A new country risk index for emerging markets: A stochastic dominance approach

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ABSTRACT

An optimal weighting scheme is proposed to construct economic, political and financial risk indices in emerging markets using an approach that relies on consistent tests for stochastic dominance efficiency. These tests are considered for a given risk index with respect to all possible indices constructed from a set of individual risk factors. The test statistics and the estimators are computed using mixed integer programming methods. We derive an economic, political and financial risk ranking of emerging countries. Finally, an overall risk index is constructed. One main result is that the financial risk is the leading contributor to sovereign risk in emerging markets followed by the economic and political risks.

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1. Introduction

There is a growing awareness that sovereign debt crises can quickly mushroom — as events in a number of emerging countries in the late 1990s have shown (Sturzenegger and Zettelmeyer, 2006) and, more recently, as a consequence of the global economic and financial crises, that affected public debt and sovereign risk, hitting developed and emerging countries with varying intensity and persistence.

It is also a common understanding that emerging economies are prone to financial crises and some of the major financial crises affecting emerging markets in recent years have been linked to risky external and domestic debt compositions, rollover risks, contingent interest payments and the poor credibility of monetary and fiscal policies (see Eichengreen and Hausmann, 2005; Hausmann and Panizza, 2003; Jeanne, 2003; Zettelmeyer and Jeanne, 2002). Rating downgrades were relatively rare until the

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1990s, and when they occurred, were of modest size and manageable. Nowadays, the credit quality of the sovereign sector is by far more heterogeneous and unstable.[1] Also in view of the globalized dimension of economic and financial markets, country risk assessment has become a more urgent matter now than ever.

And yet, there is no good understanding of the sources of vulnerability and of the determinants of country risk. Whether the problem is a weak banking sector, an excessive public or private sector external burden, some structural impediment to growth, lack of transparency of a country's political institutions – just to mention a few of the determinants considered by most providers of risk ratings – a satisfactory comprehensive measure of country risk is still to be found. A good index of country risk is also crucial for strengthening the policy response towards economic improvement and sovereign creditworthiness. The objective of our paper is to derive a new country risk index for emerging markets that outperforms the most common existing sovereign risk indicators and, at the same time, allows us to disentangle the contributions of economic, political and financial risk factors.

There are many services measuring country risk. Among the foremost providers of risk ratings, there are: the International Country Risk Guide (ICRG); the Institutional Investors (II); the Business Environment Risk Intelligence (BERI); the Economist Intelligence Unit (EIU); Euromoney; and services of the major rating agencies, that is, Standard and Poor's; Moody's and Fitch. The synopsis in Fig. 1 compares these indices.

All the above-mentioned indices are based on arbitrary weighting of the relevant variables and most of them share the conventional wisdom that political risk is the key determinant.

Relatively little research has focused on the construction of a country risk index. Erb et al. (1999) explained this lack of academic work, especially for emerging markets, because of the short time series that exist, making it very difficult to produce an accurate evaluation of the characteristics of the market. To the best of our knowledge, the only work analyzing some measures of country risk is Erb et al. (1996). They explore the political, economic, financial and composite risk indices from ICRG and the II country credit ratings and provide a comparison of S&P's and Moody's ratings. They find out that rank order correlation is higher between S&P's or Moody's rating and the ICRG financial risk index. Moreover, through the construction of a portfolio of countries that experienced a decrease in risk rating and a portfolio of countries that experienced an increase in risk rating, they investigate whether the risk indices contain information about future expected returns. They find that the financial risk index contains the most information about future expected returns and the political risk contains the least.

A broad literature has studied which factors determine or affect a country's "ability" and "willingness to pay". A first group of contributions investigates the determinants of sovereign credit ratings. In their seminal paper, Cantor and Packer (1996a) use regression analysis to measure the relative significance of eight variables that are listed in Moody's and Standard and Poor's reports and show that GDP growth, per capita income, external debt, inflation and indicator variables for economic development and default history are the main determinants of the ratings issued by S&P and Moody's. Afonso (2003) updates Cantor and Packer (1996a) and finds analogous outcomes. A further updating is in Afonso et al. (2011b), where a distinction between short- and long-run determinants of sovereign ratings is introduced. They show that the level of GDP per capita, real GDP growth, public debt level and the government balance sheet have a consistent short-run impact, while the level of external debt and external reserves together with government effectiveness is important long-run determinants. Another set of works examines the relationship between spreads and sovereign ratings. Cantor and Packer (1996b) find that agency disagreements over sovereign ratings are quite common and that the rank orderings of sovereign risks implied by market yields frequently differ from the ratings assigned by the agencies. In particular, financial markets seem to be more pessimistic about sovereign credit risk than are the rating agencies, meaning that rating agencies undervalue the perception of financial risk. Such differences of opinion appear to be most extreme for below investment-grade countries. An updated comparison of sovereign ratings is in Flandreau et al. (2009) and in Afonso et al. (2011a), where possible spillover effects from lower rated countries to higher rated countries are also considered. A recent work, assessing the effect of sovereign credit rating announcements on sovereign CDS spreads for emerging markets, is Ismailescu and Kazemi (2010).

There is a large empirical literature based on regression analyses that treat a debt crisis as the dependent variable and a number of economic, political and institutional variables as independent variables. The latter typically include solvency indicators such as the ratio of debt to GDP, GDP growth, the real exchange rate, liquidity indicators and the level of international reserves. Several recent papers, such as Reinhart (2002), Catao and Sutton (2002), Reinhart et al. (2003), Van Rijckeghem and Weder (2004), Kruger and Messmacher (2004), and Catao and Kapur (2004), have included other institutional and political variables, debt history, financing needs indicators and macroeconomic volatility. Some studies investigate the effects of macroeconomic fundamentals on sovereign credit spreads, under the view that a higher yield spread reflects higher risk. Hilscher and Nosbusch (2010) focus on terms of trade for emerging markets and examine the relative importance of country-specific and global factors. Hui and Lo (2002) develop a model to value defaultable bonds and focus on foreign exchange rates as the main variable to track the credit spreads in some emerging markets. Eichengreen and Mody (1998) conclude that changes in market sentiment, not obviously related to fundamentals, have moved the markets by large amounts.

The results from these studies are in keeping with most theories about "the ability to pay" and the "willingness to pay", and stress that sovereign debt risk crises tend to occur more often the higher the debt to GDP ratio, the lower growth, the lower reserves, the higher the financing needs and the worse the quality of the institutions.

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[1] The rising threat of instability from sovereign debt problems worsened conditions in the global financial system recently and is bound to derail the global recovery, according to the International Monetary Fund, Stability Report: "sovereign risks remain elevated as markets continue to focus on high public debt burdens, unfavorable growth dynamics, increased rollover risks, and linkages to the banking system" (5 Oct 2010).