



# Emerging market sovereign bond spreads, credit ratings and global financial crisis



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## ARTICLE INFO

*Article history:*  
4 December 2015  
10 May 2016  
Accepted 23 June 2016  
Available online xxxx

*Keywords:*  
Common correlated effects  
Emerging market economies  
EMBI global spreads  
Global financial crisis  
Sovereign credit ratings

## ABSTRACT

This paper investigates the impacts of sovereign credit ratings and global financial conditions on the evolution of EMBI Global (EMBIG) spreads for a panel of 23 developing countries by using daily data for the period between 1998 and 2012. To this end, we employ not only the conventional panel estimation procedures, but also the recent methods tackling with either cross-sectional dependence stemming from common global shocks or a potential endogeneity. Our results suggest that credit ratings along with global financial conditions are the main determinants of EMBIG spreads. The determinants of EMBIG spreads are not invariant to speculative and investment grade episodes and transitions between them. The recent global crisis changed the determinants of EMBIG spreads and led to credit ratings' impact to converge between speculative and investment grade countries.

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## 1. Introduction

The emerging market bond index (EMBI) spread<sup>1</sup> as a measure of sovereign default risk and financial fragility of emerging market economies (EME) is one of the basic macroeconomic variables, which are closely monitored by financial markets and economic policy makers. Understanding the determinants of EMBI spreads has, thus, crucial policy implications. Consequently, there is now a substantial and growing literature on this issue.

One strand of the literature maintains that not only domestic factors but also external factors stemming from advanced countries, such as global liquidity conditions and international interest rates, are the main drivers of the EMBI spreads (Kamin and von Kleist, 1999; Gonzalez-Rozada and Levy-Yeyati, 2008; Özatay et al., 2009). Another strand of the literature focuses on the effects of domestic fundamentals in the determination of the spreads (Kaminsky and Schmukler, 2002; Dailami et al., 2008; Aizenman et al., 2013; Riedel et al., 2013; and Amstad et al., 2016). According to the pioneering study by Cantor and Packer (1996, pp.49), “sovereign ratings effectively summarize and supplement the information contained in macroeconomic indicators”.

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<sup>1</sup> The EMBI spread by J.P. Morgan is the difference between the yields on EME sovereign bonds and bonds issued by an industrialized country with identical currency denomination and maturity.

Consequently, sovereign credit ratings (CR) have often been taken as one of the basic determinants of the EMBI spreads especially for high frequency data.

In this study, we aim to investigate the relationship between CR and EMBI Global (EMBIG) spreads for a panel of 23 EME by using daily data. We investigate also whether the determinants of EMBIG spreads are invariant to speculative and investment grading episodes. Furthermore, the implications of transitions between investment and speculative ratings for EMBIG spreads are analyzed. This study also investigates whether the impact of CR on EMBIG spreads changed during the recent global crisis.

The literature often employs conventional panel data estimation procedures which do not allow for cross-section dependence. However, omitted common variables or global shocks stemming from contagion induce cross-section dependence and lead to inconsistent coefficient estimates. Therefore, we consider not only the conventional panel data procedures but also the panel autoregressive distributed lag (PARDL) mean group (PARDL-MG) and cross-sectionally augmented common correlated effects PARDL-MG (CCE-PARDL-MG) procedures by Chudik and Pesaran (2015). The CCE procedure is known to yield an efficient and robust estimator in a general non-stationary framework when there is cross-section dependence (Chudik and Pesaran, 2015). The PARDL approach is valid even if the regressors are not weakly-exogenous and the variables of interest are stationary, non-stationary or mutually cointegrated (Pesaran et al., 2001).

The plan of the rest of the paper is as follows. In Section 2, we present a brief literature review about the determinants of EMBIG

spreads. Section 3 presents our empirical results. This section first presents the results of the estimations of our baseline static equation by the conventional (panel fixed effects) along with the recent CCEP (common correlated effects, pooled) and fully modified ordinary least squares (FM-OLS) procedures. The implications of augmenting the equations with cross-sectional means of the variables for the existing global financial conditions variables in the CCEP equations are also discussed in this section. Section 3 presents also the evidence that the cross-sectional means of EMBIG spreads co-moves with global financial conditions. The implications of this evidence are found to be important for our postulations and findings. Section 3.1 presents the results of our panel cointegration and error-correction mechanism (ECM) equations estimated by CCE-PARDL and CCE-PARDL-MG procedures. This section also examines the effect of global financial crisis on the determinants of sovereign spreads. In Section 3.2, we analyze the asymmetric impact of investment and speculative grade episodes on the evolution of EMBIG spreads. This section also investigates the consequences of a transition from a speculative grade to an investment grade, or vice versa, by one or more credit agency on the EMBIG spreads. Finally, Section 4 concludes.

## 2. The determinants of the EMBIG spreads: a brief review of the literature

EMBIG spreads reflect the additional borrowing cost that an EME has to bear in international financial markets relative to the risk-free country. A general model on the determinants of emerging market sovereign bond spreads ( $S$ ) can be written as:

$$S_{it} = c + \alpha X_{it} + \beta Z_{it} + u_{it} \quad (1)$$

where  $c$  is a constant term,  $X$  and  $Z$  are, respectively, the vectors of domestic and external variables,  $\alpha$  and  $\beta$  are the transposes of the corresponding coefficient vectors and  $u$  is the disturbance term. The subscripts  $i$  and  $t$  stand for country and time.

The set of variables in  $X$  contains domestic economic fundamentals indicating country default risk or creditworthiness. Sovereign debt indicators (external debt/GDP, interest payments, international reserves, net foreign asset position, fiscal positions etc.), GDP growth, international reserves, trade openness, current account deficits and default history are the most commonly used variables to represent the domestic economic fundamentals. Eichengreen and Mody (1998); Kaminsky and Schmukler (2002); Dailami et al. (2008), Aizenman et al. (2013), Riedel et al. (2013), Kennedy and Palerm (2014); Clark and Kassimatis (2015) and Amstad et al. (2016) are among the studies finding that domestic fundamentals are significant in determining sovereign spreads.

According to Cantor and Packer (1996), sovereign credit ratings (CR) efficiently summarize the macroeconomic conditions and policy variables affecting the solvency of sovereigns. Consequently, a strand of literature, especially studies using high frequency data for which many macroeconomic variables are not available, prefers to use CR as a proxy for macroeconomic conditions and policy variables.<sup>2</sup> According to an event study by Cantor (2013), positive rating changes have no considerable effect whilst negative rating changes have a small but not impressive effect on spreads. This is consistent with a view that financial markets are efficient and ratings do reflect domestic fundamentals so that rational market participants forecast and behave accordingly

<sup>2</sup> Alternatively, Riedel et al. (2013) proposes the use of variables, such as exchange rates, interest rates and asset price changes, postulated by structural credit risk models. We believe that investigating whether the structural credit risk variables and CR add a significant value over the other appears to be a promising research agenda.

before CR changes.<sup>3</sup> The results by Cavallo et al. (2013), on the other hand, suggest that CR and spreads are noisy signals of domestic fundamentals and ratings add information beyond what is already imbedded in market prices. Consistent with this, the literature often finds that ratings do matter for spreads (Kaminsky and Schmukler, 2002; Gonzalez-Rozada and Levy-Yeyati, 2008; Özatay et al., 2009; Cavallo et al., 2013; Aizenman et al., 2013).

In the literature, the set of variables in  $Z$  contains industrial country (mainly U.S.) interest rates or the Fed target rate to proxy global liquidity and some alternative measures, including high yield corporate bonds in advanced economies and volatility implicit in U.S. stock options (VIX), to capture global risk appetite or financial conditions. Increases in international interest rates are expected to increase EME default probability and risk premium, decrease the demand for risky assets and consequently increase EME sovereign spreads (Kamin and von Kleist, 1999).

Following Calvo et al. (1993), there is now a growing literature suggesting that external factors such as global financial conditions are amongst the main determinants of business cycles in EME (Kose et al., 2012 and Erdem and Özmen, 2015). The results by Gonzalez-Rozada and Levy-Yeyati (2008), Özatay et al. (2009), Levy-Yeyati and Williams (2010) and Banerji et al. (2014) suggest that sovereign default risks and thus spreads in EME are significantly triggered by global financial conditions proxied by a subset of variables including VIX, US Treasury bond yields, US high yield spreads and labor rates.

The impacts of domestic and external variables on EMBIG spreads may not be invariant to investment and speculative grade ratings. According to Jaramillo and Tejada (2011), reaching investment grade lowers sovereign spreads substantially beyond the level implied by domestic fundamentals. Levy-Yeyati and Williams (2010) finds that the effect of interest rates and liquidity preferences are significantly stronger for low grade EME.

The impacts of domestic and external variables on EMBIG spreads may also be different at tranquil periods than episodes of financial stress. Kaminsky and Schmukler (2002) finds that credit ratings have stronger effects during crisis. Riedel et al. (2013) uses the variables proposed by structural credit models to explain daily Eurobond credit spreads in four major Latin American countries. Their results suggest that the determinants of the spreads are not invariant to endogenously estimated credit cycles and a transition to a crisis regime. In their study on the determinants of EMU sovereign bond yield spreads, Gómez-Puiga et al. (2014) finds that the marginal effects of global market sentiment variables on sovereign spreads increased during the crisis compared to the pre-crisis period. According to Amstad et al. (2016), in the context of 18 EME and 10 AE sample, global risk factors has become even more dominant in explaining CDS after the GFC. Beirne and Fratzscher (2013) finds that the sensitivity of sovereign risk to domestic fundamentals has increased substantially after the GFC. On the other hand, Comelli (2012) proposes that the impact of country-specific variables weakened during the recent GFC. The results by Levy-Yeyati and Williams (2010) suggest that the impact of Fed fund rate changes is positive in tranquil times but becomes negative in times of turmoil. Compared to low and medium volatility periods of the global markets, the effect of global financial conditions is found to be higher in high-volatility periods (Csontó, 2014). This is consistent with a finding that

<sup>3</sup> Note that, credit rating agencies have been criticised extensively especially during and after the recent global financial crisis due to the accusation of being failed to accurately and timely assess the risks in financial and public sectors. Consequently, both the market efficiency under rational expectations and ratings as a summary of domestic fundamentals postulations along with a need for regulation of the ratings sectors has become an important policy and research topic. BIS (2013) and Amstad and Packer (2015) provide important contributions to these and related issues. According to Amstad and Packer (2015), after the GFC, the rating agencies have significantly changed their assessment strategies and began to put more emphasis on monetary policy regimes, financial cycles, event risk and economic growth. Consequently, the divergence between AE and EME, which is indeed still considerably high, has tend to decrease after the GFC.

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