

The causality between long term public debt and economic growth

Petar Atanasov, PhD

Plovdiv University "Paisii Hilendarski", Plovdiv, Bulgaria

petyr_atanasov@abv.bg

Abstract: The debate on the causal link between long-term public debt and economic growth remains open to this day. Moreover, the recent global financial crisis has given a new meaning, creating a huge field of work, and there is currently no consensus among economists in this direction. The net effect of debt on economic growth cannot be established theoretically, necessitating the use of a thorough and consistent empirical analysis. Historically in advanced countries the increase of debt levels occurs in response to deteriorating economic conditions and hindering growth: reduced fiscal revenues, declining asset prices or huge military spending.

Keywords: debt; gdp; financial crisis; economic growth

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1. THEORETICAL FRAMEWORK

In interpreting the long-term relationship between public debt accumulation and economic growth, two major problems stand out: theoretical and empirical. While the theoretical underpinnings of the impact of debt on economic growth are rooted in economic models, the econometric problem is much more complex. This is because the public debt is one of many factors seeking to explain economic growth [1].

The theoretical arguments for the link between public debt and economic growth could be found in the three schools of thought: (1) the Keynesian, (2) the Classical and (3) The new classical economy, which emerged in the 1970s and is built on various elements, but one of them is the Theory of rational expectations, which is the basic assumption in the Ricardian equivalent.

- First, the Keynesian school joins the mono-causal theory of growth, which suggests that debt-financed spending stimulates production [2]. As Keynes's harsh theory asserts, in a closed economy, rising government spending is linked to higher national output, which leads to higher employment. This

Keynesian view is largely supported by the "law of increasing state activity" hypothesis, which maintains that increased governmental spending enhances domestic economic activity and private investment [3].

- Second, the classics consider public debt to be detrimental to the economy, especially if public loans reduce the financial discipline and budget process as well as the access to private sector credit [4]. Classicists believe that debt-financed public spending does not fully offset the negative impact of private investment spurs, leading to economic decline. The representatives of this school maintain that the issue of public debt of the domestic market causes the liquidity crisis, thus discouraging private investment [5].
- Third, the Ricardo equivalence hypothesis suggests that fiscal stabilization efforts have a neutral impact on economic growth [6].

Four hypotheses for the causal relationship between public debt and economic growth emerge in theory.

First, there are researches to support the view that the rate of economic growth determines the level of public sector debt. This argument is supported empirically by the work of Donayre and Taivan. According to the authors, the causal link between debt growth and real GDP is inherent in each country [7].

Second, other studies support the hypothesis that high sovereign debt causes stagnant growth. This view implies that the slowdown in economic growth is to a large extent caused by increasing sovereign debt, which drives private investment away through high cost of capital [8].

Third, there is a two-way link between public debt and economic growth. This opinion is also known in the literature as a feedback hypothesis. It is empirically supported by Owusu-Nantwi and Erickson, Ferreira and Abbas and Christensen [9].

The last, the fourth hypothesis, is that there is no causal link between public debt and economic growth, known in the literature as the neutral hypothesis. It is supported by authors such as: Panizza and Presbitero, Reinhart and Rogoff, etc. [10].

Much of the empirical research has focused on finding a link between public debt and economic growth, but in order to achieve this, it is important to consider and study the channels through which public debt affects economic growth.

The first channel for the relationship between debt and tax rates relates to the expectations of economic factors. The impact of fiscal robustness may be insignificant for countries with low debt to GDP, but impressive in size for heavily indebted countries.

The second channel is limited liquidity, which is imposed by debt servicing. The large debt service payments can cause lower growth by depriving the country of its currency for capital goods needed.

The third channel (the interest rate channel) refers to factors that can curtail fiscal impact.

The fourth, but the most frequently cited channel, through which public debt impacts economic growth is through the spurring of private investment. Much of the research shows that debt has a negative impact on growth through a standard return effect by the interest rate.

For the successful analysis of the relationship between debt and growth, it is crucial what debt is spent on. The effect on growth would be one if the debt is spent refinancing previous debt, financing the pension, health and other systems or investing, research and education. Therefore, the impact of an increase in debt would depend on the type of expenditure. In this direction classics considered public debt as a capital injection to be used for investments in production and not for consumption by individuals.

The assessment of the debt-to-growth relationship is further complicated by the many concomitant factors as well as by its non-linear nature. In addition, the interactions between debt and growth are dynamic. The long-term relationship between debt and growth may depend on the level of debt itself. A number of researchers have come to this conclusion, claiming that there is a threshold above which public debt has a negative impact on economic growth. According to Baaziz, low public debt has a positive effect on economic growth, but once it exceeds a certain limit, the impact becomes negative [11].

2. LITERATURE REVIEW

A number of scientists discovered a one-way relationship between public debt and economic growth. Siddiqui and Malik examine the impact of external debt on economic growth in South Asian countries. They find that the impact of external debt on economic growth is positive and statistically significant [12]. Baum et al. suggest that the short-term impact of debt on GDP growth is positive and strongly statistically significant, but decreases to about zero and then loses significance when public debt to GDP ratio reaches approximately 67%. For high debt to GDP (ratios above 95%), additional debt has a negative impact on economic activity. They find that a 1% increase in the debt-to-GDP ratio reduces real GDP growth by 0.06 percentage points [13].

While earlier studies by Modigliani (1961), Diamond (1965), Saint-Paul (1992), support the view that the increase in public debt contributes to economic growth, more recent researches present entirely different results ([14] [15], [16]).

Patillo et al. conclude that while low levels of governmental debt have a positive effect on economic growth, high levels have a negative impact [17]. Minea and Parent find that public debt is in the opposite direction to growth when debt-to-GDP ratio is above 90 percent and below 115 percent. However, they find that the relationship between debt and growth becomes positive when debt exceeds 115 percent of GDP [18]. A significant part of the studies found evidence for negative linear relationship between public debt and growth. A good starting point for discussing the link between public debt and economic growth in advanced economies are Reinhart and Rogoff. The authors note that high levels of debt are negatively correlated with economic growth but do not find a link between debt and growth when public debt is below 90 percent of GDP [19]. The results of another study also show a counterclockwise correlation between debt growth and real GDP per capita for the OECD economies. The impact is greater for the sample of the country of Eurozone. According to the study, countries with a 90% or higher ratio tend to grow slower in the long run, but this result is not stable [20]. Égert finds some evidence in favour of a negative non-linear relationship between public debt and growth. However, he warns that these results are very sensitive to the period and country under study, the frequency of data and the assumptions about the minimum number of observations required in each non-linear regime [21].

Checherita-Westphal and Rother find a nonlinear effect between debt and long-term growth with a turning point of about 90-100% of GDP [22]. Afonso and Jalles find that the debt-to-GDP threshold is 58% of GDP for the euro area and slightly higher than 79% of GDP for emerging countries [23]. Eberhardt and Presbitero find some support for a negative effect between public debt and long-term growth in countries, but there is no evidence of a debt threshold [24]. However, some studies have emphasized that the negative relationship between public debt and growth depends on the countries and the sample period chosen. Kourtellos et al. find that higher public debt leads to lower growth only for countries with undemocratic regimes [25]. Dreger and Reimers point out that the negative impact of debt on GDP growth is limited to the euro area in periods of volatile public debt [26]. Other scientists don't find a cause-and-effect relationship between growth and debt. Looking at 31 EU and OECD countries in the period 1995-2013, the causal link between public debt and economic growth, regardless of debt levels, has not been proven [27]. Schclarek doesn't find dependence between public debt and economic growth in the industrial countries [28].

3. THE RELATIONSHIP BETWEEN LONG-TERM PUBLIC DEBT AND ECONOMIC GROWTH

A causality study between long-term public debt and economic growth was conducted - measured through the Gross Domestic Product of 15 OECD countries. The survey data are recorded on the World Bank website and the International Monetary Fund Database and cover the period 2001 - 2017. To do this, we use a Granger model, looking for dependencies of the considered variables with a time loop from one to four years. According to the model used, causality is present when the coefficient value obtained is less than 0.1. The results are presented in Table 1.

Table 1. *The causality between long term public debt and economic growth*

Country	GDP/Debt 1 :4	GDP/Debt 1 :3	GDP/Debt 1 :2
AUT	0.01963	0.01746	0.1296
BEL	0.4393	0.1856	0.05833
DNK	0.7579	0.3392	0.08937
FIN	0.7889	0.7493	0.5641
DEU	0.4651	0.2249	0.6511
GRC	0.1196	0.0339	0.09432
IRL	0.5879	0.3835	0.1378
ITA	0.1641	0.3647	0.6207
LUX	0.4999	0.373	0.6706
NLD	0.6594	0.2749	0.213
PRT	0.5968	0.1815	0.236
ESP	0.4242	0.07474	0.1539
SWE	0.6472	0.6369	0.4385
FRA	0.3281	0.5259	0.7251
GBR	0.09083	0.03361	0.7343

4. ANALYSIS AND CONCLUSION

The results of empirical analyses on the relationship between public debt and economic growth are neither categorical nor conclusive [30]. A number of authors such as Panizza and Presbitero examine the links between long-term debt and growth, summarizing the empirical studies conducted, indicating that they are characterized by high heterogeneity across countries and could change over time [29]. According to the model used, causality is present when the value of the coefficient obtained is less than 0.1. From the results we can conclude that causality is present in the variables studied in six out of fifteen countries. These are: Austria, Greece, United Kingdom, Spain, Belgium and Denmark; in the first three countries the studied dependencies are observed in two of the three possible time contours. In the other nine countries, no causality was detected between the variables. Therefore,

the study shows that no firm conclusion can be drawn about the relationship between long-term public debt and economic growth.

The decision in this direction could be an independent examination of the various countries, and the analysis to take into account the specificity of their markets.

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