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Daily pricing of emerging market sovereign CDS before and during the global financial crisis

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ABSTRACT

In this paper, we study the determinants of daily spreads for emerging market sovereign credit default swaps (CDSs) over the period April 2002–December 2011. Using GARCH models, we find, first, that daily CDS spreads for emerging market sovereigns are more related to global and regional risk premia than to country-specific risk factors. This result is particularly evident during the second subsample (August 2007–December 2011), where neither macroeconomic variables nor country ratings significantly explain CDS spread changes. Second, measures of US bond, equity, and CDX High Yield returns, as well as emerging market credit returns, are the most dominant drivers of CDS spread changes. Finally, our analysis suggests that CDS spreads are more strongly influenced by international spillover effects during periods of market stress than during normal times.

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1. Introduction

Walter Wriston, then Chairman of Citibank, once famously remarked that “countries don’t go bust” (Guill, 2009). Yet, by October 1983, and only a few months after that statement was made, 27 countries owing about $240 billion in debt had rescheduled these obligations or were in the process of doing so—in what is now commonly known as the “LDC debt crisis.” Indeed, countries *do* go bust, in the sense of refusing or being unable to meet their financial obligations. Recent developments surrounding the restructuring of Greek government debt are a stark reminder of this fact, even though such events are relatively rare. Historical data reveal a number of important patterns: sovereign defaults often occur in waves and tend to be heavily concentrated in periods of extreme stress, with the largest wave of defaults occurring during the Great Depression and World War II. Historically, the majority of defaults involve countries’ external debt; defaults involving domestic debt are less common. Both emerging market and industrialized country issuers experience default, but the former are more prone to it than the latter. Specifically, based on the frequency with which a country has moved into default, emerging market borrowers are about 10 times more likely to default than are their peers from developed markets.[1] Thus, country risk is an important factor in the pricing of sovereign debt, especially—though not only—for emerging market borrowers.

Assuming rational investors, we would expect that credit spreads on sovereign debt instruments reflect such risks. Surprisingly, the evidence on the importance of country-specific risks in the pricing of sovereign debt is rather mixed. Longstaff et al. (2011), for example, show—using monthly data—that returns on sovereign credit default swaps (CDSs), a common measure of credit risk, are substantially more correlated across countries than are corresponding stock index returns. They find that these spreads are more related to US stock and high-yield credit markets, proxies of global risk premia, and international liquidity patterns, than they are to local financial measures. Thus, the country-specific risk premium—after adjusting for global and, in particular, US risk factors—appears to be almost negligible. This suggests a potentially important role for international and, in particular, US financial variables in the determination of non-US sovereign CDS spreads—and thus a channel for spillovers into those countries’ funding costs in international debt markets.

Our approach is related to literature on the determinants of corporate credit spreads and the pricing of individual firms’ CDS, including work by Collin-Dufresne et al. (2001), Campbell and

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[1] Reinhart and Rogoff (2008) and Moody’s Investor Service (2009).

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Taksler (2003), and Ericsson et al. (2009). Longstaff and Rajan (2008), Bhansali et al. (2008), and Fender and Scheicher (2009) apply similar methodologies to multi-name CDS contracts (i.e. contracts based on portfolios of underlying credits). A standard finding of these studies is that broad factors, such as measures of risk appetite and market liquidity, play an important role in the determination of observed CDS spreads. Fontana and Scheicher (2010) study the relative pricing of euro area sovereign CDS and underlying government bonds and find that repricing of sovereign credit risk in the CDS market seems mainly due to common factors.

We explore these spillovers by building on extant literature on the impact of US financial variables on foreign asset returns. Studies of policy spillovers typically focus on equity and bond markets; however, our analysis employs daily CDS spread data for 12 emerging market borrowers.[2] Sovereign CDS are traded in relatively liquid markets and provide a direct indicator of the credit risk premium demanded by investors. As such, CDS premia are close proxies for the excess funding costs of sovereign borrowers relative to benchmark US Treasury yields. They also often serve as a lower-bound measure for the wholesale funding costs of banks and corporate issuers from the same countries. Although we take Longstaff et al.'s (2011) analysis as a starting point, our methodology differs from theirs in a number of ways. First, we employ daily instead of end-month data to measure spillover effects on sovereign CDS returns. Low-frequency data tend to exhibit higher correlations and, hence, an empirical analysis using monthly financial market data could potentially overestimate the importance of spillover effects. In contrast, daily data measure the direct impact of US financial markets on CDS spreads, thereby also incorporating the high degree of volatility typical for financial market data (see Fig. A.2 in Appendix A). Second, we quantify the economic relevance of such spillover effects, as we provide point estimates and their significances instead of presenting only *t*-statistics. Third, in addition to financial factors, we also incorporate several macroeconomic variables, such as economic growth, debt/GDP levels, fiscal deficits, net foreign assets, and country ratings. As a consequence, we can directly and systematically compare the effects of international financial variables with domestic financial variables *and* macroeconomic factors. Furthermore, we also control for target rate movements by the European Central Bank (ECB) and the Federal Reserve (Fed). Fourth, we split our sample to examine potential differences in the reaction of CDS spreads to various factors before and during the recent financial crisis.[3] Finally, we use a panel framework to estimate the influence of the factors more efficiently and to illustrate the most relevant drivers of emerging market CDS spreads at a glance in one model.

We investigate the determinants of daily spreads for emerging market sovereign CDS spreads by addressing three closely related research questions. First, are there common factors that cause daily sovereign CDS spread changes across emerging financial markets? Second, what is the impact of (1) domestic financial and macroeconomic variables and country ratings compared to (2) US and international financial variables on daily sovereign CDS spread changes? Third, are there noticeable differences in the reaction of CDS spreads before and during the recent financial crisis?

Our findings suggest that (1) common factors play a role for daily sovereign CDS spread changes across emerging financial markets, (2) daily CDS spreads for emerging market sovereigns are more related to global and regional risk premia than to country-specific risk factors. This result is particularly evident during the second subsample (August 2007–December 2011), where neither macroeconomics variables nor country ratings significantly explain CDS changes. Finally, (3) the amplified reaction to international financial variables in the second subsample suggests that CDS spreads are more strongly influenced by spillover effects during the financial crisis.

The remainder of this paper is organized as follows. Section 2 presents a brief introduction to the mechanics of sovereign CDS. Section 3 describes the CDS data and our sample selection process and introduces the explanatory variables used in the empirical analysis. Section 4 presents the econometric methodology, illustrates the results, and reports a number of robustness tests. Section 5 concludes.

2. Sovereign credit default swaps (CDSs)

Sovereign CDS are financial contracts offering insurance against losses from credit events on outstanding debt issued by sovereign entities. Standard contracts have two legs. The protection buyer pays a premium (the premium leg), expressed in basis points per notional amount of the contract, in exchange for a contingent payment (the contingent leg) if any of the contractually pre-specified credit events occur. Settlement on these contracts is typically by physical delivery of admissible bonds in return for payment of the original face value.[4] As such, CDS for both sovereign and corporate reference entities have five distinct contractual features: (1) the debt issuer (reference entity), (2) a set of reference obligations, (3) the contract term (e.g., 5 years), (4) a notional principal amount, and (5) a list of events triggering protection payments (Markit, 2008b).

The Standard International Swaps and Derivatives Association (ISDA) defines six different credit events, some or all of which may be selected for individual CDS contracts: (1) bankruptcy of the reference entity, (2) failure to pay (the reference entity fails to make interest or principal payments when due; a grace period and materiality threshold may apply), (3) debt restructuring (the configuration of debt obligations is changed in a way unfavorable to the creditor; e.g. maturity extension, coupon or par amount reduction, postponement in coupon dates, or change in currency), (4) obligation default, (5) obligation acceleration, and (6) repudiation/moratorium. The range of restructuring events included in the CDS contract depends on the selected restructuring clause. In our sample, the most common clause in sovereign CDS is the so-called complete (or cum-) restructuring (CR) clause, which allows for any form of restructuring and delivery of any bond of maturity up to 30 years.[5] This stands in contrast to CDS for corporate issuers, which tend to limit the range of qualifying events, as well as the allowable maturity of deliverable obligations.[6]

Pricing of such contracts results in a CDS premium (spread) equating the present value of both payment legs over the (expected) lifetime of the deal. Holding the annual probability of default (conditional on earlier non-default) constant over time,

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[2] For instance, Andritzky et al. (2007) show that global bond spreads respond to rating actions and changes in US interest rates rather than to domestic data and policy announcements. Examining country subsamples, they discover that US news matter less to countries with more transparent policies and higher credit ratings. Arora and Cerisola (2001) explore how country risk—proxied by sovereign bond spreads—is influenced by US monetary policy, country-specific fundamentals, and conditions in global capital markets. They conclude that the stance and predictability of US monetary policy are important for stabilizing capital flows and capital market conditions in emerging markets.

[3] Longstaff et al. (2011) use a sample break in their principal component analysis but not in their regression analysis.

[4] The first ever credit event auction for sovereign CDS was held on 14 January 2009, enabling cash settlement of contracts for Ecuador.

[5] See Markit (2008b). Given the lack of maturity limitations, protection buyers technically can deliver long-maturity obligations (cheapest-to-deliver option) in case of a credit event, as long as the bond is pari passu or senior to the reference obligation on the contract.

[6] The complete restructuring (CR) clause dates back to the original 1999 ISDA credit derivatives definitions, with the modified (MR) and modified-modified (MM) restructuring clauses introduced in 2001 and 2003, respectively.

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