Journal of International Money and Finance 88 (2018) 140–157

Contents lists available at ScienceDirect

Journal of International Money and Finance

journal homepage: www.elsevier.com/locate/jimf

On the predictability of emerging market sovereign credit spreads

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ARTICLE INFO

Article history:
Available online 2 August 2018

JEL classification:
F34
F15
F17

Keywords:
Sovereign credit spreads
Emerging markets
Out-of-sample predictability
Term structure
Macroeconomic uncertainty

ABSTRACT

This paper examines the quarter-ahead out-of-sample predictability of Brazil, Mexico, the Philippines and Turkey credit spreads before and after the Lehman Brothers' default. A model based on the country-specific credit spread curve factors predicts no better than the random walk and slope regression benchmarks. Model extensions with the global yield curve factors and with both global and domestic uncertainty indicators notably outperform both benchmarks post-Lehman. The finding that bond prices better reflect fundamental information after the Lehman Brothers' failure indicates that this landmark of the recent global financial crisis had wake-up call effects on emerging market bond investors.

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1. Introduction

Little is known about the out-of-sample, or real-time, predictability of sovereign credit spreads in markets where investors are non-trivially exposed to default risk. Beyond academia, filling this vacuum is important for several reasons. Accurate predictions of *emerging market* sovereign credit spreads at various maturities are essential for pricing emerging market assets and derivatives, and for international portfolio management. Understanding how domestic and global factors affect future international borrowing costs enables emerging market borrowers to develop better informed economic policies. Due to the systemic importance of the emerging sovereign debt market, the construction of predictive models for emerging credit spreads is relevant for financial market regulators. This is borne out, for instance, by the fact that the defaults of several Latin American and Asian governments (besides Russia) during the 1990s and 2000s triggered global market turmoil. Moreover, the stock of tradable emerging market debt has grown by 17% per annum since 2002 reaching 11.7 trillion U.S. dollars in 2011 (Bank of America Merrill Lynch, 2012). This fast growth is partly because emerging market bonds attracted large portfolio capital flows due to both their post-crisis relatively favorable risk-return profile and the ultra low interest rates in advanced economies.

This paper contributes to the sparse literature on emerging sovereign bond yield prediction with a comprehensive out-of-sample (OOS) predictive analysis. The aim of this forecasting exercise is to examine two theoretically-motivated hypotheses that have not been tested in the emerging market context as yet. *Hypothesis* 1 states that the current emerging-market credit

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https://doi.org/10.1016/j.jimonfin.2018.07.005
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spread curve alone is a sufficient statistic to predict future credit spreads. This hypothesis is motivated by the rational expectations theory of the term structure of interest rates of Sargent (1972) and Roll (1970). The Roll-Sargent theory, which builds on the seminal contributions of Hicks (1939), Lutz (1940) and Muth (1961), contends that whatever expectations mechanism is at work about future interest rates, it exploits all the available information. Thus motivated, our paper is the first to test in the emerging-market debt context the hypothesis that the spread curve contains all relevant information for predicting future spreads because it efficiently embeds rational expectations about future spreads.[1]

Thus we begin by constructing OOS forecasts from a parsimonious model that exploits the information content of the current *credit spread curve* alone; namely, the predictors are the current spread level, slope and curvature factors. To test *Hypothesis* 1, we deploy a hierarchical modeling approach by which the baseline predictive regression is gradually augmented with different types of global and country-specific macroeconomic predictors. As a by-product, the test can uncover macroeconomic variables that enhance the spread-curve-based predictions. In this regard, our aim is to advance the current knowledge on the predictability of emerging-market credit spreads which has implications for their modeling.

We further conjecture that emerging market sovereign bond spreads became more aligned with global/domestic fundamentals post-Lehman (*Hypothesis* 2). This second hypothesis is inspired by the notion of "wake-up call" effects in financial markets as originally put forward by Goldstein et al. (2000) and Bekaert et al. (2011). A wake-up call theory is proposed by Ahnert and Bertsch (2015) using global coordination games. This theory predicts that in normal (or calm) market conditions investors have weak incentives to acquire costly fundamental information about a market; consequently, the market prices may not fully reflect fundamentals. However, a crisis event in another market induces investors to acquire fundamental information about the first market even if they perceive the two markets as unrelated to each other. Following a branch of the empirical finance literature, we focus attention on the collapse of Lehman Brothers in September 2008 given that this event constitutes an important landmark of the late 2000s global financial crisis (see e.g., Baskaya et al., 2017; Ongena et al., 2015; Boyer, 2014). As the analysis in Eichengreen et al. (2012) highlights, it was a salient event that signaled to investors the imminence of a global financial crisis.

Our analysis is based on July 1, 2003 to December 31, 2015 data for four geographically dispersed and relatively mature emerging markets: Brazil, Mexico (Latin America), the Philippines (Asia) and Turkey (Eastern Europe). All four borrowers have entered the J.P. Morgan EMBI+ sovereign emerging market bond index – a market benchmark for large, frequently-traded US$ denominated bond issues – since the early 2000s. While the index is dominated by Latin American sovereigns, Turkey and the Philippines are among a handful of borrowers from other regions that still enter the index at the end of our sample period. Also, from a practical perspective (i.e., for credit spread curve estimation purposes) the size of the Eurobond markets in these four sovereigns affords a relatively large cross-section of bonds throughout the sample period. The available cross-sections of bonds for other emerging markets are much smaller, particularly, in the early part of the sample.

Among the selected countries, Brazil, Mexico and Turkey are large emerging market economies and members of the G20 ("Group of Twenty") forum; in addition, Brazil is a BRICS country. Albeit the Philippines is a relatively small economy, not typically regarded among major emerging markets, it is nevertheless identified by Goldman Sachs as a N11 ("Next Eleven") country alongside Mexico and Turkey. The N11 group consists of emerging market economies that have been predicted to follow the footsteps of the BRICS countries in rivaling major developed economies (Goldman Sachs, 2007).

For each sovereign borrower, we collect at the weekly frequency cross-sections of bond prices and use them to estimate the latent factors of the credit spread curve using the Nelson and Siegel (1987) approach. Given the size of the cross-sections available, the parsimony of this approach is important to preserve degrees of freedom and achieve as much accuracy as possible in the factor extraction. We test *Hypothesis* 1 and *Hypothesis* 2 using OOS predictive ability tests for the credit spread.[2] The length in time into the future of the forecasts is one quarter; namely, a $h = 13$ week horizon in the context of our sampling frequency.

We find pervasive evidence that the emerging-market credit spread curve is not a sufficient statistic for OOS prediction of the quarter-ahead spread, against *Hypothesis* 1, as the baseline model forecasts are no better than those from the random walk and credit-slope benchmarks. Adding the global riskless yield curve information reduces significantly the model's predictive errors. The spread curve factors and the global riskless yield curve factors together with the volatility of the riskless short-term interest rate make a better predictive model that is able to beat the benchmarks for both short- and long-term bonds. Domestic fundamentals further enhance the model predictive ability across the bond maturity spectrum. Another novel finding is that indicators of macroeconomic *uncertainty*, namely, the volatility of the U.S. short-term interest rate, the volatility of the emerging-market sovereign trade balance and terms-of-trade growth are useful predictors of the emerging-market spread. These results provide insights for refining extant structural and reduced-form models of emerging-market sovereign debt (Gibson and Sundaresan, 2005; Duffie et al., 2003; Pan and Singleton, 2008).

Comparing two periods of equal 5-year length surrounding the collapse of Lehman Brothers, we find evidence consistent with *Hypothesis* 2 (the "wake-up call" effect). The predictive ability of most global and domestic macroeconomic indicators

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[1] Akin to the one-to-one relationship that exists between yields on pure discount bonds and current forward interest rates for riskless bonds, credit spreads on defaultable bonds are linked to current forward spreads.

[2] Since credit spreads reflect not only default and recovery assessments but also market liquidity conditions and the investors' ability to diversify credit risk among other factors, changes in credit spread forecasts do not necessarily translate one-for-one into changes in expectations about default and recovery rates. For further discussion, see e.g. Hartelius et al. (2008) and Longstaff et al. (2011) for sovereign emerging market debt and Amato and Remolona (2003) and Huang and Huang (2012) for corporate debt in mature markets.

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