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Does euro area membership affect the relation between GDP growth and public debt?

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ABSTRACT

We analyse the relationship between the debt-to-GDP ratio and real per capita GDP growth for euro area members and a broader set of industrial countries by distinguishing periods of sustainable and non-sustainable debt. Thresholds for debt are theory-driven and depend on macroeconomic conditions. If the nominal interest rate exceeds nominal output growth, primary budget surpluses are required to achieve a sustainable government debt ratio. The negative impact of the debt-to-GDP ratio is limited to the euro area and periods of non-sustainable public debt. In the broader panel of industrial countries, the negative debt effect diminishes. Instead, debt will exert a positive impact on growth given that it is sustainable. This result is fairly robust and holds even for exogenous thresholds. While the relationship between debt and growth is subject to nonlinearities, the evidence suggests that the participation in monetary union might entail an additional risk for its members.

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1. Introduction

During the financial crisis, public deficits increased because of declining revenues and the launch of fiscal stimulus packages (BIS, 2012, ch5 and IMF, 2012, ch2). The strong commitment of governments to assist distressed systemic banks pushed the risk of sovereign default. As a consequence, solvency ratings worsened in many countries. At the end of 2011, Japan's debt-to-GDP of 230% has been the highest among the developed countries. The US debt-to-GDP ratio reached 100%. In Europe, the prime example is Greece with a ratio exceeding 150%. Projections of government debt-to-GDP ratios look even worse, especially if demographic trends are taken into account. The ageing population will likely imply an increase in health and pension expenditures in many countries.

The rapid transformation of the financial crisis into a sovereign debt crisis especially in Europe called into question the medium and long run stability of the European Monetary Union. While the crisis originated in the periphery, core euro area states like Italy have become increasingly affected. Policies at the EU wide level established financial rescue packages to help troubled sovereign borrowers, such as the European Financial Stability Facility and the European Stability Mechanism. Countries can obtain funding conditional on fiscal austerity and the implementation of structural reforms to improve competitiveness. However, the positive effects of these measures are typically related to the long run. A reduction of government spending could lower the debt burden and increase the growth perspectives, but it will likely have negative effects on de-

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mand and production over the period of adjustment. Therefore, the responses bear the risk of a longer period of stagnation. The debt crisis has led to a revival of the academic and policy interest on the economic impact of government debt. While theoretical models often predict a negative impact of government debt on economic growth, empirical evidence is rather scarce.

According to the historical analysis of [Reinhart and Rogoff \(2009, 2010\)](#) carried out for 44 countries over the past 200 years, the relationship between public debt and real GDP growth is characterized by strong nonlinearities. The impact of debt is weak for debt to GDP ratios below a threshold of 90%. If debt ratios exceed this level, median growth falls by 1%, and average growth falls considerably more. Therefore, countries with high debt should address their fiscal problems to avoid a deterioration in their growth perspectives. The creation of fiscal buffers might be an appropriate strategy to compensate for extraordinary shocks.

The magnitude of the debt threshold has been confirmed by other studies, more or less. Using threshold regression methods, [Cecchetti et al. \(2011\)](#) estimated a critical level of 85% for OECD countries beyond which public debt is harmful for growth. Based on a similar approach, [Caner et al. \(2010\)](#) and [Elmeskov and Sutherland \(2012\)](#) reported even lower turning points of around 70% beyond which the impact of sovereign debt is bad. In contrast, [Chang and Chiang \(2009\)](#) found an inverted *U*-type relationship: The impact of the debt ratio is positive in any case, but higher in the middle regime and lower in the two outer regimes. The low and high debt regime are defined by ratios below (above) 33 (67) percent, respectively. Following [Kumar and Woo \(2010\)](#) initial public debt has a negative impact on subsequent growth in a mixed sample of industrial and emerging countries. On average, a 10% point increase in the initial debt to GDP ratio is associated with a slowdown in real per capita GDP growth of 0.2 percentage points per year. [Panizza and Presbitero \(2012\)](#) have argued that a negative correlation between government debt and growth does not imply causality, as lower growth can result in a higher public debt to GDP ratio. [Reinhart et al. \(2012\)](#) focused on debt overhangs, i.e. periods with a debt-to-GDP ratio exceeding 90%. As a striking feature, these periods are often long lasting with an average duration of 23 years. This suggests the association of debt and economic growth is not just cyclical, i.e. not strongly affected by endogeneity bias. The cumulative shortfall in output resulting from the debt overhang can be potentially massive.

Despite the ongoing debt crisis in the monetary union, only a few papers examined the relationship for euro area countries. According to the analysis of [Checherita and Rother \(2012\)](#) the turning point, beyond which government debt negatively affects growth is at 90–100% of GDP. [Baum et al. \(2012\)](#) detected a similar threshold by employing a dynamic panel approach. While the short-run impact of debt on per capita GDP growth is positive and significant, it decreases to zero beyond debt-to-GDP ratios of 67%. For ratios above 95%, additional debt has a negative impact on output growth. The long-term interest rate is subject to increased pressure if the debt to GDP ratio exceeds 70%.

In contrast to the previous literature, this paper is based on the distinction between sus-tainable and non-sustainable debt periods. Empirical estimates of the threshold might be misguided, if they do not refer to macroeconomic conditions. If the debt-to-GDP ratio is treated as an additional regressor, it can be independent of this environment. Furthermore, optimizing criteria are applied, if a model is fitted to the data. Thus, the threshold will likely increase because of rising debt levels during the financial crisis. Such a result is counterintuitive, since risk perceptions of financial markets have become more pronounced in recent years.

Whether a debt ratio is harmful for growth depends on the macroeconomic conditions embedded in the nominal interest rate, output growth, and the primary public budget. If the interest rate exceeds nominal output growth, primary surpluses are required to stabilize debt relative to GDP, i.e. to achieve a sustainable debt to GDP ratio. This condition is applied in a nonlinear panel model with country and period fixed effects for the euro area to investigate the impact of the debt to GDP ratio on real per capita GDP growth. A wider panel of industrial countries (including the euro area) is defined for comparison. For non-sustainable debt levels, the debt ratio exerts a negative impact on real per capita GDP growth in the euro area, but not in the broader panel. For sustainable debt levels, a positive impact can be detected in the broader panel, but not for the euro area. These results are robust and hold also for exogenous thresholds in the style of [Reinhart et al. \(2012\)](#). The participation in the European monetary union might therefore entail an additional risk for its member states. The countries agreed to fulfill the Maastricht criteria, the no bail out clause and the prohibition for the European central bank to finance governments. Such an arrangement might raise the risk of a sovereign default.

The paper is organized as follows: In the next section (Section 2), criteria for fiscal sustainability are derived from the public budget constraint. Data and results are reported in Section 3, and conclusions are stated in Section 4.

2. Criteria for fiscal sustainability

Higher public debt, caused by higher public spending or lower tax revenues can stimulate domestic demand, with expansionary effects on income and output in the short run. There is a partial crowding out effect on private demand. Since the financing of the deficit will reduce public saving, nominal and real interest rates increase, if capital inflows do not offset the public borrowing. Therefore, a decline in consumption and investment is involved, but it will normally not compensate the expansionary effect ([Hall, 2009](#)). However, the positive effect in the short run might be disputed in periods of high debt. Increasing default risk could reduce the size of the fiscal multipliers and can even turn them negative.

In the long run, taxes need to be raised or spending needs to be cut to achieve the sustainability of public debt, with adverse effects on business conditions. The slowdown in real capital accumulation because of the increase in real interest rates

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