

CDS Pricing and Elections in Emerging Markets

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Christopher Balding

Abstract

To study the role of elections in financial market instability, we focus on the role of credit risk pricing during elections from 2004 to 2007 in 13 emerging market economies. We use a unique dataset of daily credit default swap (CDS) pricing, with standard macroeconomic controls, to study the role of elections in prompting financial market instability and contagion. Sovereign CDS pricing provides a number of advantages in understanding emerging market instability of previous studies. First, the daily data allows a greater level of specificity than was used in previous credit market and political studies. Second, even though sovereign credit conditions change slowly, CDS pricing changes daily, reflecting sentiment or forward-looking beliefs. Third, the CDS allows us to focus on the perceived public credit risk of an election and the incoming government. Our study reveals a number of unique findings. First, investors price in additional risk for elections regardless of party, incumbency or size of win. Second, long- and short-term investors price risk very differently, with 1-year CDS investors reacting much more strongly to election risk, causing the overall spread between 10- and 1-year swaps to narrow. Third, our results provide continued support for the theory of investor herding in international financial markets, and a focus on a small number of economic variables in determining sovereign creditworthiness. Investors do not study the relative risk factors as much as price in structural risk by the existence of definable benchmarks like elections.

Christopher Balding, Assistant Professor, HSBC School of Business, Peking University, Shenzhen. E-mail: cbalding@szpku.edu.cn

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Introduction

International financial markets are a primary source of instability in emerging markets. In a globalised world of international capital, sustained capital inflows can become outflows destabilising developing economies. Emerging markets, eager to embrace the benefits of international capital markets, must also consider the accompanying increased volatility from global finance. Sudden stops in capital flows to emerging economies occur for many reasons. Developing economies complain that even when embracing the economic orthodoxy of low inflation, well-managed trade and fiscal accounts and a pro-growth regulatory environment, international finance may cause significant instability.¹

One source of potential financial market volatility is political instability. Financial markets are concerned with the stability of financial assets, based upon the underlying soundness of the domestic economy. Holding fixed income assets, international investors are concerned with the creditworthiness of the country, which depends on a small list of economic indicators such as gross domestic product (GDP) growth, fiscal deficit or surplus, outstanding debt as a percentage of GDP and inflation. Numerous examples exist of countries with sound underlying macroeconomic fundamentals that faced financial instability for reasons unrelated to their economic fundamentals. Political instability in developing countries is a potential source of instability.

Developing countries with less established democracies and institutions, political instability, and specifically elections, can prompt financial market volatility due to a perceived risk increase irrespective of macroeconomic fundamentals. Investors depend on continued economic growth, the stability of the policy environment and the commitments of the government to abide by their obligations. Developing countries without a sustained record of policy and economic stability may face higher

levels of investor fear during periods of potential instability. Elections in countries without a lengthy history of institutionalised democracy and well-managed macroeconomic indicators, may prompt investor nervousness over the commitment of a new government to honour past contracts. Developing countries argue that even when the political parties are respected, moderate and commit to honouring debt obligations either pre- or post-election, the existence of an election can cause harmful financial market instability. A second potential source of instability is contagion. The herding behaviour of international investors can bring about sudden stops to countries not experiencing political or economic instability, but which are related to other emerging market economies. Known as contagion, this indirect source of financial instability can harm well-managed countries by causing them to be grouped in with other emerging market economies, geographic neighbours or countries with other shared traits. The direct and indirect impacts of electoral and contagion effects can affect the financial stability of countries.

This study seeks to study the impact of an election on credit default swap (CDS) pricing in emerging market economies controlling for the normal financial and macroeconomic variables. We find that when controlling for standard sovereign credit risk variables, elections have an economically and statistically significant impact on CDS pricing. In other words, the existence of an election increases the basis point cost of a CDS and the perceived credit risk of an election. The perceived credit risk of emerging market sovereigns is higher at an election, even after controlling for a range of economic and political variables. Two additional findings are noteworthy. First, contagion effects are economically and statistically significant. Elections in one emerging market country increase the price of credit insurance for all emerging market sovereigns. Second, short-term investor volatility is greater with regard to elections than long-term investor volatility. The fear of short-term investors by emerging market sovereigns appears to be well founded.

The article is broken up into three sections. First, we study the relationship between electoral politics and CDS pricing. Second, we detail the data and methodology used in this study. Third, we present the results of our study and explain nuances and derivative models. On the basis of the results of our study, investors view elections in emerging markets as an increased risk factor in credit pricing.

Capital Markets, Emerging Market Volatility and Electoral Politics

Liberalised financial markets have increased the probability of crises in emerging markets. Research indicates that free trade will benefit emerging market economies, but that financial 'globalisation' may increase the susceptibility of developing economies to sudden stops and crises (Martin and Rey 2006). Smaller countries and emerging market economies that have liberalised their financial markets have experienced sudden stops in capital flows from investors with numerous defaults. One study noted that 'changes in spreads were dominated by sharp adverse shifts in market sentiment more than by changes in fundamentals' (Eichengreen and Mody 2000). The East Asian and Russian crises in 1997 and 1998, respectively, followed by the Argentinean crisis in 2001 involved a rapid reversal of investment flows to developing countries. In each instance, significant contractions in real output occurred after the financial crisis. Free trade and financial markets bring benefits but also risks to emerging market economies dependent on international capital markets to drive rapid growth.

Instability for developing economies in international financial markets stems from their use of credit markets. Equity markets in developing countries, while experiencing higher levels of volatility than developed economies, do not induce financial crisis like sudden stops in credit access. Numerous specific risks exist for both borrower and lender when accessing international credit markets for emerging market economies.² First are the macroeconomic fundamentals. These are quantifiable risks, based upon the macroeconomic policy and management of the government, that establish the creditworthiness of a country. Research has established that a small group of macroeconomic indicators explain the risk factors of a country's cost of credit (Beck 2001; Bussiere and Mulder 1999; Ciarlone et al. 2007; Fiess 2003; Grandes 2003; McGuire and Schrijvers 2003; Min 2003; Nogues and Grandes 2001; Rowland 2005; Rowland and Torres 2004; Weigel and Gemmill 2006; Westphalen 2001).³ The primary domestic macroeconomic factors that influence the risk premium on emerging market credit pricing include GDP growth, inflation, public debt, reserves and exports. These macroeconomic fundamentals demonstrate the creditworthiness of a country by indicating

whether it will have the capacity to repay its debt obligations through sustained economic growth and prudent financial management. The macroeconomic fundamentals umbrella covers inflation and default risk. Both inflation and default risk can be reduced by a sound domestic macroeconomic policy framework.

Second, fixed-income emerging market investors face exogenous financial risks. Emerging market's access to international credit markets incurs exogenous economic risks not present in many developed country fixed-income instruments. Research indicates that a large portion of emerging market bond spreads can be explained by monetary and economic fundamentals of the United States (US) and other developed countries (Arora and Cerisola 2001; Beck 2001; Dailami et al. 2008; Ferrucci 2003; Fiess 2003; Gonzalez-Rosada and Levy Yeyati 2008; Longstaff et al. 2011; McGuire and Schrijvers 2003; Min et al. 2003; Oztay et al. 2009; Pan and Singleton 2008; Uribe and Yue 2006; Weigel and Gemmill 2006).⁴ One recent study argued that 'returns from investing in sovereign credit are largely compensation for bearing *global risk*. In particular, there is little or no country specific credit risk premium after adjusting for global risk factors...' (Longstaff et al. 2011).

Exogenous economic risk of emerging market sovereign debt also includes currency risk.⁵ Developed countries like the US, Japan and European Union members issue bonds in local currency, while emerging markets issue bonds in foreign currency, primarily the US dollar. Research indicates that exchange rates impact credit pricing via the relative terms of trade, indicating an improved probability of repayment (Hilscher and Nosbusch 2008; Min 2003). Exchange rates and the terms of trade matter because they are strongly linked to defaults via currency crises, the liquidity of the domestic country and its ability to service its debt obligations (Bussiere and Mulder 1999; Ferrucci 2003; Min 2003; Min et al. 2003; Reinhart 2002). Volatile currency movements impact the real debt level and the ability of the domestic economy to service foreign currency debt. Developing economies' access to financial markets and cost of capital is dependent on global economic conditions.

Emerging market sovereign debt, however, also prices in non-economic exogenous risk factors such as contagion and political risk. For the purposes of this study, we define contagion as the 'significant increase in cross-market linkages after a shock to an individual country (or group of countries)' (Dornbusch et al. 2000). Research has found high

degrees of correlation between emerging market financial markets, especially in times of crisis (Boyer et al. 2006; Cifarelli and Paladino 2007; Dornbusch et al. 2000; Fiess 2003; Gonzalez-Rosada and Levy Yeyati 2008; Grandes 2003; Hernandez and Valdes 2001; Kaminsky and Schmukler 2002; Kumar and Persaud 2003; Oztay et al. 2009). Contagion and cross-country correlation, however, may be declining as there is evidence that investors increasingly distinguish between emerging market economies (Oddonat and Rahmouni 2006). Countries receiving a credit rating downgrade will negatively affect their regional neighbours (Gande and Parsley 2005). Contagion risk for emerging market economies implies they must concern themselves with the economic risks presented by other developing countries. If investors do not distinguish between emerging market states, then countries with sound macroeconomic fundamentals may suffer sudden stops in capital when other emerging markets enter a crisis period.

Emerging market sovereign debt prices in other risks, most notably for the purposes of our research, political risk. Though the credit cost indicates the pricing of political and policy risk, little research has sought to study and quantify it. Previous research on the relationship between the emerging market's access to international credit market and domestic politics has tended to focus on the role of credit rating agencies (Biglaiser and DeRouen 2007; Biglaiser et al. 2007; Block and Vaaler 2004; Vaaler et al. 2006). Numerous problems exist with using credit ratings. First, sovereign credit rating is a poor measure to use due to the time inconsistency problem. Credit ratings change infrequently and fail to capture changes in investor sentiment or fundamentals. While economic and political data are updated daily, monthly and quarterly, credit ratings may change as little as every few years. This prevents any serious study of the impact of new information on investors. Second, the ordinal values of credit ratings fail to allow discrete differentiation between ratings. Pricing data have a discrete and absolute difference between units of measurement, while credit rating differences, as ordinal values, fail to capture a similar level of detail.

Research on the cost of political risk in developing economy credit markets has been sparse. Research studying the relationship between the cost of credit and emerging market political risk has either been

methodologically rudimentary or geographically segmented (Block and Vaaler 2004; Moser 2006). Other research used corruption indicators to study the change in the cost of external debt financing for developing countries and found a positive relationship (Ciocchini et al. 2003). Policy volatility can play a negative role in the pricing of credit risk. One study notes that 'countries with historically higher macroeconomic volatility are more prone to default, and particularly so if part of this volatility is policy induced. Reducing policy volatility thus appears to be key to improving a country's credit standing' (Catao and Sutton 2002). Policy volatility may manifest itself in large swings between governments or the renunciation of previous policies by leaders elected again. However, even when leaders or parties publicly commit themselves to policies either pre- or post-election, credibility issues may plague the market's belief in the stated policy framework. Financial markets may price in an implied political or commitment risk to emerging market cost of credit.

Financial markets have evolved rapidly over the past decade. Access to international financial markets has expanded rapidly for emerging market economies assisted by improved macroeconomic management and sustained growth. The mainstreaming of emerging market access to capital markets has also prompted a similar evolution of financial development in developed economies. Derivatives in currency, equity, commodity and debt instruments amounted to a notional value of nearly \$600 trillion at the end of 2008, with nearly \$42 trillion of that in CDS (Bank for International Settlements [BIS] 2009). A CDS is a derivative for which a seller provides a defined amount of money to the purchaser of the CDS in the case of a 'credit event' or default.⁶ For instance, if investors purchase a bond from country A and want to protect themselves in case the country decides not to repay the bond, they can purchase a CDS, which will repay them the outstanding amount of the bond if country A defaults. The CDS has become increasingly used by investors seeking to either hedge their specific risks or as speculative assets (Carr and Wu 2007). The market for emerging market sovereign CDS has grown rapidly in the past decade, with daily pricing for many available only back until 2004. It is important to note that a CDS does not protect the investor against other types of risk such as inflation, currency or numerous others.

Data and Methodology

The data and methodology used here is straightforward and compiled from standard sources. First, we compiled daily 1- and 10-year CDS pricing from Thomson Datastream from 2004 through 2007 for 13 emerging market countries.⁷ It is worth noting some of the data limitations and peculiarities with regard to the use of CDS data. First, due to the evolving nature of the sovereign debt market, and more specifically the growth of the CDS market, not all countries have daily pricing data for the entire time period specified. Additionally, some countries originally in our sample appeared to be very thinly traded with large variations in pricing data which we subsequently excluded.⁸ Second, we use general macroeconomic data downloaded from the International Monetary Fund's (IMF) International Financial Statistics Database. We excluded countries which did not have complete data meeting the time interval requirements needed for the study. As has already been noted, a small number of variables have been found to be important with regard to sovereign debt pricing and we restrict our study to these variables. For the purpose of thoroughness, we tested a range of related variables simply to study their importance, but utilise the commonly used macroeconomic indicators of sovereign creditworthiness. For instance, while we used quarterly GDP growth in our baseline study, we also tested related variables that might act as a proxy, such as monthly industrial production. We also tested different measures of indebtedness and liquidity to ensure the accuracy and stability of our results. Third, election variables were created from the Adam Carr Election Archive. We created a range of election-related variables to test the importance of pre- and post-election changes in credit pricing and contagion effects, both within a region and around the world.

Methodologically, the study is straightforward with a few minor issues. First, as with other cross-country spread and CDS studies, we used a panel dataset and employed standard econometric techniques and robustness tests.⁹ These include fixed, random, time and country effects as well as different robustness tests. Methodologically, we are relying on widely accepted and utilised techniques and do not stray from accepted techniques. Second, we faced the problem of integrating inconsistent time data, for instance, daily CDS pricing, monthly debt data and quarterly GDP growth statistics. We merged the data into the relevant time

period so that within a given quarter, some variables changed daily, monthly or not at all. The baseline model presented settled on quarterly data, but we tested a much larger array of data and time periods for different variables not presented here as they do not change the outcomes or add to the discussion.¹⁰ We also created leading and lagging variables to test for time effects, borrower reputation and economic information. This helps us to test better the impact of economic fundamentals on changes in implied credit risk. However, it also applies theory on investor decision making. Investors may rely on the past performance, creating a proxy for reputation and the probability of repayment. Investors also look forward, forming expectations about the future, and estimate probable economic performance, adjusting their price of credit risk.

Finally, the importance of the CDS as the dependent variable rather than bond spreads cannot be overstated when pricing political risk. While bond spreads incorporate political risk and price it daily, they are a blunt instrument for a few reasons. First, bond spreads incorporate many more risk factors into the cost of credit. While default risk is the primary risk of any debt instrument, there are a large number of risks, at varying price levels, associated with debt pricing. For instance, inflation and prepayment risk are excluded from the CDS risk profile. Second, CDS data clearly prices time in its differentiation between 10- and 1-year CDS. While some measure 10- and 1-year spreads, for reasons of security, sales and yield curve constructions, the data is less exact than the sale of a 10- or 1-year CDS. The daily price is the cost to insure against a credit event for the given time period. Third, the use of a CDS limits the channels via which a political event, not an ongoing policy, party or government, can impact the financial market pricing of credit risk. Bond spreads, by accounting for a larger number of risks, also increase the number of methods by which politics can impact financial risks. The CDS limits that risk to a clearly defined credit event. The CDS pricing is also better suited to measure the impact of political risk because a government default is the most direct financial market variable that a government can control. The discrete and limited risk of credit default excludes a range of other risks that equity and bond markets price in when considering developing economy financial markets, such as global commodity prices, currency fluctuations and international trade levels. This does not mean that equity markets are not influenced by the perception of political risk, in fact they are, only that CDS pricing captures the narrow and discrete

estimate of public credit risk. By narrowing the range of risks accounted for in the dependent variable of CDS pricing over which the government would have the most ability to directly influence of most financial market instruments, we arrive at the best estimates of the impact of election risk.

The Baseline Model

Our model is straightforward and designed to cover the primary risk factors associated with a sovereign CDS and previous literature. We use daily data, covering a period from 2004 to 2007 for 13 countries, creating a large number of observations when presented in panel form, with fixed time and country effects, as is now widely done in the literature. The baseline model can be presented as follows:

$$\ln(\text{CDS}_{it}) = \text{BOP}_{it} + \text{EXT}_{it} + \text{GDP}_{it} + \text{ELEC}_{it} + \varepsilon \quad (1)$$

CDS_{it} = the daily price of a credit default swap in basis point for country i at time t ;

BOP_{it} = the quarterly balance of payments as a percentage of GDP for country i at time t ;

EXT_{it} = the quarterly external government debt as a percentage of GDP for country i at time t ;

GDP_{it} = quarterly GDP year-on-year growth for country i at time t ; and

ELEC_{it} = a dummy variable representing an election for all countries coded 1 on the day of the election and 0 if there is no election.¹¹

Balance of payments (BOP), external government debt and GDP growth are the fundamental economic variables that determine sovereign credit worthiness. Election is used around the fundamental determinations of credit worthiness to examine their impact on CDS pricing. The basic model is used for three reasons. First, it accords well with economic logic. The BOP acts as both a direction of a country's finances and of existing economic policy. External government debt captures the historical value of previous economic policy, and explicitly quantifies the debt that

investors are seeking to insure. The GDP measures the ability of the sovereign to repay the debt owed to foreign investors.

Second, this closely follows the literature of the number of variables which significantly impact the cost of credit. As noted previously, and specifically focusing on the bond spread literature, a small number of variables explain the variance and significantly impact bond spreads. Though there has been very little published academic literature on the determinants of sovereign CDS prices, we adhered closely, in form and fashion, to the bond spread literature and its explanatory workings. Third, other economic variables that are tested, but not presented here, are highly correlated with the three economic variables. For instance, other measures of debt, current or capital accounts and liquidity are strongly related to the three economic variables used. The three primary variables, and others used for robustness tests, demonstrate low levels of correlation, while other variables add nothing to the analysis. The fixed time and country effects used in the model both mirror the literature in cross-country economic studies but also reduce the variance and account for potentially unobserved variables such as political uncertainty. The election dummy variable is designed to measure the impact of the event of an election on CDS pricing and not political turbulence or risk. In subsequent derivations of the baseline model, we include additional domestic economic and global risk variables which, as will be seen, do not change the economic and statistical significance, and do not add to our analysis or insights.

The Baseline Results

The baseline results are presented in Table 1 and reveal a number of results consistent with the expectation that an election raises perceived credit risk. First, the economic variables are all statistically and economically significant. Statistically, the variables are all significant at the 1 per cent level with high *t*-statistics. For instance, the marginal impact of GDP growth implies that a 1 per cent increase in GDP growth, lowers the price of a CDS by 5 per cent. The largest impact on sovereign CDS pricing comes from external government indebtedness. A 1 per cent increase in external government debt as a percentage of GDP increases the CDS

Table 1. The Baseline Results

Dependent Variable	10-Year CDS	10-Year CDS	1-Year CDS	1-Year CDS
Balance of payments	-0.004* (0.0002)	-0.004* (0.0002)	-0.004* (0.000)	-0.004* (0.000)
External government debt	0.61* (0.03)	0.59* (0.03)	0.83* (0.05)	0.69* (0.04)
GDP growth	-0.05* (0.002)	-0.05* (0.003)	-0.02* (0.004)	-0.02* (0.003)
Election dummy	0.10*** (0.06)	0.10*** (0.06)	0.24** (0.10)	0.23** (0.10)
Observations	11,989	11,989	11,989	11,989
Countries	13	13	13	13
Specification	Fixed Effects	Random Effects	Fixed Effects	Random Effects
Time effects	Yes	Yes	Yes	Yes
R-squared within	0.58	0.58	0.32	0.32

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, ** and *** indicate significance at 1%, 5% and 10% levels, respectively.

price by 61 per cent. Second, the results are similar across both methodological specification and time differences between CDS. Fixed and random effect panel specifications return strikingly similar results.¹² The differences between the 10- and 1-year CDS in both methodological specifications is minimal with only marginal differences in economic variables. Third, the variables all return the expected sign. Balance of payment surpluses and positive economic growth result in lower CDS prices and a negative coefficient. Conversely, higher external government debt is positive due to the higher risk and subsequent higher CDS pricing. As theorised, an election raises the perceived sovereign credit risk.

The most interesting result, however, comes from the perceived difference in election risk between the 10- and 1-year CDS. While the impacts on BOP, external government debt and GDP growth are similar between the 10- and 1-year CDS, the economic impact of an election on the 1-year CDS in the baseline model is more than twice as large. The election coefficient for the 10-year CDS is 0.10, while it is 0.24 for the 1-year CDS. In other words, 1-year CDS investors believe that the credit risk from an election is much higher than owners of the 10-year CDS. This result seems oddly counter-intuitive. The risk of a credit event stemming from election-related politics seems significantly higher to holders of the 10-year CDS, who will typically witness a minimum of two major national elections if holding to maturity. Longer-term instruments carry higher risk premiums for precisely this reason, because while short-term economic growth and BOP are relatively predictable, forecasting over the medium and long-term requires more faith. It seems counter-intuitive that short-term investors should perceive such a large difference in credit risk in an election.

Our theory behind this finding is that of investor's self-selection bias between time horizons. In other words, the investors in the 10-year CDS are very different than the investors in the 1-year CDS, creating a self-selection bias between the holders and how they react to perceived risk. Specifically, there are three sub-categories of risk that help us understand the risk differentiation patterns of investors. First, investors evaluate short- and long-term future economic and political risk differently. For instance, investors may see high risk for short-term but lower long-term risk. Just as yield curves indicate the markets belief in future economic activity, investors may be differentiating between the short- and long-term

risks. Second, investors have fundamentally different country risk evaluations. Investors willing to provide long-term credit insurance assume much larger risk but arrive at a fundamentally different country risk profile than short-term investors. Third, different products may be attracting different investors. In other words, the 1-year CDS may be attracting more speculative or rapid trading investors, while the long-term or buy-and-hold investors are represented in the 10-year CDS. Though we cannot say for sure what is driving the difference in the evaluation of political risk between the 10- and 1-year CDS, each time horizon values risk differently.

Testing Data Exclusions

To further test the baseline model, we subjected the dataset to data exclusions tests. Due to the fact that the dataset only contains 13 countries and 3 economic variables, we were not able to subject the data to a wide range of data exclusions, as might be available from a larger panel. However, we were still able to further test our model, as can be seen in Table 2. The basic distinction made when separating countries was based upon the fact that our dataset contains seven countries from Latin America, and six countries throughout the rest of the world. We tested the 10- and 1-year CDS for panels of exclusively Latin American countries, and all countries excluding Latin America.

The data exclusion regressions confirm and build upon our previous findings in a number of key ways. First, the fundamental economic variables remain broadly similar. Balance of payments, external government debt and GDP growth are all broadly in line with previous regressions.¹³ Second, as in the baseline model, the perceived credit risk from an election is fundamentally different between the 10- and 1-year CDS. The election coefficient in each 10-year CDS group is statistically insignificant. The election coefficient for Latin America and the rest of the world for the 1-year CDS is both economically large and statistically significant. In other words, as in the baseline model, the 10- and 1-year CDS investors treat credit risk from an election very differently. In the baseline, elections were statistically significant across time horizon, but differed in their economic impact. When dividing the countries into smaller groupings,

Table 2. Data Variations

Dependent Variable	10-Year CDS	10-Year CDS	1-Year CDS	1-Year CDS
Balance of payment	-0.002* (0.00)	-0.004* (0.00)	-0.003* (0.00)	-0.007* (0.00)
External government debt	0.59* (0.03)	0.03 (0.07)	0.76* (0.05)	0.44* (0.12)
GDP growth	-0.03* (0.00)	-0.03* (0.00)	-0.04* (0.00)	0.02* (0.00)
Election dummy	0.09 (0.07)	0.13 (0.09)	0.24*** (0.13)	0.28*** (0.15)
Comment	Latin America only	Latin America excluded	Latin America only	Latin America excluded
Observations	6,122	5,867	6,122	5,867
Countries	7	6	7	6
Specification	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes
R-squared within	0.74	0.41	0.41	0.25

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, ** and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Please see Footnote 11 and Appendix 3 for an explanation of the differences in results between Latin America and the rest of the world.

the statistical significance of election disappears in the 10-year CDS, while its economic and statistical significance remain in the 1-year CDS. Investors treat election risk differently across time.

Cross-border Risk

An important question of emerging market finance concerns the possibility of contagion and whether emerging market economy risk might impact other similar countries. Emerging market finance has suffered from sudden stops either from its domestic situation or, more frustratingly, from the economic situation of its neighbour. Contagion refers to the specific situation where states, through a variety of potential channels, suffer from economic or financial problems due to the issues in another similar economy. This may stem from a geographic or economic similarity. A contingent factor is the role of international investors. International investors have tended to group emerging market economies or geographically similar states into their evaluation of a specific country or region. Consequently, if one country in a region suffered, it could easily harm, through international financial transmission mechanisms, the economy of its neighbour even if they did not enjoy similar problems. To address this question, we created two different contagion variables capturing election risk. The first contagion variable is regional only, while the second is global.

The results from the regressions capturing contagion are presented in Table 3. Working under the hypothesis that will impact emerging market economies *not* in an election cycle, provides evidence that global contagion does impact similar countries. There are a few interesting results. First, regional contagion is economically and statistically insignificant. There is no regression presented, under any model in which the contagion dummy variable was economically or statistically significant. The coefficients are very small, and since the dummy variables are regressed against a natural log, this implies that the economic value of contagion from election is approaching zero and statistically its significance is not even borderline. The regional contagion measure may however be incomplete given our dataset, as it essentially divides the sample into Latin American countries and all other countries.

Table 3. Contagion and the CDS

Dependent Variable	10-Year CDS	10-Year CDS	10-Year CDS	1-Year CDS	1-Year CDS	1-Year CDS
Balance of payment	-0.003* (0.00)	-0.004* (0.00)	-0.004** (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.61* (0.03)	0.61* (0.03)	0.61* (0.03)	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)
GDP growth	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)
Election dummy		0.10*** (0.06)			0.24** (0.10)	
Global contagion			0.03** (0.02)			0.10* (0.03)
Regional contagion	-0.004 (0.03)	-0.004 (0.03)		-0.001 (0.05)	-0.001 (0.05)	
Comment						
Observations	11,989	11,989	11,989	11,989	11,989	11,989
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.58	0.58	0.58	0.32	0.32	0.32

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, ** and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Second, the model is as expected in all other respects, and continues to confirm our previous findings. The interesting paradox presented here is that while investors seem to differentiate between the impact of an election on credit risk between states within a given region, they do not appear to differentiate between election risk across time. Third, when accounting for global contagion risk, we find that the contagion coefficient is both economically and statistically significant, at the 1 per cent level for the 1-year CDS. We find that global contagion is priced into credit risk across countries, even for political factors. In other words, investors seem to link Brazilian elections with Malaysian elections but not Argentinean ones. This seems somewhat paradoxical. If political risk is priced into a CDS, it would seem to flow first to neighbouring countries and not around the world. In other words, while global economic risk pricing is logical, global political risk from isolated elections seems driven more by emotions than calculated and rational thought.

Event Methodology and More Politics

We also seek to test whether related political variables impact the perceived credit risk or whether it is simply the discrete event of an election. Tables 4 and 5 present the results from regressions testing the impact of related political variables on 10- and 1-year CDS pricing, respectively. Different countries have both different political and election systems. It seems worthwhile to study whether political or economic systems could impact perceived credit risk. The biggest finding from Table 4 is no finding at all. In both the 10- and 1-year CDS, very few of the political variables demonstrate statistical significance. The only political structural variable that demonstrates statistical significance is the presidential dummy variable with a 1-year CDS (Table 5). Though this finding should not be considered robust as it is not significant when regressed with the election variable, there is some theoretical reason to believe that a presidential system may present higher risk. Presidential systems generally have more executive power, though less legislative authority, making policy more difficult to change. These factors may increase perceived credit risk. The only other variables that demonstrate statistical significance are the election variables, when regressed along with the political

Table 4. More Politics—I

Dependent Variable	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS
Balance of payment	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.61* (0.03)	0.61* (0.03)	0.61* (0.03)	0.61* (0.03)	0.61* (0.03)	0.61* (0.03)
GDP growth	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)
Election dummy				0.16*** (0.09)	0.15** (0.07)	0.15** (0.07)
Presidential	0.06 (0.08)			-0.10 (0.12)		
Round		-0.003 (0.06)			-0.10 (0.08)	
Multi-round				0.004 (0.10)		-0.14 (0.12)
Comment						
Observations	11,989	11,989	11,989	11,989	11,989	11,989
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.58	0.58	0.58	0.58	0.58	0.58

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, ** and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 5. More Politics—II

Dependent Variable	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS
Balance of payment	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)
GDP growth	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)
Election dummy					0.30** (0.13)	0.26** (0.13)
Presidential	0.27** (0.13)					
Round		0.07 (0.11)			-0.12 (0.13)	
Multi-round				0.18 (0.18)		-0.08 (0.22)
Comment						
Observations	11,989	11,989	11,989	11,989	11,989	11,989
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.32	0.32	0.32	0.32	0.32	0.32

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, ** and *** indicate significance at the 1%, 5% and 10% levels, respectively.

and election structural variables. Though due to the fact that their coefficients are relatively close to their stand-alone value, this should be considered more a reflection of their underlying value than importance to the structural political risk captured in CDS pricing.

Tables 6–9 present the results from an event methodology by changing the time perspective of election by leading and lagging it over a long- and short-term time horizon. Three basic results stand out in these regressions. First, the economic variables fall within the expected range of both economic and statistical significance based upon previous regressions. Second, most time variations of the election dummy variable are statistically insignificant except for the 10 day leading election variable which is true of both the 10- and 1-year CDS. In other words, investors do not appear to anticipate the potential credit risk they believe stems from an election. Third, surprisingly, but in line with the divergent investor risk assessment found in previous regressions, the 10-day lagging election dummy variable is found to be both economically and statistically significant for holders of the 1-year CDS. In other words, 1-year CDS investors appear to be waiting to see continued political stability and expectation of debt repayment as an explicit policy before lowering their pricing. For the 10-year CDS holder, 10-day lagging election variable is not even borderline significant, but the 1-year CDS holder appears to be waiting to see the dust settle.

Also, over a short-term time horizon, the 10-year CDS investors appear to anticipate the coming election more than 1-year CDS holders and forget about it much quicker. For instance, while the 10-year CDS election variable enters as statistically significant and does not change the coefficient value between the 8 and 2 days prior to an election, the 1-year CDS election variable enters as statistically insignificant but nearly doubles in value from the eighth day before an election to the second day before an election. Additionally, while 10-year CDS holders largely treat political risk as completed after the election, 1-year CDS holders lower the statistical and economic significance of political risk over time after an election.

Tables 10 and 11 test the investment theory of politically induced credit risk volatility. To test the theory that investors fear uncertainty and are forward looking with regard to risk, we created three variables that capture this investment variable. First, for each election, we recorded the

Table 6. More Politics—III

Dependent Variable	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS
Balance of payments	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.61* (0.03)	0.60* (0.03)	0.59* (0.03)	0.57* (0.03)	0.63* (0.03)	0.64* (0.03)	0.66* (0.03)	0.66* (0.03)	0.68* (0.03)	0.68* (0.03)
GDP growth	-0.005* (0.002)	-0.005* (0.00)	-0.005* (0.00)	-0.005* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.003* (0.00)	-0.003* (0.00)
10-Day leading election	0.11*** (0.06)									
20-Day leading election	0.09 (0.06)									
40-Day election leading			0.05 (0.06)							
60-Day leading election				0.09 (0.06)						

Table 7. More Politics—IV

Dependent Variable	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS
Balance of payments	-0.004* (0.00)	-0.005* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.005* (0.00)	-0.004* (0.00)	-0.005* (0.00)	-0.005* (0.00)
External government debt	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.89* (0.05)	0.84* (0.05)	0.85* (0.05)	0.87* (0.05)	0.88* (0.05)	0.88* (0.05)
GDP growth	-0.02* (0.000)	-0.02* (0.00)	-0.03* (0.00)	-0.03* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)
10-Day leading election	0.16*** (0.10)								
20-Day leading election		0.06 (0.10)							
40-Day election leading			0.10 (0.10)						
60-Day leading election				0.02 (0.10)					

Table 8. More Politics—V

Dependent Variable	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS
Balance of payments	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.61* (0.03)	0.61* (0.03)	0.61* (0.03)	0.62* (0.03)	0.62* (0.05)	0.62* (0.03)
GDP growth	-0.05* (0.000)	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)	-0.05* (0.00)	-0.04* (0.00)
2-Day leading election	0.12** (0.06)					
5-Day leading election						
8-Day election leading			0.12** (0.06)	0.11** (0.06)		
2-Day election lagging				0.08 (0.06)		
5-Day election lagging					0.10*** (0.06)	
8-Day election lagging						0.04
Observations	11,963	11,924	11,885	11,979	11,964	11,949
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.59	0.59	0.59	0.58	0.59	0.59

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 9. More Politics—VI

Dependent Variable	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS
Balance of payments	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.83* (0.05)	0.84* (0.05)
GDP growth	-0.02* (0.000)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)	-0.02* (0.00)
2-Day leading election	0.26** (0.10)					
5-Day leading election		0.18*** (0.10)				
8-Day election leading		0.15 (0.10)				
2-Day election lagging			0.23** (0.10)			
5-Day election lagging				0.19*** (0.10)		
8-Day election lagging					0.16 (0.11)	
Observations	11,963	11,924	11,885	11,979	11,964	11,949
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.32	0.33	0.33	0.32	0.32	0.32

Source: Author's calculations.**Notes:** Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 10. More Politics—VII

Dependent Variable	10-Year CDS	1-Year CDS	10-Year CDS	1-Year CDS	10-Year CDS	1-Year CDS
Balance of payments	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)
External government debt	0.61* (0.03)	0.83* (0.05)	0.61* (0.03)	0.83* (0.05)	0.61* (0.03)	0.83* (0.05)
GDP growth	-0.05* (0.000)	-0.02* (0.00)	-0.05* (0.00)	-0.02* (0.00)	-0.05* (0.00)	-0.02* (0.00)
Victory percentage	0.10 (0.11)	0.41** (0.20)				
Marginal victory percentage			0.03 (0.18)	0.58*** (0.32)		
Incumbent winner					0.03 (0.08)	0.12 (0.13)
Observations	11,989	11,924	11,989	11,989	11,989	11,989
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.58	0.33	0.58	0.32	0.58	0.32

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 11. More Politics—VIII

Dependent Variable	10-Year CDS	1-Year CDS	10-Year CDS	1-Year CDS	10-Year CDS	1-Year CDS
Balance of payments	-0.004* (0.00)	-0.005* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.004* (0.00)	-0.005* (0.00)
External government debt	0.61* (0.03)	0.83* (0.05)	0.61* (0.03)	0.83* (0.05)	0.61* (0.03)	0.83* (0.05)
GDP growth	-0.05* (0.000)	-0.02* (0.00)	-0.05* (0.00)	-0.02* (0.00)	-0.05* (0.00)	-0.02* (0.00)
Victory percentage						
10-day lead	0.14 (0.11)	0.21 (0.19)				
Marginal victory percentage, 10-day lead			0.12 (0.18)	0.10 (0.31)		
Incumbent winner						
10-day lead					0.04 (0.08)	0.01 (0.14)
Observations	11,859	11,859	11,859	11,859	11,859	11,859
Countries	13	13	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.59	0.34	0.59	0.34	0.59	0.34

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

winning percentage of the vote by the winning candidates or parties. Second, we calculated the marginal vote percentage calculated by subtracting the second candidate or party from the winners's vote share. Third, we created dummy variables for incumbents that won the subsequent election. The economic logic is rather straightforward. If investors fear uncertainty-inducing credit risk via an election and uncertain economic policy, investors will prefer incumbents and large margins of victory. In Table 11, we also test for the forward-looking nature of these variables which carries important consequences. If investors actually fear the uncertainty of changes in economic policy, then informed rational investors should have some foresight about elections and political events in the country and price credit risk accordingly. If uncertainty of economic policy is the fear behind changes in CDS prices and not simply the event of an election, then forward-looking investors, ignoring noise with knowledge of the country, should have some foresight into economic policy through the channel of political events.

There are a number of interesting findings that are presented in Tables 10 and 11. First, the previous variables of BOP, external government debt and GDP growth, all returned expected value both economically and statistically. Second, of the three variables created, only victory percentage and marginal victory percentage for the 1-year CDS are returned as significant. All measures of political stability for the 10-year CDS and political incumbency for the 1-year CDS are statistically and economically insignificant. Third, all forward-looking measures of economic policy stability and uncertainty in Table 11 are insignificant. These collective findings appear to refute the uncertainty theory of politically induced credit risk volatility. Policy uncertainty appears to have little if anything to do with credit risk pricing. The given event of an election appears to play a larger role than the potential policy or political implications. Furthermore, if investors are forward looking, they appear to be either poor predictors of election outcomes or have little or no interest in predicting the outcomes and implications of elections.¹⁴ While some political outcomes and their implications are obviously more difficult to predict, many of the elections brought clear predictability with large amounts of pre-election polling data. In short, the results presented here imply that investors are acting on noisy herding around a given event and not upon forward-looking political risk implications.

Global Risk

An important risk factor in emerging credit markets is their exposure and relation to larger developed economy financial markets. The bond spread literature has found emerging market credit access to be significantly impacted by a global risk component. We test if emerging market CDS pricing includes a global risk component using the US GDP growth as a proxy. In Table 12, we present regressions including time variations of US quarterly GDP acting as the global risk component.

The inclusion of a global risk factor provides a number of interesting findings. First, the model, coefficients and significance levels remain close to previous levels, demonstrating further robustness of the model. The BOP, external government debt, local GDP growth and the election dummy variable, all retain expected signs, coefficients and significance levels. Second, as in previous regressions, we find a significant difference of the impact of an election between 10- and 1-year CDS pricing. The 1-year CDS election coefficients are larger and more statistically significant than the 10-year CDS results. Third, when leading domestic and US GDP growth are taken into consideration, the election variable turns insignificant in the 10-year CDS and borderline significant in the 1-year CDS. The reason for this, and later regressions will further support this assertion, is that investors appear more concerned with the economic environment the government is inheriting rather than who is doing the inheriting. Fourth, the global risk component pricing appears to be relatively small. Investors are focused primarily on the overall indebtedness of the country and not its growth prospects. Fifth, the global growth component is similar in significance to the domestic growth coefficients, indicating that macro growth is priced in but weighted against the country-specific factors. Global risk is factored into the overall credit risk factors, but does not drive the fundamental profile analysis of countries.

Proxy Economic Variables with Leads and Lags

To further test the robustness to changes in the data or model, we created variables which lead and lag future economic activities. We create

Table 12. Global Risk

Dependent Variable	10-Year CDS	10-Year CDS	1-Year CDS	1-Year CDS
Balance of payments	-0.004* (0.00)	-0.005* (0.00)	-0.004* (0.00)	-0.006* (0.00)
External government debt	0.60* (0.03)	0.54* (0.03)	0.83* (0.05)	0.86* (0.04)
GDP growth	-0.05* (0.000)		-0.02* (0.00)	
Leading domestic GDP growth		-0.04* (0.00)		-0.02* (0.00)
US GDP growth	-0.02* (0.00)		0.003 (0.003)	
Leading US GDP growth		-0.05* (0.00)		-0.08* (.00)
Lagging US GDP growth				
Election	0.10*** (0.06)	0.06 (0.06)	0.24** (0.10)	0.17*** (0.10)
Observations	11,989	11,209	11,989	11,209
Countries	13	13	13	13
Specification	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes
R-squared within	0.59	0.63	0.32	0.42

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

variables that lead and lag domestic GDP growth by one quarter. Additionally, as investors will study new data, incorporating it into their pricing models and look for higher levels of granularity, we lead and lag monthly industrial production data at one- and two-month intervals. The results are presented in Tables 13, 14 and 15. There are a number of valuable results from varying the time of economic activity. First, the results continue to hold up well to changes in the data, further demonstrating their robustness. The BOP and external government debt variables remain within the expected levels for the 10-year CDS. Interestingly, BOP and external government debt increase significantly when leading and lagging economic activity are included in the regressions. For instance, the external government debt coefficient rises as high as 1.48 and retains high levels of statistical significance. Second, the election variables are of a similar magnitude for both the 10- and 1-year CDS, though only statistically significant half the time for the 10-year CDS, and more specifically, when used in conjunction with leading economic activity variables. If investors make short-term forecasts that, across a market, approximate actual economic activity, then these values would be incorporated into credit pricing. The long-term investors appear to be signalling their interest in the economic environment which a new government will face when elected, not necessarily which party is elected.

Third, as with previous regressions throughout this study, 10- and 1-year CDS investors analyse risk differently. Elections in the 10-year CDS regressions are only statistically significant in half the regressions. Election coefficients in the 1-year CDS regressions are at least twice as large as the 10-year CDS coefficients and always significant. Fourth, all of the leading and lagged variables in both GDP growth and industrial production held up well. Fifth, turning to the 1-year CDS, investors focus on the external government debt risk factor. The implicit analysis appears to be that over the short run, external government debt matters most because balance and GDP growth will not vary enough outside expectation to cause a credit event. Total external government indebtedness changes much slower than GDP growth or BOP. Consequently, total external sovereign government indebtedness becomes the dominant risk factor. Sixth, when GDP growth and election variables are both leading in the same regression, as in Table 15, the election variables become statistically

Table 13. Changing the Economics—I

Dependent Variable	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS	10-Year CDS
Balance of payments	-0.004* (0.00)	-0.004* (0.00)	-0.008* (0.00)	-0.009* (0.00)	-0.008* (0.00)	-0.008* (0.00)
External government debt	0.70* (0.03)	0.58* (0.03)	0.79* (0.04)	0.81* (0.04)	0.79* (0.04)	0.85* (0.05)
1-Quarter lagging GDP growth	-0.04* (0.00)					
1-Quarter leading GDP growth		-0.04* (0.00)				
1-Month lagged industrial production			0.001* (0.00)			
2-Month lagged industrial production				0.00 (0.00)		
1-Month leading industrial production					0.002* (0.00)	
2-Month leading industrial production						0.004* (0.00)
Election	0.11** (0.06)	0.07 (0.06)	0.11*** (0.06)	0.11*** (0.06)	0.09 (0.06)	0.09 (0.06)
Observations	11,689	11,209	11,381	11,281	11,241	11,001
Countries	13	13	12	12	12	12
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.58	0.58	0.57	0.57	0.59	0.61

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 14. Changing the Economics—II

Dependent Variable	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS	I-Year CDS
Balance of payments	-0.005* (0.00)	-0.005* (0.00)	-0.01* (0.00)	-0.01* (0.00)	-0.01* (0.00)	-0.01* (0.00)
External government debt	0.89* (0.03)	0.91* (0.03)	1.19* (0.06)	1.23* (0.06)	1.29* (0.06)	1.48* (0.05)
I-Quarter lagged GDP growth	-0.02* (0.00)					
I-Quarter leading GDP growth		-0.02* (0.00)				
I-Month lagged industrial production			0.001*** (0.00)			
2-Month lagged industrial production				0.002** (0.00)		
I-Month leading industrial production					0.001*** (0.00)	
2-Month leading industrial production						0.003* (0.00)
Election	0.24** (0.10)	0.18*** (0.10)	0.25** (0.10)	0.25** (0.10)	0.22** (0.10)	0.23** (0.10)
Observations	11,689	11,209	11,381	11,281	11,241	11,001
Countries	13	13	12	12	12	12
Specification	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared within	0.30	0.40	0.34	0.34	0.38	0.42

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 15. Changing the Economics—III

Dependent Variable	10-Year CDS	10-Year CDS	1-Year CDS	1-Year CDS
Balance of payments	-0.004* (0.00)	-0.005* (0.00)	-0.004* (0.00)	-0.005* (0.00)
External government debt	0.60* (0.03)	0.58* (0.03)	0.84* (0.05)	0.91* (0.05)
1-Month leading GDP growth	-0.05* (0.00)		-0.02* (0.00)	
1-Quarter leading GDP growth		-0.04* (0.00)		-0.02* (0.00)
1-Month leading election	0.09 (0.06)		0.06 (0.10)	
1-Quarter leading election		0.07 (0.06)		-0.02 (0.10)
Observations	11,729	11,209	11,729	11,209
Countries	13	13	13	12
Specification	Fixed	Fixed	Fixed	Fixed
Time effects	Yes	Yes	Yes	Yes
R-squared within	0.60	0.62	0.35	0.40

Source: Author's calculations.

Notes: Standard errors are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

insignificant. In other words, investors appear more interested in the forecasted state of the economy a government will inherit, rather than which government will inherit that economic environment.

Dividing the Results by Time

To further test the robustness of our results, we divided up the data into two different ways and subjected it to our baseline model. First, we divided up the data into the first two years and the second two years. Second, rather than using daily data, we used the average monthly CDS price, regressing against the baseline model. Our results are presented in Table 16. The table yields a number of encouraging results. First, the model continues to hold well when compared to previous regressions and even within these specific tests. The coefficients are economically and statistically significant, in line with previous regressions, with the expected signs. Second, though the division between the first two years and second two years holds up well, there are a couple of unique factors. There seems to be a distinct difference between the risk analysis by investors between the first and second group of two years. For instance, elections in the 10-year CDS are insignificant in 2004 and 2005 but statistically and economically significant in 2006 and 2007. We also notice a significant difference between the importance of external government debt on the 1-year CDS between the first and second group. Sovereign indebtedness appears to have become less worrisome for 1-year CDS investors.

Third, the regressions using monthly data yield results similar to those we get from daily data. Due to the loss of granularity and observations, on moving from daily to monthly CDS pricing, we notice a few changes. The coefficients of 10- and 1-year CDS become much more similar. Previous regressions produced 1-year CDS coefficients for external government debt anywhere from 50–100 per cent higher than the 10-year CDS. Using monthly CDS pricing rather than daily, the coefficients for external government debt across CDS times, range from a low of 0.58 to a high of 0.67, both from the 10-year CDS. The variables lose some degree of

significance, which is to be expected from the large decrease in observations, but remain broadly statistically and economically significant. External government debt remains economically large and statistically significant, while GDP growth, though broadly significant, loses significance domestically but gains importance for US GDP growth. A very reasonable interpretation is that CDS pricing across time is more dependent on the US economy as a global risk factor, though short-term movements are driven more by local country risk factors.

Testing for Stationarity

In Tables 17, 18 and 19, we present our results from testing for the stationarity of the financial asset data, spread and robustness.¹⁵ We find interesting findings from the tests run in Tables 17, 18 and 19. Due to the nature of financial asset data, a reasonable methodological concern will question the stationarity of the CDS-dependent variable. The primary test used is the Fisher test which allows us to test the stationarity of data in a panel setting, under which the null hypothesis assumes that all series are non-stationary. On the basis of Table 17, with up to four lags, we reject the null hypothesis and find that at least one series in the panel is stationary. Tables 18 and 19 present a variety of stationary tests for individual countries using both 10- and 1-year CDS.¹⁶ As can be seen from the battery of tests conducted on the 10- and 1-year CDS, numerous countries are stationary, confirming our Fisher test finding that at least one series of the panel is stationary. Consequently, based upon the numerous findings of stationarity, we proceed to analyse the data as a stationary panel.

In Table 17, we present two additional but interesting tests. First, we use the White–Huber Sandwich Robust Estimator to further test the robustness of our model and data. The White–Huber robustness test continues to confirm our previous results. The coefficients are similar to previous results with similar patterns of statistical significance. External government debt and elections are economically and statistically significant to CDS prices. Second, the spread between the 10- and 1-year CDS narrows in economically and statistically significant ways for all

Table 17. Testing for Stationarity

Dependent Variable	10-Year CDS	1-Year CDS	CDS Spread Difference	10-Year CDS	1-Year CDS
Balance of payment			0.00** (0.00)	-0.00*** (0.00)	-0.00 (0.00)
External government debt			-0.22* (0.03)	0.61* (0.19)	0.83** (0.32)
GDP growth			-0.03* (0.00)	-0.05* (0.01)	-0.02 (0.03)
Election dummy			-0.14*** (0.07)	0.10*** (0.05)	0.24** (0.09)
1 Lag	67.16* (0.00)	123.27* (0.00)			
2 Lags	54.62* (0.00)	104.33* (0.00)			
3 Lags	49.31* (0.00)	89.53* (0.00)			
4 Lags	43.11** (0.02)	84.45* (0.00)			
Stationary Test	Yes Fisher	Yes Fisher			
Chi-square Observations	Yes	Yes			
Countries	11,989 13	11,989 13			
Specification	Fixed	Fixed			
Time effects	Yes	Yes			
R-squared within	0.13	0.58			0.32

Source: Author's calculations.

Notes: Chi-square probability is in parentheses below the coefficient when testing for stationarity.

Standard errors are in parentheses below the coefficients in other regressions.

*, ** and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 18. Individual Country Stationary Tests—I

Country	Mexico	Thailand	Peru	Tunisia	South Africa	Israel	Turkey	Chile
CDS	10 year 21	10 year 21	10 year 6	10 year 6	10 year	10 year	10 year	10 year
Total Lags								
Maxlag Criterion	Schwert	Schwert	Newey– West	Newey– West				
Stationary Test	Yes Dickey– Fuller	Yes Dickey– Fuller	Yes Phillips– Perron	Yes Phillips– Perron	Yes Aug. Dickey– Fuller	Yes Aug. Dickey– Fuller	Yes Aug. Dickey– Fuller	Yes Aug. Dickey– Fuller
High Tau Statistic	–3.60* (20)	–3.43** (1)						
Low Tau Statistic	–2.52 (10)	2.63*** (5)						
Z(rho)			–22.46**	–64.42*				
Z(t)			–3.76**	–5.82*				
Control	Trend	Trend			–4.12* Trend	–3.17*** Trend	–2.54* Drift	–3.20* Drift
Observations	1,021	1,021	962	1,042	1,042	912	868	1,042

Source: Author's calculations.

Notes: Lags are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

Table 19. Individual Country Stationary Tests—II

Country	Thailand	Tunisia	South Africa	Malaysia	Argentina	Chile	Turkey	Brazil
CDS	1 year 21	1 year 21	1 year 6	1 year 6	1 year	1 year	1 year	1 year
Total Lags								
Maxlag Criterion	Schwert	Schwert	Newey–West	Newey–West				
Stationary Test	Yes Dickey–Fuller	Yes Dickey–Fuller	Yes Phillips–Perron	Yes Phillips–Perron	Yes Aug. Dickey–Fuller	Yes Aug. Dickey–Fuller	Yes Aug. Dickey–Fuller	Yes Aug. Dickey–Fuller
High Tau statistic	–4.90* (1)	–3.92* (1)						
Low Tau statistic	–3.04** (6)	–1.96 (13)						
Z(rho)			–27.65**	–25.59**				
Z(t)			–3.53**	–3.62**	–3.13***	–5.13*	–2.36*	–3.32*
Control	Trend	Trend			Trend	Trend	Drift	Drift
Observations	1,021	1,021	1,042	955	673	1,042	868	955

Source: Author's calculations.

Notes: Lags are in parentheses below the coefficients.

*, **, and *** indicate significance at the 1%, 5% and 10% levels, respectively.

expected variables.¹⁷ The previous larger coefficients in the 1-year CDS mean that election news reduces the spread between long- and short-term instruments. The previously noted differences of the independent variables on the 10- and 1-year CDS prices is further confirmed by the consistent narrowing of spread given in the data.

Discussion

There are a number of broader points about our results that should be noted. First, if emerging markets fear short-term investors, our results indicate they have good reason to be concerned. Whereas the 10-year CDS price has a lower variance within countries than the one year, it also reacts much less frequently to political risk, and when it does, the reaction is much smaller. Because we use a derivative in the form of a CDS, our results do not directly test for long-term investors or ‘hot money’. However, as a US-based product with clearly differentiated time horizon, the daily pricing of the CDS acts as a very good proxy for differentiating between long- and short-term investors. On the basis of the results presented here, emerging markets appear to have valid concerns about the behaviour of short-term investors and their impact on financial markets.

Second, short- and long-term investors appear to analyse and value risk very differently. In numerous results presented here, political variables impact CDS pricing very differently between the 10- and 1-year CDS. Aggregating the same information, the 1-year CDS price is volatile, while the 10-year CDS responds with a collective yawn. Though we do not have data to support our assertion, we believe there is a type of selection bias occurring between investors in the 10- and 1-year CDS. Ten-year CDS holders assign a lower risk profile to the country while receiving a higher yield. One-year CDS investors assign a higher risk profile to the country and receive a smaller yield for holding a one-year instrument. This results in a smaller margin for error, making them more willing to trade the product and induce higher volatility. Consequently, when reacting to the same information, 10-year CDS investors shrug, while 1-year CDS holders panic. In other words, 10-year CDS investors believe there is lower risk in the country than 1-year CDS investors.

Third, investors do not appear rational, but rather make decisions based upon noise. For instance, global contagion variable came back positive for elections in one emerging market, making credit risk pricing increase for all emerging markets. Simply the event of an election drives CDS prices up regardless of who wins or by how much. It is difficult to understand how the event of an election, not a change in government or economic policy, would increase credit risk much less for countries around the world. Fourth, if investors are forward looking on emerging market credit risk, incorporating all known information, they appear to do a poor job. Other than noting the date of an election, they appear to have no specific insight of predictive power about political or policy changes. Fifth, they do not appear to have any distinct preference for certainty. Incumbent wins do not appear to change credit risk pricing and investors seem to do a poor job judging incumbent wins if uncertainty does matter. If certainty of economic policy does matter, it does not appear in the data.

Sixth, there appear to be pricing inconsistencies between the 10- and 1-year CDS that would allow for investment opportunities. Whether the further development of the emerging sovereign CDS market will arbitrage out these anomalies remains to be seen, however, there appears in this data to be exploitable investment data. Seventh, the CDS financial asset stationarity is somewhat puzzling. This might be explained by either the lack of development of the CDS market for emerging sovereigns or that investors treat it as an insurance market and not a financial asset market. If the market simply needs further development, then this will verifiably change over time. If it does not, then this would seem to present investment opportunities as the CDS would then move in more predictable patterns.

Conclusion

International financial market volatility can significantly impact and harm emerging market economies. On the basis of the results of our study, we find that non-economic political factors play a major role in the pricing of credit risk by international financial investors. Though economic factors underpin the analysis, volatility is driven by investor time

profile and the existence, not substance, of non-economic factors like elections. Though investors may increasingly differentiate between countries within a given region, the risk of contagion for emerging market sovereigns remains large.

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Appendices

Appendix I. Country and Data List

Country	CDS Pricing	Balance of Payments	External Government Debt	GDP Growth	Industrial Production	Election Date	Observation
Argentina	Daily	Quarterly	Quarterly	Quarterly	Monthly	21/10/05	674
Brazil	Daily	Quarterly	Quarterly	Quarterly	Monthly	26/10/07 29/09/06	956
Chile	Daily	Quarterly	Quarterly	Quarterly	Monthly	27/10/06 9/12/05	1,046
Colombia	Daily	Quarterly	Quarterly	Quarterly	Monthly	18/01/06 26/5/06	935
El Salvador	Daily	Quarterly	Quarterly	Quarterly	Monthly	12/03/06	508
Israel	Daily	Quarterly	Quarterly	Quarterly	Monthly	8/03/06	913
Malaysia	Daily	Quarterly	Quarterly	Quarterly	Monthly	19/03/04	956
Mexico	Daily	Quarterly	Quarterly	Quarterly	Monthly	30/06/06	1,043
Peru	Daily	Quarterly	Quarterly	Quarterly	Monthly	7/04/06	963
South Africa	Daily	Quarterly	Quarterly	Quarterly	Monthly	5/06/06	1,043
Thailand	Daily	Quarterly	Quarterly	Quarterly	Monthly	14/04/04 4/02/05	1,043
						31/03/06 3/04/06	
Tunisia	Daily	Quarterly	Quarterly	Quarterly	Monthly	21/12/07	1,043
Turkey	Daily	Quarterly	Quarterly	Quarterly	Monthly	25/10/04 20/07/07	869

Source: Author's calculations.

Appendix 2. Variable Correlation Table

	10-Year CDS	1-Year CDS	Balance of Payments (BOP)	External Government Debt	GDP Growth	US GDP Growth	Industrial Production	Inflation
10 Year	1.00							
1 Year	0.92	1.00						
BOP	-0.05	-0.04	1.00					
External Government Debt	0.17	0.17	0.06	1.00				
GDP Growth	0.28	0.28	0.13	0.17	1.00			
US GDP Growth	0.02	0.05	0.01	0.04	-0.06	1.00		
Industrial Production	0.00	-0.01	0.01	0.01	0.03	0.03	1.00	
Inflation	0.56	0.55	-0.04	-0.16	0.30	-0.04	-0.01	1.00

Source: Author's calculations.

Appendix 3. Country Variable Averages

Country	Balance of Payments (%)	External Government Debt (%)	GDP Growth (%)
Argentina	0.64	0.38	8.84
Brazil	3.40	0.34	4.63
Chile	0.05	0.14	5.22
Colombia	1.69	0.68	6.22
El Salvador	4.21	8.75	3.44
Israel	-0.96	0.89	5.15
Malaysia	8.24	0.22	6.05
Mexico	0.14	0.07	3.91
Peru	4.49	1.04	7.11
South Africa	0.55	0.06	5.06
Thailand	4.86	0.10	5.28
Tunisia	3.85	1.38	5.45
Turkey	2.52	0.55	7.41
All	2.56	0.97	5.67
Latin America	2.01	1.36	5.62
Excluding Latin America	3.18	0.53	5.73
Asia	6.55	0.16	5.67
Excluding Asia	1.82	1.12	5.68

Source: Author's calculations.

Notes

1. The International Monetary Fund has even begun to rethink its policies on liberalised capital flows, recognising that they can induce macroeconomic volatility for reasons that have little if anything to do with underlying economic soundness (Blanchard et al. 2010).
2. The risks presented here are not intended to be an exhaustive list of risks incurred by the lender but only key risks in the sovereign debt market.
3. The research listed specifically describes or calculates the value of basic economic indicators to the spread of emerging market debt. Most other research on the cost of credit to emerging market sovereigns uses a rather focused group of indicators based upon this line of study on creditworthiness.
4. This line of research specifically studies the role of either developed country or global economic factors and their impact on the cost of capital to emerging markets.
5. Currency risk is considered an exogenous risk for emerging market sovereign debt investors because unlike the government budget, developing countries cannot unilaterally control it.

6. While different debt instruments and CDS contracts can have different definitions of a 'credit event', for purposes of this study, a credit event will refer to a default only. In other instances, a credit event may be precipitated by a ratings downgrade, not meeting financial ratios specified in the bond or CDS contract or bankruptcy. However, in the sovereign debt market, a credit event is defined as a default.
7. Please see Appendix 1 for a complete listing of the countries and data frequency included in this study.
8. Regressions were run with the excluded countries and they do not change the outcomes.
9. We tested for multicollinearity and presented the results in Appendix 2. As can be seen, the baseline data does not demonstrate any danger of collinearity across the range of variables used.
10. As an example of how including additional time differences adds little to the analysis, we included fixed annual effects as is common in cross-country studies. Due to the fact that the CDS data was daily and the economic data in the baseline model was quarterly, we tested quarterly, monthly and daily fixed time effects. This did not change the results either economically or statistically, and we decided to present the annual effects.
11. In instances when the election was held on either a holiday or a non-business day, election was coded 1 for the last trading day before the election.
12. Regressions to test the fixed and random effects difference, not presented in this article, support the robustness of the underlying model and the idea that methodological specification will not fundamentally change the results.
13. The one exception to this is external government debt in a 10-year CDS when excluding Latin America. As can be seen in Appendix 3, the average external government debt level is fundamentally different between the two groups creating an economically and statistically insignificant finding in the second group.
14. While we have only presented the '10 Day Leading' variation of the political outcome variables, all leading variables at 2-, 10- and 30-day intervals were insignificant.
15. In this section on testing for stationarity in panel data, we have not only drawn from Maddala and Wu (1999) but also used a variety of panel and series methods.
16. It should be noted that results from unit root tests presented here are only a small sampling. Numerous other countries not presented are also stationary. Our intent is to show that there are numerous countries that are stationary under numerous unit root tests with different controls. Anyone interested in seeing the full range of country results under all unit root tests is welcome to contact the author for data and log files.
17. The spread between the 10- and 1-year CDS is calculated as $\ln(10\text{yr}cds - 1\text{yr}cds)$.

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