures.

The results provided through this study present data on developing European countries' policies about the ratio of public debt to private consumption.

Keywords: Public Debt, Private Consumption, Economic Growth, Government Expenditure, European Developing Countries.

JEL Classification: H63, E21, 040, H50, B40

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1. Introduction

Through this scientific paper, we will attempt to provide empirical evidence about the ratio of public debt and private consumption expenditure in developing European countries. Based on data obtained from various credible sources, the study will guide economic and political experts on the impact of public debt on private consumption expenditure in developing countries. Many theories and approaches have addressed the impact of public debt on the economy, with some highlighting a negative link between public debt and economic growth, while others argue empirical evidence of a positive link between public debt and economic growth. From the literature review, we see many studies which have addressed the link between public debt and economic growth in developed as well as developing countries (Almada & Juarez, 2016; Irons & Bivens, 2010; Pescatori et al., 2014; Baum et al., 2013; Avdimetaj et al., 2021; Garcia & Rigobon, 2004; Andres et al., 2017; Gómez-Puig & Sosvilla, 2017). However, very few studies have addressed the relationship between public debt and private consumption, i.e. the effect of how public debt growth affects private consumption (Berben & Brosens, 2007; Gogas et al., 2014; Bahadir et al., 2020; Kusairi et al., 2019).

Developing countries find it more challenging to repay the debt because they face an unsustainable economic situation. Unsurprisingly, developed countries are characterized as countries with high levels of consumer spending as well as high levels of debt public.

Private consumption expenditures are one of the main indicators of a country's economic development and should definitely be paid attention to because they are the primary driver of economic growth.

In this study, we will try to present the importance of public debt as an instrument that can affect economic growth in developing countries, judging by the stimulation of consumer spending. This scientific paper aims to answer the dilemmas related to public debt viewed through the prism of private consumption. Also, this study, it aims to analyze the possible link between public debt and private consumption.

To investigate the relationship between public debt and private consumption, we have proposed two hypotheses:

H1: Increased public debt negatively affects private consumption in developing countries.

H2: Increased government spending has a positive impact on increasing private consumption in developing countries

To support and validate the hypotheses set out above we will use a diversified methodology, which will include comparative, narrative and econometric methods. To test the ratio between public debt and private consumption, as well as other control variables we will use econometric models such as: OLS, Fixed Effects, Random Effects, and GMM (General Moment Method). The data source is publications from international institutions such as the World Bank, International Monetary Fund, and

European Central Bank, as well as reports of Central Banks of developing countries (20 countries included in the research). This study will have scientific significance, because public debt plays an important role in the economic development of a country, it also represents a crucial indicator in private consumption, thus promoting the economic development of developing countries.

To summarize, we see that this scientific study's main findings show there is no possible link between public debt and private consumption expenditure. In contrast, concretely, the results show that public debt negatively affects private consumption expenditure by -0.032% in developing European countries, which has very high statistical reliability.

The structure of this scientific paper is as follows: the first part begins with the introduction and motivation of the thesis, then continues with the literature review and methodology, and the last part presents the results and conclusions of the study.

2. Literature Review

Based on the literature's theoretical and empirical view, we will try to present the evidence of studies that address the link between public debt and final consumption expenditure in developing countries. Several studies have provided empirical evidence about the relationship between public debt and economic growth, where they specifically emphasize that public debt growth can have a positive impact on economic growth in developed and developing countries (Cecchetti et al., 2011; Blanchard, 2019; Baum et al., 2013; Adam & Bevan, 2005).

According to a study by Wigger (2009), it is concluded that future generations will be able to benefit from certain schemes by issuing public debt and then invest according to their preferences in technology or other industries that may promote economic development and growth in general.

Also, Greiner (2012), in his study, points out that there is a relationship between high public debt, and a low economic growth rate in the long term. (Checherita & Rother, 2010) analyze the relationship between public debt and economic growth in a sample of twelve EU countries, and the results of this study show that the threshold for using public debt varies from 82% to 91%, which means that the eventual growth above this threshold may have negative consequences on economic growth in these countries.

Also, the scientific study by (Egert, 2013) tries to determine the public debt threshold, which starts from low levels and varies from 20% to 60% of GDP, where the public debt exceeds the threshold determined negatively affects economic growth. (Reinhart & Rogoff, 2010) created a major debate when they published findings showing that increasing the public debt ratio above 90% of GDP could negatively impact economic growth.

On the other hand, we have a group of researchers who present a non-linear relationship between public debt and economic growth (Panizza & Presbitero, 2013;

Rubin, Orszag & Sinai, 2004). The study conducted by (Kourtellos et al., 2013) shows that if countries do not have stable and quality institutions, public debt is likely to negatively affect economic growth if the other parameters are equal. However, if the quality of institutions is very high, then public debt growth is neutral to economic growth.

Researchers (Gomez & Sosvilla, 2017) have also investigated the link between public debt and economic growth in EU countries. The results of this scientific study show different views regarding the use of public debt; in general, public debt negatively affects economic growth, while in the short term, public debt can have a positive impact, but the positive effect is at the discretion of EU countries.

According to the findings of (Afonso & Alves, 2015) it has been concluded that the eventual increase in the level of public debt has a negative impact on economic growth, both in the short and long term.

However, through empirical evidence, we see that few studies have addressed the relationship between public debt and private consumption expenditure in developing and developed countries. The study conducted by the authors (Kusairi et al., 2019) have analyzed the relationship between public debt and private consumption; the results from this study show that an increase in public debt does not increase private consumption because consumers expect governments to increase taxes to finance debt, such as principal and interest payments. However, according to the traditional approach, the “Ricardian” equivalence does not exist, so public debt affects private consumption.

(Gogas et al., 2014) attempt to investigate the long-term relationship between public debt and private consumption in order to test the possible validity of the Ricardian equivalence proposal, in a sample of fifteen OECD countries. The results of this study fail to provide empirical evidence in support of the “Ricardian” equivalence proposition for all countries analyzed. Also, the study by (Cho & Rhee, 2013) addresses the non-linear effects of public debt and private consumption in a sample of 16 OECD countries, and the results show the optimal threshold of 83.7% of public debt relative to GDP, where exceeding this threshold negatively affects private consumption expenditures.

To summarize, we note that many studies have analyzed the relationship between public debt and economic growth, providing empirical evidence for and against the impact of public debt on the economy. However, through this scientific study, we will try to investigate the possible link of public debt to private consumption spending in developing European countries.

3. Research Methodology

3.1. Description of Data

This paper is based on indicators of public debt, private consumption expenditures, government expenditures, and economic growth in developing countries, including about 20 countries. Empirical data used to test variables in developing European countries cover the period from 1995 to 2020.

As a method of data collection, the quantitative method was used, which was realized through secondary data, which includes data from the World Bank, International Monetary Fund, European Central Bank, European Bank for Reconstruction and Development, as well as the reports of the Central Banks of the countries included in this study. The data used in this study cover gross domestic product, private consumption expenditures, foreign direct investment, exports of goods and services, imports, gross savings, and government expenditures. Based on this study's main objectives, we will try to prove the validity of the two hypotheses set out at the beginning of this scientific study. To confirm the reliability of the hypotheses, we will use econometric methods in order for the results to have a higher scientific significance, such as the following: OLS, Fixed Effects, Random Effects, as well as the dynamic GMM estimator.

3.2. Evaluation of Methods

The dynamic panel model (GMM) tests the relationship between public debt and private consumption, as well as other independent variables in developing European countries. In the framework of this study, we will use the GMM estimator developed by (Arellano & Bond, 1991), (Blundell & Bond, 1998), (Blundell, Bond & Windmeijer, 2000), as well as (Roodman, 2009). To increase the reliability of the results, we will also apply the methods presented above: OLS, Fixed Effects, and Random Effects. Through the application of the small squares method (OLS), we will test the relationship between public debt and private consumption, where the primary objective of regression is to calculate or predict the average value of a Y variable (dependent variable) based on values of the other variable (independent variable) X. The "Fixed Effects" model assumes that the explanatory variable has a fixed or constant relationship with the responsive variables in all observations. In econometrics and statistics, the "Fixed Effects" model is a statistical model that represents the quantities observed in terms of explanatory variables and which are treated as fixed units and not random.

The advantage of the "Fixed Effects" model is the removal or exclusion of individual-specific heterogeneity. At the same time, the model based on the "Random Effects" approach assumes that the explanatory variables have a fixed relationship with the response variable in all observations but these fixed effects may vary from one observation to another.

The reason for using the "Random Effects" model is because it differs from the "Fixed Effects" model. After all, the variation of all the subjects involved is assumed to be random and is not correlated with the predicted variables, as well as with other variables of independent included in the econometric model. If we have a model-dependent variable, then it is preferable to use the random effects model. It follows that in the "Fixed Effects" model, it is assumed that there are "n" unknown parameters to be treated in econometric estimates, while in the case of the "Random

Effects” model, it is treated as a diagram with an average distribution of μ , as well as a variance independent of the explanatory variables in the model.

As we pointed out above, to analyze the relationship between public debt and private consumption, as well as the validity of the hypotheses, we will use the GMM estimator, which allows us to check the problem of endogenous bias caused by the opposite impact resulting from private consumption expenditures to public debt and private consumption, as well as to other control variables.

This model uses instrumental variables obtained through delays of endogenous variables for treating the endogeneity problem. Depending on the use by the assessor, these delays can be applied to diverse differences or levels. The divisions between these two methods will be expressed in the following equations (Labra & Torrecillas, 2018).

Instruments in differences and levels

$$X_{(t-n)} - X_{(t-(n-1))} \quad (1)$$

$$X_{(t-n)} \quad (2)$$

Equations in differences and levels:

$$\Delta Y_{(t-1)}; Y_{t-(n-1)} = Y_{(t-n)} \quad (3)$$

$$Y_t = T_{t-1}; Y_{t-(n-1)} = Y_{t-n} \quad (4)$$

Where, Y_{t-n} is the instrument of $Y_{t-(n-1)}$.

The reliability of the GMM assessor depends on the validity of its groups. To address this issue, we will consider the two tests suggested by (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1997).

Besides, we will use the estimator Roodman (2009) developed, known as “xtabond2”, to test the model’s results and variables (Roodman, 2009). This evaluator follows the same logic as the GMM system but presents more options in using the instruments. In addition, “xtabond2” allows us to work separately on the endogeneity of dependent or independent variables.

The specification of the dynamic panel (GMM) model in this study is as follows

$$\begin{aligned} Final_Consumption_Expenditure = & \mu + Final_Consumption_Expenditure^{(t-1)} + \\ & B^1 Public_Debt_{it} + B^2 GDP_Growth_{it} + B^3 Fdi_{it} + B^4 Export + B^5 Import + \\ & B^6 Bruto_Savings_{it} + B^7 Final_Government_Expenditure_{it} + \delta_i + \gamma_i + \epsilon \end{aligned} \quad (5)$$

The dependent variable represents private consumption expressed through private consumption expenditures, where from the equation, we see that place is i , t represents years, and μ is the term constant. While the explanatory variables include *Final_Consumption_Expenditure*^($it-1$) the first set of dependent variables is *Public_Debt* ^{it} .

Based on the theoretical assumptions, the ratio between public debt and private consumption expenditures is assumed to be a non-linear relationship, but for this assumption to be valid, we will see through the results obtained from the dynamic GMM estimator.

Empirical studies conducted by (Mencinger et al., 2015; Reinhart & Rogoff, 2010; Checherita & Rother, 2010) showed a positive relationship between public debt and economic growth, defining the optimal threshold at which countries can utilize public debt to stimulate economic growth. On the contrary, exceeding this threshold in the form of an (U) inverted can then negatively affect economic growth in developed as well as developing countries. We also include control variables within the econometric model to improve the model's performance, and ensure reliable results. Control variables are selected based on key determinants of economic growth (Sala-i-Martin, 2004; Kumar & Woo, 2010; Checherita & Rother, 2010). The control variables are: foreign direct investment, export of goods and services, import, gross savings, and government expenditures, additional clarifications are in Appendix, Table A2.

4. Results and Findings

In this section, we will present the empirical results worked through several econometric approaches such as OLS, Fixed Effects, Random Effects, and the dynamic GMM estimator. The reason for the variety of use of these econometric models is that the results obtained should reflect high statistical reliability. The results in Tables 1 and 2 show that all the methods calculated in the dynamic panels are well modeled, as their coefficients have shown reliable results.

4.1. Descriptive Statistics

In this study, we use the annual data in the form of a panel for developing European countries (Eastern European countries, as well as Western Balkan countries). Empirical data, which have been used to investigate the relationship between public debt and private consumption in developing European countries, cover the period from 1995 to 2020. In Appendix in Table A1, we will provide data about the list of the countries included in the study.

The data sources are the World Bank, International Monetary Fund, and Eurostat. To investigate the relationship between public debt and private consumption, we have used econometric models, which include several econometric approaches, ranging from OLS, Fixed Effects, Random Effects, and the dynamic GMM estimator. These are also used by other empirical studies, which attempt to explain the relationship between

public debt and other macroeconomic indicators (Checherita & Rother, 2010; Reinhart & Rogoff, 2010; Mencinger et al., 2015; Kumar & Woo, 2015).

Table 1. Statistical description of exogenous and endogenous variables in developing countries.

| Variables | OBS | Std.Dev | Min | Max |
|--|------------|----------------|------------|------------|
| <i>Final_Consumption _ Expenditure</i> | 476 | 4.9 | -32.02 | 19.04 |
| <i>Public_Debt</i> | 497 | 25.69 | 0 | 224.75 |
| <i>Gdp_Growth</i> | 504 | 6.1 | -15.16 | 88.96 |
| <i>FDI</i> | 423 | 12.04 | -40.32 | 205.92 |
| <i>Export</i> | 508 | 19.17 | 5.17 | 96.37 |
| <i>Import</i> | 508 | 15.01 | 8.22 | 98.36 |
| <i>Bruto_Savings</i> | 429 | 6.1 | -8.29 | 33.84 |
| <i>Final_Government _ Expenditure</i> | 501 | 3.41 | 9.45 | 39.28 |

Source: Calculated by the Author

Through Table 1, we can see the statistical description of the exogenous and endogenous variables included in the study; the results show that most of them contain a high number of observations, which increases the reliability of the findings and results. All variables in this empirical study are expressed as a percentage of GDP.

The interpretation of the empirical results in this study are done through the dynamic estimator GMM, or better to say, according to the latest model in Table 2, because the data obtained from this estimator are estimated to be more reliable.

4.2. Empirical Results

Through empirical data we will test the variables described above in developing European countries over 20 years, more specifically from 1995 to 2020. Table 2 presents the empirical results obtained through several methods and econometric approaches. The results will be interpreted through the GMM

estimator, which confirms the finding that the instrumental variables are not related to the waste group. As a result, the Arellano-Bond tests AR (1) and AR (2) with associated t-values are rejected in the first order, while they are accepted in the second order, which confirms that there is no autocorrelation in the second order between error term, while the Sargan test tests the invalid hypothesis of limitations on identifying the set of exogenous instruments that apply to the model.

Table 2. Regression results of the impact of public debt on the growth of private consumption.

| Variables | OLS Model (1) | Fixed Effects Model (2) | Random Effects Model (3) | GMM Model (4) |
|---|--------------------------|------------------------------------|---|--------------------------|
| <i>Final_Consumption</i> <i>_Expenditure_Lag1</i> <i>T-Statistics</i> | | | | -0.36*** (-6.27) |
| <i>Public_Debt</i> <i>T-Statistics</i> | -0.019*** (2.42) | -0.022*** (-2.73) | -0.021*** (-2.60) | -0.032*** (-3.74) |
| <i>Gdp_Growth</i> <i>T-Statistics</i> | 0.87*** (19.60) | 0.78** (14.07) | 0.86*** (19.45) | 0.83*** (12.94) |
| <i>FDI</i> <i>T-Statistics</i> | -0.019* (-1.41) | -0.021** (-1.52) | -0.018* (-1.37) | -0.002 (-0.17) |
| <i>Export</i> <i>T-Statistics</i> | -0.016 (-0.90) | -0.009 (-0.50) | -0.009 (-0.50) | 0.024* (1.13) |
| <i>Import</i> <i>T-Statistics</i> | 0.025* (1.30) | 0.030** (1.51) | 0.023* (1.11) | -0.019* (-0.86) |
| <i>Bruto_Saving</i> <i>T-Statistics</i> | -0.008 (0.22) | -0.016 (-0.44) | -0.011 (-0.34) | -0.027 (-0.74) |
| <i>Final_Government_</i> <i>Expenditure</i> <i>T-Statistics</i> | 0.076* (1.19) | 0.039 (0.57) | 0.078* (1.26) | 0.18*** (2.76) |

| | | | | |
|--|---------|--------|---------|----------|
| <i>Constant</i> | -0.85 | 0.057 | -0.77 | |
| <i>T-Statistics</i> | (-0.50) | (0.03) | (-0.47) | |
| <i>Observation</i> | 401 | 401 | 401 | 338 |
| <i>Arellano – Bond test for AR (1)</i> | | | | (-4.46) |
| <i>Arellano – Bond test for AR (2)</i> | | | | (-1.85) |
| <i>Sargan Test</i> | | | | (257.41) |
| $X^{2(56)prob.}$ | | | | |

Source: Calculated by the Author

Note: The significance will be based on the T-Statistics coefficient, where parameters 1 to 1.5 results are significant on *, parameters 1.5 to 2 are **, and over 2 are ***.

Table 2 presents the results from the regression analysis, which includes several econometric approaches and techniques such as OLS, Fixed Effects, Random Effects, and GMM. While the interpretation of the results is based on the dynamic GMM estimator, due to its higher reliability.

The results from the regression analysis are based on a high number of observations. Through this estimator, we investigate the relationship between public debt and private consumption in developing European countries from 1995 to 2020. Referring to the results presented in Table 2, we notice a non-linear relationship between public debt and private consumption; more precisely, according to the results from the dynamic estimator GMM, we see that the increase of the public debt by 1% negatively affects private consumption expenditures by -0.032% in developing European countries, and this result represents a very high statistical reliability. The result is in line with several other empirical studies which have addressed the relationship between public debt and private consumption and have shown a non-linear relationship between public debt and consumer spending, emphasizing that the eventual increase in public debt does not affect the increase of private consumption expenditures (Kusairi et al., 2019; Gogas et al., 2014). Therefore based on these empirical results, we support the first hypothesis presented at the beginning of the study (H1).

On the contrary, a linear relationship is observed between economic growth and private consumption, where according to the results, we see that the GDP growth of 1% in developing European countries has a positive effect on increasing private consumption spending by 0.83%. This result presents a very high statistical reliability, as well as is in full harmony with economic theory, which emphasizes that economic growth has a positive effect on the growth of private consumption. Also, from the results, we see that the eventual increase of foreign direct investment negatively affects private consumption by -0.002% in developing European countries, and this result does not reflect statistical reliability. While in exports, there is a linear relationship with private consumption, where the eventual increase of exports by 1% has a positive effect on the increase of private consumption expenditures by 0.024%. This result reflects certain statistical reliability.

On the contrary, the results show that imports negatively affect private consumption by -0.019% in developing European countries, although this result does not show statistical reliability. Also, gross savings do not show a linear relationship with private consumption, where according to the dynamic estimator results, the increase in gross savings negatively affects private consumption expenditures by -0.027%. This result does not reflect certain statistical reliability, although it is in line with economic theory. Through the dynamic GMM estimator we have also investigated the link between government spending and private consumption in developing European countries.

We note that the increase in government spending by 1% has a positive impact on the growth of private consumption in developing European countries by 0.18%; this result shows a very high statistical reliability and is in line with other studies which have analyzed the relationship of government spending with other determinants of economic growth (Adam & Bevan, 2005; Cohen, 1993; Elmendorf & Mankiw, 1998).

Therefore based on the results given through the GMM dynamic estimator, we fully support the second hypothesis set out at the beginning of the study (H2). Nevertheless, that is contrary to the neoclassical theory, which emphasizes that the increase in public debt affects the increase in government spending and the increase in demand for money, which then stimulates the increase of interest rates, and, consequently, rising interest rates negatively affect private consumption spending.

5. Conclusion

The study addressed the relationship between public debt and private consumption in developing European countries from 1995 to 2020, representing a pretty long period. This study investigated how the increase of public debt

affects the expenditures of private consumption in a sample of twenty European developing countries. The study's main results, based on the dynamic estimator GMM, emphasize that public debt reflects a non-linear relationship with private consumption expenditures. More specifically, according to the results, we notice that the increase of public debt in European developing countries has a negative impact, thus reducing private consumption expenditures by -0.032%. These findings have shown high statistical reliability and claim that the increase in public debt in these countries does not affect the growth of private consumption. This statement is also in line with economic theory, which emphasizes that increasing public debt can affect future generations through tax increases, and tax increases then negatively affect consumption because it directly reduces consumer wealth. From the results, we also notice a non-linear relationship with other control variables in the model, such as FDI, import, and gross savings, where their increase does not affect the stimulus of private consumption expenditures in developing European countries.

Another issue analyzed during this study is the relationship between government spending and private consumption. According to the results through the dynamic GMM estimator, we notice that government and private consumption spending reflect a linear relationship.

More specifically, we see from the results that the eventual increase of government expenditures in European developing countries positively impacts the growth of private consumption by 0.18%. At the same time, other control variables such as GDP growth and export have shown a positive relationship with private consumption; their eventual increase also boosts private consumption expenditures in developing European countries, where all their coefficients reflect statistical reliability.

Finally, based on the obtained results, we suggest that developing European countries not to increase the level of public debt to stimulate private consumption because, from the empirical analysis, we see that the increase of public debt negatively affects private consumption expenditures. Debt growth should be based on the optimal utilization threshold because the growth above the threshold can negatively affect economic growth and reduce private consumption expenditures. The results of this study are significant for the leaders of the governments of developing European countries, because they provide empirical evidence about the ratio of public debt with private consumption.

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Appendixes

Table A1. List of Developing European Countries

| N. | Countries of the Central Europe |
|----|---------------------------------|
| 1 | Estonia |
| 2 | Lithuania |
| 3 | Latvia |
| 4 | Slovenia |
| 5 | Czech Republic |
| 6 | Poland |
| 7 | Bulgaria |
| 8 | Belarus |
| 9 | Hungary |
| 10 | Moldova |
| 11 | Romania |
| 12 | Slovakia |
| 13 | Ukraine |
| 14 | Croatia |
| 15 | Albania |
| 16 | Bosnja and Herzegovina |
| 17 | Macedonia |
| 18 | Serbia |
| 19 | Montenegro |
| 20 | Kosovo |

Table A2: Description of variables in Developing European Countries

| Nr | Variables | Code |
|-----------|--|----------------------|
| 1 | Final Consumption Expenditure (% of GDP) | Final_Consumption_Ex |
| 2 | Public Debt (% of GDP) | Public_Debt |
| 3 | Gdp Growth (gdp growth annual %) | Gdp_Growth |
| 4 | FDI (% of GDP) | FDI |
| 5 | Export (% of GDP) | Export |
| 6 | Import (% of GDP) | Import |
| 7 | Bruto Savings (% of GDP) | Bruto_Savings |
| 8 | Final Government Expenditure(% of GDP) | Final_Government_Ex |