



Debt sustainability in emerging market countries: Some policy guidelines from a fan-chart approach



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ABSTRACT

This paper uses a probabilistic approach to simulate the medium-term public debt trajectories of several major emerging market countries. We extend the standard debt sustainability analysis framework so as to more faithfully reproduce these countries' economic reality in two aspects. First, we allow them to differ in the cyclical stance of their fiscal policy and in their degree of fiscal responsiveness to debt. Second, we explicitly integrate the specific risk premium paid by each country when borrowing in foreign currency. It allows us to evaluate the impact of alternative policies that the government may consider to improve sustainability. The results lead to three policy recommendations: i) a country should consider decreasing its exposure to currency risk only in extreme cases (like Argentina); ii) on the contrary, greater fiscal responsiveness (i.e. stronger fiscal tightening whenever there is a debt increase) could enhance sustainability to a much greater extent; iii) countries with low responsiveness to debt or a poor fiscal consolidation track record should be cautious with countercyclical fiscal policies, as they may trigger an unsustainable debt trajectory in the trough of the economic cycle.

1. Introduction

The question of debt sustainability is once again at the heart of economic debates in recent years, in light of the increased uncertainty in the macroeconomic environment. As developed countries progress towards less accommodative monetary policies and commodities enter an era of low prices, emerging markets need to be able to identify potential external threats to their sustainability. This is especially true as they gradually became more integrated into world financial markets. Furthermore, some emerging countries' debt ratios have recently demonstrated worrying upward trends, and the volatility that characterizes their economies is likely to affect their debt dynamics. As a result, their need to be in a position to rationally choose their path towards more sustainable public finances becomes a source of concern (see *UNCTAD note*, [United Nations, 2015](#)). In particular, credible fiscal and monetary policies, the quality of institutions and their capacity to manage public debt efficiently have been highlighted as playing a significant role in enhancing the countries' ability to weather any unfavourable reversal of the external economic environment ([Hauner and Kumar, 2005](#); [Da Silva, 2015](#)). This is why we believe it is vital to deepen the sustainability exercise for emerging countries. However, as emphasized by [Wyplosz \(2011\)](#), assessing the debt sustainability of emerging market countries is a complex issue because of its forward-looking nature. For this reason, we simulate emerging countries' debt

dynamics over the medium term, but also evaluate the relative impact of some of the policies they may adopt. In particular, we focus on attempts to tackle two of their most important vulnerabilities: the exposure to currency risk and the lack of fiscal discipline.

The International Monetary Fund and World Bank's standard Debt Sustainability Analysis (DSA) methodology is regarded as the reference model in analyzing medium-term debt trajectories in the emerging countries. It consists of a core equation of debt accumulation that relates future debt-to-GDP to the current debt ratio, primary balance, real GDP growth and the real interest rate. Standard DSA builds on several risk scenarios to stress test a baseline scenario. This scenario relies on medium-term forecasts for macroeconomic variables and on assumptions regarding changes in the primary balance. One advantage of this approach is its simplicity, which allows it to be easily replicated for different countries. However, it has two major drawbacks: i) the framework is not stochastic, but builds on alternative risk scenarios without stating their probability. Simulations do not take into account the uncertainty of macroeconomic forecasts in the volatile environment faced by emerging market countries. They also ignore the linkages between the different types of shocks to which an economy is exposed (see [Akyüz, 2007](#) for a critical overview); ii) stochastic DSAs assume that countries react identically to changes in their macroeconomic environment. In particular, their fiscal policy reaction (to output gap and debt) is assumed to differ only in terms of country fixed effects.

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To address the first caveat, stochastic frameworks have been proposed in the literature. [Burger et al. \(2011\)](#) and [Berti \(2013\)](#) propose a methodology which lies somewhere between the standard DSA analysis and “pure” stochastic methodology, as they allow for uncertainty around an independently-defined central scenario. [Celasun et al. \(2006\)](#) and [Medeiros \(2012\)](#) propose a methodology that is completely stochastic. [Medeiros’ work \(Medeiros, 2012\)](#) can be considered as the benchmark for advanced countries. The general framework consists of two distinct pillars: a panel VAR estimation to simulate the evolution of macroeconomic variables that will impact debt (real growth rate, inflation, average of short and long term real interest rates and real effective exchange rate) and a fiscal reaction function describing a country’s budget response to a change in its debt level or to business cycle fluctuations. The shocks are simulated from the VAR by assuming either normally distributed or bootstrapped errors. [Celasun et al. \(2006\)](#) simulate debt paths for emerging market countries, taking the exchange rate into account when determining the debt ratio by considering how much of their public debt is denominated in foreign currency. This work develops the so-called fan-chart approach, which builds a distribution of possible debt scenarios along the forecast horizon, assigning a probability to each of them.

Our stochastic framework is akin to these papers but we introduce two new features to better take into account the particularities of emerging countries and therefore better reflect the specificities of their debt dynamics. These novelties relate to currency risk and the responsibility of the fiscal policy, which we consider to be key aspects of emerging market countries’ sustainability. They enable us to assess the impact of: i) the reduction in the exposure to currency risk; ii) the adoption by the country of a more responsive fiscal policy.

First, our foreign interest rate is not the US 10-year Treasury rate, as usually assumed in similar stochastic exercises. Specific rates are assigned to each country, reflecting the individual risk premium charged by the markets on their foreign currency sovereign debt. We justify this with the observation that the US Treasury rate is usually considered a risk free rate because it represents a safe haven. However, if we assume that the expectations of international capital markets are rational, emerging countries’ interest rates should equal this risk free rate plus a risk premium, which takes into account their fundamental values and the credibility of their fiscal policy in the eyes of foreign investors. This feature is particularly important when evaluating the risk-cost trade-off for borrowing in foreign currency (which is more risky, but cheaper than borrowing in domestic currency). Unlike previous works, it allows us to simulate the reduced exposure to currency risk and assess its impact on debt trajectories. It is recognized that the exchange rate influences emerging countries’ debt outcomes (see, for instance, [Celasun et al., 2006](#), and [Acevedo et al., 2008](#)). Our motivation for simulating the impact that a reduced exposure to currency risk will have on sustainability is the following: the literature emphasizes that emerging market countries are characterised by the “original sin” ([Eichengreen et al., 2005](#)), at the origin of a higher exposure to currency risk. This risk notably depends on the share of their debt that is denominated in foreign currency ([CGFS, Bank of International Settlements, 2007](#); [Mehl and Reynaud, 2005](#)) and can be exacerbated by currency mismatches and sudden stops in capital flows, increasing the probability that a crisis will happen ([Bordo, 2006](#)). This exercise is run in a stochastic (rather than deterministic) framework, because the macroeconomic variables and public revenues of emerging markets have been shown to be highly volatile (see, amongst others, [Mendoza, 1995](#); [International Monetary Fund, 2003](#); [Kaminsky et al., 2005](#), and [Ferrarini and Amayandi, 2015](#)), and therefore cannot be easily forecasted.

Second, with regard to the second caveat of standard DSA models, we deal with the issue of heterogeneity by assuming that the fiscal responses of governments to past debt and to the business cycle vary across countries and years. This seems more robust than considering homogeneous fiscal reactions and differentiating the countries’ beha-

viours only through individual fixed effects. We find two advantages in doing this. First, we overcome the limits imposed by an insufficient number of observations when the fiscal reaction functions are estimated on time series of a specific country and therefore rely on a short time span ([Ghatak and Sanchez-Fung, 2007](#); [Hajdenberg and Romeu, 2010](#); [Burger et al., 2011](#); [Mupunga and Le Roux, 2015](#) and [Budina and van Wijnbergen, 2008](#)). Second, we offer a new perspective on the issue of nonlinear fiscal reaction functions. A common interpretation is that the marginal response of primary balances to an increase in public debt will get weaker, a phenomenon known as “fiscal fatigue” (see, for instance, [Mendoza and Ostry, 2008](#), and [Ghosh et al., 2013](#)). In our case, the nonlinear effects are underlined alongside the distribution of the primary balance, showing that the responsiveness of a country’s fiscal policy increases with its financing needs. It seems to be the first attempt to introduce nonlinearities not only in the debt coefficient, but also in the terms reflecting the cyclical stance and the persistence of the primary balance. This is done by estimating an instrumented quantile fiscal reaction function for a broad panel of 48 countries, from BRICS countries to less advanced ones, using observations from 1989 to 2013.

For illustrative purposes, this paper presents a selection of simulated debt trajectories for six major emerging countries: Argentina, Brazil, Russia, Turkey, the Philippines and South Africa. These countries are from different regions and differ from each other in terms of initial fiscal situation and in their degree of exposure to currency risk. They therefore allow us to analyse the impacts of a same policy for different types of countries. Our findings lead to the following policy recommendations. First, a country should consider decreasing its exposure to currency risk only in extreme cases (like Argentina). Second, in contrast, greater fiscal responsiveness (i.e. stronger fiscal tightening whenever there is a debt increase) could enhance sustainability to a much greater extent. Third, countries with low responsiveness to debt or a poor fiscal consolidation track record should be cautious with countercyclical fiscal policies, as they may trigger an unsustainable debt trajectory in the trough of the economic cycle.

As regards macro-fiscal linkages, we focus on the reaction of fiscal policy to the business cycle in order to assess whether it is countercyclical or not. We are interested in the systematic response of the primary balance to the output gap and the debt ratio, so that we can anticipate future debt trends. We leave the evaluation of the second-round effect of fiscal policy on macroeconomic variables (including GDP growth and interest rates), which is typically not accounted for in debt sustainability analyses, open for future research. A reason why it has been left aside so far is probably because of the difficulty of an *ex-ante* simulation of both macroeconomic variables movements and the policy reactions to it. The macroeconomic variables’s reaction to fiscal policy may therefore be considered of second order (notably for emerging market countries characterized by high volatility, see above)¹. This is why we do not break budget tightening down into expenditure and revenues, but focus on the size and the systematic nature of the overall fiscal adjustment (which is the aspect that matters for first round effects on debt dynamics). As spending cuts and tax increases differ precisely in the extent to which they affect economic activity (see [Mountford and Uhlig, 2009](#); [Hur et al., 2014](#) and [Jha et al., 2014](#)), it would be interesting to distinguish between their effects in an extension of our work that takes into account the reverse effects of fiscal tightening on growth. This constitutes an interesting avenue for future research.

The remainder of this paper is organized as follows. [Section 2](#) contains our estimates of fiscal reaction functions and the methodology

¹ Moreover, for emerging countries, fiscal data is not robust enough on a quarterly basis. Because of the shortness of available time series for these countries, we must use quarterly data to capture comovements in the macroeconomic variables (in the VAR). This is a further reason why fiscal data has so far not been integrated into the estimated VARs in stochastic DSA exercises.

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