Sovereign credit rating determinants under financial crises

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ABSTRACT

This paper empirically examines the determinants of sovereign credit ratings using panel data on a sample of 86 countries for 1993–2013. It further investigates whether the countries' average credit rating differs by region and for crisis and non-crisis periods, and how the bursting of the dot-com bubble, the Asian crisis, and the 2008 international financial crisis affected the average rating of each region. The estimation results reveal that macroeconomic, external, government, and qualitative factors importantly affect sovereign credit ratings, and that average ratings differ across all geographical regions except for North America and the Eurozone. While the recent crisis reduced the average rating across all regions, the dot-com bubble burst had no effect, the Asian crisis affected only the average rating of Asian countries, and the downgrade resulting from the 2008 crisis was larger in the Eurozone.

1. Introduction

The three main rating agencies, Standard and Poor's, Moody's, and Fitch, use a combination of economic, social, and political factors to assess a country's capacity and willingness to honor its current and future debt obligations in full and on time (Chen, Chen, Chang, & Yang, 2016). Sovereign credit ratings play an important role in determining countries' access to international financial markets and the terms of that access, since these ratings are perceived as useful in predicting sovereign distress. Moreover, Teixeira, Silva, Fernandes, and Alves (2014) show that sovereign credit ratings also affect banks' profitability and capital ratios, and Cavallo, Powell, and Rigobon (2013) provide evidence that sovereign credit ratings do matter for investors. As the dot-com bubble burst, the Asian crisis, and the recent international financial crisis of 2007–2008 led to several sovereign rating downgrades, it is important to examine in detail the quantitative and qualitative factors that determine these ratings.

Are there substantial regional differences in the average sovereign credit ratings produced by the three main rating agencies during the last two decades? Did the dot-com bubble burst, the Asian crisis, and the recent international financial crisis lead to a downgrade on the sovereign credit rating across all regions worldwide, or have some regions seen their rating unchanged during these crises? This paper addresses these questions using panel data on a sample of 86 countries, spanning 7 regions worldwide, for the period 1993–2013.

We investigate the determinants of sovereign credit rating as follows. First, we estimate an ordered probit model where the dependent variable is the average of the sovereign credit ratings assigned by Moody's, Standard and Poor's, and Fitch (converted to a...
numeral scale), and the explanatory variables are a set of macroeconomic, external, government, and country-specific qualitative factors. Among macroeconomic factors we consider GDP per capita, GDP growth, unemployment, inflation, and total investment; among external factors, external debt, deficit in the current account, reserves, terms of trade, and liquidity risk. Among government factors we take into account the level of government debt and the fiscal balance. Lastly, among qualitative variables we incorporate the country’s history of default, level of corruption, and political stability.

We then expand this model by including dummy variables for years, in order to examine whether the average rating across the sample differs across the periods of the Asian crisis (1997 and 1998), the dot-com bubble burst or dot-com crisis (2000 to 2002), the recent international financial crisis (2008 to 2013), and the noncrisis periods. In parallel, we add dummy variables for seven regions: North America, the Eurozone, the rest of Europe, Africa, Asia, Latin America, and Oceania. We also incorporate a set of variables representing interactions between the year dummies and the region dummies in order to evaluate whether the effect of each crisis on ratings differs by region.

This paper contributes to the empirical literature on the determinants of sovereign credit rating as follows. First, it examines the effect of country-specific qualitative variables (history of default, level of corruption, and political stability). Although some of these variables have been previously considered, for instance by Depken, LaFountain, and Butters (2011) and Erdem and Varli (2014), we integrate them into our analysis along with macroeconomic, external, and government factors. Second, the panel incorporates countries from most regions worldwide and covers two decades, allowing us to examine the effects of three crises on credit ratings, and whether these effects vary across regions.

The remainder of this paper is organized as follows. Section 2 presents our model of the determinants of sovereign credit rating and discusses the expected effect of each explanatory variable on the rating, in line with the empirical literature. Section 3 describes the data and the descriptive statistics of the variables. Section 4 presents the initial estimation results of the main model and subsequently examines the results of other models that assess whether crises and regions affect the ratings. Section 5 concludes.

2. The determinants of sovereign credit ratings

In this section, we describe the econometric specification of our model and discuss the expected relation between each explanatory variable and the country’s rating.

Cantor and Packer (1996) were among the first scholars to assess the importance of eight macroeconomic variables explaining rating assignments by Moody's and Standard and Poor's, using a cross-section analysis of 49 countries. Our paper provides a more comprehensive analysis of these determinants and relates to the literature that uses panel data, in particular the studies by Mellios and Paget-Blanc (2006), Bissoondoyal-Bheenick (2005), Bissoondoyal-Bheenick, Brooks, and Yip (2006), Afonso, Gomes, and Rother (2011), Erdem and Varli (2014), and Maltritz and Molchanov (2014).2 It also contributes to the empirical literature that discusses geographical differences in sovereign credit ratings, as do Depken et al. (2011) and Afonso et al. (2011), and the literature that examines the effect of financial crises on sovereign credit ratings, as do Ferri, Liu, and Stiglitz (1999) and Amstad and Packer (2015).

Maltritz and Molchanov (2014) provide a good summary of a related literature that studies the determinants of countries' credit risk, as measured by sovereign yield spreads. A recent article by Dilly and Mählmann (2016) highlights, however, that the determinants of sovereign credit ratings are not exactly the same as the determinants of sovereign yield spreads. They show that initial ratings disagree with bond spread levels during booms: rating agencies hold a systematically more optimistic view. Moreover, Becker and Milbourn (2011) provide empirical evidence that in recent years increased competition from Fitch has coincided with lower quality of ratings from the incumbents Moody's and Standard and Poor's: rating levels went up, the correlation between ratings and market yields fell, and the ability of ratings to predict default deteriorated. There are also a few recent studies that analyze the effect of sovereign rating revisions on economic growth and other macroeconomic variables, as do Chen et al. (2016), and others that examine the linkage between financial openness and sovereign credit ratings, as do Andreasen and Valenzuela (2016).

The empirical literature has identified a set of country-specific factors that play an important role in determining the sovereign credit rating (see, among others, Afonso et al., 2011; Bissoondoyal-Bheenick, 2005; Cantor & Packer, 1996; Erdem & Varli, 2014; Maltritz & Molchanov, 2014; Mellios & Paget-Blanc, 2006). However, given the differences in time periods, datasets, and countries, the empirical evidence of these studies does vary. Nevertheless, it is possible to identify a set of common factors.

The literature seems to agree on the relevance of four vectors of specific factors: macroeconomic, external, governmental, and qualitative. As macroeconomic factors, we include GDP per capita, GDP real growth rate, unemployment, inflation, and total investment. As external factors we consider external debt, ratio of reserves to imports, deficit in the current account, terms of trade, and liquidity risk. Among government factors we take into account public debt and fiscal balance. Among qualitative factors we incorporate past default, the corruption index, and the political stability index.

Following Bissoondoyal-Bheenick (2005) and Mellios and Paget-Blanc (2006), we measure the dependent variable rating as the arithmetic average, for each end of the year, of the sovereign credit ratings assigned by the rating agencies Moody's, Fitch, and Standard and Poor's, converted onto a numerical scale from 1 (worst) to 21 (best), as Table 1 shows. Other studies use an analogous rating transformation but with different numerical scales; Afonso et al. (2011) use a scale from 1 to 17, while Erdem and Varli (2014) use a scale from 1 to 46.

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