

# **THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND PUBLIC DEBT: A SURVEY OF THE EMPIRICAL LITERATURE**

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## **Abstract**

*This paper surveys the recent literature on the relationship between public debt and economic growth. While many papers have found a negative correlation between debt and growth, our reading of the empirical literature is that there is no paper that can make a strong case for a causal relationship going from debt to economic growth. Economic theory generally supports a negative relationship between debt and growth in the long-run, whereas in the short-run fiscal stimulus may induce positive effects. Empirical literature provides some evidence for both, showing that the negative relationship might become more important after reaching a certain threshold, but the results are not absolutely conclusive. Problems of unobserved heterogeneity might be a major reason for that.*

*Keywords: Government Debt, Economic Growth, Fiscal Policy, Monetary Policy, Interest Rates*

## **INTRODUCTION**

The relationship between economic growth and public debt is a very controversial issue by economists. According to Elmendorf and Mankiw (1999) state debt is important for effects that it brings itself, directly or indirectly, in the country's economy. Firstly, the state debt could affect monetary policy. A country with high government debt tends to face higher interest rates, and

the monetary authority can be found under pressure to reduce these rates by the Monetary Policy. This strategy may reduce interest rates in the short term, but in the long run will have unchanged real interest rates and inflation and higher nominal interest rates. The growth of these two indicators will be reflected in the reduction of private investment, and consequently the reduction of the Gross Domestic Product (GDP) and economic growth. Secondly, the state debt could affect the political process, which determines the Fiscal Policy. Some economists argue that the possibility of a government borrowing reduces the discipline of the budget process use. With the latter we understand that, if a government makes additional costs, which are not related to income tax, the policy makers and the public worry less if these costs are appropriate. Thirdly, the state debt makes a country's economy more vulnerable to an international crisis of confidence. A high state debt pressure on bank balance through several different channels. For example, it increases the cost of financing to financial institutions after increasing the risk assets. Financial institutions, which hold a large share of government debt of countries with an "economic stress", perceived as risky, may have to pay higher interest rates and have difficulty in raising funds in all market. They also can be found under potential pressure to increase capital and liquidity. All these factors make the cost of debt service to increase, which will bring a negative impact on economic growth. Finally, according Guraziu et al., (2012) financial institutions may face capital outflow and replacement of assets. All the factors mentioned above indicate that a high level of public debt affects the country's international confidence, would damage the business climate and it will affect the reduction of investment and economic growth. Throughout the theoretical literature, we can distinguish Classics, who see public debt as a burden on society; Neoclassical view, which sees public debt as detrimental to investment and growth; Ricardian view that sees the state as a tax debt in the future (Barro, 1974); Modern economists, who see public debt as a driver of economic growth if the funds are used for productive purposes, and Conventional view under which public debt stimulates aggregate demand and growth in the short term and encourages the reduction of capital and national income in long term. Classical economists created their belief as they felt that balancing the annual budget from the government was a virtue for government itself and a budget deficit for them were seen as a sign of the bankruptcy of the state. David Ricardo, one of the main representatives of the Classical school, was referred to the debt as "... one of the most terrible dangers, that was ever invented, which could affect a nation" as "... a system which tends to make us less thrifty, and blind to our real situation "(Balassone et al., 2004, p. 1). Neoclassical economists on the other hand, claimed that the level of public debt is important because of the existence of distortionary, and the fact that economic agents cannot properly predict the effects of tax changes in the future. In such cases, an increase of debt today would

have an effect on the behavior of these agents, which will negatively impact on aggregate demand and economic growth (Cowan et al., 2006). In the Ricardian view, state debt was considered equivalent to future taxes (Barro, 1974). Considering consumers rational and farsighted, additional tax, which came from the growth of the latter to finance the deficit, it would be equivalent to the current deficit. So, according to the Ricardian view of budget deficit financing through taxes would have the net effect on national income in the long run (Mankiw, 2002). On the other hand, modern economists carried a quite opposite attitude. They were convinced that if government borrowing is done for productive purposes, and not for the consumption of goods and services, than they kept the action in every aspect. They see government debt as a necessary tool of a modern economy, especially in developing countries, who depend on these loans precisely from internal or external to accelerate their process of economic development. An important contribution comes from conventional viewpoint, according to which the state debt stimulates aggregate demand and growth in the short term and encourages the reduction of capital and national income in the long run (Mankiw, 1998). In the short run, an increase in public debt will continue to increase the demand for output. If we assume that the government creates a budget deficit while keeping costs constant and reducing tax revenues, this it brings an increase in disposable income of households, and possibly an increase in their welfare. Conventional analysis assumed that by increasing income and well-being of individuals will boost spending on consumption goods, so will boost aggregate demand for goods and services. According to this view, in the short term Keynesian theory works, where prices and wages are solid. So, in the short term an increase in aggregate demand would increase national income, which means that there is a positive relationship between public debt and economic growth in the short term. In the long term, an increase in public debt will result in the reduction of national savings. According to the classical theory in the long run it has flexible prices and wages. This makes fiscal policy affect the national income only by changing the bid for the factors of production. To better understand how it works in the long run should be considered some identities. Let denote the national income  $Y$ ,  $C$  private consumption, private savings  $S$ , and  $T$  the difference of taxes with government transfers. According to budget limitations of the private sector we have:

$$Y = C + S + T \quad (1.1)$$

National income may also appear in the following form:

$$Y = C + I + G + NX \quad (1.2)$$

Combining the above two equations we get:

$$S + (T - G) = I + NX \quad (1.3)$$

Where,  $I$  is domestic investment,  $G$  is government spending on goods and services, and  $NX$  is net exports of goods and services.

Equation (1.3) shows that the amount of private and public savings should equal the amount of investment and net exports. Assuming again that the government keeps spending constant and reduces tax revenues, then we have created a budget deficit and public savings have decreased. One way that equation (1.3) to be balanced after reducing public savings is the reduction of investments for a certain period of time, resulting in reduction of capital stock. This will mean less output and less income for the country. A decrease in capital stock brings for a country a higher marginal product of capital, increasing the interest rate and the rate of return per unit of capital. At the same time we will have a lower productivity of labor, which leads to reduction of average real wage and total income from work. Apart from the contribution of the main economic schools, and other economists have studied the relationship of public debt to economic growth. Dombush and Fisher (1978) stated that the national debt is a direct consequence of domestic budget deficit. They referred to the budget deficit equation:

$$-DF = (G_o + R) - T = BUS \quad (1.4)$$

Where,  $DF$  is the budget deficit,  $G_o$  state expenses for goods and services,  $T$  are spending on transfers,  $BUS$  is a budget surplus, and  $(G_o + R)$  are the total government expenditures. From the equation above we can see that there is a negative relationship between debt and economic growth (Umaru et al., 2013). From the above theoretical literature, we can say that economists have failed to agree on the relationship between public debt and economic growth, although the dominant opinion is the negative relationship between them. From the Conventional standpoint on which our work will be based on, we can say that the public debt has a positive effect on economic growth in the short term, and a negative effect in the long run. So, the relationship between public debt and growth from the Conventional standpoint takes the form of an inverted U, defined by economists as the Laffer curve.

## **REVIEW OF EMPIRICAL LITERATURE ON THE RELATIONSHIP BETWEEN DEBT AND ECONOMIC GROWTH**

Many authors have given their contributions to various empirical analysis to study the mutual relationship between economic growth and public debt. Many have discovered that high levels of state debt have a negative effect on economic growth in developing countries (Pattillo et al., 2002; Pattillo et. al., 2004; Schclarek, 2004; Kumar and Woo, 2010). For example, Pattillo et al. (2002) analyzed 93 developing countries for the period 1969-1998. The authors used a dynamic model with panel data with fixed effects, and concluded that external debt had a negative impact on economic growth in the value of debt over 35-40 per cent of GDP (Pattillo et al, 2002). They

confirmed that between these two indicators, existed a non-linear relationship, in the form of Laffer curve (Reinhart et al, 2012). In another recent study, Pattillo et al. (2004) tested again non-linear effects of debt on economic growth taking into account a larger number of developing countries (61) for the same period (1969-1998). Assessment methodology of standard growth models was OLS, instrumental variables and GMM. They found that the negative impact of high public debt on economic growth operates through a strong negative effect on the factor of physical capital accumulation and the growth of total factor productivity output. On the other hand, Alfredo Schclarek (2004) found in his study that there was a linear negative impact of external debt on growth, after studying 59 developing countries and 24 industrial countries for the period 1970-2002. The methodology used was applied GMM on panel data. After they divided total external debt in private and public debt, they concluded that only the external public debt had a statistically significant negative effect on economic growth. The authors explain that the effect of external debt on growth comes mainly from the effect on the accumulation of physical capital, and did not provide arguments why private foreign debt had not resulted in a statistically significant effect on growth. Kumar and Woo (2010), in their study about the impact of public debt on economic growth in the long term, were based on a panel of 38 countries in the developed and developing countries for a period of four decades (1970-2010). To the purpose of their model they tested for, linearity, and the difference between developed countries and developing ones. They confirmed a non-linear relationship between negative initial level of public debt and economic growth. Non-linear relationship between debt and negative economic growth was visible only on 90 percent of the value of public debt. This relationship mainly reflected by a reduction in investment and the reduction of capital stock growth per employee, and the latter influence the reduction of labor productivity. On average, an increase of 10 percentage points in the debt to GDP in industrial countries would lead to a 0.4 percentage point decrease in investment, measured as a percentage of GDP. The impact on developing countries will be even greater, an increase of 10 percentage points in public debt will trigger a reduction in economic growth of 0.2 percentage points per year. In developed countries, the effect would be smaller. Patrizio Laine (2011) studied the dynamic relationship of public debt and economic growth in the United States (US) for the period 1959 - 2010. The methodology used was SVAR, Granger causality test, impulse response test, VECM, etc. The author concludes in her paper that the public debt had a positive effect on economic growth in the short term, and a negative effect in the long term, and it is quite difficult to have economic growth if we have a total debt reduction. On the other hand, many researchers have discovered a positive role of public debt on economic growth. Abbas and Christensen (2007) attempted to explore the role of domestic debt on economic growth. Their study included 93 countries with

low income, for the period 1975-2004. The methodology used was that of fixed effects, OLS and GMM. Results of the study by three methods used showed that domestic debt played a significant role in supporting economic development in countries with low income. Maana et al. (2008) analyzed the economic impact of domestic debt in the economy of Kenya. The authors used OLS method using annual data for the period 1996-2007. The results showed that the growth of domestic debt has a positive effect statistically insignificant on economic growth. However, we should mention the number of surveys (10) taken on analysis by the authors and their method followed by the conclusions we can't say that are reliable. On the other hand, Sheikh et al. (2010) studied the impact of domestic debt on economic growth in Pakistan. The methodology used was that OLS for the period 1972- 2009. Their study showed that the stock of domestic debt positively affects economic growth in Pakistan. Their work also focused on the assessment of the impact of debt service on economic growth and resulted in a negative effect of it. The authors argue that this negative effect is the result of more nonproductive costs that impede economic growth. We might add that the methodology used by the authors is very poor, taking into account the existence of advanced methods of analyzing time series at the time of publication of the paper. Unlike Sheikh et al. (2010), Uzun et al. (2012) used the autoregressive model with distributed delay (ARDL) to study the relationship between debt and economic growth in transition countries in the period 1991-2009. They concluded that there is a positive relationship between debt and economic growth in the long term, and that these countries were positive in the Laffer curve. To sum up, the existing literature summarized above shows that in many of the studies there is a concave non-linear relationship (in the form of an inverted U). This shows that public debt may have a positive or negative effect on economic growth. For a more concise presentation of the empirical literature, in table 1 is the main studies that have studied the relationship between debt and economic growth.

Table 1. Studies on the relationship between debt and economic growth

| <b>Authors</b>  | <b>The case of study</b>  | <b>Methodology</b>   | <b>Conclusions</b>   |
|---|---|--|--|
| <b>Chatherine Pattillo, Helene Poirson, Lucca Ricci, (2002)</b> | Non-linear impact of external debt on growth for 93 developing countries for the period 1969-98 | Dynamic data model with fixed effects panel                                  | External debt has a negative impact on economic growth in the value of debt over 35-40% of GDP   |
| <b>Chatherine Pattillo, Helene Poirson, Lucca Ricci, (2004)</b> | The channels through which public debt affects economic growth for 61 countries                 | Evaluation of standard growth model with OLS, instrumental variables and GMM | Negative impact of high public debt on economic growth operates through a strong negative effect on the factor of physical capital accumulation and growth of total factor productivity output |

|                                     |   |  |   |
|-------------------------------------|---|--|---|
| <b>Schclarek (2004)</b>             | The role of external debt on growth for 59 developing countries for the 1970s period in 2002  | GMM for panel data   | There is a linear negative impact of external debt on growth  |
| <b>Kumar and Woo (2010)</b>         | The impact of public debt on economic growth based on a panel of 38 countries in the developed and developing countries for the years 1970-2010 | OLS; linearity test, and the difference between developed and developing countries | There is a negative relationship between non-linear initial level of public debt and economic growth                        |
| <b>Patrizio Lainà (2011)</b>        | Dynamic relationship between public debt and economic growth in the US for the period   | SVAR, Granger causality, impulse response.   | Public debt has a positive effect on economic growth in the short term, and the negative effect on growth in the long term. |
| <b>Abbas and Christensen (2007)</b> | The role of domestic debt on economic growth  | Fixed effects, OLS and GMM   | Domestic debt plays an important role in supporting economic development in developing countries                            |
| <b>Maana et al. (2008)</b>          | The economic impact of domestic debt in the economy of Kenya, for the period 1996-2007  | OLS  | The growth of domestic debt has a positive effect statistically insignificant on economic growth                            |
| <b>Sheikh et al. (2010)</b>         | The impact of domestic debt on economic growth in Pakistan for 1972-2009  | OLS  | The stock of domestic debt positively affects economic growth   |
| <b>Uzun et al. (2012)</b>           | The relationship between debt and economic growth for countries in transition, for the period 1991- 2009  | ARDL test for stationarity, CADF test, LM  | There is a positive relationship between debt and economic growth in the long term  |

## CONCLUSIONS

Public debt is important as it may affect monetary policy, the political process, the international level of confidence for the country, the capital outflows and asset replacement. Transmission channels to a growing (reduction) effect of public debt on economic growth in the long term are: net savings channel, the channel of the cost of debt service, and the channel of national confidence level. Along the theoretical literature, regarding the contribution of the main economic schools on the relationship between public debt and growth, we can distinguish two main groups. On the one hand, they remain Classics, Neoclassics, Ricardian view who consider public debt as harmful to economic growth. On the other hand, we have Modern economists, who see debt as a stimulant of economic growth, but only if the funds are used for productive purposes. Separately these two groups stands the Conventional view, which states that, in the short term public debt show a positive effect on economic growth, while in the long run it displays a negative effect, which is transmitted through reduction of capital and national income.

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