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Long-run and short-run determinants of sovereign bond yields in advanced economies



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ABSTRACT

We analyze determinants of sovereign bond yields in 22 advanced economies over the 1980–2010 period using panel cointegration techniques. The application of the cointegration methodology allows distinguishing between long-run (debt-to-GDP ratio, potential growth) and short-run (inflation, short-term interest rates, etc.) determinants of sovereign borrowing costs. We find that in the long run, government bond yields increase by about 2 basis points in response to a 1 percentage point increase in government debt-to-GDP ratio and by about 45 basis points in response to a 1 percentage point increase in the potential growth rate. In the short run, sovereign bond yields deviate from the level determined by the long-run fundamentals, but about half of the deviation adjusts in one year. When considering the impact of the global financial crisis on sovereign borrowing costs in euro area countries, the estimations suggest that spreads against Germany in some European periphery countries exceeded the level determined by fundamentals in the aftermath of the crisis, while some North European countries have benefited from “safe-haven” flows.

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1. Introduction

What factors affect the interest rate that governments pay to borrow in the long run? The economics literature suggests that borrowing costs depend on the fundamental conditions in the economy, and especially the fiscal accounts. For example, as government debt rises, sovereign bond

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yields should go up in recognition of the higher risk (default, monetization-driven depreciation and inflation) carried by investors holding government securities.

The long-run relationship between sovereign bond yields and macroeconomic fundamentals can break down in the short run, especially during periods of financial stress. For example, despite the piling up of general government debt in the United States in the aftermath of the global financial crisis, U.S. bond yields have been trending downward. Conversely, despite a relatively lower initial level of general government debt, sovereign borrowing costs in some euro area countries such as Spain have persistently exceeded those of more highly indebted countries such as the United Kingdom.

This behavior suggests the need to distinguish between long-run and short-run determinants of borrowing costs. In this paper, we attempt to shed light on this issue for a sample of advanced economies. Our conjecture is that sovereign bond yields can temporarily deviate from their long-run equilibrium level driven by short-run factors (such as monetary policy). We use the panel cointegration methodology, which has two main advantages over the fixed effects (FE) estimator employed in the vast majority of existing studies.¹ First, it allows the coefficients of short-run factors to differ across countries, while the impact of long-run factors remains the same. The latter assumption is in line with theoretical predictions and our methodology allows testing whether it holds in practice.² Second, we allow sovereign borrowing costs to deviate from their long-run equilibrium levels and evaluate the extent of this deviation during the global financial crisis in euro area countries. In addition, we assess the speed of adjustment of sovereign bond yields to their long-run equilibrium level.

Using annual data for a sample of 22 advanced economies over the period 1980–2010, we find evidence supporting the long-run relationship between sovereign borrowing costs and their main fundamental determinants: the government debt-to-GDP ratio and potential growth. We provide statistical support to the hypothesis that this relationship is common to all advanced economies. In the long run, government bond yields increase by about 2 basis points in response to a 1 percentage point increase in the government debt-to-GDP ratio and by about 45 basis points in response to a 1 percentage point increase in the potential growth rate. At any period of time, sovereign bond yields may deviate from the level determined by the long-run fundamentals, but about half of the deviation adjusts in one year. In the short run, changes in government bond yields respond to changes in the debt-to-GDP ratio, the money market rate (monetary policy effect), and inflation (nominal shocks), while the impact of changes in the growth rate and the primary balance ratio is weaker. One caveat with interpreting the short-run results is that they are obtained from a very parsimonious model that does not account for some factors that likely contributed to the temporary deviation of sovereign borrowing costs from their long-run equilibrium level in the aftermath of the crisis but are difficult to quantify (for instance, policy uncertainty).

The rest of the paper is structured as follows. Section 2 reviews the existing literature, with a particular focus on government debt as a determinant of sovereign bond yields. Section 3 describes the new empirical technique employed in the analysis and the data. Section 4 presents and discusses the empirical findings. The last section concludes.

2. Determinants of sovereign bond yields: review of existing studies

2.1. Theoretical considerations

Economic theory suggests that in the *long run*, real government bond yields depend on two main determinants: potential output growth and government debt.

The link between *potential output growth* and real bond yield can be illustrated using Euler's equation from the consumer's utility maximization problem. In a Ramsey model of economic growth with a representative household's preferences described by the CES utility function and a production

¹ The only paper we are aware of that uses a similar methodology is Conway and Orr (2002). However, their sample includes only a limited number of advanced economies (seven in total) and does not cover the global financial crisis period.

² The fixed effects methodology employed in previous studies imposes the relationship between sovereign bond yields and their fundamentals (the slope coefficients) to be the same across countries, without testing the validity of this assumption.

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