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Financial stress, sovereign debt and economic activity in industrialized countries: Evidence from dynamic threshold regressions



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We analyze how the impact of a change in the sovereign debt-to-GDP ratio on economic growth depends on the level of debt, the stress level on the financial market and the membership in a monetary union. A dynamic growth model is put forward demonstrating that debt affects macroeconomic activity in a non-linear manner due to amplifications from the financial sector. Employing dynamic country-specific and dynamic panel threshold regression methods, we study the non-linear relation between the growth rate and the debt-to-GDP ratio using quarterly data for sixteen industrialized countries for the period 1981Q1–2013Q2. We find that the debt-to-GDP ratio has impaired economic growth primarily during times of high financial stress and only for countries of the European Monetary Union and not for the stand-alone countries in our sample. A high debt-to-GDP ratio by itself does not seem to necessarily negatively affect growth if financial markets are calm.

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1. Introduction

The 2007–08 global economic recession has been followed by a crisis in public finances, especially in the countries of the European Monetary Union (EMU). Naturally, a vast literature on the relationship

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between the fiscal stance and sovereign debt on the one hand and the macroeconomic performance on the other has emerged. While the previous work such as [Blanchard and Perotti \(2002\)](#) has typically used linear theoretical models and estimation techniques to study these relations, more recent contributions focus on the regime-dependence of the effects of fiscal policy and sovereign debt on economic activity.

An influential contribution is the study by [Reinhart and Rogoff \(2010\)](#) who identify the debt-to-GDP ratio as a relevant threshold variable in an empirical analysis of forty-four advanced and emerging economies. They argue that sovereign debt beyond a certain threshold, 90% of GDP according to their results, will reduce economic growth.¹ A second strand of research such as [Mittnik and Semmler \(2012b\)](#), [Auerbach and Gorodnichenko \(2012\)](#), [Taylor et al. \(2012\)](#) and [Fazzari et al. \(2013\)](#) investigates how the growth effect of the fiscal stance depends on the business-cycle. The core result is that fiscal multipliers are more pronounced during recessions than during booms. Finally, a third strand in the literature emphasizes *financial-market stress* as the crucial source for the non-linearity in the relationship between a country's fiscal stance and its macroeconomic performance. [Afonso et al. \(2011\)](#) and [Mittnik and Semmler \(2013\)](#), for instance, argue that the main factor determining the effectiveness of fiscal policy as well as the sustainability of fiscal debt is the state of financial markets, and not the extent of public indebtedness itself as postulated by [Reinhart and Rogoff \(2010\)](#).

The mechanism through which financial markets affect the relationship between the fiscal stance and sovereign debt on the one hand and economic activity on the other have been studied extensively in the theoretical literature (cf. [Stein, 2011, 2012](#); [Brunnermeier and Sannikov, 2012](#); [Mittnik and Semmler 2012a, 2013](#)).² The common theme in this literature is that financial stress affects the relationship between debt and economic growth via its impact on risk premia, in particular bond spreads. For instance, [Brunnermeier and Oehmke \(2012\)](#) put forward the possibility of a *diabolic loop* according to which sovereign debt held by the banks can make the banking system unstable by exposing it to financial stress, forcing banks to cut down on loans, reducing economic growth and generating a downward spiral.

Given the crucial role of bond spreads for the effect of sovereign debt on economic growth, an additional aspect of the non-linear nexus between these two variables is the question whether a country is in a monetary union or not. As argued by [De Grauwe and Ji \(2013\)](#), this point is of particular relevance for the EMU since bond spreads may be more sensitive to investor sentiment in countries of a monetary union than in stand-alone countries. Their findings suggest that the explanatory power of the debt-to-GDP ratio for bond spreads in EMU countries is significantly higher during times of economic distress than during times of economic stability. Yet, for stand-alone countries, the relationship between the debt-to-GDP ratio and bond spreads is weak, independent of the state of the financial market. A similar result is obtained by [Schoder \(2014\)](#) who additionally argues that investor sentiment is even more volatile for the EMU countries of the periphery than for the core EMU countries. According to these findings, the non-linearity in the sovereign debt-economic growth relation should be expected to be more pronounced in EMU countries, especially in the peripheral countries, than in

¹ As demonstrated by [Herndon et al. \(2013\)](#), however, coding errors and selective exclusion of observations biased the results of [Reinhart and Rogoff \(2010\)](#). Using the same data set, they argue that the threshold debt-to-GDP ratio of 90% is not significant and that growth effects of debt in high- and in low-debt regimes do not differ considerably.

² [Stein \(2011, 2012\)](#) emphasize over-leveraging of economic agents. Because of low interest rates, low credit spreads, rising capital gains and leveraging, economic booms may increase the vulnerability of the banking sector. Feedback loops between the financial sector and the macroeconomy may then give rise to a regime of low financial stress and a stable period of expansion, but may also generate destabilizing forces which trigger contractions and recessions when the financial sector starts to come under stress with risk premia rising and rapidly falling capital gains affecting aggregate demand and output. The models by [Brunnermeier and Sannikov \(2012\)](#) and [Mittnik and Semmler \(2012a\)](#) focus solely on the banking system which borrows to accumulate assets with returns, while there are preferences over payouts, serving as a consumption stream. When leveraging and payouts are less constrained, and financial stress and risk premia are high, the banking system is vulnerable and more prone to instability. With stronger restrictions, and low interest rates and low credit spreads there is a greater corridor of stability, creating a more stable environment for the banks. On the other hand, with less decision constraints and a banking system facing state-dependent risk premia and credit spreads which increases the cost of leveraging of banks, there may exist only a small corridor of stability, as banks may be more vulnerable to financial stress and crises. [Schoder \(2013\)](#) emphasizes asymmetric credit and profitability constraints on private investment which depend on the state of the business cycle.

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