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Sovereign credit ratings in the European Union: A model-based fiscal analysis

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ABSTRACT

We present a model-based measure of sovereign credit ratings derived solely from the fiscal position of a country: a forecast of its future debt liabilities, and its potential to use fiscal policy to repay these. We use this measure to calculate credit ratings for 14 European countries over the period 1995–2012. This measure identifies a European sovereign debt crisis almost two years before the official ratings of the credit rating agencies.

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1. Introduction

1.1. Motivation

In recession, discretionary fiscal policy has traditionally focused on stabilizing economic activity. In contrast, following the financial crisis, the ensuing recession and the build up of government debt, fiscal policy in many countries has been more concerned than before with controlling that debt and its cost. As a result, a country's credit rating has become a key indicator of the credibility of its fiscal stance. Official credit ratings are provided by the credit rating agencies (CRAs). Concerns have, however, been expressed about their lack of transparency and timeliness by, for example, the European Commission. In this paper we present a measure of sovereign credit ratings that can be calculated easily and quickly that may be of use to government and the private sector as a benchmark. This measure is based solely on the ability of a country to use tax policy to repay its outstanding financial liabilities and consequently focuses on its fiscal stance. It therefore differs somewhat from official credit ratings which take into account additional factors that might determine the ability of a government to service and repay its debt together with the willingness of governments to do so which is difficult to quantify.

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In November 2011, the European Commission issued a proposal for stricter rules on CRAs to make them more transparent and accountable, and to increase competition in the credit rating sector. The Commission's proposal stressed the role of conflict of interests, political interference and inefficiencies in existing CRAs methodologies. It also suggested the creation of an European-based CRA to counter the influence of US-based CRAs (European Commission, 2011).[1]

New regulations on CRAs were subsequently approved on January 2013 by the European Parliament. These allow agencies to issue unsolicited sovereign debt ratings only on set dates; make CRAs more accountable for their actions; and ensure that information on the underlying facts and assumptions on each rating is made publicly available in order to facilitate a better understanding of credit ratings (European Commission, 2013). Both the 2011 proposal and the 2013 regulations stressed the importance to financial investors of determining their own independent evaluation of credit ratings.[2] Subsequently, however, the Commission abandoned the plan of establishing a new (European-based) CRA as it was thought too costly.

1.2. Methodology

The measure of a sovereign credit presented in this paper is model based. This makes it easy to replicate and to amend, transparent, independent, simple to derive and hence may be made in a timely manner. Transparency refers to the ease of the general public to access and to reproduce credit ratings and to the ability of the public to make its own judgments about their validity. The model itself can be amended to suit individual preferences whilst retaining the transparency of the credit rating. Independence reflects the derivation of sovereign credit ratings due to being model-based rather than driven by the subjective evaluation of analysts. The rating can be updated systematically using the latest available data and, for this reason, is timely; it is inexpensive to produce, and can even be automated.

The measure is an adaption to sovereign debt of the logic of Black and Scholes's (1973) formula for pricing the probability of exercising an American option. It entails estimating the probability that the debt–GDP ratio will exceed a given limit or threshold at any time over a given time horizon and then mapping this default probability into a credit rating. Uncertainty about the credit rating can be taken into account using estimates of the distributions of the forecast error of the debt–GDP ratio and of the debt limit. We implement the procedure in a particular way using specific forecasts of the future debt–GDP ratio and a specific model for the debt limits. The methodology, however, provides a general framework for constructing sovereign credit ratings that can be implemented using any forecast or official budget projections of the distribution of the debt–GDP ratio and any measure of the debt limit.

In this paper we obtain forecasts of the debt–GDP ratio using a rolling-window VAR (a ROVAR model), that is based on an open-economy reduced-form specification. The parameters vary due to structural or policy changes and the model is subject to shocks that have time-varying volatility. In this way we are able to track changes over time in both the point forecasts of debt–GDP ratio and their uncertainty; both affect the subsequent credit rating. This choice of forecasting method reflects the well-known finding that VARs forecast at least as well as structural models, including dynamic stochastic general equilibrium (DSGE) models. A ROVAR is also easily estimated and updated.

The debt limit measures the maximum borrowing capacity of an economy. It is derived from an open-economy DSGE model with distortionary taxation in which the probability of default on sovereign bonds is treated as exogenous. The debt limit is based exclusively on the ability of a government to alter fiscal policy in the future to meet its outstanding financial obligations. This depends on whether fiscal policy changes are anticipated or unanticipated by market participants and, if unanticipated, whether they could arise from changes in expenditure policy, tax policy or both. The model is solved using a nonlinear algorithm calibrated with time-varying and country-specific data. This delivers a time series of the debt limit that shows how the maximum borrowing capacity of an economy evolves over time as a result of the changing ability of a government to use its fiscal instruments to repay its financial obligations and of changes in the state of the economy.

Basing the debt limit solely on fiscal considerations provides a narrower assessment of sovereign creditworthiness than that of the CRAs as it excludes factors that might contribute to the ability of a government to repay debt, such as the willingness and the political ability of delivering the required changes in fiscal policy, or the possibility of using either domestic or external non-fiscal sources of debt repayment, for example, changes in monetary policy and external bailouts. The merit of this narrower but simpler definition is that it conveys a clear and unambiguous interpretation of the credit rating, a feature particularly relevant for investors seeking transparent and independent assessments of credit ratings. Any discrepancies between the model-based and the official ratings could therefore be due to the CRAs taking into account factors beyond the mere financial ability of generating savings to repay debt. The methodology outlined in the paper can be extended to include some, if not all, of these non-fiscal factors but would be at the expense of further complicating the cross-country analysis and the interpretation of the determinants of the credit rating.

The paper builds on Polito and Wickens (2014) which provides model-based credit ratings for the United States. The focus in this paper is on providing model-based credit ratings for the major countries of the European Union, many of which have experienced an unprecedented deterioration in their public finances over the past 10 years. This has prompted a

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[1] The role of asymmetric information and conflict of interests in the credit-rating industry has been extensively analysed in the economic literature. Recent examples include Mathis et al. (2009) and Bolton et al. (2012).

[2] White (2010) review of the regulatory structure of CRAs concludes with a similar proposal of investors seeking their own independent assessment of the credit rating as a way for reducing reliance on CRAs.

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