

THE PRICE OF DEMOCRACY: SOVEREIGN RISK RATINGS, BOND SPREADS AND POLITICAL BUSINESS CYCLES IN DEVELOPING COUNTRIES*

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ABSTRACT

This study examines the proposition that political business cycle theory is relevant to private foreign lenders to developing countries. We find that: credit rating agencies downgrade developing country ratings more often in election years, and do so by approximately one rating level; bond spreads are higher in the 60 days before an election compared to spreads in the 60 days after an election; and spreads trend significantly downward in the 60 days before an election, but then flatten out in the 60 days after an election. Agencies and bondholders apparently view elections negatively, thereby increasing the cost of capital to developing democracies.

Keywords: political business cycles; elections; developing countries; credit ratings; bond spreads
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1. INTRODUCTION

This empirical study examines links between the possibility of political business cycles in developing countries and the behavior of actors central to allocating and pricing credit for investment and economic development. Political business cycle (“PBC”) theory suggests that elected incumbent government officials (“incumbents”) have incentives to pursue economic policies calculated to increase voter support in an election year. Evidence of PBCs in industrialized countries is mixed, but a more recent stream of empirical work focusing on non-industrialized countries suggests that the onset and aftermath of elections is correlated with fiscal, monetary and or related policies consistent with incumbent aims of retaining office even if such policies are contrary to concurrent economic reform programs and potentially prejudicial to post-election economic growth and development.

This mounting evidence may have important implications for foreign investment and lending, and the private, often foreign-based actors facilitating such transactions. For example, major credit rating agencies (“agencies”) from the US, UK and other industrialized countries provide advice to and certify the creditworthiness of borrowers from developing countries. Indeed, agencies facilitate credit transactions for developing country borrowers by publishing letter-grade sovereign risk ratings (“sovereign ratings”), typically on a 6- or 16-point ordinal scale commonly understood and relied on by capital market participants. Recent studies by Cantor and Packer (1996a-b), Larrian *et al.* (1997), and Kaminsky and Schmukler (2001) suggest that changes in sovereign ratings have significant short-term effects on market determined credit spreads for developing country sovereign bonds. The implication is that information on the creditworthiness of sovereigns and related country risks is less transparent for developing country borrowers, and investors rely more on the expert assessments by agencies.

Investor interest in developing countries and the importance of agencies in facilitating such interest appears to have increased markedly in the 1990s. The number of developing country sovereign ratings from agencies jumped from 12 in 1987 to 51 in 1997. Also by 1997, annual financing (loans, bonds and

equity) issued by governmental and private individuals from developing countries had reached \$274.8 billion, up from less than \$60 billion only five years earlier (IMF, 2001). Anywhere from two (in the early 1990s) to six (in the mid 1990s) to three (at the end of the 1990s) agencies vied for business in this growing market during the 1990s, including Moody's Investor Services , Standard & Poor's Ratings Services , Duff & Phelps Credit Rating Company , Fitch Investors Services, International Bank Credit Analysis, and Thomson Bank Watch.¹

In this context, it is interesting that the PBC lens has rarely been applied to investigate links in and around election periods between incumbents on the one hand, and investors and expert advisors like bondholders and agencies on the other hand.² Typically, PBC theory has been limited to incumbents' incentives to implement fiscal, monetary and related policies geared to assure their re-election by domestic constituencies. Arguably, competitive democratic elections constitute some of the most "traumatic" events that might affect the cost and availability of credit in the developing world in the 1980s and 1990s. The exercise of the franchise in genuinely competitive national elections marks a stark departure in many developing countries formerly characterized by one-party political systems, or by multi-party political systems experiencing substantial unrest, extra-constitutional changes in government, and or military coups. As Goldsmith (1995) notes, these democratization efforts were thought by many to promote greater political freedom and stability and, in turn, enhanced attractiveness for lending and investment purposes.

¹ While the size of the sovereign ratings market and the number of agencies serving it both increased substantially in the 1990s, the sovereign rating process itself remained relatively stable. A team of analysts typically begins by reviewing a broad range of data on the sovereign and its country both from the agency's home office and in the field. Team members frequently interview government officials, business executives and other individuals for an overview of risk factors. The agency's rating committee evaluates findings of the preliminary report and makes recommendations on the final sovereign rating. At this stage in the process, agencies characteristically invite the sovereign's participation including presentations to the committee and related agency personnel. Once a prospective final sovereign rating has been agreed to in committee but before its publication, agencies may allow sovereigns to "appeal" their decision and provide additional information and or analyses. When finally published, the sovereign rating is subject to ordinary review on a regular annual basis unless there is some unforeseen and extraordinary event such as, for example, the financial crisis in Thailand in 1997, in Russia and Brazil in 1998, and in Argentina in 2001. For more on sovereign lending and the industrial organization of agency sovereign rating, see, *e.g.*, White (2001).

² Discussions with Phil Uhlmann highlighted this point for us and we are especially grateful for his comments and suggestions.

The fundamental proposition of our study is that incumbent behavior predicted by PBC theory during election periods matters not only to domestic constituencies but also to foreign actors including agencies and bondholders. They, too, are assessing the creditworthiness of developing countries in and around elections. Agencies do so with letter rankings of developing country sovereign credit risk while bondholder assessments are reflected in the market-determined credit spreads on developing country sovereign bond yields. Whether these assessments are significantly affected by the occurrence of elections, and if so, how, are the questions we address.

We examine empirical support for this proposition with data on long-term foreign currency denominated sovereign ratings from agencies, and with data on market determined credit spreads for representative dollar-denominated sovereign bonds from developing countries holding presidential elections between 1987 and 1999. We find consistent support for our fundamental research proposition that elections in developing countries are associated with both significant effects on their agency ratings and their market-determined credit spreads on sovereign bonds relative to comparable US Treasuries (“relative bond spreads,” or “bond spreads”). Elections are associated with greater frequency of sovereign rating downgrades. The extent of election-related downgrades is estimated to be approximately one rating level on a 17 (0-16) -point scale, *ceteris paribus*. Similarly, we find higher pre- versus post-election bond spreads. Much of this difference dissipates in the final run-up to elections; in the last 60 days prior to elections, bond spreads decline monotonically by about 15 percentage points. These and other results suggest that at least two key actors in international credit transactions, agencies and bondholders, view elections in developing countries (and the associated pre-election policy distortions predicted by PBC theory) negatively and exact a substantial premium on developing countries seeking capital; however, this premium also appears to dissipate as these actors gain more information regarding the actual extent of PBC-behavior by incumbents. In addition to extending PBC theory to interactions involving foreign actors, our results provoke additional research questions about short- and long-term trade-offs between political and economic development, and the private actors actually assessing that trade-off.

The remainder of this study is structured as follows. Section 2 describes the relevant theory and empirical predictions for political business cycles applied to traditional incumbent government-domestic voter interactions, and to interactions with the private actors of interest in this research. Section 3 summarizes our data set and methodology for addressing the impact of elections on sovereign ratings and bond spreads. Section 4 presents our findings, and Section 5 discusses the findings' implications for PBC research and policy. The paper concludes with suggestions for future research extending PBC theory to other relationships linking developing country political factors to other individuals in the broader international financial system.

2. RESEARCH BACKGROUND

Prior PBC Theory and Evidence

Since the seminal papers of Nordhaus (1975), Lindbeck (1976) and Tufte (1978), PBC theory has been debated by economists, political scientists and other academicians largely in the context of industrialized democracies and exclusively in the context of interactions among domestic political stakeholders, such as between elected incumbents and voters. These original models, which posited identical “opportunistic” (*i.e.*, office-seeking) politicians and “naïve” (*i.e.*, with adaptive expectations) voters have been challenged by alternative characterizations of both politicians and voters. Hibbs (1977, 1987) asserted that politicians are distinguished by partisan preferences over policy outcomes, yet retained the characterizations of voters as having adaptive expectations, as a consequence of which, voters can be “fooled” repeatedly by politicians. More recently, both opportunistic (Rogoff & Siebert, 1988; Rogoff, 1990) and partisan (Alesina, 1987) branches of PBC theory have been refined to endow voters with rational expectations. These theoretical refinements are thoroughly reviewed in Alesina and Roubini (1997) and Drazen (2000).

While it is difficult to generalize across the range of developing countries, recent studies of such countries have favored the opportunistic branch (Schuknecht, 1996; Svensson & Shi, 2000; Block, 2002). The clear left-right ideological divide apparent in most industrialized democracies is not as clearly

apparent in many developing countries, where elections are more often referenda on specific rulers and recent economic conditions. As Ka and van de Walle (1994: 290) note, for example, about elected officialdom in African states, “[S]tate elites in Africa are rarely motivated by specific policies. Rather, they seek to maximize their chances of political survival and therefore base their policy decisions on perceptions of political risk.” Application of opportunistic rather than partisan PBC models to other developing country settings would appear appropriate, especially given results from recent empirical studies in this context.

The interaction of opportunistic governments and naïve voters leads to the prediction that governments will systematically intervene to create regular multi-year cycles of growth and unemployment in which growth is above normal and unemployment below normal just prior to elections; this is followed by a post-election period of economic contraction, slow growth and increasing unemployment, all of which may persist longer than the pre-election trends. Traditional PBC theory also predicts that monetary and fiscal policies will be expansionary just prior to elections and contractionary afterwards. PBC theory emphasizing incumbent opportunism further predicts that pre-election inflation may decrease only to return with greater post-election force. More recent theoretical refinements of opportunistic PBC theory assume rational rather than adaptive voters, but generate similar empirical predictions with greater emphasis on the manipulation of policy tools and temporary information asymmetries between voters and incumbents. In these models, opportunistic governments are still shown to have incentives to manipulate macroeconomic policy variables just prior to elections in order to appear competent (at least temporarily) to their electorate.

Empirical testing of different PBC models to date has relied largely on data from the industrialized democracies, where results have been mixed. A small but growing body of empirical work on developing countries, however, consistently finds evidence of behavior by incumbents consistent with opportunistic PBC theory. This empirical work in industrialized and developing country contexts is summarized below in Table 1:

(Insert Table 1 Approximately Here)

As this summary of theoretical and empirical work indicates, opportunistic PBC theory shows great promise in explaining incumbent government behavior in and around election periods in developing countries. Yet, behavior examined to date has focused on interactions between incumbents and voters; rarely has research broadened the probe to include others outside government, much less outside the country itself. Goldsmith's (1995) examination of links between developing country democratization and business climate is an exception that helps to lay the foundation for our investigation. He found that democratization efforts in the 1980s were *not* correlated with increased developing country attractiveness for business and investment among foreign executives. An implication for research and policy is that, at least in the short- to medium-term, democratization in the developing world does not necessarily engender perceptions of greater stability and attractiveness for foreign lending, foreign portfolio investment and foreign direct investment.

Political business cycle theory provides a natural context in which to investigate links between political reform in developing countries and the lending and investment decisions of international actors. To date there has been little previous research in this vein. Bachman (1992), for example, found that elections between 1973 and 1985 leading to a change in the governing party in Canada, France, the UK and the US were associated with significant changes in forward exchange bias. Bachman argued that increased bias reflected in part anticipation in currency markets of election-related manipulations of monetary and fiscal policies by incumbents involved in hard-fought (and, ultimately, losing) electoral campaigns. Pantzalis *et al.* (2000) found that share market prices in a sample of 33 industrialized and developing countries reacted negatively to uncertainty in the outcome of elections held in those countries between 1974 and 1995. Pantzalis and his colleagues maintained that the resolution of uncertainty regarding the likely winner of an election would, in turn, decrease the uncertainty premium investors demanded to hold shares in firms from that country during the pre-election period.

PBC Hypotheses for Agencies, Bondholders and Developing Countries

Hypotheses for empirical analysis in this study draw on both PBC-related anticipation and uncertainty among two important private financial actors in a developing country electoral context. We

propose that political development and democratization in developing countries may not be consonant in the short- to medium-term with the creditworthiness of the country among agencies and bondholders, particularly in election periods. Specifically, they will anticipate incentives among developing country incumbents to manipulate policies calculated to increase their likelihood of re-election. For agencies with regular annual cycles of review and revision of developing country ratings, such anticipation related to PBCs suggests that:

H₁: Election years will be associated with lower ratings published by agencies.

Similarly, bondholders will anticipate PBC-related behavior and demand higher bond spreads as a price for bearing that additional pre-election risk. In contrast to agencies, however, bondholders may, at low cost, review and update their risk perceptions with additional information on a continuous basis. In the run-up to the day of election, bondholders will be able to decrease the level of uncertainty about whether incumbents have engaged in PBC-related behavior, and if so, how much. The decrease in uncertainty, should contribute to an overall decline in the spreads they demand to hold sovereign bonds in the pre-election period. Accordingly, anticipated PBC-behavior and decreased uncertainty regarding the extent of such behavior in the pre-election period suggest that:

H₂: Spreads will be higher in a pre-election period compared to spreads from a comparable post-election period. Spreads will tend to decline as an election approaches.

3. METHODOLOGY

Empirical Models and Variable Measures

We define two empirical models to test these hypotheses. Differences between these two models are motivated by the goal of re-creating the information environment of the decisionmakers whose actions we model. Tests of our first hypothesis rely on the tendency of agencies to make sovereign ratings decisions on an approximately annual basis, thus weighing heavily countries' recent macroeconomic indicators in their decision. In contrast, tests of our second hypothesis are based on daily information on bond spreads within a given window around elections. The previous year's macroeconomic indicators

(e.g., those data actually available to investors) do not change within the relevant window and, thus, cannot explain daily changes in bond spreads.³

The first model below examines the impact of elections on sovereign ratings and, therefore, provides the basis for testing Hypothesis 1:

$$RATING_{rit} = \beta_0 + \beta_1 RATING_{rit-1} + \sum_{r=1}^4 \alpha_r AGENCY_r + \sum_{i=1}^{16} \gamma_i COUNTRY_i + \sum_{t=1988}^{1998} \xi_t YEAR_t + \sum_{j=1}^7 \psi_j MACRO_{it} + \eta ELECT_{it} + u_{rit} \quad (1)$$

In (1), the subscript r indicates rating agency, i country and t year. The dependent variable, $RATING$, is the 17-level (0-16) rating from agency r for country i on December 31 of each year t from 1987 to 1998.

On the right-hand side of (1) we include a lagged dependent variable, $RATING_{t-1}$, and dummy variables to control for unobserved and possibly idiosyncratic effects related to $AGENCY$, $COUNTRY$, and $YEAR$. As additional controls, we include seven macroeconomic and financial variables, $MACRO$, for country i in year t . The seven macroeconomic control variables, for which ψ are parameter estimates, include: 1) Per capita income (“ PCT ”) measured in the current year, in thousands of constant US dollars and expected to be positively related to $RATING$; 2) Economic growth (“ $GDPG$ ”) measured as the average annual real GDP growth rate in the current and previous two years, and expected to be positively related to $RATING$; 3) Inflation (“ INF ”) measured as the average annual consumer price inflation in the current and previous two years, and expected to be negatively related to $RATING$; 4) Fiscal balance (“ $FISCBAL$ ”) measured as the average annual overall budget balance relative to GDP for the current and previous two years, and expected to be positively related to $RATING$; 5) External balance (“ $EXBAL$ ”) measured as the average current account balance relative to GDP for the current and previous two years, and expected to be positively related to $RATING$; 6) External debt (“ $EXDEBT$ ”) measured as the present value of debt relative to exports of goods and services for the current year, and expected to be negatively related to $RATING$; and 7) Recent default indicator (“ DEF ”) measured as a 0-1 indicator (1 if default; 0 if no default), indicating that the sovereign has defaulted on its long-term foreign currency denominated

³ Indeed, our maintained assumption that investors are rational (e.g., forward-looking) suggests that past

debt in the last five years, and expected to be negatively related to *RATING*. These macroeconomic controls are intended to isolate the impact of elections as distinct from potentially election-motivated fluctuations in those control variables.⁴ Previous research by Cantor and Packer (1996a-b), Larrian *et al.* (1997) and McNamara and Vaaler (2000) show that these seven variables explain substantial variation in agency sovereign risk ratings for industrialized and developing countries in the 1980s and 1990s.

In the context of these sovereign risk-rating controls, we then add the independent variable of central interest to our study, whether the developing country sovereign experienced a presidential election in a current year (“*ELECT*”). This is measured as a 0-1 indicator (1 if there was an election; 0 if there was no election) and is expected to be negatively related to *RATING*. Accordingly, Hypothesis 1 above predicts that the parameter estimate for *ELECT* (η) in (1) will be:

$$H_1: \eta < 0.$$

We use a second empirical model to examine the impact of elections on market determined credit spreads for sovereign bond yields compared to bond yields on comparable US Treasuries. The empirical model used to test Hypothesis 2 is:

$$RELSREAD_{it} = \beta_0 + \sum_{i=1}^{11} \gamma_i COUNTRY_i + \sum_{t=1993}^{1999} \xi_t YEAR_t + \sum_{t=-60}^{+60} \beta_1 DAY_{it} + \sum_{t=-60}^{+60} \beta_2 (DAY * POSTDAY)_{it} + u_{it} \quad (2)$$

In (2), the subscripts i and t again indicate country and year respectively.

The dependent variable, *RELSREAD*, is defined as:

$$RELSREAD_{it} = (YIELD_{it} - YIELD_{US,t}) / YIELD_{US,t}$$

where $YIELD_{it}$ is the total yield measured in basis points on a sovereign bond issued by country i and trading on day t relative to the total yield, $YIELD_{US,t}$, for the comparable US Treasury. Lamy and Thomson (1988) suggest that this relative bond spreads measure is a more stable risk measure than

macroeconomic indicators may play only a limited role in shaping their short-term expectations.

⁴ Note from the subscripts in model (1) that, in some cases, the data set provides several agencies’ sovereign ratings for a given country-year, in which cases all right-hand side data are identical across observations. If uncorrected, this type of clustering may result in biased standard errors that could exaggerate statistical significance. We correct for this problem in each of the estimators described above.

measures based on absolute bond spreads, especially over longer periods of observation where the general level of interest rates may fluctuate substantially.⁵

In addition to inclusion of dummies to control for fixed *COUNTRY* and *YEAR* effects, we include two time variables to assess pre- and post-election effects on bond spreads. The first time variable, *DAY*, is a day counter running from 60 days before to 60 days after election day. The second time variable, *POSTDAY*, is a 0-1 indicator variable, which takes a value of 1 if the day is after election day, and 0 otherwise. In this piece-wise specification, the parameter estimate for β_1 represents the pre-election bond spreads slope, while the post-election bond spreads slope is represented by the sum of the two parameter estimates, $\beta_1 + \beta_2$. We found no previous research in PBC or related fields to guide our choice of length for the pre- and post-election periods. We examined the length of the general election (post-primary or other preliminary election) campaigning period in our data to establish a pre-election period, which we then mirrored for the post-election period. A 60-day pre-election window approximated the average length for our developing country sample, as it also approximates the length of the general election campaign in many industrial democracies such as the US.

Hypothesis 2 above predicts that bond spreads will be relatively higher during pre-election periods compared to post-election periods. Bondholders will demand higher bond spreads in the pre-election period given the prospect of PBC-related behavior by incumbents seeking re-election. In terms of Hypothesis 2, this implies that mean daily observations of bond spreads starting at a given pre-election point $-D$ (e.g., -60 days) and running up to the election day itself, will be greater than mean daily observations of bond spreads starting on election day 0 and running to a symmetrical post-election point $+D$ (+60 days).

As stated earlier, if bondholders anticipate in the pre-election period PBC-style behavior by incumbents, then they do so with only limited information and observational capability. It is reasonable, therefore, to suppose that bond spreads would be greatest early in the pre-election period. If uncertainty

⁵ Accordingly, references to “bond spreads” in our study mean relative bond spreads (*RELSPREAD*) rather than absolute bond spreads.

regarding the realized pre-election economic policy diminishes as an election day nears, then spreads may also decline. In model (2), this hypothesis would be confirmed by finding that:

$$H_2 : \beta_1 < 0, \beta_2 > 0$$

Estimation Strategy

Previous empirical research on sovereign ratings estimation suggests many different approaches for estimating models described above. For the sovereign ratings model (1), ordinary least squares regression provided the earliest approach (*e.g.*, Horrigan, 1966; Cantor & Packer, 1996a-b), but n-level ordered logit or probit approaches are more appropriate given the ordinal nature of sovereign ratings measures (Zavoina & McElvey, 1975; Maddala, 1983; Ederington, 1985). In practice, these different estimation approaches yield very similar results when there are observations at several of the defined ordinal levels. The ratings data in our sample cover 13 of the possible 17 ordinal levels commonly used by agencies and in previous research (*e.g.*, McNamara & Vaaler, 2000). We estimate sovereign ratings model (1) using ordered probit regression.⁶

Model (1)'s inclusion of a lagged dependent variable complicates estimation of fixed effects models, as Hsiao (1986) demonstrates that such specifications are inconsistent (with finite T) due to a correlation of the order $(1/T)$ between the lagged variables and the residuals. Thus, we leave it to our final (albeit linear) estimator to address the potential effects of lagged dependent variables in our fixed effects specification.

Arellano and Bond (1991) propose a dynamic generalized method of moments ("GMM") estimator intended to yield consistent parameter estimates in the presence of both fixed effects and lagged dependent variables. Arellano and Bond's estimation strategy, employed here, is to first-difference the equations to eliminate unobserved country effects, and to fix the resulting inconsistency by applying instrumental variables consisting of appropriately lagged levels of the variables. The set of valid

⁶ Results using ordered logit and OLS estimators are consistent with the results reported in this study, and are available from the authors on request.

instruments grows incrementally as the year in question approaches T .⁷ Arellano and Bond's (1991) GMM estimator builds on this foundation and fixes the remaining problem of autocorrelated errors in the resulting model.⁸

To estimate bond spreads model (2), the high (daily) frequency of the time series and multi-dimensional cross-sections (national elections, agencies) in the panel requires us to resort to a flexible general estimating equation ("GEE") approach. The GEE procedure provides general linear model estimates, with independent correlation structures and semi-robust standard errors for defined groups in the sample. This permits us first to define groups in each sample –14 election groups in model (2). The GEE procedure also allows for first through tenth-order autocorrelation adjustment of error terms for observations in each group, with standard errors reflecting between-group heteroskedasticity in the cross-section.

Data Sources and Samples

Data for estimation in sovereign ratings model (1) and bond spreads model (2) are of four types. First, we collected annual data for macroeconomic characteristics linked to developing countries from 1987 to 1999 using World Bank World Development Indicators ("WDI") (World Bank, 2001) and agency sources (Standard & Poor's Ratings Services, 1999). These data provide measures of the *MACRO* variables in risk rating model (1).

Second, we collected data on the dates and types of presidential elections held from 1987 to 1999 using the World Bank's recently published Database of Political Institutions ("WBDPI") (version 2, described in Beck *et al.*, 2000). From these WDI data, we extracted dates of presidential elections in developing countries classified as either "Presidential" or "Assembly-Elected Presidential." Presidential elections from the countries we selected are based either on a direct popular vote or indirect vote of

⁷ By using appropriately lagged levels of the right-hand side variables as instruments, this estimator also addresses possible concerns that certain of the macroeconomic controls (*e.g.*, fiscal balance, external debt) may be endogenous.

⁸ Blundell and Bond (1998) demonstrate that Arellano and Bond's first difference GMM estimator may be biased in small samples with few cross sections and a highly stationary dependent variable. Blundell and Bond, however, also provide Monte Carlo simulation evidence suggesting that such concerns are minimal in the present exercise.

legislators or specialized electors. The presidential systems chosen by these means were also judged to accord substantial executive governmental powers rather than mere state ceremonial duties as presidential heads of state tend to have in parliamentary systems. Other factors motivated our decision to focus on presidential rather than parliamentary system elections. Elections in countries with presidential systems tend to follow fixed schedules. By contrast, parliamentary system election dates are often chosen by the executive. This can lead to endogeneity problems in empirical models of PBC-related election effects. The WDI data also include assessments of executive electoral competitiveness as measured by the extent of multi-party competition. The measure ranges from 1 (least competitive executive electoral systems) to 7 (most competitive executive electoral systems). All of the presidential elections we sampled scored 6 or 7 on this scale, indicating that they were “real” elections. The month, year and location of these presidential elections are summarized in Table 2. These data provide measures of the *ELECT* variable in sovereign ratings model (1) and provide anchoring points for definition of the pre- and post-election spreads trends in bond spreads model (2).

(Insert Table 2 Approximately Here)

Third, using Bloomberg International (2001) on-line sources, we collected data on developing country sovereign ratings published by Nationally Recognized Statistical Rating Organizations (“NRSRO”) agencies from 1987 to 1999. We limited our data collection to NRSRO agencies since US Securities and Exchange Commission rules as well as previous US legislation and regulations require at least one and usually two NRSRO agency ratings debt offerings (SEC, 1994). For each year, we noted the published agency sovereign rating on December 31 measured on a 17-point (0-16) scale. The month and year that these agencies first published sovereign risk ratings for a given country in our sample are noted in Table 2. Table 3 provides a brief explanation of this rating scale agencies commonly use. The important breakpoint on this ordinal scale is at 7 (BBB-). Below this level, ratings move from investment- to junk-grade, which increases bond yields considerably and may constrain the availability of bond offerings to US institutional investors. These data provide measures of the *AGENCY* and *RATING* variables used in sovereign ratings model (1).

(Insert Table 3 Approximately Here)

Fourth and finally, we again turned to Bloomberg International (2001) on-line sources, to collect data on large-issue, liquid, dollar-denominated, bonds issued by developing sovereigns from 1987 to 1999. We chose one representative bond for each sovereign based on its initial offering size, liquidity and notoriety among sovereign bond analysts we contacted at several investment banks. We noted its daily yield paired to a comparable US Treasury, either actually published that same day or synthetically derived from a constructed yield curve for that same day. Summary data on the bonds used in our analysis are given in Table 4 below:

(Insert Table 4 Approximately Here)

For analysis of annual sovereign ratings during election periods, we ended up with a sample of 236 observations with complete data from 1987 to 1998. This covered annually observed sovereign ratings for 19 developing countries holding 18 presidential elections between 1987 and 1998. For analysis of changes in spreads during election periods, we ended up with 1,694 observations with complete data from 1994 to 1999. This covered daily spreads observations for 11 developing countries holding 14 presidential elections.

4. RESULTS

Overview of Results

This section presents results from our analyses, which are summarized in Tables 5 and 6 below. Overall, our results indicate strong support for Hypothesis 1 concerning sovereign ratings during election years. Across different model specifications and sub-sample analyses, we consistently find that election years are significantly correlated with lower (less creditworthy) sovereign ratings from agencies. Generally speaking, ratings are one level lower than would otherwise be appropriate given all other relevant rating factors. Our results also support Hypothesis 2. Bond spreads are significantly higher in pre-versus post-election periods, and the pre-election trend in bond spreads is negative, indicating that

bondholders anticipate PBC behavior but exact a smaller premium for it as the day of election nears.

These and related results are discussed in greater detail below.

Sovereign Ratings Model Results

The mean sovereign rating in our sample is 5.8, which is approximately equal to a BB+ (S&P) rating. This mean value is important because BB+ is at the breakpoint between the lowest “investment-grade rating (BBB-) and the first “junk” rating (BB+). In effect, small changes – even one level — can move a sovereign from junk to investment grade status, which greatly facilitates the placement of its debt with institutional investors. Columns 1 and 2 in Table 5 present descriptive statistics from the sample. The means and standard deviations for various macroeconomic control variables in the regression exhibit characteristics typical of emerging-market countries, including mid-range per capita income levels (\$3,981), and higher GDP growth (4.36%) and inflation rates (138%).

(Insert Table 5 Approximately Here)

Table 5, Columns 3-5, present results from ordered probit estimation of equation (1) using three specifications. The specification in Column 3 is our base case, and includes only the seven macroeconomic control variables (described above), demonstrated by Cantor and Packer (1996) as well as McNamara and Vaaler (2000), closely to approximate the algorithm commonly employed by agencies. Six of these seven macroeconomic controls are statistically significant at the $p < .05$ level; among those six, all but per capita income (*PCI*) are of the expected sign. GDP growth (*GDPG*) is not significantly different from zero. In general, the base model’s results are intuitively plausible. Agencies accord higher ratings to countries with smaller fiscal deficits and lower inflation, with lower inflation, and no recent history of default on sovereign debt. The anomalous results for the level and growth of income may be an artifact, unaccounted for by year and country dummies, of certain years of financial crisis (*e.g.*, 1994, 1997 and 1998), which disproportionately affected the developing world’s richest and fastest growing economies. The remaining Columns (4-6) test the effect of elections on developing country sovereign risk ratings, holding constant this set of baseline macroeconomic, year and country factors.

Column 4 introduces the election year dummy into the baseline equation, with virtually no impact on the previously included coefficient estimates. The election dummy itself enters negatively, as expected from Hypothesis 1 ($\hat{\eta} = -0.817$; $p < 0.001$). The lack of impact of elections' inclusion on other regressors suggests that elections' negative effect on sovereign ratings is not merely a proxy for election-motivated changes in those macroeconomic controls. The ordered probit estimator readily enables simulations based on estimated coefficients. The practical impact of this election effect is substantial. Evaluating explanatory variables at their respective means, the estimates in Column 3 suggest that the occurrence of an election results in a reduction in the predicted rating by one rating level.⁹

While an annual dummy variable for elections is a somewhat blunt indicator, it is appropriate for the present analysis because it reflects approximately the same frequency with which the agencies review their country ratings. Of the 64 agency downgrades in our sample of developing countries, 30 occur in countries during their election year. The significantly higher frequency of downgrade in election years compared to the overall downgrade frequency is confirmed in a χ^2 -test rejecting the null hypothesis of equivalent frequencies at typically acceptable statistical levels ($p < 0.01$). Closer examination of the data suggests that this annual elections dummy can still be interpreted as reflecting anticipatory behavior by agencies. Of the 30 downgrades that occurred during election years in our sample, 26 were announced within six months *prior* to the election; there were only three upgrades announced during election years, all of which *followed* the election.¹⁰

Given that the mean rating for this sample of sovereigns lies very close to the junk versus investment grade cut-off, an election-related downgrade of one rating level could be a decisive factor in forcing developing country issuers to offer substantially higher coupon rates, and constraining issue placement with certain investors. These results survive the inclusion of a lagged dependent variable – as

⁹ As specified, the election dummy takes no account of when within a given year an election occurs. To test the robustness of that approach, we also specified an alternative version of the election dummy such that it equals 1 in the *pre*-election year if the election occurs during the first six months of the year, one in the election year if an election occurs during the second six months, and 0 otherwise. Re-estimating our model with this alternative dummy variable did not change our results.

shown in Column 5. In this case, the negative effect of elections on risk ratings appears even stronger ($\hat{\eta} = -1.20$; $p < 0.001$).

Column 6's results provide further validation of the election effect on developing country sovereign risk using the dynamic panel GMM estimator proposed by Arellano and Bond (1991). Recall that this estimation approach allows us to control for potential bias arising from endogeneity as well as from the inclusion of both a lagged dependent variable and year and country dummies. Applying this GMM estimator to a sub-sample of ratings from the most active agency in developing countries over the 1987-1998 period, Moody's,¹¹ we again observe negative election-related effects that are statistically significant ($\hat{\eta} = -1.49$; $p < 0.01$). The overall model results are remarkably consistent in finding that elections are associated with average decreases in sovereign risk ratings of at least one rating level, *ceteris paribus*. Our support for Hypothesis 1 is, thus, robust to alternative estimators, specifications and sub-sampling. Agencies perceive elections in developing countries as risky events and react by downgrading (or refraining to upgrade otherwise less risky) countries during election years.

Bond Spreads Model Results

Hypothesis 2 predicts that pre-election bond spreads will be higher than comparable period post-election bond spreads; similarly, it predicts a negative trend in bond spreads throughout the pre-election period. We employ three different analyses to investigate the evidence relevant to this prediction. First, we examine mean bond spreads observed in different pre- and post-election periods. The mean bond spread for the -90 to -60 day pre-election period is 1.31. The mean bond spread for the -60 to -30 day pre-election period is 1.20. The mean bond spread for the -30 to 0 day pre-election period is 1.15. The mean bond spread for the +1 to +30 day post-election period is 1.09. T-tests of the mean bond spreads for progressively smaller pre-election windows versus a +1 to +30 post-election window (*e.g.*, -90 to 0 vs. +1

¹⁰ Stated differently, of the 18 elections included in our estimating sample, 8 were preceded by downgrades within 6 months.

¹¹ Multiple observations for the same country-year are not permitted in the GMM estimator. Thus, it was necessary to limit the sample to sovereign ratings from a single agency. Similar results in terms of signs (though not significance due to power restrictions) are obtained using other agency sovereign ratings (*e.g.*, S&P). These results are available from the authors on request.

to +30, -80 to 0 vs. +1 to +30, *etc.*) show that the pre-election windows from -90 to 0 through -60 to 0 are statistically higher than the +1 to +30 post-election mean at the $p < .05$ -level or less; pre-election windows from -50 to 0 through -40 to 0 are statistically higher than the +1 to +30 post-election mean at the $p < 0.10$ -level.¹² These results are consistent with the first part of Hypothesis 2 regarding bond spreads before and after elections.

Two other analyses provide additional support. One is a non-parametric analysis of trends in pre- and post-election bond spreads in Figure 1:

(Insert Figure 1 Approximately Here)

Figure 1 represents smoothed bond spreads values on the Y-axis plotted against a day counter on the X-axis. Smoothing is performed around each spreads data point in the sample, based on an unweighted mean with a specified proportion of the sample (40% in this case) around a given point. Confidence intervals indicate the 95% certainty range around each smoothed point. Bond spreads exhibit steady decline in the pre-election period and then flatten out in the post-election period, consistent with Hypothesis 2. The non-parametric result in Figure 1 also validates the piecewise linear specification with which we parametrically test Hypothesis 2.

(Insert Table 6 Approximately Here)

Table 6's results provide additional support for Hypothesis 2 that election periods are associated with a significant downward trend in bond spreads. The GEE estimate for the pre-election bond spreads slope is negative ($\hat{\beta}_1 = -0.0025$; $p < 0.01$), while the post-election slope is more positive by $\hat{\beta}_2 = 0.0036$ ($p < 0.10$). Relative to zero, the post-election slope point estimate is positive ($\hat{\beta}_1 + \hat{\beta}_2 = 0.0011$; $p < 0.58$), but not statistically different from zero at commonly acceptable statistical levels. This pattern of negative pre-election followed by flat post-election slopes in bond spreads persists in regressions with

¹² T-tests comparing pre-election windows of 30 days or less with a 30-day post-election window fail to reject the null hypothesis that the pre-election period mean is greater, though the pre-election point estimates remain greater than the post-election mean.

longer observation windows (*e.g.*, 90-90, 180-180), although the statistical significance of the coefficient estimates naturally declines as the election window increases.¹³

This finding is again consistent with our overall research proposition that bondholders are cognizant of incumbent tendencies to engage in PBC-related behavior. They demand a risk premium as compensation for this pre-election risk, but then give back part of it as elections approach and incumbents' intentions with regard to pre-election policy interventions are revealed. Using the coefficient estimate for the pre-election spreads slope ($\hat{\beta}_1 = -0.0025$) we infer that spreads over a 60-day pre-election period decrease an average of 15 percentage points. Two elections drawn from our sample, Argentina's presidential elections in May 1995 and October 1999 illustrate this negative trend with even more dramatic changes than predicted in our piecewise regression analysis. As the panels in Figure 2 illustrate, bond spreads as well as absolute domestic (Argentina) bond yields move downward substantially in the last 60 days before elections. In Panel A, bond spreads stand at 2.42 on March 16, 1995, 60 days before the presidential election on May 14, 1995. By May 14, bond spreads have fallen to 1.52, a drop of 37 percentage points. In Panel B, bond spreads are 1.43 on August 26, 1999, 60 days before the presidential election on October 24, 1999. By October 24, bond spreads have fallen to 1.02, a drop of 28 percentage points.

(Insert Figure 2 Approximately Here)

Trends in bond spreads from these two elections have several implications for our broader research proposition. In both Panel A and Panel B, we see an upward trend in spreads running from approximately 180 days before elections to somewhere between 70-80 days before elections. Then, bond spreads gradually decline in the run-up to elections, after which they exhibit a post-election drift with

¹³ We also re-ran our analyses with pre- and post-election windows for every day between 50-50 days and 70-70 days in length inclusive (20 different window lengths from the 60-60 days results reported above). The signs on all coefficient estimates for pre- and post-election slopes were consistent with the signs and estimate levels for the 60-60 day results discussed here. Levels of statistical significance on the positive post-election coefficient estimates ranged from $p < 0.37$ to $p < 0.07$ with p-values on seven of the 20 coefficients at the $p < 0.10$ level. The average p-value for all 20 coefficients was 0.16. In addition, we re-ran these analyses with dummies for bonds with floating-rate (rather than fixed rate) coupons. Signs and significance of coefficients do not change. These results are available from the authors on request.

much less change compared to the pre-election period. In terms of our research proposition, bondholders become increasingly concerned about the possibility of PBC behavior by incumbents about six months before the election, and demand increasingly high bond spreads to assuage those concerns. In the final run-up to voting day, those concerns decrease with greater information about the incumbents' extent of PBC-related behavior. In this context, it would seem preferable for sovereigns to avoid issuing bonds during this six-month pre-election "spreads bubble," lest they be compelled to pay a substantial but temporary premium. For example, pre-election bubble in 1999 for Argentina in Panel B starts in late-April when bond spreads are 1.08, then rise to nearly 1.70 in mid-August, only to fall back to 1.02 on election-day in late-October. Movements in the cost of funding sovereign debt provide a good indication of changes in the cost of funds for other sub-sovereign organizations and individuals. If compelled to raise funds during such a pre-election spreads bubble, they may very well have to pay a premium.

Our various results from analysis of bond spread levels and trends over time are consistent with other recent research linking election uncertainty-reduction to changes in domestic securities value (*e.g.*, Pantzalis *et al.*, 2000). Our results focus on effects related to one specific class of investors, sovereign bondholders, and elaborate on the basis for election-related anticipation and uncertainty using PBC theory. Bondholders, like the agencies we analyzed earlier in this study, appear to act rationally in the context of anticipated PBC-related behavior that gradually reveals itself in the run-up to the election.

5. CONCLUSION

This study of election-related changes in developing country sovereign ratings and bond spreads adds to the PBC literature by looking at it from the "outside." While PBC theories characterize politicians and voters and their interaction around elections, we address the possibility that third parties may be cognizant of the incentives for economic misbehavior described in the PBC literature. Specifically, we posit that agencies rating sovereign risk in developing countries and bondholders holding sovereign debt will act as if they are aware of the potential for incumbent politicians to create PBCs. We find firm support for Hypothesis 1 that average agency ratings for developing countries decline during

election years. Holding constant a set of macroeconomic control variables thought to explain sovereign ratings, we find an additional decline of approximately one level during election years in our sample of developing countries. This result is robust to the inclusion of year, county, agency and lagged dependent variable effects, as well as to changes in the sample, specification and estimators used. We also find support for Hypothesis 2, that bond spreads are greater in the pre-election than in the post-election periods, and that they decline as elections approach.

These findings raise several broader questions about elections and the apparent price they entail for developing countries. Sovereign ratings are of central concern to developing countries seeking to finance their growth strategies by attracting mobile investment capital in a global economy. Downgrades portend substantial increases in the cost of capital, and perhaps other negative reactions such as reduced capital inflows, and in extreme cases, even capital outflows (*see, e.g., Larrain et al., 1997*). If incumbent political leaders in developing countries are prone to creating PBCs (as a growing literature suggests they are), and if outside observers such as agencies and bondholders are aware of that potential, then elections may be quite costly events. Our findings suggest that the electoral aspects of democratization in developing countries are accompanied by more skittish investors and more costly capital in the short- to medium-term. These costs have previously been ignored in the PBC literature. Yet, in an era of globalization, such costs may be substantial, particularly as competitive elections become increasingly frequent events among the nascent democracies of the developing world.

This research invites further exploration of related PBC issues. For example, the PBC effects we observed may be contingent on the competitiveness of a particular presidential election, rather than on the overall competitiveness of the developing country's electoral system. Work by Schultz (1995) and others suggests that PBC incentives to manipulate fiscal and monetary policies to retain office are contingent on a developing country incumbents' base popularity with their respective electorate. Pre-election polls indicating great popularity (unpopularity) may curb (magnify) the PBC incentives, which in turn, should decrease (increase) anticipatory concerns of agencies and bondholders concerning developing country sovereign creditworthiness.

Other future research questions follow from our findings. For instance, are there negative spillover effects on sovereign ratings and or bond spreads for one developing country when a neighboring country holds an election? Kaminsky and Schmukler (2001) suggest that there may be such spillovers during severe financial crises. Perhaps the “crisis” elections represent in democratizing countries will spark similar negative spillovers for a region, particularly if democratic reform in one country increases pressure for similar reform in neighbors.

Yet another PBC-related issue for future inquiry concerns other relevant third parties and their perceptions of increased risk surrounding competitive elections. Goldsmith’s (1994) findings are validated in this study with respect to agencies and bondholders, two key players in international capital markets. Other key individuals may be similarly affected by elections, including banks making loans, individuals engaged in portfolio investments, and firms engaged in foreign direct investment in developing countries. Pantzalis *et al.* (2000), for example, have already shown that share prices in both industrialized and developing country stock markets react negatively to pre-election outcome uncertainty. Perhaps PBC theory can be used to examine post-election variation in share prices linked to the detrimental impact of policies incumbents enacted in the pre-election period to assure their re-election. Uhlmann’s (2002) study of bank lending to developing countries from 1985 to 1999 suggests that there may also be “political banking cycles” during which bankers cut back on lending, particularly to non-governmental borrowers, prior to executive elections in both parliamentary and presidential political systems. Deeper understanding of the composition of such fluctuations before and after elections will also contribute to future PBC research.

Perhaps future research might benefit as well from examining the same risk phenomena we did with PBC theory’s other prominent branch, rational partisan theory. With this alternative PBC lens, we might examine the risk perceptions of private, foreign-based actors observing developing country elections with Right- or Left-leaning incumbents capable of PBC behavior that primarily benefits capital (Right-leaning incumbents) or labor (Left-leaning incumbents). In this context, we might expect individuals such as agencies and bondholders favoring capital-oriented Right-leaning incumbents. For a

preliminary sense of empirical support for this proposition, we present results from a short *post hoc* t-test of pre-election bond spreads for what we judged to be Right- versus Left-leaning incumbents facing elections in the 11-country, 14 election sample analyzed previously above.¹⁴ Average bond spreads 60 days before elections with a Right-leaning incumbents are 0.961, while average bond spreads over the same period for Left-leaning incumbents are 1.471; the difference between the two is significant at $p < 0.01$. This suggests that partisan political orientation may matter, and perhaps that bondholders have fewer concerns that Right-leaning incumbents will engage in PBC behavior detrimental to the interests of creditors.

Such related issues are relevant, not only to the PBC literature as it is increasingly extended to developing countries, but also to broader issues of the relationship between democracy and growth. While in the long run democracy undoubtedly is a good in itself, its long-term benefit may be offset by the short- to medium-term perception that competitive elections induce costly economic misbehavior by political incumbents. To the extent that this perception may increase the cost and reduce the supply of capital to developing countries, it adds to the price of democracy even if that cost is still worth paying.

¹⁴ The definition of “Right-leaning” versus “Left-leaning” incumbents was ascertained primarily by reference to the World Bank Database of Political Institutions (“WDPI”) (World Bank, 2000). For at least three elections in the 1990s, two in Colombia and one in the Philippines, the WDPI did not provide information on the partisan political orientation of the incumbents. In these cases, we consulted several alternative sources and made our own judgments.

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TABLE 1

Selected Empirical Tests of PBC Theory: Industrialized and Developing Country Samples^a

Author	Variables Tested	Country Coverage	General Finding
<i>Industrialized Country Samples</i>			
Tufte (1978)	Transfers	US	Positive, <i>i.e.</i> , Support for PBC Theory
McCallum (1978)	Unemployment	US	Negative, <i>i.e.</i> , Contrary to PBC Theory
Beck (1987)	Money Growth	US	Positive
Alesina (1988)	Transfers	US	Weak Positive
Lewis-Beck (1988)	Output, Unemployment	OECD (non-US)	Negative
Keech <i>et al.</i> (1989)	Veterans' Benefits	US	Weak Positive
Grier (1989)	Money Growth	US	Positive
Sheffrin (1989)	Monetary Policy	US	Weak Positive
Haynes <i>et al.</i> (1989, 1990, 1994)	Output, Unemployment, Inflation	US	Positive
Alesina <i>et al.</i> (1990, 1997)	Output, Unemployment, Inflation, M1 Growth	US and OECD	Negative for Opportunistic Models Generally; Positive for Partisan Effects, and for Inflation and Money Supply Effects in OECD Countries
Ellis <i>et al.</i> , (1995)	Current Account, Terms of Trade	OECD (14 Countries)	Positive
Klein (1996)	Output	US	Positive
Paldam (1997)	Output, Unemployment	OECD (non-US)	Negative
Faust <i>et al.</i> (1999)	Monetary Policy, Output, Unemployment	US	Mixed
Gartner (1999)	Inflation	G-7	Weak Positive
Carlsen (1999) Carlsen <i>et al.</i> (1999)	Output, Inflation	US OECD	Positive for Rational Partisan PBC Theory
<i>Developing Country Samples</i>			
Ben-Porath (1975)	Taxes	Israel	Positive
Ames (1987)	Total Govt. Expenditures	Latin America (17)	Positive
Edwards (1993)	Inflation	Chile	Positive
Krueger <i>et al.</i> (1993)	Fiscal Aggregates	Turkey	Positive
Remmer (1993)	Inflation	Latin America (8)	Mixed
Schuknecht (1996, 1999, 2000)	Output, Fiscal Deficit	Non-Industrialized Countries (35)	Positive
Fouda (1997)	Money Growth	Cameroon	Positive
Brender (1999)	Fiscal Policy	Israel	Positive
Gonzales (1999)	Total Govt. Expenditures	Mexico	Positive
Moyo (1999)	Public Savings	Industrialized and Non-Industrialized Countries	Positive
Khemani (2000)	Commodity Taxes, Capital Spending, Road Construction	India	Positive
Pantzalis <i>et al.</i> (2000)	Stock Market Returns	Industrialized and Non-Industrialized Countries	Positive
Svenssen & Shi (2001)	Govt. Consumption, Fiscal Surplus, Tax Revenues	Industrialized and Non-Industrialized Countries	Positive
Block (2001)	Fiscal and Monetary Aggregates	Sub-Saharan Africa	Positive

a. Based on reviews given in Drazen (2000) and Block (2002)

TABLE 2

Developing Country Rating History and Presidential Elections^a, 1987-1999

Country	Month/Year First Rated by NRSRO Agency ^b	87	88	89	90	91	92	93	94	95	96	97	98	99
Argentina	M: 11/86; S: 8/93; D: 12/93; T: 1/94; I: 5/97			May						May				Oct
Bolivia	T: 4/96; M: 5/98; S: 7/98			May				June				June		
Brazil	M: 11/86; T: 1/94; I: 12/94; S: 12/94; D: 2/95			Nov					Oct				Oct	
Bulgaria	M: 9/96; T: 12/97; I: 4/98; S: 10/98						Jan				Nov			
Chile	S: 8/92; M2/94; T: 6/94; D: 6/94; F: 6/94; I: 8/94			Dec				Dec						Dec
Colombia	S: 6/93; M: 8/93; D: 12/93; T: 10/94				May				June				June	
Ecuador	T: 5/94; M: 7/97		Jan				July				July		July	
Indonesia	S: 7/92; T: 12/93; M: 3/94; I: 12/97; D: 10/98		Mar					Mar					Mar	Oct
Mexico	M: 12/90; S: 11/91; D: 5/93; T: 1/94; I: 8/95		July						Aug					
Paraguay	S: 10/95; M: 7/98		Feb					May					May	
Peru	T: 11/95; M: 2/96; S: 12/97; D: 3/98				April					April				
Philippines	M: 7/93; S: 7/93; T: 12/93; D: 5/95; I: 7/99						May						May	
Poland	I: 5/95; M: 6/95; S: 6/95; D: 9/97				Dec					Dec				
Russia	T: 7/96; S: 10/96; M: 10/96; D: 10/96; I: 10/96					June					June			
South Africa	I: 9/94; S: 10/94; M: 10/94; T: 5/95; D: 6/97			April					April					June

South Korea	M: 1/86; S: 10/88; T: 12/93; I: 6/96; D: 12/97	Dec					Dec					Dec	
Tunisia	M: 4/95; I: 9/95; S: 4/97; T: 6/99			April					Mar				Oct
Uruguay	M: 10/93; S: 2/94; I: 1/95; D: 1/97; T: 5/97			Nov					Nov				Nov
Venezuela	S: 10/77; M: 6/87; T: 7/94; I: 9/97; D: 3/98		Dec					Dec				Dec	

- a. Presidential elections sampled from countries with presidential systems only. The definition of a presidential system relies on Beck *et al.* (2000) and World Bank (1999-2001). Countries with “Direct Presidential” and “Indirect Presidential” regime classifications in these sources are included, while countries classified under a third “Parliamentary” regime classification are excluded from the sample. The year (month) of these elections is given in the top column (cell), and represents the date of the final elections (second-round, run-off round, etc.).
- b. Agency symbols are: M (Moody’s); S (S&P); I (IBCA); F (Fitch); D (DCR); and T (Thompson). In December 1997, Fitch and IBCA announced their merger. In December 1998, Fitch-IBCA and Duff merged. In December 2000, Fitch-IBCA-Duff, now doing business under the name Fitch alone, absorbed Thompson. Thus, there are currently (Summer 2002) only three NRSRO agencies publishing sovereign risk ratings, down from six only four years earlier. For additional detail on these changes in the number of agencies see, *e.g.*, White (2001). The month and year of first long-term foreign currency sovereign risk-rating published follows the agency symbol.

TABLE 3

Agency Letter Ratings, Grades, Numerical Equivalents, and Interpretations

<i>Moody's</i>	<i>S&P and Other NRSROs</i>	<i>Grade</i>	<i>Numerical Equivalent on 0- 16 Scale</i>	<i>Common Interpretation</i>
<i>Aaa</i>	<i>AAA</i>	<i>Investment</i>	<i>16</i>	<i>Extremely strong capacity to meet its financial commitments.</i>
<i>Aa1</i>	<i>AA+</i>	<i>Investment</i>	<i>15</i>	<i>Very strong capacity to meet its financial commitments.</i>
<i>Aa2</i>	<i>AA</i>		<i>14</i>	
<i>Aa3</i>	<i>AA-</i>		<i>13</i>	
<i>A1</i>	<i>A+</i>	<i>Investment</i>	<i>12</i>	<i>Adequate capacity to meet its financial commitments.</i>
<i>A2</i>	<i>A</i>		<i>11</i>	
<i>A3</i>	<i>A-</i>		<i>10</i>	
<i>Baa1</i>	<i>BBB+</i>	<i>Investment</i>	<i>9</i>	<i>Less vulnerable than lower rated obligors but facing adverse conditions which could lead to obligor's inadequate capacity to meet its financial commitments.</i>
<i>Baa2</i>	<i>BBB</i>		<i>8</i>	
<i>Baa3</i>	<i>BBB-</i>		<i>7</i>	
<i>Ba1</i>	<i>BB+</i>	<i>Speculative (Junk)</i>	<i>6</i>	<i>More vulnerable than the obligors rated above. Obligor currently has the capacity to meet its financial commitments but adverse conditions will likely impair this capacity.</i>
<i>Ba2</i>	<i>BB</i>		<i>5</i>	
<i>Ba3</i>	<i>BB-</i>		<i>4</i>	
<i>B1</i>	<i>B+</i>	<i>Speculative (Junk)</i>	<i>3</i>	<i>Currently vulnerable and dependent on favorable conditions to meet its financial commitments.</i>
<i>B2</i>	<i>B</i>		<i>2</i>	
<i>B3</i>	<i>B-</i>		<i>1</i>	
<i>C</i>	<i>C</i>		<i>0</i>	

TABLE 4**Representative Developing Country Sovereign Bonds**

Developing Country	Bond Series	Bond Issuer	Bond Issue Date	Bond Maturity Date	Bond Issue Face Amount (in 000's)	Bond Coupon	Exchange
Argentina	Series FRB	Republic of Argentina	3/31/1993	3/29/2005	\$8,466,548	LIBOR + 0.8725%	Dusseldorf
Brazil	Series 20Y	Federal Republic of Brazil	4/15/1994	4/15/2014	\$7,387,519	8%	Luxembourg
Bulgaria	Series A	Bulgaria	7/28/1994	7/28/2024	\$1,685,595	LIBOR + 0.8725%	NA
Chile	NA	Republic of Chile	4/28/1999	4/28/2009	\$500,000	6.875%	Luxembourg
Colombia	NA	Republic of Colombia	2/23/1994	2/23/2004	\$250,000	7.25%	NA
Mexico	Series A	United Mexican States	3/28/1990	12/31/2019	\$6,211,456	6.25%	Luxembourg
Philippines	Series B	Republic of Philippines	12/1/1992	12/1/2017	\$1,740,600	6.50%	Luxembourg
Poland	Series PDIB	Republic of Poland	10/27/1994	10/27/2014	\$2,673,600	6%	Luxembourg
Russia	Series IV	Ministry of Finance, Russia	5/14/1993	5/14/2003	\$3,462,000	3%	NA
South Africa	NA	Republic of South Africa	5/19/1999	5/19/2009	\$1,500,000	9.125%	Luxembourg
Uruguay	Series B\$	Banco Central del Uruguay	2/19/1991	2/19/2007	\$447,600	LIBOR + 0.875%	Luxembourg
Venezuela	Series DL	Republic of Venezuela	12/18/1990	12/18/2007	\$5,153,173	LIBOR + 0.875%	Luxembourg

TABLE 5

Ordered Probit and GMM Regression Results

Dependent Variable: Agency Long Term Foreign Currency Sovereign Risk Ratings, 1987–1998

Coefficient Estimator	(1) Mean	(2) Std. Dev.	(3) Ordered Probit ^c	(4) Ordered Probit	(5) Ordered Probit	(6) GMM ^e
Constant (β_0)						-1.6708*** (0.2948)
$RATING_{t-1}$ (β_1)	5.835	2.977			.4449* (0.1739)	0.5717*** (0.1324)
PCI (ψ_1)	3,981.55	2,427.27	-0.0004* (0.0002)	-0.0004* (0.0002)	-0.0004** (0.0001)	-0.0006*** (0.0002)
$GGDP$ (ψ_2)	4.361	3.349	-0.0263 (0.0418)	-0.0141 (0.0403)	-0.0942*** (0.0161)	-0.0052 (0.0832)
$INFL$ (ψ_3)	136.667	363.579	-0.0009** (0.0004)	-0.0012** (0.0004)	-0.0011* (0.0005)	-0.0067† (0.0004)
$FISBAL$ (ψ_4)	-1.379	2.898	0.1743*** (0.0336)	0.2061*** (0.0414)	0.2041*** (0.0207)	0.03880 (0.0550)
$EXBAL$ (ψ_5)	-1.506	2.928	0.0281** (0.010)	0.0341* (0.0170)	0.0460 (0.0303)	-0.0395 (0.0258)
$EXDEBT$ (ψ_6)	197.639	111.587	-0.0096*** (0.0010)	-0.0087*** (0.0009)	-0.0065*** (0.0007)	-0.0020 (0.0017)
DEF (ψ_7)	0.1144	0.319	-2.201*** (0.2965)	-2.192*** (0.2806)	-1.918*** (0.2086)	-1.8937*** (0.5201)
$ELECT$ (η)	0.1340	0.348		-0.8171*** (0.2173)	-1.202*** (0.2529)	-1.4901** (0.5201)
N ^a	236	236	236	236	236	63
R ²			0.376 ^d	0.387 ^d	0.434 ^d	
LM2 test ^b						Pr>z= 0.5944

- Countries in the Columns (3-5) sample include: Argentina, Brazil, Chile, Colombia, Costa Rica, Indonesia, South Korea, Mexico, Paraguay, Peru, Philippines, Poland, Russia, South Africa, Tunisia, and Venezuela. 18 presidential elections covered by ratings from up to five NRSRO agencies are included in this sample from the 1987-1998 period. Countries in the Column (6) sample include: Argentina, Brazil, Chile, Colombia, Indonesia, South Korea, Mexico, Peru, Philippines, Poland, Russia, South Africa, Tunisia, and Venezuela. Nine presidential elections covered by ratings from Moody's are included in this sample from the 1987-1998 period.
- Lagrange multiplier test for second-order serial correlation in errors. Test based on z-score where $Pr > z = 0.5944$ does not suggest rejection of null hypothesis that there is no second-order serial correlation in errors.
- Results reported in Columns (3-5) include year, country and agency dummy variables. The majority of coefficient estimates for indicator variables of each type are significant at $p < 0.05$ or higher levels. Joint significance of coefficient estimates for indicator variables of each type are also significant at $p < 0.05$ or higher levels. These results are available from the authors on request.
- Pseudo-R²
- Results reported in Column (6) based only on ratings published by Moody's only. GMM estimator is Arellano and Bond's (1991) dynamic panel model, one-step estimator with robust standard errors. Note that the Sargon test of instrumental validity has an undefined distribution for the robust estimator. Results reported in Column (6) also include year and country indicator variables. The majority of coefficient estimates for indicator variables of each type are significant at $p < 0.05$ or higher levels. Joint significance of coefficient estimates for indicator variables of each type are also significant at $p < 0.05$ or higher levels. These results are available from the authors on request.

† = $p < 0.10$, * = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$

TABLE 6

Regression Results

Dependent Variable: Sovereign Bond Spreads Relative to Comparable US Treasuries 60 Days Before and After Election, 1994–1999

Estimator	(1) GEE ^{a, b, c}
Constant (β_0)	2.6376* (0.1122)
<i>DAY</i> (β_1)	-0.0025† (0.0010)
<i>DAY*POSTDAY</i> (β_2)	0.0036† (0.0022)
$\beta_1 + \beta_2 = 0$ (<i>Post-Election Slope</i>)	0.0011 (0.0019)
N ^a	1,694
Wald χ^2	1.37e+18***

- a. Results based on population-averaged panel data model. Stata’s (StataCorp, 2001) General estimating equations (“GEE”) procedure provides general linear model estimates, allows for independent correlation structures for each of the downgrade groups, and provides semi-robust standard errors. Results include country and year indicator variables, semi-robust standard errors adjusted for clustering and equation error terms adjusted for first through tenth order auto-correlation (AR10). The majority of coefficient estimates for country and year indicator variables are significant at $p < 0.05$ or higher levels. Joint significance of these coefficient estimates are also significant at $p < 0.05$ level. These results are available from the authors on request.
- b. Countries in sample include: Argentina, Brazil, Bulgaria, Chile, Colombia, Mexico, Philippines, Poland, Russia, Uruguay and Venezuela. 14 presidential elections are covered in this sample from the 1994-1999 period.
- c. Re-estimation with 50-50 to 70-70 day windows yields coefficients with identical signs and similar estimated impact on spreads, but statistical significance on these coefficients varies (see footnote 14 in text). These results are available from the authors on request.

† = $p < 0.10$; * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$

FIGURE 1

Non-Parametric Analysis

Sovereign Bond Spreads Relative to Comparable US Treasuries 90 Days Before and After Elections, 1994-1999

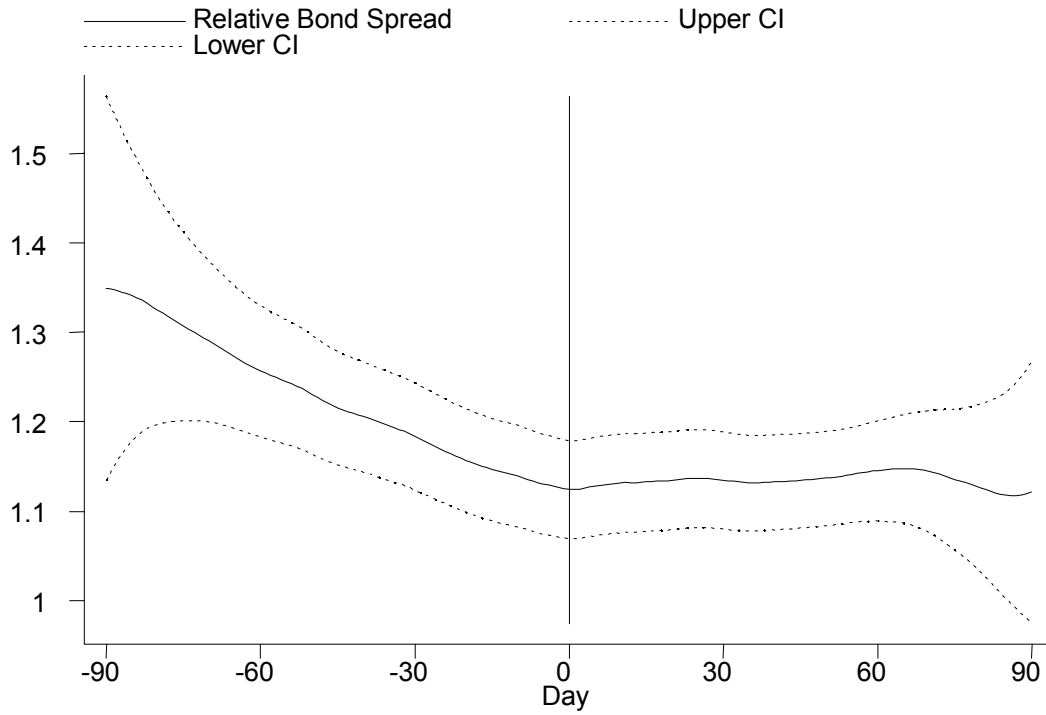
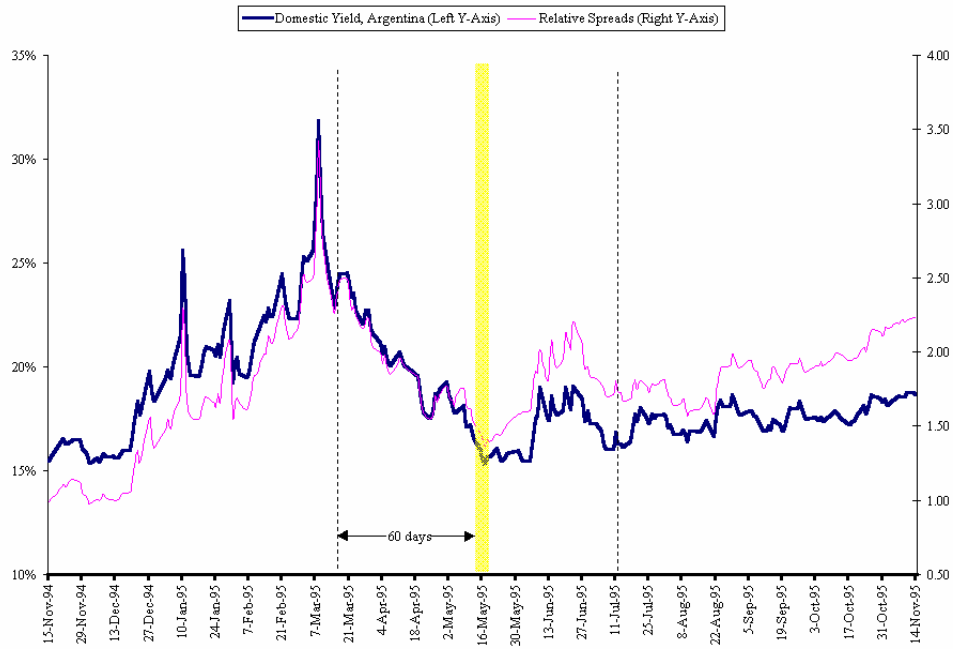


FIGURE 2

Panel A

Argentina's Presidential Election, May 14, 1995: Related Sovereign Bond Yields and Relative Spreads



Panel B

Argentina's Presidential Election, October 24, 1999: Related Sovereign Bond Yields and Relative Spreads

