Journal of International Money and Finance 32 (2013) 809–821

Contents lists available at SciVerse ScienceDirect

Journal of International Money and Finance

journal homepage: www.elsevier.com/locate/jimf

Debt and growth: New evidence for the euro area

Anja Baum [a], Cristina Checherita-Westphal [b,*], Philipp Rother [b]

[a] University of Cambridge, Faculty of Economics, Austin Robinson Building, Sidgwick Avenue, Cambridge CB3 9DD, UK
[b] European Central Bank, Fiscal Policies Division, Kaiserstrasse 29, D-60311 Frankfurt am Main, Germany

JEL classification:
H63
O40
E62
C20

Keywords:
Public debt
Economic growth
Fiscal policy
Threshold analysis

A B S T R A C T

Against the background of the euro area sovereign debt crisis, our paper investigates the relationship between public debt and economic growth and adds to the existing literature in the following ways. First, we use a dynamic threshold panel methodology in order to analyse the non-linear impact of public debt on GDP growth. Second, we focus on 12 euro area countries for the period 1990–2010, therefore adding to the current discussion on debt sustainability in the euro area. Our empirical results suggest that the short-run impact of debt on GDP growth is positive and highly statistically significant, but decreases to around zero and loses significance beyond public debt-to-GDP ratios of around 67%. This result is robust throughout most of our specifications, in the dynamic and non-dynamic threshold models alike. For high debt-to-GDP ratios (above 95%), additional debt has a negative impact on economic activity. Furthermore, we can show that the long-term interest rate is subject to increased pressure when the public debt-to-GDP ratio is above 70%, broadly supporting the above findings.

1. Introduction

The current sovereign debt crisis with its epicenter in the euro area has forcefully revived the academic and policy debate on the economic impact of public debt. Market concerns with respect to fiscal sustainability in vulnerable euro area countries have grown and spread to other countries, strengthening the concern that high public debt levels harm economic growth. Against this background, empirical research has started to focus on possible non-linearities within the debt-growth nexus, with specific attention given to high public debt levels.

* Corresponding author.
E-mail addresses: ab862@cam.ac.uk (A. Baum), cristina.checherita@ecb.europa.eu (C. Checherita-Westphal), philipp.rother@ecb.europa.eu (P. Rother).

0261-5606/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.jimonfin.2012.07.004

Nonetheless, the empirical literature on this topic remains scarce (see for example Schclarek, 2004; Reinhart and Rogoff, 2010; Kumar and Woo, 2010) and only few studies employ a non-linear impact analysis and are of particular interest for our paper. A recent contribution is provided by Checherita and Rother (2010). Expressing growth as a quadratic functional form of debt in a sample of twelve euro area countries over a period starting in 1970, the paper finds significant evidence for a concave (inverted U-shape) relationship. The debt turning point, beyond which debt starts having a negative impact on growth, is found at about 90–100% of GDP.[1]

Papers that relate more closely to the non-linear panel threshold methodology employed in our paper include the work by Chang and Chiang (2009) and Cecchetti et al. (2011). Both of these papers employ the threshold methodology for non-dynamic panels. Chang and Chiang (2009) analyse a sample of 15 OECD countries and use yearly observations for the period 1990–2004. In a generalisation of the Hansen (1999) multiple regime panel threshold model, they find two threshold values in a regression of GDP per capita growth on the debt-to-GDP ratio. Using two control variables (unemployment and gross fixed capital formation) they find debt-to-GDP threshold values of 32.3% and 66.25%. Interestingly, the impact of the debt ratio is positive and significant in all three regimes, higher in the middle regime and lower in the two outer regimes. They thus cannot support the crowding-out view if the debt-to-GDP ratio is higher than the upper threshold value.[2] Cecchetti et al. (2011) use a sample of 18 OECD countries for the period 1980–2010 and obtain a threshold for government debt at 85% of GDP. In contrast to Chang and Chiang (2009), they find a negative impact on growth in the high debt regime.

Going through the current empirical debt-growth literature, three characteristics become apparent. First, none of the above mentioned papers uses a dynamic panel threshold approach, which – due to the likely persistence of the GDP growth rate – can lead to inconsistent results. We include these dynamics in our analysis, therefore controlling for growth persistence and adding to the reliability of our results. As a direct consequence we can rely upon a methodology that is well suited for a short-run relationship as it is estimated here.

Second, most of the above papers study the long-term impact of debt on growth (Schclarek, 2004; Reinhart and Rogoff, 2010; Kumar and Woo, 2010; Checherita and Rother, 2010).[3] So far the only exception has been Chang and Chiang (2009), who rely exclusively on yearly data and thus capture a short-term impact comparable to our focus. Other short-term growth analyses normally study the impact of monetary or fiscal policy shocks (see Hemming et al. 2002 and van Riet 2010 for relevant surveys on fiscal multipliers) and if the role of debt is accounted for, its influence is indirect. As an example, IMF (2008) finds the impact of discretionary fiscal impulses on real GDP growth to be contingent on the level of debt (i.e. it is positive and larger at low government debt levels), but a direct impact of debt on growth is not analysed. Differently from these studies, our objective is to investigate the direct (short-term) impact of debt on growth.

Third, Checherita and Rother (2010) has been so far the only paper focussing exclusively on euro area countries. This is surprising as the EMU offers economic dynamics that are rarely found elsewhere in the world. Moreover, with the current sovereign debt crisis, the euro area would be in need of particular attention, while averaging across OECD countries would make such inferences difficult.

To summarise, our paper adds to the existing literature in the following ways. First, we use a dynamic threshold panel methodology to analyse the non-linear impact of public debt on GDP

[1] Confidence intervals for the debt turning points provided in Checherita and Rother (2010) suggest that the negative growth effect of high debt may start already from levels of around 70–80% of GDP.

[2] Chang and Chiang (2009) apply a panel smooth transition regression (PSTR), with a continuous transition function depending on an observable transition variable. In their additive version of this model, the transition function becomes an indicator function, with $I[A] = 1$ when event A occurs, and 0 otherwise. As a consequence, the additive PSTR model is equivalent to the multiple regime threshold model developed by Hansen (1999).

[3] Checherita and Rother (2010) use both yearly data for the dependent variable (and one year-lagged debt data), as well as 5-year overlapping and non-overlapping averages (with debt measured at the beginning of the 5-year period and estimates corrected in all cases for time autocorrelation), but do not find radically different results across the various specifications. Cecchetti et al. (2011) use the (less conventional) long-term approach by employing only the 5-year overlapping average growth rates.