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# Immunity and infection: Emerging and developed market sovereign spreads over the Global Financial Crisis

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## ABSTRACT

We compare sovereign bond spreads during the international financial crisis across groups drawn from 43 countries, including 20 emerging economies. We extend traditional factor analyses and utilize propensity score matching to select a non-crisis sample for comparison with the crisis sample that is more robust to exogenous crisis dating. We find minimal changes over the crisis period in the average spreads of local-currency-denominated emerging market bonds. In contrast, the spreads of peripheral Eurozone sovereign bonds increased by large amounts and were subject to sovereign risk contagion.

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## 1. Introduction

Since 2007, international financial markets have experienced a prolonged period of major shocks that have emanated from advanced economies. One phase of the Global Financial Crisis (GFC) has been particularly marked by a significant escalation in sovereign bond yield spreads around the world, associated with troubled European sovereign debt. In this study we re-examine the spread of financial contagion across sovereign debt markets, motivated by these developments. In particular, we aim to understand differences in the way developed and emerging economies experienced the spread of financial turbulence, and the implications of that contagion for sovereign debt yield spreads. The question of whether any markets were entirely immune from the adverse impacts of the recent spate of shocks remains unclear to researchers, regulators and market participants. The scope and duration of the great recession allows us to assess and compare the economic vulnerabilities of various debt-issuing countries. Our results propose effective diversification strategies for sovereign bond holders and show the importance of currency choice for sovereign debt issuers.

Sovereign bond yields are benchmarks from which other debt and capital instruments are priced (Dittmar and Yuan, 2008). To explain the level and changes in sovereign yields is therefore an important task for financial researchers and policymakers. Some commentary has postulated that a deterioration in country-specific fundamentals drove sovereign spreads upwards during the fi-

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nancial crisis although no single factor can explain all sovereign spread movements. Studies concur that prior to and during the first stage of the GFC, changes in global risk aversion were the chief cause of changes in sovereign spreads (Caceres et al., 2010; Sgherri and Zoli, 2009). However from 2009 onwards, country-specific fundamentals became dominant. The perceived fragility of a country's financial sector and consequently its potential to deplete public finances, as well as weaker macroeconomic fundamentals and changes in trade variables, explain differences in sovereign spreads of Eurozone countries since the onset of the European sovereign debt crisis (Arghyrou and Kontonikas, 2012; Chiarella et al., 2015; Dieckmann and Plank, 2012; Mody, 2009; Schuknecht et al., 2010). Country-specific fundamentals, proxies for risk aversion and liquidity have also been documented to be major determinants of credit spread variations in emerging market bonds in recent years (Fender et al., 2012; González-Rozada and Yeyati, 2008; Hilscher and Nosbusch, 2010; Remolona et al., 2008). The importance of country-specific factors during the GFC stands in sharp contrast to previous crises in emerging countries where changes in spreads were driven mainly by global factors (Diaz and Gemmill, 2006; Martinez et al., 2013; Mauro et al., 2002).<sup>1</sup>

There are many possible sources of influence on sovereign spreads and it is important to understand what factors - global, country-specific or latent - are the main drivers behind recent changes in sovereign spreads. The literature on financial contagion offers a taxonomy of transmission channels that can be used to categorize factors that are likely to affect spreads. Dungey and Martin (2007) classify the transmission channels into three categories: 1) Common or market shocks 2) Country-specific shocks and 3) Latent or idiosyncratic shocks. Moreover, Giordano et al. (2013) offers a useful economic interpretation of crisis-related changes in common shocks as “shift contagion”, in country-specific transmissions as “wake-up-call” contagion, and new latent factor transmissions as “pure contagion”.

Our main objective and contribution in this study is to comprehensively assess recent changes in sovereign borrowing costs, as experienced in different bond market segments, in order to better understand the potential costs of financial market interdependence in times of crisis. In doing so, we also contribute to the literature on financial contagion by measuring the true extent of contagion using a novel approach that is more robust to traditional exogenous crisis dating methods. Researchers who want to measure pure contagion effects must, first, choose a robust set of fundamental factors, and second, choose dates for crisis and non-crisis periods. We extend standard factor analyses and apply propensity score matching techniques combined with an Average Treatment Effect on the Treated (ATET) method to correct for potential biases in the selection of a matching “control” non-crisis sample period. We then compare across crisis and matched non-crisis periods to detect material changes in sovereign spreads. Crisis period observations are “treated” units in the ATET setup. We can thus test whether the spreads during crisis periods are statistically different from non-crisis periods, holding all factors that determine spreads constant. It is particularly important to understand the behaviour of emerging market bond spreads because other studies have shown them to be negatively related to emerging countries' economic output, investment and trade balances (Uribe and Yue, 2006).

Our sample includes sovereign bonds of all maturities from 43 countries classified into nine representative test groups based on market type (developed or emerging), geographical location (peripheral Eurozone) and also currency of debt denomination (US dollars, Euros and local currencies). Thus, the nine test groups consist of a composite of all 43 sovereigns, as well as groups of developed markets, emerging markets, Euro-denominated, US dollar-denominated, local currency denominated (for developed and emerging markets, respectively) and the group of troubled peripheral Eurozone countries (PEC) - Portugal, Ireland, Italy, Greece, and Spain.

Our study provides several major new findings. First, we find that the changes in spreads between crisis and non-crisis periods that we estimate with traditional exogenous dating methods are very different from the results from matched estimation. The estimates of average changes in spreads that we made with traditional dating methods are much larger than the estimates we made with propensity score matching. Second, our new empirical test reveals that in addition to the more stable developed markets, local currency denominated sovereign bonds from emerging markets also exhibited very low proportional changes in spreads throughout the crisis. The policy implication of this new finding is that emerging market sovereigns could strengthen their future immunity from external global shocks by raising their capacity to borrow in their own currencies. Third, we find that the funding costs for peripheral Eurozone (PEC) sovereign bonds were significantly affected throughout the prolonged crisis, with economically significant increases in spreads. Fourth, both “shift” and “wake-up-call” contagion affected sovereign bond market segments throughout the crisis, which shows that it is important for governments to remain vigilant over both the financial health of their own economies and over global conditions. Our results corroborate for sovereign bond markets Bekaert et al.'s (2014) finding that wake-up-call contagion played a critical role in the spread of the GFC across international equity markets.

Section 2 sets out the data sources and choice of variables for our base factor regression models; Section 4 describes the propensity matching model, Section 5 contains the summary of contagion tests, and Section 5 concludes.

## 2. Method

We start by describing the construction of the zero coupon bond yield spread series, then the estimation of panel factor models for all sovereign bond groups.

<sup>1</sup> Other studies attribute the increase in global liquidity to the fall of emerging market spreads and a shift from common factors to country-specific factors during the GFC (Eichengreen et al., 2012; Hartelius et al., 2008). Similarly, unobservable factors and risk aversion have accounted for a large part of the observed variations in emerging market sovereign CDS spreads (Coudert and Gex, 2008; Longstaff et al., 2011).

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