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DETERMINANTS OF SOVEREIGN
BOND SPREADS IN 1870-1913
AND TODAY**

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*FINANCIAL ECONOMICS and
ECONOMIC HISTORY Initiative*



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ABSTRACT

Bloodshed or Reforms? The Determinants of Sovereign Bond Spreads in 1870-1913 and Today*

Drawing on a newly-collected data set on bond yields, macroeconomic variables, and news of various categories for a panel of emerging markets, we provide the first comparative analysis of the determinants of sovereign bond spreads in the first era of financial globalization and bond finance (1870-1913) and today (1994-2002). We find that news about wars or episodes of politically-motivated violence are a significant and robust determinant of spreads; fiscal variables also play a role; in contrast, news about institutional reforms seldom have a rapid and significant impact. There are also important differences between the two eras: country-specific fundamentals account for a greater share of variation in spreads during the pre-WWI period than today.

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Bloodshed or Reforms? The Determinants of Sovereign Bond Spreads in 1870-1913 and Today

1. Introduction

What determines variation in the interest rates faced by emerging market countries that borrow internationally? Do prudent macroeconomic policies and institutional reforms help reduce borrowing costs? What role is played by wars and episodes of violent political turmoil? In light of recent interest in the effects of institutions on economic development, can the determinants of the cost of capital provide clues regarding which aspects of institutional quality have a more immediate and direct impact?²

These questions are especially interesting and relevant in an international financial environment—such as the one in which today’s emerging markets operate—characterized by high integration and considerable reliance on bond finance. However, in modern times, this environment has been in place only since the early 1990s, and therefore offers useful but limited information. To provide a broader perspective on these questions, it is helpful to go back in history to the most recent previous period of financial globalization and bond finance, namely 1870–1913. During that past era, London—the world’s main financial center at the time—saw massive amounts of bond issuance by emerging markets and active trading by well informed investors. In this paper, we analyze the determinants of spreads on emerging market bonds for the two periods, identifying both similarities and differences between them. In both the pre-World War I period and today, investors responded to economic data and news events, albeit in somewhat different ways, and a comparison yields interesting insights.

To address these questions empirically, we have compiled a new and extremely comprehensive data set on bond yields, macroeconomic variables, and news items of various categories for eighteen emerging markets in 1870–1913 and eight emerging markets in 1994–2002.³ The analysis in this paper is the first to provide a systematic comparison of the determinants of spreads in the 1870-1913 period and today, using the same methodology for both sample periods. Moreover, this is the first study of the determinants of emerging market

² A number of contributions have addressed the potential importance of “institutions” in economic growth and development, with varying emphasis on different aspects of institutional quality, such as property rights, political stability, the legal and constitutional framework, and the form of government—see North and Weingast, 1989; North, 1990; Barro, 1991; Acemoglu, Johnson, and Robinson, 2001; and Glaeser and others, 2004.) More generally, there is increasing interest in obtaining information on the impact of specific aspects of institutional quality, rather than the effects of broad “clusters” of institutions (Acemoglu, 2005).

³ As detailed in Section 2, the data on news are unique to the present study: they were hand collected for the historical period and compiled through an electronic search for the modern period. The data on macroeconomic variables combine data used by other researchers and newly collected data from primary sources. The data on bond yields for a subset of countries were used in Mauro, Sussman, and Yafeh (2002); we have now expanded the country coverage.

bond spreads to incorporate systematic summary measures of events reflected in news, and to assess the importance of various categories of news. We consider the variation in spreads for our entire sample of emerging markets, in an attempt to identify the determinants of bond spreads more generally. Using multivariate regression analysis, we simultaneously relate emerging market bond spreads to macroeconomic variables and the number of news items regarding various types of events. This allows us to gauge the extent to which fundamentals—including both macroeconomic variables and the information available to investors from news on political, economic, and institutional events—explain variation in spreads on bonds issued by emerging markets, for 1870–1913 and the modern period.

We obtain two main results. The first, based on evidence from both periods, is that wars and episodes of politically-motivated violence have the most immediate and pronounced impact on the cost of borrowing.⁴ In contrast, institutional and political reforms (such as the introduction of a constitution) or efficiency-enhancing structural reforms seldom reduce the cost of capital quickly, though there are tentative signs that, in a few instances, reforms of the monetary framework have a rapid and substantial impact on spreads, especially when they are seen as the focal point of a concerted effort at buttressing the credibility of macroeconomic policies. Thus—at least at the quarterly and annual frequency—peace and stability seem to matter more for the ability of countries to borrow than does the establishment of investor friendly institutions. While the findings are consistent with the view (which we consider eminently sensible) that appropriate reforms can be beneficial in the long run, the benefits of reforms seem to accrue in a gradual manner, possibly because it takes time for investors to observe whether new *de jure* arrangements are respected *de facto*, in a durable manner.

The second result relates to the differences between the two periods: country-specific fundamentals (both news and macroeconomic variables) played a more important role in determining spreads in 1870–1913 than they did in the 1990s. Both the country's political and economic climate, as reflected in quantitative summaries of news items, and macroeconomic variables, such as exports and the fiscal balance, affected spreads in the earlier period of globalization. In contrast, country-specific fundamentals seem to matter to a lesser extent in the modern sample. At the same time, the same broad patterns regarding the types of variables that matter remain valid in both the historical and the modern sample. In particular, low spreads are associated with sound macroeconomic policies and absence of violence. Consistent with this result, in Mauro, Sussman, and Yafeh (2006; henceforth MSY) we find that, controlling for fundamentals, the association between the market-capitalization-based average spread for emerging markets and individual country spreads is higher in

⁴ The regression-based evidence is especially strong for the historical period. In a broader effort (Mauro, Sussman, and Yafeh, 2006), this is complemented by case studies and an analysis systematically relating sharp changes in spreads with important news items. On that basis, to the extent that country-specific news matter, episodes of war and politically-motivated violence are the most relevant in the modern period as well; in contrast, news regarding reform episodes are seldom found to play a significant role.

modern times than in the historical period; stated differently, co-movement between bonds of different countries is higher today.⁵ We conjecture that these results could be partly due to the important role played by institutional investors in modern times, and arrangements underlying their behavior, such as portfolio benchmarking.

The present study is naturally related to our own previous work (Mauro, Sussman, and Yafeh, 2002), which analyzed the behavior of sovereign bond spreads for emerging markets in 1870–1913 and the 1990s, finding greater co-movement in the 1990s than in the pre-WWI period; that effort, however, did not address the determinants of sovereign bond spreads—a task that we have now been able to undertake after collecting an extensive data set on macroeconomic variables and news events.

Our current focus on the determinants of spreads is related to a pioneering study by Bordo and Rockoff (1996), who argue that adherence to gold standard rules acted as a “seal of approval” that was reflected in significantly lower spreads on sovereign bonds; in contrast, the role of fiscal policy and monetary policy indicators was significant in only few of Bordo and Rockoff’s specifications. A flurry of more recent studies has analyzed the determinants of spreads for the historical period, focusing on the role of the gold standard and the British Empire (Obstfeld and Taylor, 2003; Ferguson and Schularik, 2004 and 2005), and providing some evidence of a significant association between bond spreads and macroeconomic variables (Flandreau and Zumer, 2004).⁶

Our interest in the link between news and bond spreads is also connected to a number of studies on modern period data, which usually find that asset prices cannot be easily linked to fundamentals: macroeconomic variables explain, if anything, a small portion of the variation in spreads.⁷ Moreover, different studies identify different variables as relevant. Indeed, the only variable that seems to be consistently significant across several empirical studies is a country’s credit rating.⁸ This is not to say that fundamentals do not matter, or

⁵ The higher co-movement of emerging market bond spreads in the 1990s relative to 1870–1913 cannot be fully attributed to higher co-movement of economic fundamentals in modern times (see Mauro, Sussman and Yafeh, 2002 and 2006). As documented in MSY, Argentina’s massive default in 2001 seems to have been followed by a decline in co-movement of spreads across emerging markets.

⁶ Flandreau and Zumer (2004) emphasize the importance of the ratio of interest payments to revenues. We do not consider interest payments as a determinant of interest rates, because of concerns about the direction of the causal relationship; such concerns would remain even using lagged values, owing to the autocorrelation of interest rates.

⁷ Examples include: Cline and Barnes (1997); Dell’Ariccia, Schnabel, and Zettelmeyer (2002); Eichengreen and Mody (1998); Kamin and von Kleist (1999); Min (1998); and Sy (2002).

⁸ Rating agencies are likely to pay close attention not only to macroeconomic variables and other fundamentals, but also to spreads and market participant views in providing ratings; thus, owing to concerns about potential endogeneity, we do not use credit ratings in our estimation.

have no predictive value at all.⁹ On the whole, however, the predictive power of existing models seems to be rather limited.

The remainder of this paper is structured as follows. The next section describes the data and discusses related methodological issues. The empirical results for the historical and modern periods are presented in Sections 3 and 4, respectively. Section 5 concludes.

2. Data and Methodological Issues

Before proceeding, it may be useful to define the term *emerging market countries*. We apply a similar definition to that adopted by Bordo and Eichengreen (2000). They classify countries as emerging markets—following modern parlance—on the basis of whether they were far from the industrial core of Europe; had relatively low per capita incomes; were net recipients of capital inflows; and had relatively under-developed domestic financial markets. For example, we include Canada and Australia, despite their relatively high incomes, because they remained recipients of capital and their domestic financial markets did not develop as much as in other advanced countries. In contrast, we exclude the United States from the sample because by the turn of the century the U.S. was no longer a net recipient of capital flows, had a fairly developed domestic financial market, and was as economically advanced as the European core. To be included in the sample, we also require borrowing in Pounds Sterling; some European countries—notably Spain—are excluded from the sample because they borrowed extensively in their own currencies (Flandreau and Sussman, 2004). Of course, we recognize that there is no single definition or classification of emerging market countries, and therefore we strive in our estimation and interpretation to ensure that our key results are robust to changes in the sample of countries.

Our sample consists of the following eighteen emerging market countries: Argentina, Brazil, Canada, Chile, China, Colombia, Costa Rica, Egypt, Greece, Hungary, Japan, Mexico, Portugal, Queensland,¹⁰ Russia, Sweden, Turkey, and Uruguay. This includes all the largest borrowers of the time, and represents a diverse group of countries, varying substantially with respect to geography, trade structure, macroeconomic policies, and political, institutional, and economic regimes. The sample includes three major less developed European borrowers—Hungary, Russia and Turkey—as well as the stable but as yet under-developed Sweden, a smaller borrower; the European peripheral countries of Greece and Portugal, the latter a declining colonial power; all the major borrowers in Latin America (Argentina, Brazil, Chile, Mexico and Uruguay), and the two major Asian powers (China and Japan); the two largest countries with close ties to Britain, namely, Canada and

⁹ Several private sector analysts (notably, in investment banks) provide model-based views to their clients on whether countries' current market spreads are justified by fundamentals.

¹⁰ Queensland was a British colony starting in 1859 and became one of the states forming the federation of Australia upon independence in 1901.

Australia (proxied by Queensland), as well as Egypt, though only before it became closely tied to Britain in 1882.

In choosing the historical variables and data to be used in the analysis, we strive to stay as close as possible to the data that were available at the time to investors active on the London market, and focus on variables that were reported regularly in the contemporary financial press, especially the *London Times* and *The Economist's Investor's Monthly Manual* (IMM). Thus, for example, we do not use data on GDP, a concept not used at the time.¹¹

Our focus is on the determinants and behavior of emerging market bonds. We therefore collect data on bond characteristics and prices, and on variables that may capture investors' perceptions of borrowing developing countries and their creditworthiness. We are interested in "country risk," defined as the interest premium a country has to offer investors in excess of the risk-free rate of return. More specifically, our analysis is based on the assumption that differences in default risk (measured in various ways) account for differences in the cost of capital across borrowing countries.

Historical Spreads

In the historical sample, the risk premium is the differential between the yield on emerging market bonds and British Consol yields. We collect all of our spread series directly from the IMM, correcting them on the basis of bond features (such as varying coupons, and instances in which the coupons were changed or not paid) as reported in the same source. To ensure the quality of the spreads data, we exclude all observations where the IMM notes that the country is not paying coupons.¹²

For the eighteen emerging market countries in our sample, we use end-of-year bond yields. (Details on the bonds used for each of these countries appear in Appendix 1.) In addition, our data set includes an average index of historical government bond yields for all emerging markets in the sample. Whereas previous studies used unweighted or GDP-weighted indexes of yields, this index is, for the first time, market-capitalization-weighted and thus similar in concept to the modern EMBI index (see below). Specifically, we compute the index using 5-year variable weights based on the market capitalization reported in the IMM. Countries in default (where yields cannot be reliably computed) are excluded from the index during the default period.

¹¹ The quality of the GDP data constructed by modern scholars for the historical period might also be a source of potential concern.

¹² In addition, we exclude eight observations where the yield is above 10 percent (implausibly high given the standards of the time, and likely to reflect measurement errors). Our results are essentially unchanged if we include all such observations in the estimates.

In computing bond yields for the historical sample, we seek to stick as much as possible to the methods used by contemporaries, and to avoid the pitfalls often encountered in modern-day estimates of historical yields. In particular, as mentioned above, we note all bond details and covenants, as well as information on actual coupon values and payments, as reported in the IMM. This helps us generate the most accurate bond yield data currently available for 1870–1913. A thorough explanation of the methods we use in estimating yields, as well as a number of interesting methodological issues and changes that have occurred in this respect over the past 100 years or so is provided in MSY.

Modern Spreads

The modern data on spreads are those from JPMorgan’s Emerging Markets Bond Index (EMBI). This is a standard and widely available source that reports secondary market spreads for emerging market bonds and also computes a weighted index of all the emerging market bonds covered by JPMorgan. Issuance of sovereign bonds and their secondary market trading is a phenomenon of the 1990s, which began with the Brady deals. Our sample thus consists of the eight countries (Argentina, Brazil, Bulgaria, Mexico, Nigeria, the Philippines, Poland and Venezuela) for which data are available since 1994. As secondary market trading for each of the countries in our modern sample began essentially with the Brady deals, one important characteristic that distinguishes the modern from the historical sample is that all countries in the modern sample had defaulted prior to the period under consideration, whereas only some of the countries in the historical sample had defaulted prior to 1870. Even though this may complicate comparison with the historical sample, we feel that this is the relevant sample for today, particularly because these countries are among the most important in terms of market capitalization. (For another important issuer, Russia, available data begin only in 1998).

Investors’ Information Set – The Historical Sample

We compile a dataset consisting of macroeconomic variables and news reports in order to generate a picture of each borrowing country’s stability, economic and institutional development, and perceived credit worthiness. This data set is based on information from contemporary newspapers articles.

Our source for news and the related numerical indicators in the historical sample is the *London Times* (and Palmer’s Index to find news related to the countries we analyze).¹³ This source is used to reconstruct the perception of an emerging economy that a contemporary investor would have had on the basis of daily news reports.

¹³ Unfortunately, neither the *London Times* nor Palmer’s Index provide a practical way of identifying major news on the basis of criteria such as the size and location of the articles. In fact, *London Times* editions of the late nineteenth century were not structured like modern newspapers, with a front page and headline news: the newspaper began with what today would be the classified section of newspaper, rather than news items.

For each country in our sample, we classify all news articles reported in Palmer's Index to the *London Times* into the following categories:

(i) *Wars/violence*, including events such as coups, assassinations, riots, and strikes; but also suppression of rebellions (relatively good news following a period of turbulence).

(ii) *Bad economic news* such as natural disasters, poor crops, and other adverse economic developments including those reflected in statistical data releases on macroeconomic variables such as fiscal or trade deficits, but excluding adverse changes in asset prices, especially bond spreads (the variables we seek to explain).

(iii) *Good/neutral economic news*: economic news that seem either positive or neutral from the viewpoint of foreign investors, such as good harvests and increased tax revenues.

(iv) Investor-friendly *reforms* and institutional changes, including tax reforms, adoption of the gold standard or currency boards, tariff reductions, and changes in the constitution, the legal system, the franchise, or the school system.

(v) *Domestic politics*: news on elections and political parties. (It would not have been possible to classify such news into good, neutral, or bad news, as perceived by contemporaries).

(vi) *Foreign relations*: exchange of ambassadors, diplomatic visits, peace treaties, trade agreements, and so forth.

(vii) *Miscellaneous* other articles.

Investors' Information Set: The Modern Sample

For 1994–2002, the news items are drawn from the *Financial Times* (FT), through a systematic (electronic) search of all the news items that contained the name of the country in the title or electronic subject line. Many news items were discarded as not relevant for the purpose of this research (for example, the numerous items related to sports events such as the soccer world cup matches). We then allocated the news items among the same categories as for the historical sample, as listed above. The electronic search makes it possible to distinguish between articles that appear on the front page and articles that appear in other pages; and between articles that only appear in brief summary form on the front page, and articles that appear also in other pages.

Macroeconomic Data

To complete our information set on emerging markets we compile essential macroeconomic variables that are usually associated with country risk. For the historical period, we collected annual data on government finance, exports and population from Mitchell's International Historical Statistics and a host of other country specific sources, as

described in detail below and in Appendix 2 (the notion of GDP did not exist at the time). We supplemented a few of the missing series by using the data collected by Obstfeld and Taylor (2003b), kindly provided by Alan Taylor (and, through him, several earlier vintages of scholars). Ideally we would have preferred to use data that contemporaries had. However, the data coverage by the IMM has some gaps which would have rendered the econometric tests infeasible. Therefore, we opted to use the IMM only as a complementary source, for the countries where data from other sources were not available or seemed less reliable.

For the modern period, annual data on GDP per capita, exports, government revenues and expenditures, and the exchange rate are drawn from the International Monetary Fund's International Financial Statistics; data on public debt are from the World Bank's Global Development Finance. Quarterly data are drawn from the International Financial Statistics and the International Monetary Fund's country desks.

Some of the data we work with are, of course, of uncertain quality, especially for the historical sample, and one has to recognize this in interpreting the results of our empirical analysis. At the same time, statistics—however imperfect—do convey useful information that allows for meaningful economic analysis. What is clear is that some of the data we use are more reliable than others. Financial variables, notably bond yields, are presumably not subject to error, although we are unable to take into consideration some of the detailed features of all of the bonds; in addition, there are challenges involved in computing yields appropriately in times of partial or complete default, or around changes in relevant bond features (see MSY, Annex 2.1). The news we rely on are drawn from the newspapers and of course there is judgment involved in classifying them in various categories. Nevertheless, generally speaking, and for our purposes, we do not think that the accuracy of the news indicators today is substantially different from that of a hundred years ago. The one type of data where we believe quality is a more serious issue, and to an even greater extent in historical times than modern times, relates to the macroeconomic variables. To some extent, this is because macroeconomic concepts were different in the pre-World War I period; in addition, some of the variables were not systematically constructed or monitored.

Given that one of our main findings is that news items, and especially war news, are associated with higher spreads, the reader might wonder whether our approach, based on the number of news, provides substantial value added compared with an alternative approach that might be based upon simply noting when important wars were taking place. More generally, does the number of news really present major advantages compared with dummy variables that might be chosen to represent important events? In our opinion, an approach based upon the number of contemporary news reports has three related advantages. First, it leaves far less room for the researchers' judgment in influencing the results: although we do exercise a minimal degree of judgment in allocating news among the various categories, we include all news reports related to a given country, and therefore have essentially no discretion in choosing which news items to include in our analysis. We would have far more discretion if we were to select events from history books or other sources (in that case, we would have to choose what constitutes an event with no objective criterion to guide us). Second, history books have the benefit of hindsight in highlighting major events. Thus, if we

were to use dummies for “major wars,” for example, drawing them from history books, we would be picking our events on the basis of more information than was available to contemporary investors at the time. Third, the number of news items is a reasonable proxy for the perceived degree of importance at the time. Minor wars were likely to be reflected in fewer news items than were major wars, as viewed by contemporaries.

Our regression estimation approach does not introduce technical innovations, as most of the techniques that we use have been adopted by at least one previous study on related topics. Nevertheless, as existing studies have used a variety of approaches, it is worth highlighting a number of features of the approach we take, as follows:

- We use secondary market spreads, rather than primary market spreads. An advantage of this approach is that secondary market spreads are available at all times, not just at times when bonds are being issued.
- We include country-specific dummies (fixed effects) in most of our estimates, though we also present estimates without such dummies, mainly for the sake of data description. Country dummies are necessary to take into account that both spread levels and many, possibly unobservable, country-specific characteristics tend to persist in time. Failure to include such dummies would be equivalent (informally speaking) to overestimating the number of observations that can be truly claimed to be independent.

Our main approach is to run panel regressions with the logarithm of spreads (expressed in basis points) as the dependent variable, and several independent variables, as follows.

News

Our “raw data” consist of the number of news of various categories for each country and each year. (Monthly data are here aggregated to yearly data to be consistent with the macroeconomic data). These data range from zero, very frequently, to—in a few rare cases—hundreds or even thousands of news items per country per year. To use these data in regression analysis, we adopt either of two transformations of the data. The first is the logarithm of one plus the number of news in each of the following categories: “good economic,” “bad economic,” “political,” “reform,” “war/violence,” and “foreign relations.” The second is the share of news in each of the categories listed above in total news for the country and the year in question.¹⁴ (A final category, “other,” or “none of the above,” is omitted from the regressions, and therefore all estimated coefficients need to be interpreted with respect to it.) A disadvantage of the first approach is that it does not allow for an easy

¹⁴ For the few country/years with no news reports, we set all fractions to be zero. This is preferable to treating these cases as missing values, and is equivalent to adding one news item to the category “other news” when the total number of news would otherwise be zero.

assessment of the importance of news of a given category as a share of total news. Moreover, Palmer's Index to the *London Times*, from which we draw our news, changed format and became far more detailed beginning with the news for 1906. This resulted in approximately a trebling of news items reported from 1906 onwards.¹⁵ To correct for this change, we divide by three the number of news for each country, category, and year, beginning in 1906. A disadvantage of the second approach is that instances in which a given country's news items are few but all refer to the same category take an even greater value than do instances in which news items are plentiful but do not all refer to the same category. Thus, for example, a minor incident of violence that generated a handful of news items in otherwise uneventful times may take a greater value than a major war in a country where news are usually plentiful.

Macroeconomic Variables and Other Controls

Exports: the logarithm of exports expressed in common currency (pounds sterling)—an indicator of economic performance, availability of foreign currency, and ability to repay the foreign debt.

Fiscal surplus: the difference between fiscal revenues and expenditures, divided by revenues, as an indicator of fiscal performance. (We use revenues as a “scaling” variable—today we would use GDP instead.)

Debt per capita: as an indicator of debt sustainability. The IMM often provides data on debt in this form, and contemporary commentary often refers to debt per capita. We find this preferable to the debt/GDP ratio because GDP is a modern concept that was not used at the time, and the GDP series that have been constructed for the historical period may not be sufficiently reliable. We also prefer this indicator to the ratios of debt to exports or debt to revenues because, compared with data on population, data on exports or revenues have more missing observations and seem less reliable. We only use this variable in a limited number of specifications, because debt levels are likely to be endogenous to interest rate spreads.

Gold standard: dummy variable taking the value of 1 when countries were on the gold standard in a given year and 0 otherwise.

Default history: dummy variable taking the value of 0 when a country has never defaulted, and 1 in the year of default and all subsequent years.

¹⁵ More precisely, the average number of news for all countries and all news categories in 1906-08 is 2.96 times the average number of items for all countries and all categories in 1903-05. (The increase does not seem to affect particular countries or categories more than proportionately.) This approximate “splicing” procedure assumes that the years 1903-05 were as “eventful” as 1906-08.

Market-capitalization-weighted average of the spreads for all emerging markets: to control for developments that affected all emerging markets simultaneously. This is especially useful to capture the decline in spreads experienced by most emerging markets in the early twentieth century.

3. Results for the Historical Sample

Overall, the results in this section indicate that several macroeconomic variables and news-related indicators are significantly associated with spread levels, with the expected signs, though for some variables the results are not robust to changes in sample and specification.

We begin with descriptive statistics and simple cross sectional exercises. We report the 1870–1913 average of the spreads and all the potential explanatory variables, for each emerging market individually and for the subgroups of countries that ever defaulted at some point in 1800–1913, and those that never did.¹⁶ Few variables differ systematically across the two subgroups, reflecting several instances where individual countries really stand out as having particularly high values of some of the variables (debt per capita in Queensland, for example), and such countries fall in both sub-samples. These patterns suggest that the pure cross-sectional information in the data may not lead to strikingly significant results; moreover, the results are likely to be subject to “influential observations,” that is, the results may change substantially if a particular country is removed from the sample. In what we present below, we check to the best of our ability that our main results are not substantially affected by such changes in the sample.

¹⁶ We include Russia in the list of countries that defaulted, in light of its default in 1839 and imposition of a coupon tax in 1885 (Beim and Calomiris, 2001). The results are unaffected if we include Russia among the non-defaulters.

Table 1. Averages of Spreads and Potential Explanatory Variables, 1870–1913

Country	Spread (percentage points)	News items per year										Fractions (in percent of total news)					
		Wars	Econ. Good	Econ. Bad	Foreign	Reform	Political	Total	Govt. Balance	Exports (mill. Pounds)	Debt per Capita	Wars	Econ. Good	Econ. Bad	Foreign	Reform	Political
Never Defaulted																	
Sweden	1.0	1	5	1	8	1	4	29	-0.01	18.43	3.38	2.7	17.2	2.0	15.8	5.4	20.1
Queensland	1.1	0	11	2	0	2	3	23	0.00	7.41	63.00	1.8	49.6	6.9	1.3	7.9	10.6
Canada	1.2	9	173	8	26	2	62	343	-0.13	31.14	10.22	4.7	37.7	3.0	9.9	0.8	19.5
Hungary	2.0	9	7	1	3	2	11	42	-0.25	69.79	9.76	10.4	21.7	2.6	5.7	3.5	26.9
China	3.1	55	48	7	48	6	4	193	n.a.	25.08	0.12	18.2	27.4	5.3	32.2	2.8	1.2
Japan	3.2	4	27	3	36	1	7	56	0.13	19.18	2.11	24.1	54.5	8.7	41.1	6.9	9.6
Defaulted																	
Russia	1.8	92	69	16	153	5	100	515	-0.18	77.62	4.77	14.5	15.8	3.0	31.9	0.6	15.7
Brazil	2.2	7	34	4	7	2	10	74	-0.16	32.17	2.31	9.8	31.6	6.2	15.8	5.1	16.6
Portugal	2.4	16	14	7	26	5	19	102	-0.07	4.98	9.35	8.6	16.1	5.8	25.4	2.2	16.6
Chile	2.5	4	13	1	10	1	5	36	-0.10	12.88	4.86	13.0	23.6	3.5	28.6	3.7	17.3
Turkey	2.7	44	133	12	274	11	113	517	n.a.	14.48	3.79	6.1	23.5	3.2	48.4	1.7	20.2
Greece	3.0	8	24	6	67	2	26	148	-0.14	3.75	12.50	2.9	19.7	5.4	34.7	1.6	24.0
Mexico	3.0	16	23	2	9	1	2	50	0.05	18.31	1.83	15.1	54.4	1.3	7.6	3.0	4.3
Argentina	3.2	4	28	6	5	4	6	56	-0.36	29.07	12.82	10.5	38.8	8.4	11.5	6.8	12.5
Uruguay	4.2	4	13	1	1	0	5	25	0.01	5.90	22.71	9.7	37.0	9.7	6.9	1.9	21.1
Egypt	4.7	133	53	26	98	12	42	446	-0.14	12.12	15.92	11.4	25.4	5.4	25.6	5.3	9.2
Colombia	4.8	1	8	0	1	0	0	10	-0.06	3.35	1.00	15.7	30.8	0.8	4.7	0.6	2.2
Costa Rica	6.1	0	1	0	0	0	0	2	-0.01	1.26	9.85	8.8	31.6	15.8	3.5	5.3	0.0
Averages (unweighted)																	
Never Defaulted	1.9	13	45	4	20	2	15	114	-0.05	28.51	14.76	10.3	34.7	4.8	17.7	4.6	14.6
Defaulted	3.4	27	34	7	54	4	27	165	-0.11	17.99	8.48	10.5	29.0	5.7	20.4	3.2	13.3

Notes: The list of countries that defaulted is based upon Beim and Calomiris (2001). Data sources and definitions are provided in the text. Within each category (defaulters and non-defaulters) countries are ranked by their average spread.

We now turn to regression analysis. To focus on the news data, which constitute one of our main contributions, we provide the results of regressions using news indicators only (Table 2). This also allows us to explore the relationship between news and spreads for a larger sample of countries, because for some of the countries in our sample macroeconomic variables are not available (and were not available to investors at the time).

As a preliminary, descriptive exercise, and to provide a sense of the results including not only the time series information, but also the cross sectional information in the data, we report the results of pooled regressions without individual country fixed effects. The regressions include quantitative indicators of news and, in some specifications, the average (market-capitalization weighted) spread for all emerging markets of a given type (using either logarithms or shares) of news. More precisely, in some regressions we use the logarithm of the number of news of each type (our preferred specification); in other regressions, we use the share of news of a given type in total news (that is, for example, the share of war news in total news).

Recalling that our dependent variable is the logarithm of the spread, the size of the coefficients on quantitative indicators of news needs to be interpreted as follows. When using the logarithm of the number of news, the size of the coefficient is the estimated elasticity with respect to the number of news, that is, the percent increase in spreads resulting from a one percent increase in the number of news of a given category. When using fractions, the size of the coefficient indicates the percent increase in spreads resulting from a one percentage point increase in the share of news of a given category. The omitted category is “other” news (those that were not classified in any of the categories listed in the estimation), and the coefficients are to be interpreted with respect to that omitted category.

Table 2 indicates that news on wars and violence are significantly associated with higher spreads, in all specifications. The impact of war news on spreads seems to be substantial: on the basis of the log specification (first column), a doubling of the number of war news would result in an 11.4 percent increase in the spreads; on the basis of the shares specification (seventh column), a 10 percentage point increase in the share of war news at the expense of “other” news would result in a 6.4 percent increase in the spreads.

The estimated coefficients on both bad economic news and good/neutral economic news have the expected signs, though they are statistically significant only in a subset of specifications. In the shares specification, the coefficient on bad economic news is always significantly larger (more positive) than the coefficient on good/neutral economic news. This implies that a shift of news items from the category “other” to the category “bad economic news” tends to raise spreads more than a shift to the “good/neutral economic news” category. The coefficients on other types of news are not robust to changes in specification. Default history is significantly associated with higher spreads when individual country fixed effects are omitted. Controlling for country effects, default history has the expected sign but is no longer statistically significant (i.e. the default history variable is strongly correlated with the country fixed effects). The average (market-capitalization weighted) spread for all emerging markets is significantly and robustly associated with the spreads in individual markets (with

Table 2. Spreads and News, Panel Regressions, 1870–1913

	News in logarithms				News in fractions							
	No fixed effects		With fixed effects		No fixed effects		With fixed effects					
Wars	0.114 [0.021]*	0.109 [0.020]**	0.095 [0.018]**	0.052 [0.017]**	0.044 [0.014]**	0.044 [0.014]**	0.640 [0.115]*	0.540 [0.106]**	0.509 [0.096]**	0.359 [0.084]**	0.232 [0.065]**	0.234 [0.065]**
Good / Neutral Economic	-0.165 [0.027]*	-0.098 [0.026]**	-0.049 [0.024]*	-0.147 [0.023]**	-0.033 [0.019]	-0.034 [0.020]	-0.302 [0.078]*	-0.108 [0.073]	-0.055 [0.067]	-0.314 [0.058]**	-0.088 [0.046]	-0.091 [0.047]
Bad Economic	0.069 [0.032]*	0.066 [0.030]*	0.056 [0.027]*	0.041 [0.023]	0.052 [0.018]**	0.051 [0.018]**	0.834 [0.241]*	0.910 [0.221]**	0.783 [0.200]**	0.163 [0.175]	0.260 [0.136]	0.254 [0.137]
Reform	0.010 [0.034]	-0.006 [0.031]	0.020 [0.028]	-0.008 [0.026]	-0.017 [0.021]	-0.018 [0.021]	0.160 [0.293]	0.003 [0.269]	0.248 [0.245]	0.241 [0.211]	0.123 [0.164]	0.119 [0.165]
Political	-0.119 [0.023]*	-0.126 [0.021]**	-0.162 [0.019]**	-0.014 [0.023]	0.014 [0.018]	0.014 [0.018]	-0.346 [0.160]	-0.273 [0.147]	-0.280 [0.133]*	0.164 [0.124]	0.262 [0.097]**	0.261 [0.097]**
Foreign	0.071 [0.022]*	0.042 [0.021]*	0.019 [0.018]	0.007 [0.021]	-0.008 [0.017]	-0.007 [0.017]	0.360 [0.121]*	0.329 [0.111]**	0.249 [0.101]*	0.087 [0.108]	0.041 [0.084]	0.041 [0.085]
Default History			0.522 [0.041]**		0.027 [0.083]	0.027 [0.083]			0.488 [0.042]**			0.045 [0.082]
Portfolio Spreads		0.453 [0.044]**	0.517 [0.040]**		0.561 [0.029]**	0.563 [0.030]**		0.498 [0.046]**	0.545 [0.042]**		0.555 [0.028]**	0.559 [0.029]**

Note: The sample consists of 627 country/year observations. Single asterisks indicate significance at the 5 percent level; double asterisks indicate significance at the 1 percent level. Standard errors are in brackets.

an elasticity of 0.45–0.55): co-movement of spreads across emerging markets was substantial in historical times, though not as high as in the 1990s.

Table 3 presents regression specifications with controls for various macroeconomic characteristics. In addition to default history and market-capitalization-weighted average spreads, we include gold standard adherence, exports, the government surplus, and debt per capita. In this table, we report the results obtained using not only fixed effects panels, but also two econometric techniques (Feasible Generalized Least Square and Arellano-Bond) aimed at taking into account the fact that spreads tend to be persistent in time.¹⁷ The Annex reports the results obtained using alternative econometric techniques and equation specifications, showing that our key results are robust to such changes.

The importance of war and violence news is confirmed when controlling for other variables, including macroeconomic variables and adherence to the gold standard. As before, a shift from bad economic news to good economic news would typically tend to be associated with a decline in spreads. Controlling for the gold standard is of special interest, in view of the significant results obtained by Bordo and Rockoff (1996) and Obstfeld and Taylor (2003). In our sample, and controlling for individual country effects, the gold standard is significantly associated with lower spreads in some, though not all specifications.¹⁸ In a number of specifications, some macroeconomic variables are significant. In particular, higher exports and a higher fiscal surplus are negatively and significantly associated with spreads. Other macroeconomic variables, such as debt per capita and inflation, are typically not significant.¹⁹

¹⁷ The first technique, feasible generalized least squares, lets the residuals (unexplained portion of the spreads) take an AR(1) form, with a country-specific autoregression coefficient. The second technique, developed by Arellano and Bond (1991), includes the lagged dependent variable in the list of regressors, and corrects the well known bias that would result in a panel context by using further lags of the variables (in levels and changes) as instruments. In the Arellano-Bond specifications, we let debt per capita be an endogenous variable because, as discussed above, spreads contribute to determining the debt level.

¹⁸ At the same time, countries with a perfect record of adherence to the gold standard clearly enjoyed lower spreads, an issue we discuss below.

¹⁹ The coefficient on debt per capita is usually not significantly associated with spreads; moreover, the coefficient is not robust to changes in specification and sample (not reported for the sake of brevity), especially in regressions without individual country fixed effects. In particular, the results are highly sensitive to the inclusion of Queensland in the sample. This may partly reflect the endogeneity of debt with respect to bond spreads: countries that are able to borrow at relatively low interest rates will accumulate considerable amounts of debt. Queensland may be an example of this, as it had relatively low spreads and an unusually high debt to population ratio in our set of countries. In additional (unreported) specifications, inflation (which reduced the size of the sample considerably, owing to limited data availability) did not turn out to be significant. Perhaps this should not be too surprising, given that inflation was not one of the variables of interest in publications such as the IMM.

Table 3. Spreads, News, and Macroeconomic Variables, 1870–1913

	Fixed Effects Panel			Feasible Generalized Least Squares			Arellano-Bond		
Wars	0.032	0.045	0.042	0.024	0.023	0.027	0.028	0.034	
Good / Neutral Economic	[0.016]*	[0.013]**	[0.015]**	[0.006]**	[0.007]**	[0.006]**	[0.008]*	[0.008]**	
	-0.024	-0.032	-0.021	0.002	-0.004	0.008	0.012	-0.005	
Bad Economic	[0.023]	[0.020]	[0.023]	[0.009]	[0.010]	[0.009]	[0.013]	[0.013]	
	0.013	0.048	0.030	0.011	0.013	0.012	0.029	0.026	
Reform	[0.022]	[0.018]**	[0.021]	[0.008]	[0.008]	[0.007]	[0.011]*	[0.011]*	
	-0.017	-0.021	-0.006	-0.006	-0.009	-0.006	-0.008	-0.007	
Political	[0.024]	[0.020]	[0.023]	[0.009]	[0.010]	[0.009]	[0.013]	[0.013]	
	0.028	0.014	0.022	-0.007	-0.002	-0.009	0.008	-0.001	
Foreign	[0.021]	[0.018]	[0.020]	[0.008]	[0.009]	[0.008]	[0.012]	[0.011]	
	0.041	-0.001	0.019	-0.003	-0.004	-0.000	0.014	0.004	
Gold Standard	[0.019]*	[0.017]	[0.019]	[0.007]	[0.008]	[0.007]	[0.011]	[0.010]	
	-0.052	-0.093		-0.178		-0.184	-0.151	-0.158	
Default History	[0.045]	[0.038]*		[0.037]**		[0.034]**	[0.045]**	[0.041]**	
	0.213	0.057	0.229	0.079		0.238	0.518	0.566	
Exports	[0.116]	[0.084]	[0.110]*	[0.068]		[0.060]**	[0.169]**	[0.118]**	
	-0.465		-0.195			-0.230	-0.114	-0.088	
Fiscal Surplus	[0.042]**		[0.057]**			[0.026]**	[0.060]	[0.054]	
	-0.143		-0.053			-0.040	-0.018	-0.010	
Debt per Capita	[0.069]*		[0.068]			[0.032]	[0.037]	[0.035]	
			0.014				0.077	0.077	
Portfolio Spreads		0.541	[0.052]			0.445	0.264	0.175	
		[0.031]**	0.411			[0.042]**	[0.055]**	[0.046]**	
Lagged Spreads			[0.054]**				0.425	0.462	
							[0.039]**	[0.033]**	
Number of Observations	531	627	522	627	531	627	482	477	

Note: News in logarithms. Single asterisks indicate significance at the 5 percent level; double asterisks indicate significance at the 1 percent level. Standard errors are in brackets. News indicators refer to the logarithm of the number of news for the category indicated.

While we prefer techniques that include individual country fixed effects, the individual country fixed effects contain useful information which we try to relate to time-invariant (or near time-invariant) country characteristics. The estimated individual country dummies seem to bear some relationship to characteristics such as adherence to the gold standard, geographic location, links to the British Empire, and a history of default. Table 4 ranks the countries in our sample according to the individual country dummies estimated in the fixed effects regression in the fifth column of Table 2, which includes news and the portfolio spreads, but excludes the gold standard dummy and macroeconomic variables.²⁰ The dummies represent the (period average) portion of the spreads that is not explained by the independent variables in the regression for each country. Serial defaulters such as Costa Rica, Colombia, and Uruguay display the largest individual country dummies; more generally, countries with a history of default have larger individual country fixed effects than do countries with an impeccable repayment record. Countries located in Europe, countries that adhered to the gold standard for essentially the whole period (Queensland, Sweden, and Canada), and countries with close links to the British Empire (Canada and Queensland) also have relatively low individual country fixed effects. Given the substantial overlap of countries across categories, and the small sample, the reader will note how difficult it is to tell whether what matters is, for example, links to the Empire or adherence to the gold standard. Interestingly, China and Japan faced relatively high spreads (controlling for fundamentals), despite their unblemished repayment record, possibly because they were not well known to British investors: not only were these countries far from Britain in terms of geography and culture, but also they had accessed the London market for the first time relatively recently.

All in all, regression analysis on the historical data suggests that some types of news, notably “war and violence” news are significantly and fairly robustly associated with higher spreads; and that macroeconomic variables such as the fiscal deficit and exports are significantly associated with spreads, with the expected signs.

²⁰ Similar exercises based on alternative regression specifications yield broadly similar rankings.

Table 4. Individual Country Effects and Country Characteristics, 1870–1913

Country	Individual Country Effect	Gold standard	History of Default	Links to British Empire	Europe
Costa Rica	0.90	~	+		
Colombia	0.68	~	+		
Uruguay	0.60	~	+		
Mexico	0.47	~	+		
China	0.32				
Japan	0.31	~			
Argentina	0.29	~	+		
Egypt	0.27	~	+		+
Greece	0.26		+		
Turkey	0.25	~	+		
Chile	0.10	~	+		
Portugal	-0.03	~	+		+
Brazil	-0.05	~	+		
Hungary	-0.17	~			+
Russia	-0.33	~			+
Queensland	-0.66	+		+	
Sweden	-0.80	+			+
Canada	-0.87	+		+	

Note: Individual country effects are the estimated dummies from the regression in the fifth column of Table 2. For the gold standard, a “plus” sign indicates adherence for essentially the entire period, and a tilde indicates adherence for only part of the period.

4. Results for the Modern Sample

For the modern period, we find substantially weaker results regarding the importance of news, and similar or slightly weaker results for the role of macroeconomic variables. We present estimates based on both annual and quarterly data. Our sample consists of the eight emerging markets for which spreads are available beginning in 1994. This yields about 70 annual observations with the requisite macroeconomic data and news indicators. Using quarterly data makes it possible to increase the number of observations to around 150–230 (depending on the specification), though this requires excluding Nigeria from the sample, owing to data limitations.²¹

²¹ While one could increase the number of emerging markets by accepting a shorter sample period, it seems important to work with the longest available sample period, given that the historical sample period is already far longer than the modern period. A number of existing studies on modern data have used shorter sample periods, with larger samples of countries, and have found broadly similar results for the macroeconomic variables.

Quantitative indicators of news are often significant, especially in the regressions without individual country fixed effects. To the extent that country-specific news seem to matter, economic news bear the closest association with spreads (Table 5). Somewhat paradoxically, positive/neutral economic news seem to raise spreads even more than do negative economic news, though the difference is not statistically significant. Our interpretation is that the financial press tends to pay more attention to countries experiencing trouble, and will report both positive and negative economic news about countries experiencing a crisis or emerging from a crisis. News about wars and violence are also significant in a number of specifications, though the evidence is not as strong as for the historical period. In the modern sample there are also a number of specifications where news regarding investor-friendly reforms are associated with lower spreads—an empirical association that we do not find in the historical period.²² In some specifications, macroeconomic variables are significantly associated with spreads: the higher exports, real economic growth, and the fiscal balance (as a share of GDP), the lower the spreads (Table 6). Other macroeconomic variables, such as the debt/GDP ratio do not seem to play much of a role and occasionally are found to have an impact contrary to expectations.

On the whole, however, the most striking fact about modern spreads is their degree of co-movement across countries, far exceeding co-movement observed in historical times (Mauro, Sussman and Yafeh, 2002, and MSY). Consistent with that theme, we find the coefficient on (market-capitalization-weighted) average spreads to be 0.8–0.9 in modern times, compared with 0.4–0.5 in historical times.²³ A possible reading of the evidence is that this fact is more relevant than considerations regarding the relative importance of various country-specific factors (for example, wars/violence versus reforms) in modern times.

In interpreting our results for the importance of news about wars and other instances of politically motivated violence, and reforms, in the modern period compared with the historical period, a few caveats are in order. Regarding wars, there was certainly no shortage of major events in the modern sample, including political assassinations, coups, ethnically motivated unrest, and so on. Nevertheless, even if we do not have a precise way of comparing the importance of war news between the modern and historical periods (beyond the sheer number or share of news items), most people's intuition is that the number of major wars and all-out armed conflicts seem to have been less frequent in the modern sample than in the historical sample. Perhaps this is a factor underlying the result that war news seem to have had less impact on spreads in modern times than in historical times. Regarding reforms, the very notion of reforms seems to be fundamentally different in modern times than in

²² In the exercises (at the monthly frequency) relating sharp changes in spreads to news that we present in MSY, we find very few instances of reform news associated with sharp changes in spreads, whereas there are notable cases of war/violence news that seem to affect spreads rapidly and significantly.

²³ Including the lagged dependent variable among the regressors reduces the estimated coefficient on average spreads for both the historical sample and the modern sample; the result of higher co-movement in modern times than in historical times is thus maintained, as long as comparable techniques are used for both periods.

historical times. Indeed, classifying news about reforms for the modern period seems to us to have been a somewhat easier exercise than for the past. In modern times, there seems to be a considerable degree of consensus on what constitutes “market-friendly, investor-friendly” reforms. In this light, the tentative evidence that reforms may help reduce spreads in modern times, though only in a few of our estimates, seems fairly consistent with modern notions of reform.

On the whole, investors today and in the past seem to pay attention to both macroeconomic fundamentals and information reflected in the news, especially news related to violent conflict. It seems, however, that country-specific fundamentals today play a less significant role in determining spreads than they did in the past: news matter somewhat less today than they did in the past; and while macroeconomic variables matter as much or almost as much today as they did in the past, it is important to bear in mind the higher quality of today’s macroeconomic data. We conjecture that while investors in the past paid close attention to macroeconomic data, they were aware of the limitations of such data, and therefore focused even more closely on information that they obtained through the news.

Table 5. Spreads and News, 1994–2002

	Annual Data						Quarterly Data					
	Logs			Fractions			Logs			Fractions		
	No Fixed Effects	With Fixed Effects		No F.E.	With F.E.		No F.E.	With F.E.		No F.E.	With F.E.	
Wars / Instability	0.166 (0.079)*	0.183 (0.074)*	0.033 (0.086)	0.063 (0.074)	2.641 (0.699)*	1.683 (0.767)*	0.165 (0.056)*	0.041 (0.041)	1.155 (0.239)*	0.471 (0.177)*		
Good / Neutral Economic	0.397 (0.108)*	0.366 (0.101)*	0.262 (0.102)*	0.208 (0.089)*	2.665 (0.503)**	1.316 (0.496)*	0.251 (0.047)**	0.121 (0.033)*	1.481 (0.206)**	0.542 (0.148)*		
Bad Economic	0.235 (0.089)*	0.217 (0.083)*	0.089 (0.086)	0.055 (0.074)	3.381 (0.684)*	1.722 (0.723)*	0.218 (0.051)*	0.071 (0.035)*	1.527 (0.234)**	0.514 (0.166)*		
Reform	-0.331 (0.109)*	-0.294 (0.103)*	-0.125 (0.105)	-0.095 (0.091)	-1.282 (0.814)	-0.147 (0.681)	-0.217 (0.061)*	-0.103 (0.041)*	-0.013 (0.264)	-0.016 (0.174)		
Political	-0.118 (0.087)	-0.107 (0.081)	0.024 (0.082)	0.038 (0.071)	0.922 (0.539)	0.578 (0.476)	-0.031 (0.045)	0.098 (0.032)*	0.755 (0.200)*	0.463 (0.138)*		
Foreign	-0.270 (0.087)*	-0.291 (0.082)*	-0.033 (0.103)	-0.079 (0.089)			-0.317 (0.053)**	-0.103 (0.039)*				
Portfolio spreads		0.798 (0.241)*		0.849 (0.184)*	0.799 (0.240)*	0.876 (0.184)*	0.869 (0.104)**	0.885 (0.068)**	0.878 (0.111)**	0.918 (0.071)**		
Constant	1.653 (0.229)**	0.011 (0.540)	1.376 (0.290)*	-0.276 (0.437)	-1.221 (0.648)	-0.763 (0.554)	0.017 (0.222)	-0.054 (0.146)	-0.748 (0.274)*	-0.318 (0.182)		
Number of Observations	72	72	72	72	72	72	282	282	263	263		

Note: F.E.= fixed effects. Single asterisks indicate significance at the 5% level; double asterisks indicate significance at the 1% level. Standard errors in brackets.

Table 6. Spreads, Macroeconomic Variables, and News, 1994–2002

	Annual Data			Quarterly Data		
	Fixed Effects	Feasible Generalized Least Squares	Arellano-Bond	Fixed Effects	Feasible Generalized Least Squares	Arellano-Bond
Wars / Instability	-0.002 [0.085]	0.041 [0.076]	0.125 [0.048]*	0.061 [0.045]	0.041 [0.049]	0.037 [0.027]
Good / Neutral Economic	0.288 [0.100]*	0.229 [0.090]*	0.121 [0.061]	0.124 [0.036]*	0.076 [0.045]	0.014 [0.025]
Bad Economic	0.077 [0.083]	0.053 [0.074]	0.016 [0.053]	0.041 [0.039]	0.057 [0.045]	-0.004 [0.024]
Reform	-0.164 [0.106]	-0.119 [0.095]	-0.223 [0.058]**	-0.064 [0.045]	-0.114 [0.053]*	-0.066 [0.027]
Political	0.000 [0.081]	0.023 [0.072]	-0.022 [0.044]	0.084 [0.036]	0.089 [0.042]*	0.017 [0.022]
Foreign	0.058 [0.108]	-0.021 [0.098]	-0.116 [0.055]*	-0.061 [0.045]	-0.079 [0.052]	-0.025 [0.028]
Exports	-0.438 [0.218]	-0.258 [0.200]	-0.535 [0.220]*	-0.251 [0.091]*	-0.322 [0.108]**	-0.318 [0.100]*
Fiscal Surplus	-2.457 [1.921]	-1.334 [1.734]	-2.381 [1.133]*	0.000 [0.003]	0.000 [0.003]	-0.001 [0.002]
Portfolio Spreads	0.759 [0.192]**	0.720 [0.111]**	0.676 [0.137]**	0.838 [0.073]*	0.839 [0.089]**	0.521 [0.053]*
Debt / GDP		-0.317 [0.348]	-0.815 [0.224]**			
Growth Real GDP		-1.034 [0.952]	-2.110 [0.818]**		-1.195 [0.270]**	-0.618 [0.135]*
Lagged Spreads						0.411 [0.047]*
Number of Observations	72	72	56	230	161	154

Note: News in logarithms. Single asterisks indicate significance at the 5% level; double asterisks indicate significance at the 1% level. Standard errors in brackets.

5. Conclusions

This paper provides the first comparative analysis of the determinants of spreads on sovereign bonds issued by emerging markets, for 1870–1913 and 1994–2002, drawing on a newly collected and extremely comprehensive data set on spreads, macroeconomic variables, and news items of various categories. This is also the first systematic analysis of the role of news of various categories in determining emerging market spreads.

We obtain two main results. The first is that wars and episodes of politically-motivated violence have the most immediate and pronounced impact on the cost of borrowing, particularly in the historical period. In contrast, while there is tentative regression-based evidence of an association between spreads and news about reforms for the modern period, institutional and political reforms (such as the introduction of a constitution) or efficiency-enhancing structural reforms seldom reduce the cost of capital quickly: only in a few instances did reforms of the monetary framework (such as the introduction of the gold standard or a currency board) have a rapid and substantial impact on spreads.²⁴ Considering the evidence from both periods jointly, in the short run peace and stability seem to matter more for countries' borrowing costs than does the establishment of investor-friendly institutions. While we do think that appropriate reforms can be beneficial in the long run, their benefits seem to accrue in a gradual manner; novel institutions are rarely rewarded swiftly by financial markets. Thus, on the whole, our impression on the basis of the results presented above and in MSY is that the aspects of (broadly defined) institutional quality that matter the most relate to ensuring the absence of violence (international wars or domestic turmoil) and, more generally, the quality of *de facto* rather than *de jure* institutions.

The second result is that country-specific developments played a more important role in determining spreads in 1870–1913 than they did in the 1990s. This is reflected in both greater ability of country-specific fundamentals (both news and macroeconomic variables) to explain historical spreads, and in the higher co-movement of spreads across emerging markets in the 1990s. However, the higher co-movement of emerging market bond spreads in the 1990s relative to 1870–1913 can only partially be explained by higher co-movement of economic fundamentals. We conjecture that the arrangements underlying institutional investor behavior have important consequences for the behavior of bond spreads. Yet, the current era of financial globalization and bond finance is still in its infancy, and developments in the years ahead will continue to yield useful information on the factors underlying the behavior of emerging market spreads. For example, Argentina's massive default in 2001 seems to have been followed by a decline in co-movement of spreads across emerging markets; it remains to be seen whether this is simply a temporary reversal, or a more permanent return to the distant past.

²⁴ The limited number of instances in which monetary reforms have a significant impact tend to occur when they are seen as the focal point of a concerted effort at buttressing the credibility of macroeconomic policies (see the case studies in MSY).

Annex—Robustness of the Results

In this Annex, we check the robustness of our results to the use of a variety of estimation methods, as customary in those empirical studies in economics where there is no overwhelming presumption that a particular estimation method is the most appropriate. As in the baseline estimates reported in the main text, our key results remain that: war news are significantly and robustly associated with spreads; gold standard adherence and default history are statistically significant in many specifications; exports and, less frequently, fiscal measures are also significant in a number of cases (Tables A1 and A2). We include estimates based upon a variety of techniques, each of which has both advantages and drawbacks, as follows.

Pooled panel regressions with no individual country fixed effects make use of the cross country information, but are subject to the well know drawback that non-time varying country-specific features that are not included in the list of control variables may be driving the results. *Panel regressions with fixed effects* appropriately take into consideration individual country fixed effects, though it does not correct for persistence in the spreads. In some specifications, we include the lagged spreads. In a panel context, this introduces a bias in the coefficients, though such bias becomes smaller as the length of the time period increases. With more than 40 years of data, the bias is relatively small (Judson and Owen, 1999). *Seemingly Unrelated Regressions* (not reported for the sake of brevity) increases the efficiency of the estimates by taking into account the contemporaneous correlation of the residuals across countries. *Feasible Generalized Least Squares* let the residuals be autocorrelated with a country-specific AR(1), thus taking into account that of the persistence of spreads through the persistence of the residuals. *Arellano-Bond* includes the lagged dependent variable, but appropriately corrects the bias that would result in a panel context, by using further lags of all the variables as instruments.

Annex Table A1. Pooled And Fixed Effect Regressions, 1870–1913

	No fixed effects										With Fixed effects												
Wars	0.086	0.081	0.142	0.095	0.081	0.080	0.054	0.031	0.032	0.027	0.023	0.029	[0.020],	[0.019]**	[0.017]**	[0.019]**	[0.016]**	[0.016]*	[0.008]*	[0.009]**	[0.009]**	[0.009]**	
Good / Neutral Econ.	-0.119	-0.098	-0.050	-0.024	-0.036	0.003	-0.110	-0.016	-0.017	-0.010	-0.015	-0.017	[0.026],	[0.025]**	[0.023]	[0.026]	[0.023]**	[0.024]	[0.011]	[0.013]	[0.013]	[0.013]	[0.013]
Bad Economic	0.057	0.053	0.019	0.031	0.051	0.035	0.041	0.018	0.013	0.015	0.006	0.012	[0.030]	[0.029]	[0.026]*	[0.029]	[0.023]	[0.022]	[0.011]	[0.012]	[0.012]	[0.012]	[0.012]
Reform	-0.006	0.018	0.028	0.049	0.010	0.022	-0.017	-0.013	-0.013	0.002	0.005	0.007	[0.032]	[0.034]	[0.027]	[0.030]	[0.025]	[0.024]	[0.012]	[0.014]	[0.013]	[0.013]	[0.013]
Political	-0.086	-0.118	-0.123	-0.088	-0.138	-0.092	-0.013	0.025	0.025	0.003	0.006	0.005	[0.022],	[0.021]**	[0.019]**	[0.024]**	[0.022]	[0.021]	[0.010]	[0.012]	[0.012]	[0.012]	[0.012]
Foreign	0.033	0.026	0.052	-0.004	0.003	-0.032	0.019	0.034	0.043	0.005	0.015	0.008	[0.021]	[0.020]	[0.018]	[0.020]	[0.021]	[0.010]	[0.010]	[0.011]	[0.011]	[0.011]	[0.011]
Gold Standard	-0.450	-0.366			-0.250	-0.169	-0.275			-0.015	-0.004	-0.011	[0.047],	[0.046]**	[0.043]**	[0.050]**	[0.044]**	[0.022]	[0.022]	[0.026]	[0.025]	[0.025]	[0.025]
Default History		0.380		0.380	0.463	0.427	-0.213		0.216		0.022	0.035											
Exports		[0.044]**		[0.048]**	[0.041]**	[0.050]**	[0.101]*																
Fiscal Surplus			-0.216	-0.185		-0.125		-0.468															
Debt per Capita			[0.024]**	[0.024]**		[0.024]**		[0.038]**															
Portfolio Spreads			-0.405	-0.400		-0.144		-0.142															
Lagged Spreads			[0.093]**	[0.087]**		[0.087]		[0.069]*															
Number of Observations	627	627	531	522	627	522	627	531	522	600	508	508	627	531	522	522	627	522	600	508	508	508	508

Note: Single asterisks indicate significance at the 5 percent level; double asterisks indicate significance at the 1 percent level. Standard errors are in brackets. News indicators refer to the logarithm of the number of news for the category indicated.

Annex Table A2. Feasible Generalized Least Squares and Arellano-Bond Regressions, 1870-1913

	Feasible Generalized Least Squares				Arellano-Bond				
	0.025 [0.006]**	0.024 [0.007]**	0.023 [0.007]**	0.030 [0.007]**	0.029 [0.007]**	0.029 [0.009]**	0.028 [0.008]**	0.028 [0.009]**	0.031 [0.007]**
Wars									
Good / Neutral Economic	-0.002 [0.009]	-0.004 [0.010]	-0.004 [0.010]	-0.002 [0.012]	-0.003 [0.012]	0.014 [0.013]	0.012 [0.013]	0.010 [0.013]	-0.002 [0.012]
Bad Economic	0.011 [0.008]	0.011 [0.008]	0.010 [0.008]	0.030 [0.010]**	0.030 [0.010]**	0.030 [0.011]**	0.027 [0.011]**	0.028 [0.011]**	0.032 [0.010]**
Reform	-0.007 [0.009]	-0.006 [0.010]	-0.006 [0.010]	-0.016 [0.012]	-0.015 [0.012]	-0.014 [0.013]	-0.007 [0.013]	-0.007 [0.013]	-0.017 [0.012]
Political	-0.006 [0.008]	-0.004 [0.008]	-0.005 [0.008]	0.010 [0.011]	0.008 [0.010]	0.005 [0.012]	0.002 [0.012]	0.004 [0.012]	0.013 [0.011]
Foreign	-0.003 [0.007]	-0.005 [0.008]	-0.004 [0.008]	0.005 [0.009]	0.006 [0.009]	0.008 [0.011]	0.009 [0.011]	0.010 [0.011]	0.010 [0.009]
Gold Standard	-0.191 [0.037]**	-0.115 [0.037]**	-0.108 [0.037]**	-0.135 [0.042]**	-0.129 [0.042]**	-0.127 [0.045]**	-0.130 [0.045]**	-0.130 [0.045]**	-0.152 [0.042]**
Default History		0.063 [0.084]	0.134 [0.096]		0.630 [0.163]**		0.456 [0.169]**	0.418 [0.171]**	0.684 [0.163]**
Exports		-0.216 [0.027]**	-0.211 [0.028]**			-0.153 [0.060]**	-0.106 [0.060]	-0.113 [0.061]	
Fiscal Surplus		-0.031 [0.030]	-0.029 [0.030]			-0.026 [0.037]	-0.024 [0.037]	-0.020 [0.037]	
Debt per Capita			-0.010 [0.031]				-0.043 [0.052]		
Portfolio Spreads									0.239 [0.049]**
Lagged Spreads				0.346 [0.034]	0.344 [0.034]**	0.437 [0.039]**	0.411 [0.039]**	0.413 [0.040]**	0.371 [0.034]**
Number of Observations	627	531	522	568	568	482	482	477	568

Note: Single asterisks indicate significance at the 5 percent level; double asterisks indicate significance at the 1 percent level. Standard errors are in brackets. News indicators refer to the logarithm of the number of news for the category indicated.

Appendix 1: Bonds Used in Computation of Spreads

	Starting date	Ending date	Bond name	Coupon	Issue date	Issue price	Redemption date	Sinking fund	Coupons paid	Underwriter	Remarks
Argentina											
1	Jan_1870	Apr_1871	6%	6.0	1866	72.5	1890	2.5%	January; July	Baring	
2	May_1871	Mar_1886	Public works	6.0	1871	88.5	1892	2.5%	March; September	Murrieta	
3	Apr_1886	Dec_1913	5%	5.0	1886	80.0	1919	1%	January; July	Baring	Redemption suspended in January 1894. Redemption moved to 1922 on January 1904. Coupon reduced to 4% from 1893 1898
Canada											
1	Jan_1870	May_1873	6%	6.0	1870	na	77-84		1 January; 1 July	Glyns, Baring	
	Jun_1873	Dec_1881	6%	6.0	1870	na	77-84		1 January; 1 July	Glyns, Baring	Redeemable in 81-84
	Dec_1881	Jul_1884	6%	6.0	1870	na	77-84		1 January; 1 July	Glyns, Baring	Redeemable in 82-84
2	Aug_1884	Dec_1913	3.5%	3.5	1884	91.0	1909-1934	0.5%	1 June, 1 December	Baring	
Chile											
1	Jan_1870	Mar_1886	6%	6.0	1867	82.0	1891	2%	1 January, 1 July	J. S Morgan	Jan-1878 drawings suspended till 1884
2	Apr_1886	Jul_1907	4.5%	4.5	1885	89.0	consol	0.5%	January, July	City bank	
3	Aug_1907	Dec_1913	4.5%	4.5	1886	98.5	Consol	0.5%	January, July	Rothschild	
China											
1	May_1877	May_1885	8%	8.0	1877	98.0	1885		February, August	Hong Kong and Shanghai bank	
2	Jun_1885	Mar_1895	Domestic 7% series A	7.0			1895		February, August	Hong Kong and Shanghai bank	
3	Apr_1895	Apr_1896	6% gold bonds	6.0	1895	96.8	no redemption date		June, December	na	
4	May_1896	Dec_1913	5%	5.0	1896	98.8	1933		April, October	Hong Kong bank	
Columbia											
1	Jan_1870	Jun_1874	6%	6.0	1863	86.0	1874	7.5%	April, October	London and Country bank	
2	Jul_1874	Dec_1887	4.5%	4.5	1873		no redemption date		January, April, July, October	London and Country bank	Default since Aug-1879
3	Jan_1888	Dec_1896	New Granada Debt Converted	4.8	1873						Converted 4.5%; default
4	Jan_1897	Dec_1913	1.5 - 3%	1.5-3	1896				January, July		Default in Aug-1899. Jan-Dec, 1906 2.5% paid. From Jan-1907-3%

	Starting date	Ending date	Bond name	Coupon	Issue date	Issue price	Redemption date	Sinking fund	Coupons paid	Underwriter	Remarks
Costa Rica											
1	Jun_1871	Dec_1871	6%	6.0	1871	72.0	1895	2%	May, November	Goldsmith Knowltes and Foster	Default in May-1874.
2	Jan_1872	Aug_1886	7%	7.0	1872	82.0	1903	1%	April, October	River Plate T.L. Agency	Aug-1887 to Aug-1889 4% paid
3	Sep_1886	Dec_1894	5% "B" Bonds	5.0			Commencing June 1898 from 1917		January, July		
4	Jan_1895	Mar_1898	2.5% "B" Bonds	5.0			from 1917				In default
5	Apr_1898	Jan_1905	2.5% "B" Bonds	2.5			from 1917		April, October	Glyn Mills	Default since November 1901
6	Feb_1905	Dec_1911	5% "B" Bonds	5.0			from 1917				Default until Aug-1909
7	Jan_1912	Dec_1913	4% Refund Bonds	4.0	1911		None Till 1921		January, July	Glyn Mills	
Egypt											
1	Jan_1870	Dec_1876	7%	7.0	1868		1892	1%	January, July	Imperial Ottoman bank	
2	Jan_1877	Dec_1890	5% preferred	5.0	1877				April, October	comptoir d'escomptes Paris	
Greece											
1	Jan_1870	May_1880	5%	5.0	1824		1891				In default
2	Jun_1880	Jul_1881	consolidated 5%	5.0	1879		1899		January, July	Ionian Bank	
3	Aug_1881	May_1893	5%	5.0	1881	74.0	1921	1.25%	January, July	Hambro	In default
	Jun_1893	Nov_1894	5%	5.0	1893						
	Dec_1894	Dec_1898	5%	1.5	1893						
	Jan_1899	Dec_1899	5%	1.7	1893						
	Jan_1900	Jan_1901	5%	1.8	1893						
	Feb_1901	Dec_1901	5%	1.7	1893						
	Jan_1902	Dec_1902	5%	1.8	1893						
	Jan_1903	Dec_1903	5%	1.7	1893						
	Jan_1904	Dec_1905	5%	1.9	1893						
	Jan_1906	Dec_1906	5%	2.1	1893						
	Jan_1907	Dec_1907	5%	2.2	1893						
	Jan_1908	Dec_1908	5%	2.6	1893						
	Jan_1909	Dec_1909	5%	2.8	1893						
	Jan_1910	Dec_1911	5%	3.0	1893						
	Jan_1912	Dec_1912	5%	3.1	1893						
	Jan_1913	Dec_1913	5%	3.2	1893						
Hungary											
1	Jan_1870	Dec_1871	6%	6.0	1867		1891				
2	Jan_1872	Dec_1881	5%	5.0	1871	81.0	1904	1.5	April, October	R. Raphael and sons	
3	Jan_1882	Dec_1913	4% gold rents	4.0	1881		no redemption date		January, July	Rothschild	

	Starting date	Ending date	Bond name	Coupon	Issue date	Issue price	Redemption date	Sinking fund	Coupons paid	Underwriter	Remarks
Japan											
1	Jun_1870	Mar_1873	9% customs loan	9.0	1870	98.0	1882	10%	February, August	Schroder	
2	Apr_1874	Jul_1897	7%	7.0	1870	92.5	1898	2%	January, July	Oriental Bank and Glyn Mills	
3	Aug_1897	Dec_1913	5%	5.0	1897	no redemption	no redemption date		June, December	Yokohama specie bank	
Mexico											
1	Jan_1870	Aug_1888	3%	3.0	1846		Consol			Baring	In default
2	Sep_1888	Dec_1899	6%	6.0	na		Consol	0.5%	January, April, July, October	Gibbs	
3	Jan_1900	Dec_1913	5% domestic	5.0	1899		Consol				
Portugal											
1	Jan_1870	May_1892	3%	3.0	55-1884	32.5-50	Consol		1 January, 1 July	Portuguese financial agency, London, Paris, Lisbon	
	Jun_1892	Dec_1899	3%	1.0	55-1884	32.5-50	Consol		1 January, 1 July	"	
	Jan_1900	Dec_1900	3%	1.1	55-1884	32.5-50	Consol		1 January, 1 July	"	
	Jan_1901	Oct_1901	3%	1.0	55-1884	32.5-50	Consol		1 January, 1 July	"	
	Nov_1901	Feb_1902	3%	1.2	55-1884	32.5-50	Consol		1 January, 1 July	"	
2	Mar_1902	Dec_1913	New 3%	3.0	1902		Consol		1 January, 1 July		
Queensland											
1	Jan_1870	Dec_1873	6%	6.0	1866	91.0	1891		January, July	Union Bank of Australia	
2	Jan_1874	Dec_1913	4%	4.0	1873-4	88.0	1913		January, July	Union Bank of Australia	Additional issues of bonds redemption changed to 1915
Russia											
1	Jan_1870	Dec_1913	5% consol	5.0	1822	na	consol		March, September	Rothschild	
Sweden											
1	Jan_1870	May_1881	5%	5.0	1868	90.0		0.25%	January, July		Purchase when below par
2	Jun_1881	Dec_1913	4%	4.0	1880/7.5-98.5		1930		April, October		With various subscriptions into the series until 1888 reduced to 3.5% in 1894 and redemption date no longer quoted.

	Starting date	Ending date	Bond name	Coupon	Issue date	Issue price	Redemption date	Sinking fund	Coupons paid	Underwriter	Remarks
Turkey											
1	jan_1870	Feb_1883	6%	6.0	1869	60.5	1902	1%	April, October	Imperial Ottoman Bank	In default since Apr-1876
2	Mar_1883	Dec_1899	1% registered bonds	1.0					March, September		Nov-1889 - converted into C series bonds
3	Jan_1900	Aug_1903	4% priority loan consol	4.0	1890				April, October	Dent and Palmer	
4	Sep_1903	Dec_1905	4% loan	4.0	1902				January, July	Dent and Palmer	
5	Jan_1906	Dec_1913	4% Unified English scripture	4.0					March, September	Imperial Ottoman bank	
Uruguay											
1	Jan_1870	Dec_1870	6%	6.0	1864	60.	Redeemable by purchase	1%	January, July	McGregor and Co.	
2	jan_1871	Jul_1878	6%	6.0	1871	72.	1893	2.5%	May, November	Thomson Bonar	Default since Feb-1876
	Aug_1878	Feb_1879	6%	1.3	1871	72.	1893	2.5%	May, November	Thomson Bonar	
	Feb_1879	Nov_1883	6%	2.5	1871	72.	From 1883	2.5%	May, November	Thomson Bonar	
	Dec_1883	Feb_1884	6%	3.0	1871	72.	From 1883	2.5%	May, November	Thomson Bonar	
3	Mar_1884	Feb_1892	5%	5.0	1883	na	1935	0.5%	January, April, July, October	Thomas Bonar Roberts	
4	Mar_1893	Dec_1913	3.5% domestic	3.5	1893			0.5%	February, May, August, November	Baring Glynn Mills	

Appendix 2: Macroeconomic Data Sources

Modern Sample, 1994–2002

Annual data for Argentina, Brazil, Bulgaria, Mexico, Nigeria, Philippines, Poland, and Venezuela were drawn from the International Monetary Fund's *International Financial Statistics* for the following variables: current account balance (in U.S. dollars); exchange rate (period average) versus the U.S. dollar; exports of goods and services in U.S. dollars; fiscal balance in local currency; GDP in local currency current prices; GDP deflator; inflation (the rate of change of the consumer price index). In addition, central government debt was drawn from the World Bank's *Global Development Finance* data base. Quarterly data for the same countries (except Nigeria), sample period, and variables are drawn from the IMF's country desks (through the World Economic Outlook database).

Historical Sample, 1870–1913

Annual data for Argentina, Brazil, Canada, Chile, China, Colombia, Costa Rica, Egypt, Greece, Hungary, Japan, Mexico, Portugal, Queensland, Russia, Sweden, Turkey, and Venezuela were drawn from a variety of sources—mainly Mitchell's *Historical Statistics*, the *Investor's Monthly Manual*, and national publications (many collected by a host of previous researchers and kindly transmitted to us by Alan Taylor from the data set used for Obstfeld and Taylor, 2003). For national publications, we cite the original publications when we were able to check them. More specifically, we draw the variables we use from the following sources:

Gold standard dates: from Larry Officer's data on Eh.net

Historical defaults (prior to 1870): taken from Calomiris and Beim (2000), Appendix to chapter 1.

Fiscal Balance: expressed as the difference between government revenue and expenditures, as a ratio to revenues. Revenues and expenditures from Mitchell (1992, 1993, and 1995). Colombia, Costa Rica, and Queensland from the IMM.

Exports: denominated in British pound sterling, from the collected volumes of Mitchell (1992, 1993, 1995). Completed from the IMM for Chile in 1871–1877, Queensland in 1871–1913, and Uruguay in 1870–1913. For Hungary we used Mitchell for the total combined exports of Hungary and Austria.

Population: from the collected volumes of Mitchell (1992, 1993, 1995). Completed from the IMM for Egypt in 1870–1884, Mexico in 1872–1913, Queensland in 1870–1913, and Uruguay in 1872–1899.

Public Debt: total central government debt, from Bordo and Jonung (1996), except: Argentina: 1870–1883 from IMM, 1884–1913 from della Paolera (1988); Brazil: 1870–1879 from IMM, 1880–1910 consolidated (federal state and municipal) foreign debt in pounds sterling from IBGE (1990) and domestic debt in contos from Levy (1995); Canada 1870–1913 from Statistics Canada. Chile: 1870–1913 from Mamalakis (1978–89, vol. 6, 493, Table 8.62), thence from United Nations, with appropriate conversions of some series from (gold) pesos of 6 pence (the interwar parity) to current pesos via the exchange rate series as

above from Braun et al. (2000); China: 1882–1913 from the IMM (foreign debt only); Egypt: 1870–1884 from Obstfeld and Taylor (2003); Greece: 1871–1913 from the IMM; Japan: 1873–1879 from the IMM and 1880–1913 from Bordo and Jonung (1996); Mexico: 1872–1913 from the IMM; Portugal: 1871–1880 from IMM and Flandreau (2004) from 1881–1913; Queensland: 1870–1913 from the IMM; Russia: 1870–1884 from the IMM, 1885–1913 from Flandreau (2004). Sweden: 1871–1879 from the IMM and 1879–1913 from Obstfeld and Taylor (2003); Turkey: 1872–1913 from the IMM; Uruguay: 1872–1913 from the IMM.

Foreign public debt for Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Portugal and Uruguay from IMM.

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