THE ROLE OF DOMESTIC FUNDAMENTALS ON THE ECONOMIC VULNERABILITY OF EMERGING MARKETS

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Abstract

This paper evaluates policies that can potentially reduce the economic vulnerability of a group of 23 emerging market countries in the period 1998-2007. Through a panel data model on sovereign spreads, this study focuses on the role of macroeconomic fundamentals as multipliers of external shocks. The results support policies towards financial liberalization, public debt management, consistent economic growth, development of the domestic financial market and improvements in governance indicators. Pricing models for sovereign spreads where all counties are equally affected by global risk aversion shocks might induce misleading conclusions regarding the effects of sound economic policies.

**Keywords:** Country risk, economic vulnerability, emerging markets, global risk aversion

**JEL:** E44, G15, F01
1. Introduction

Since 2003, emerging markets have been enjoying an extremely favorable economic climate, generated by high global liquidity. In 2007 the excess of liquidity and the overall positive economic performance of these countries led to the lowest sovereign spreads in history, measured by the J.P. Morgan Emerging Markets Bond Index Global, falling below 200 basis points, as shown in Exhibit 1.

In the middle of 2007, the US sub-prime mortgage crisis changed this positive scenario and led to a generalized increase in the global market risk perception\(^1\). Nevertheless, it has been noteworthy that emerging countries have so far been showing higher resilience to the current crisis. Such resilience can also be inferred by comparisons between sovereign spreads and those on high-yield US corporate bonds (JP Morgan Domestic High Yield), as shown in Exhibit 2. Both were grouped according to the rating classifications B and BB\(^2\), and by the end of 2007, sovereign spreads were lower than US corporate bonds spreads of same rating.

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1 The VIX Index, sometimes called the “investor fear gauge”, was first introduced in 1993 by the Chicago Board Options Exchange to reflect the 30-day expected volatility of eight S&P100 at-the-money call and put options. It was expanded in 2003 to include a broader range of options based on the S&P500, considering various weights on options prices with diverse strike prices. This index is widely used as a global risk aversion proxy.

2 Rating criteria consist of an appraisal of each country's overall creditworthiness, both from a quantitative and qualitative standpoint. The rating agencies analyze both economic and political risk as the key determinants of credit risk. The ratings are usually classified from the highest to the lowest as: AAA – AA – A – BBB – BB – B – CCC – CC – C – D, with a subdivision of +, – or neutral. Ratings above BBB (inclusive) are considered as "investment grade".
According to the Global Financial Stability Report [2007], the improvement in sovereigns’ economic vulnerability was achieved through policies implemented after 2003, during the favorable global economic climate. Among those domestic policy efforts it is worthy to mention: i) the improvement in public debt management, by increasing the average debt maturity, decreasing the stock of FX-currency debt and
placing external debt denominated in domestic currency; ii) the development of domestic financial markets with the broadening of the investor base and improvements in the risk measurement techniques of financial institutions; iii) the gradual financial liberalization of the capital account; iv) the adoption of institutional governance indicators; and finally iii) sustainable fiscal adjustment, reserve accumulation and price stability policies.

Nevertheless, the crucial issue for emerging markets is whether this economic resilience is sustainable in the face of a potential reversal of cyclical factors, such as those involving liquidity, changes in global risk aversion and uncertainties related to a general economic slowdown triggered either by the US sub-prime mortgage crises or by high oil and commodity prices.

The objective of this study is to empirically evaluate policies that can potentially lessen the economic vulnerability of a group of emerging market economies, comprising 23 countries in the period 1998-2007, which in December 2007 accounted for nearly 96% of the JP Morgan EMBIG. The economic vulnerability analysis is conducted through a panel data model on sovereign spreads and their response to a global risk aversion shock.

This study differs from others in the literature of determinants of sovereign spreads by focusing on the role that domestic fundamentals play in lessening economic vulnerability. Such argument is stressed by Calvo [2003], who points out that the same external shock can lead to different responses in each economy. In this context, domestic fundamentals act as multipliers of external shocks. Thus, in our

3 Calvo (2003) p. 25: “... domestic factors could be powerful multipliers of external shocks. The problem for the econometrician is that nonlinearities imply that, faced with the same external shock, some economies enter into deep crisis, while others escape totally unscathed.”
model, sovereign spreads are explained mainly by global risk aversion shocks, allowing fundamentals to act as multipliers of those shocks.

Among a list of macroeconomic fundamentals, we select: financial liberalization; stock of public debt in relation to GDP, ratio of FX-currency debt to total public debt; volatility of nominal GDP rate; development of domestic financial market; and World Bank governance indicators.

The study is organized as follows: the next section presents the literature related to the determinants of sovereign spreads; Section 3 introduces the model and the explanatory variables; Sections 4 and 5 present the results and the last section summarizes.

2. A Review of the Literature on the Determinants of Sovereign Spreads

The empirical literature on the determinants of sovereign spreads has recently increased, especially after the Asian and Russian crises (1997–1998). While most studies initially focused on the macroeconomic fundamentals determining sovereign risk, increasing attention is now being paid to the influence of external shocks related to international liquidity and investors' risk appetite.

More recently, the debate has also turned to the influence of several governance indicators, quality of fiscal policy adjustments, development of domestic financial markets and the degree of financial liberalization in determining country risk.

Among the contributions regarding the influence of macroeconomic variables on sovereign spreads, it is worth mentioning Min [1998], Eichengreen and Mody [1998] and Kamin and von Kleist [1999]. As a general rule, these studies evidence that sovereign spreads in the 1990s declined more than countries’ fundamentals were able to explain, but they fail to establish a significant relationship to external shocks.
Recent studies, such as Arora and Cerisola [2001] and Ferrucci [2003], establish not only the influence of macroeconomic fundamentals but also the effect of US monetary policy on sovereign spreads. By applying principal component analysis, McGuire and Schrijvers [2003] identify a single common factor related to investors’ risk perception that explains approximately 80% of the common spread variations. The analysis presented in the Global Financial Stability Report [2004] also suggests that external shocks have become more important than fundamentals after September 2001, pointing to the VIX\(^4\) Index as the key factor for determining the sovereign spreads in the period analyzed (1994 to 2003). Finally, Kashiwase and Kodres [2005] and Rozada and Yeyati [2006] conclude that both macroeconomic fundamentals and global market liquidity and risk perception are the main drivers of sovereign spreads. Similar conclusions can also be found in Fávero, Pagano and Von Thadden [2005], who analyze the sovereign spreads of the European Union countries.

Fiscal policy was recently included as driving force of sovereign spreads in European Union countries by Afonso and Strauch [2004]; Bernoth, Von Hagen and Schuknecht [2004] and Hallerberg and Wolff [2006]. Concerning emerging economies, the analysis performed by Akitoby and Stratmann [2006] stresses the importance of fiscal policy sustainability as well as the quality of fiscal adjustment, with the so-called Type I adjustment (expenditure-based mainly on current expenditures) being more effective on spread reduction than Type II (tax increase and cuts in public spending).

The financial liberalization of the capital account, the currency convertibility risk premium, the rule of law and jurisdictional risk are issues raised by Arida, Bacha and Lara-Resende [2005] and Bacha, Holland and Gonçalves [2008] as determinants of

\(^4\) See footnote 2.
the local interest rates of emerging economies. This debate is also recurrent in Edwards [2005, 2007], through the link between financial liberalization and foreign direct investments in emerging economies. Finally, the arguments for financial liberalization, development of domestic financial markets and adoption of best practices for governance are consolidated in the Global Financial Stability Report [2007]. All of these policies are recommended to mitigate the contagion effect and reduce the economic vulnerability of emerging economies.

3. The Economic Vulnerability Model

According to González-Páramo [2006], the economic vulnerability of any country can be measured through data on sovereign spreads in the market. This argument is based on the idea that economic agents price sovereign spreads by making judgments regarding expectations of future macroeconomic fundamentals of a certain economy. Such expectations are related to the credit risk of the debtor and measure both the ability and willingness to pay the debt.

Although sovereign spreads reflect country-specific and idiosyncratic fundamentals, one can note a co-movement of their time evolution, which suggests a common factor affects all sovereigns simultaneously. According to most authors, such a common factor is a measure of global risk aversion, and stands as an additional element in the determinants of sovereign spreads.

Calvo [2003] extends this argument further by stating that country-specific fundamentals act as multipliers of global risk aversion shocks.

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5 A preliminary study by the authors indicates that the common component explains more than 50% of the total sovereign spread variations for the 23 emerging countries in the data sample.
In order to analyze the economic vulnerability of emerging economies, we propose versions of the general model (1). Function $\beta(\cdot)$ measures the country-specific vulnerability, i.e., variations in sovereign spreads ($s$) in response to a change in the perception of global risk aversion ($R$), while function $\alpha(\cdot)$ corresponds to the spread portion subject solely to the country-specific fundamentals ($F$). This specification permits testing the argument of Calvo [2003] empirically. Summarizing, general model (1) relates the spread ($s$) of country ($i$) on day ($d$) of year ($y$) with a measure of global risk aversion of the same day and year; and country-specific fundamentals in that year. The following subsections describe the variables employed in this study.

$$ s_{iyd} = \alpha\left(F_{iy}\right) + \beta\left(F_{iy}\right)R_{yd} + e_{iyd} $$  

(1)

### 3.1 Dependent Variable: Sovereign Spreads

Sovereign spreads are defined by the difference, in basis points, between a risky bond issued by a sovereign entity and a risk-free instrument with similar characteristics (US government securities of the same maturity). A common approach in the literature, this involves data from the EMBIG sub-indices. As described in J.P. Morgan [2004], the EMBIG is constructed by weighting the market value of US dollar denominated Brady bonds, Eurobonds and traded loans issued by sovereign or quasi-sovereign entities. This index relaxes some liquidity criteria of the EMBI and EMBI+, including more countries and instruments in its composition. The data refer to daily stripped spreads from 1998 to 2007, where the present value of the flow of collateral is removed, since collateral is equivalent to a type of insurance not subject to sovereign risk. We added dummy variables for spreads above 2500 basis points seen in countries that experienced either long or severe moratorium crises, such as Russia, Ecuador and Argentina.
The study analyzes a group of 23 emerging market economies between 1998 and 2007, which comprise nearly 96% of the JP Morgan Emerging Markets Bond Index Global (EMBIG)\(^6\) in December 2007, as shown in Exhibit 3.

### Exhibit 3: EMBIG – Market Capitalization of EMBIG sub-indexes*

<table>
<thead>
<tr>
<th>Country</th>
<th>Share (%)</th>
<th>Country</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>14.9%</td>
<td>China</td>
<td>2.1%</td>
</tr>
<tr>
<td>Mexico</td>
<td>13.0%</td>
<td>Argentina</td>
<td>2.1%</td>
</tr>
<tr>
<td>Russia</td>
<td>12.5%</td>
<td>Ukraine</td>
<td>1.8%</td>
</tr>
<tr>
<td>Turkey</td>
<td>9.3%</td>
<td>Uruguay</td>
<td>1.8%</td>
</tr>
<tr>
<td>Philippines</td>
<td>7.4%</td>
<td>Chile</td>
<td>1.5%</td>
</tr>
<tr>
<td>Venezuela</td>
<td>7.2%</td>
<td>Ecuador</td>
<td>1.3%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.2%</td>
<td>South Africa</td>
<td>1.3%</td>
</tr>
<tr>
<td>Colombia</td>
<td>3.1%</td>
<td>Poland</td>
<td>1.2%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3.1%</td>
<td>El Salvador</td>
<td>1.2%</td>
</tr>
<tr>
<td>Panama</td>
<td>2.5%</td>
<td>Bulgaria</td>
<td>0.5%</td>
</tr>
<tr>
<td>Lebanon</td>
<td>2.4%</td>
<td>Hungary</td>
<td>0.5%</td>
</tr>
<tr>
<td>Peru</td>
<td>2.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>96.1%</strong></td>
</tr>
</tbody>
</table>

* JP Morgan: December 2007

### 3.2 Explanatory Variables: Global Risk Aversion and Macroeconomic Fundamentals

The volatility index (\(VIX\)) calculated by the Chicago Board Option Exchange (CBOE)\(^7\) and the JP Morgan Domestic High Yield spreads (\(HY\)) are widely accepted proxy variables to represent market risk perception. In this study we run robustness analyses for both as the global risk aversion proxy.

Regarding macroeconomic fundamentals, we considered several variables grouped in the following classifications: i) public debt sustainability; ii) economic instability and iii) financial and economic effectiveness, taken annually from Moody’s [2007] database in the period 1998-2007, if not otherwise specified.

\(\text{i) Public Debt Sustainability}\)

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\(^7\) See endnote 2.
- **DEBT_GDP**: Total government debt as a proportion of GDP. Total government debt includes the consolidated budgets of the central, state/regional and local governments, the social security system and other extra-budgetary funds for non-commercial activities. The concept excludes loans and refinancing of government controlled corporations, except financial transfers in the form of subsidies\(^8\).

- **FX_DEBT**: General Government Foreign-Currency and Foreign-Currency-Indexed Debt/Total General Government Debt. Measures the extent to which central and sub-national governments in each country resorted to issuing debt in currencies other than their own or to indexing domestic-currency debt to the exchange rate. These practices often reflect a lack of investor confidence in the domestic currency, resulting from expectations of a high risk of inflation should the government choose to monetize a large and growing debt burden.

**ii) Economic Instability**

- **GDP_VOL**: Volatility of nominal GDP\(^9\). Economies with higher volatility reflect unstable and vulnerable policies to external shocks.

**iii) Financial and Economic Effectiveness**

According to Fischer [1998] and Obstfeld [1994], the free mobility of capital could promote a globally efficient allocation of external wealth and better risk diversification, thus improving countries’ growth and economic welfare. Opposite arguments rely to differing degrees on the efficient market hypothesis (Stiglitz

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\(^8\) Due to the lack of available data, we use the concept of total general public debt instead of the net public debt of the public sector.

\(^9\) We use the exponentially weighted moving average (EWMA) with a discount factor of 0.9, indicating that variations in a period of more than seven years correspond to 50% of the weight.
[2000; 2004]), and are highly controversial in the literature on growth and economic development (Eichengreen [2001]). According to Klein and Olivei [1999], economic integration can further promote the development of the domestic financial market and reduce the cost of corporate borrowing in emerging economies. To incorporate the aspects of economic and financial integration, we adopt the following:

- **FO1: KAOPEN.** Developed by Chinn and Ito [2007], measures a *de jure* indicator of financial openness. It considers the extent of capital controls based on information from the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER), including the presence of multiple exchange rates; restrictions on current account transactions; restrictions on capital account transactions; and the requirement to surrender export proceeds.\(^{10}\)

- **FO2: Investment inflow as a proportion of GDP.** Measures a *de facto* indicator of financial openness, and corresponds to the sum of foreign direct investments (FDI), portfolio investments (equity and debt) and other investments (loans), available from International Financial Statistics (IFS-IMF).

- **PC: Private Credit.** Represents the development of domestic financial markets, and corresponds to the ratio of domestic credit to GDP, available from International Financial Statistics (IFS-IMF). This is a useful indicator of the depth of financial intermediation and the financial system, and also of the degree to which the provision of credit is dominated by banks.

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\(^{10}\) This index corrects distortions regarding intensity, efficacy and capital controls. It is available for 181 countries since 1970.
- **GOV1: Rule of Law.** Developed by Kaufmann, Kraay and Mastruzzi [2006], this indicator measures the extent to which agents have confidence in and abide by the rules of society, in particular the quality of contract enforcement, the police, the courts, as well as the likelihood of crime and violence.

- **GOV2: Regulatory Quality.** Developed by Kaufmann, Kraay and Mastruzzi [2006], it represents the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

### 4. The Influence of Fundamentals on Economic Vulnerability

As already mentioned, several macroeconomic fundamentals are often used in the literature as determinants of sovereign spreads. However, any group of variables, particularly the one selected in Section 3.2, certainly do not exhaust all the possibly relevant variables, which are also limited by the public availability of data for the emerging economies considered. This question, known as omitted-variables bias, might lead to inconsistent estimates and induce misleading conclusions. To cope with this while testing the argument of Calvo [2003] regarding the role of fundamentals as multipliers of an external shock, we propose Model (2a) and Model (2b).

Model (2a) controls for the role of fundamentals in sovereign economic vulnerability, while Model (2b) examines whether such control actually increases information in the model. Since the relevant fundamentals are defined in dimensions of time (\(y\)) and country (\(i\)), the fixed-effect specification of both models stands for all omitted variables in these particular dimensions.
Models (2a) and (2b) associate the sovereign spread \( s \) of country \( i \) on day \( d \) and year \( y \) with a measure of global risk aversion \( R \) of the same day and year; and with country-specific fundamentals \( F \) in that year.

\[
\begin{align*}
    s_{iyd} &= \alpha_{iy} + \beta_{iy} R_{yd} + \beta_{iy} F_{iy} R_{yd} + \epsilon_{iyd} \\
    s_{iyd} &= \alpha_{iy} + \beta_{iy} R_{yd} + \epsilon_{iyd}
\end{align*}
\]

(2a) \hspace{1cm} (2b)

Regarding the argument of whether fundamentals act as multipliers of an external shock, we compare Model 2a and 2b by running three different information criteria: Akaike (AIC), Schwarz (SC) and Hanna-Quin (HQ). The results, given by Exhibit 4, support the argument of Calvo [2003], since for all combinations, Model 2a performs better than Model 2b. We should mention that a conventional F-test for exclusion of the block of variables reached the same results, favoring Model 2a.

The results for Model (2a), presented in Exhibit 5, show that all parameters are statistically significant at the five percent level with the expected sign for all sets of explanatory variables defined in Section 3.2, indicating model robustness\(^{11}\).

Development of the domestic financial market, the degree of financial openness (\textit{de jure} or \textit{de facto}) and the adoption of governance indicators (rule of law and regulatory quality) improve the economic resilience of an emerging country, while growth instability, total debt as a proportion of GDP and the stock of debt in FX currency increase sovereign vulnerability.

\[\text{11 Both models were estimated through Stata v8.0 by executing the } ivreg2 \text{ routine, which implements the HAC (heteroskedastic and autocorrelation consistent) matrix (as suggested by Newey and West [1987]). As suggested by Wooldridge [2004], we also conducted the serial correlation test.}\]
### Exhibit 4: Information Criteria

<table>
<thead>
<tr>
<th>Model</th>
<th>VIX</th>
<th>VIX</th>
<th>VIX</th>
<th>HY</th>
<th>HY</th>
<th>HY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GDP_VOL</td>
<td>GDP_VOL</td>
<td>GDP_VOL</td>
<td>GDP_VOL</td>
<td>GDP_VOL</td>
<td>GDP_VOL</td>
</tr>
<tr>
<td></td>
<td>DEBT_GDP</td>
<td>DEBT_GDP</td>
<td>DEBT_GDP</td>
<td>DEBT_GDP</td>
<td>DEBT_GDP</td>
<td>DEBT_GDP</td>
</tr>
<tr>
<td></td>
<td>FX_DEBT</td>
<td>FX_DEBT</td>
<td>FX_DEBT</td>
<td>FX_DEBT</td>
<td>FX_DEBT</td>
<td>FX_DEBT</td>
</tr>
<tr>
<td></td>
<td>PC</td>
<td>PC</td>
<td>PC</td>
<td>PC</td>
<td>PC</td>
<td>PC</td>
</tr>
<tr>
<td></td>
<td>FO2</td>
<td>FO1</td>
<td>FO2</td>
<td>FO2</td>
<td>FO1</td>
<td>FO2</td>
</tr>
<tr>
<td></td>
<td>GOV1</td>
<td>GOV1</td>
<td>GOV2</td>
<td>GOV1</td>
<td>GOV1</td>
<td>GOV2</td>
</tr>
<tr>
<td>2a – HQ</td>
<td>0.538</td>
<td>0.587</td>
<td>0.536</td>
<td>0.578</td>
<td>0.615</td>
<td>0.578</td>
</tr>
<tr>
<td>2b – HQ</td>
<td>0.692</td>
<td>0.712</td>
<td>0.692</td>
<td>0.757</td>
<td>0.758</td>
<td>0.757</td>
</tr>
<tr>
<td>2a – AIC</td>
<td>0.544</td>
<td>0.595</td>
<td>0.542</td>
<td>0.584</td>
<td>0.623</td>
<td>0.584</td>
</tr>
<tr>
<td>2b – AIC</td>
<td>0.698</td>
<td>0.719</td>
<td>0.698</td>
<td>0.763</td>
<td>0.766</td>
<td>0.763</td>
</tr>
<tr>
<td>2a – SC</td>
<td>0.557</td>
<td>0.609</td>
<td>0.555</td>
<td>0.597</td>
<td>0.638</td>
<td>0.597</td>
</tr>
<tr>
<td>2b – SC</td>
<td>0.711</td>
<td>0.734</td>
<td>0.711</td>
<td>0.775</td>
<td>0.781</td>
<td>0.775</td>
</tr>
</tbody>
</table>

### Exhibit 5: The Role of Fundamentals on Economic Vulnerability ($\beta_1$)

| | VIX | VIX | VIX | HY | HY | HY |
| | FO2,GOV1 | FO1,GOV1 | FO2,GOV2 | FO2,GOV1 | FO1,GOV1 | FO2,GOV2 |
| GDP_VOL | 0.015 | 0.013 | 0.016 | 0.164 | 0.156 | 0.165 |
| DEBT_GDP | 0.003 | 0.003 | 0.003 | 0.019 | 0.020 | 0.019 |
| FX_DEBT | 0.001 | 0.002 | 0.001 | 0.008 | 0.010 | 0.008 |
| PC | -0.058 | -0.042 | -0.063 | -0.404 | -0.255 | -0.427 |
| FO** | -0.189 | -0.015 | -0.193 | -1.325 | -0.104 | -1.338 |
| GOV** | -0.064 | -0.054 | -0.061 | -0.084 | 0.081 | -0.063 |

* All parameters $\beta_1$ are significant at 5%.

** We test for de-jure (FO1) and de-facto (FO2) financial openness and rule of law (GOV1) and regulatory quality (GOV2) governance indicators.

## 5. The Influence of Fundamentals on the Level of Sovereign Spreads

To the best of our knowledge, most empirical studies of the determinants of sovereign spreads mentioned in Section 2 rely on linear models. Sovereign spread is set as a linear relationship to a selected group of explanatory variables, such as fundamentals and some measure of global liquidity or market risk aversion.
In the previous section we proposed Model 2a, where fundamentals actually act as multipliers of external shocks, and confirm the explanatory power of this specification vis-à-vis the traditional linear ones, such as Model 2b. Although Model 2a has the advantage of coping with the omitted-variables bias defined in dimensions of time and country, its fixed effect specification limits the analysis of how macroeconomic fundamentals, i.e. idiosyncratic variables, influence the level of spreads.

To analyze the influence of fundamentals on the level of sovereign spreads, while testing the argument of Calvo [2003], we propose Model 3a and Model 3b, coping just with the omitted variables that are country specific and time invariant\(^{12}\).

\[
s_{\text{lyd}} = \alpha_i + \alpha_{Fy} + \beta_0 R_{\text{yd}} + \beta_1 F_{iy} R_{\text{yd}} + \epsilon_{\text{lyd}} \tag{3a}
\]

\[
s_{\text{lyd}} = \alpha_i + \alpha_{Fy} + \beta_0 R_{\text{yd}} + \beta_1 R_{\text{yd}} + \epsilon_{\text{lyd}} \tag{3b}
\]

Exhibit 6 presents the information criteria tests of Akaike (AIC), Schwarz (SC) and Hanna-Quin (HQ) for both specifications, and results continue supporting the argument that external shocks should be controlled by domestic fundamentals. The estimates for Model 3a were not statistically significant at a five percent level for most cases, stressing the problem of separating the effect of domestic fundamentals on level of spreads while still controlling for external shocks. Exhibit 7 presents the estimates for Model 3b with all parameters statistically significant at the five percent level with the expected sign for all sets of explanatory variables defined in Section 3.2, indicating model robustness.

The results remain in accordance with those of the previous section and in the literature. Growth instability, total debt as a proportion of GDP and the stock of debt

\(^{12}\) The models’ estimations were implementing as described in endnote 12.
in FX currency increase the sovereign spreads, while development of domestic financial markets, the degree of financial openness and the adoption of governance indicators decrease it.

Exhibit 6: Information Criteria

<table>
<thead>
<tr>
<th>Model</th>
<th>VIX</th>
<th>VIX</th>
<th>VIX</th>
<th>HY</th>
<th>HY</th>
<th>HY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GDP_VOL</td>
<td>DEBT_GDP</td>
<td>FX_DEBT</td>
<td>PC</td>
<td>FO2</td>
<td>GOV1</td>
</tr>
<tr>
<td></td>
<td>GDP_VOL</td>
<td>DEBT_GDP</td>
<td>FX_DEBT</td>
<td>PC</td>
<td>FO1</td>
<td>GOV1</td>
</tr>
<tr>
<td>3a – HQ</td>
<td>0.424</td>
<td>0.495</td>
<td>0.423</td>
<td>0.414</td>
<td>0.474</td>
<td>0.396</td>
</tr>
<tr>
<td>3b – HQ</td>
<td>0.431</td>
<td>0.503</td>
<td>0.430</td>
<td>0.431</td>
<td>0.491</td>
<td>0.429</td>
</tr>
<tr>
<td>3a – AIC</td>
<td>0.425</td>
<td>0.497</td>
<td>0.424</td>
<td>0.416</td>
<td>0.476</td>
<td>0.398</td>
</tr>
<tr>
<td>3b – AIC</td>
<td>0.432</td>
<td>0.504</td>
<td>0.431</td>
<td>0.432</td>
<td>0.492</td>
<td>0.430</td>
</tr>
<tr>
<td>3a – SC</td>
<td>0.427</td>
<td>0.499</td>
<td>0.426</td>
<td>0.418</td>
<td>0.479</td>
<td>0.400</td>
</tr>
<tr>
<td>3b – SC</td>
<td>0.433</td>
<td>0.507</td>
<td>0.432</td>
<td>0.434</td>
<td>0.494</td>
<td>0.432</td>
</tr>
</tbody>
</table>

Exhibit 7: The Role of Fundamentals on Sovereign Spreads (α_i)

<table>
<thead>
<tr>
<th></th>
<th>VIX</th>
<th>VIX</th>
<th>VIX</th>
<th>HY</th>
<th>HY</th>
<th>HY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FO2,GOV1</td>
<td>FO1,GOV1</td>
<td>FO2,GOV2</td>
<td>FO2,GOV1</td>
<td>FO1,GOV1</td>
<td>FO2,GOV2</td>
</tr>
<tr>
<td>GDP_VOL</td>
<td>0.649</td>
<td>0.680</td>
<td>0.704</td>
<td>1.368</td>
<td>1.654</td>
<td>1.287</td>
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<tr>
<td>DEBT_GDP</td>
<td>0.097</td>
<td>0.095</td>
<td>0.094</td>
<td>0.107</td>
<td>0.104</td>
<td>0.112</td>
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<tr>
<td>FX_DEBT</td>
<td>0.037</td>
<td>0.040</td>
<td>0.038</td>
<td>0.033</td>
<td>0.018</td>
<td>0.030</td>
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<tr>
<td>PC</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-2.059</td>
<td>-3.208</td>
<td>-2.615</td>
</tr>
<tr>
<td>GOV**</td>
<td>-1.136</td>
<td>-2.117</td>
<td>-0.822</td>
<td>-</td>
<td>-</td>
<td>0.847</td>
</tr>
</tbody>
</table>

* All parameters α1 are significant at 5%.
** We test for de-jure (FO1) and de-facto (FO2) financial openness and rule of law (GOV1) and regulatory quality (GOV2) governance indicators.
6. Conclusions

High international liquidity and low investor risk perception have generated an extremely favorable situation for emerging markets since 2003. This fact, along with the improved fundamentals of these countries, pushed down the sovereign spreads to their lowest historical level in 2007, breaking the 200-basis-point barrier.

It is noteworthy that emerging economies so far have been showing higher resilience to the US sub-prime mortgage crisis of 2007.

Nevertheless, the crucial issue for emerging markets is whether this improvement in economic vulnerability is sustainable in the face of a potential reversal of cyclical factors, such as those involving liquidity, changes in global risk perception and uncertainties related to a general economic slowdown triggered either by the US sub-prime mortgage crisis or by high oil and commodity prices.

This study empirically evaluates several policies that can potentially improve the economic vulnerability of a group of 23 emerging market economies from 1998 to 2007. We confirm the importance of domestic fundamentals as multipliers of external shocks, as suggested by Calvo [2003].

The results support policies towards financial liberalization, public debt management, consistent economic growth, development of the domestic financial market and improvements in governance indicators, especially the rule of law and regulatory quality.

Pricing models for sovereign spreads where all counties are equally affected by global risk aversion shocks might induce misleading conclusions regarding the effects of sound economic policies over the economic vulnerability of emerging markets.
References


