Title
Sovereign Risk, Credibility and the Gold Standard: 1870-1913 versus 1925-31

Authors
Obstfeld, Maurice
Taylor, Alan M.

Publication Date
2003-01-11

UNIVERSITY OF CALIFORNIA, BERKELEY

Department of Economics

Berkeley, California 94720-3880

CENTER FOR INTERNATIONAL AND DEVELOPMENT ECONOMICS RESEARCH
Working Paper No. C02-125_Rev

Sovereign Risk, Credibility and the Gold Standard: 1870-1913 versus 1925-31

Maurice Obstfeld
University of California, Berkeley, CEPR and NBER

Alan M. Taylor
University of California, Davis and NBER

Rev_January 2003

Keywords: Gold standard, sovereign risk, credibility, monetary regimes, exchange rates

JEL Classification: F2, F33, F36, F41, N10, N20

This paper is forthcoming in *The Economic Journal*. For help with data we thank Pranab Bardhan, Luis Bertola, Michael Bordo, Guillermo Bozzoli, Charles Calomiris, Gregory Clark, Niall Ferguson, Albert Fishlow, Stephen Haber, Ian McLean, Lawrence Officer, Sevket Pamuk, Leandro Prados de la Escosura, Jaime Reis, Gail Triner and Tarik Youself. For outstanding research assistance we thank Miguel Fuentes and David Jacks. We received very helpful comments from participants at the joint Money, Macro and Finance/Understanding the Evolving Macroeconomy conference held at the University of Warwick in September 2002. All errors are our own. Obstfeld gratefully acknowledges the support of the United State National Science Foundation, through a grant to the National Bureau of Economic Research. Taylor gratefully acknowledges the support of the Chancellor's Fellowship at the University of California, Davis.

Abstract

What determines sovereign risk? We study the London bond market from the 1870s to the 1930s. Our findings support conventional wisdom concerning the low credibility of the interwar gold standard. Before 1914 gold standard adherence effectively signalled credibility and shaved up to 30 basis points from country borrowing spreads. In the 1920s, however, simply resuming prewar gold parities was insufficient to secure benefits. Countries that devalued before resumption were treated more favorably, and markets scrutinized other signals. Public debt and British Empire membership were important determinants of spreads after World War One, but not before.

Maurice Obstfeld
Department of Economics, 549 Evans Hall #3880
University of California
Berkeley, CA 94720-3880
Tel: 510-643-9646. Fax: 510-642-6615.
Email: obstfeld@econ.berkeley.edu
WWW: <http://emlab.berkeley.edu/users/obstfeld/>

Alan M. Taylor
Department of Economics, One Shields Avenue,
University of California
Davis, CA 95616-8578
Tel: 530-752-1572. Fax: 530-752-9382
Email: <amtaylor@ucdavis.edu>.
WWW:
http://www.econ.ucdavis.edu/faculty/amtaylor/>.

1 Introduction

Can macroeconomic policymakers enhance credibility, and thus performance, by the adoption of a hard currency peg? The experiment is often attempted. In recent years many countries have tried to end histories of macroeconomic instability through reform programs based on a fixed exchange rate. The variants of fixed exchange rates have ranged from conventional currency pegs to currency boards to currency unions to dollarisation, sometimes accompanied by elaborate institutional engineering meant to enhance credibility with the markets.

Yet the success of these efforts has varied a great deal across countries. In particular, the Argentine peso's diastrous collapse in 2002 after more than ten years of parity with the United States dollar illustrates the difficulty nowadays of establishing credibility even through some of the "harder" variants of currency peg. How should we interpret such an outcome? We think that an exploration of a large set of historical episodes could be informative. This paper aims to thow light on the relationship between exchange rate regimes and credibility by closely examining two adjacent but very different historical epochs of widespread exchange rate stabilisation, the classical pre-World War One gold standard period and the years 1925–31 of the interwar gold standard.

It is now widely believed that prior to 1914, gold standard orthodoxy conferred credibility and was a *sine qua non* for access to global capital markets on favorable terms. A path-breaking study by Bordo and Rockoff (1996) found that adherence to gold standard rules acted as a "seal of approval" for sovereign debt. Gold standard countries had lower country risk, measured by their bond spreads in London relative to the British consol. By the time the interwar gold standard was reconstituted starting in 1925, however, the underlying political equilibrium in most economies had changed, with more political power in the hands of previously disadvantaged working class parties and a greater awareness of government's role in steering economic outcomes (Polanyi, 1944; Temin, 1989; Eichengreen, 1996). Indeed, divergent interest-group positions on macroeconomic policy were reflected in the high inflation rates rampant in the early 1920s and in the national debates over the appropriate exchange parity—devalued or not—at which to return to gold.

Hard evidence of a new political dynamic might be sought in a changing relationship between country risk and gold after 1925. With the rules of the game in question after World War One, perhaps investors doubted that the mere adoption of a gold standard regime would ensure the repayment of public debts. Consistent with such imperfect credibility, other indicators that could reassure foreign investors about public solvency (such as the debt-GDP ratio) or protection of capi-

tal (such as membership in the British Empire) might have had a bigger impact on international bond spreads under the reconstituted gold standard than before. Do the data indeed support these conjectures?

There is no uniform and comprehensive study of bond spreads across the pre-1914 and interwar gold standards that would allow us definitively to answer such questions. A study of interwar spreads by Bordo, Edelstein, and Rockoff (1999), however, came to a conclusion that was surprising, even by the authors' own admission.[1] Looking solely at 1920s bond yields, they found continued evidence that the gold standard remained a seal of approval when a country returned to its prewar exchange parity with gold, lowering bond spreads significantly in that case. Devaluers were not so lucky with their bond spreads: for them, the effect of being on gold was found to be small and statistically insignificant. Such findings seem to challenge the conventional wisdom that the interwar gold standard was a pale and less credible shadow of its predecessor.

The papers by Bordo and Rockoff (1996) and by Bordo, Edelstein, and Rockoff (1999) are pioneering studies, but they are not ideal for comparative work across regimes because of differences in the type of data that each employs. The former study looked at long-term government bonds in the secondary market, and examined their yield to maturity; the latter examined new issues and their yield at the moment of flotation only. The former study therefore had complete time series, whereas the latter had a small sample that was often interrupted by missing data in years when no issues took place – a not uncommon event in the 1920s, and one that raises a potential sample-selection issue (presumably, bonds tend not to be floated when conditions are unfavorable). Finally, the former study examined prices in London, the latter prices in New York, a defensible switch as the hegemonic centre of global capital markets shifted across the Atlantic around this time, and one that allowed the use of Cleona Lewis's (1938) figures on new issues during the 1920s.

To overcome the differences between these two earlier investigations, we compare the determinants of bond spreads in the pre-1914 and interwar years using a consistent set of data for a larger sample of countries from 1870 through 1939. We focus on a sample of more than 20 diverse countries – some within the British Empire, some outside, some in the core and some in the periphery – to see how their country risk evolved. This allows us to focus on the same type of risk measure across both prewar and interwar eras. To isolate the effects of default (as opposed

[1] See also Ferguson (2001, 333), who suggests that the surprising conclusion of the interwar study throws doubt on the findings in the original Bordo-Rockoff study of pre-1914 yields. However, the two studies use very different sources for their yield data, as we explain in a moment.

to exchange rate) risk, spreads over London are exclusively for bonds denominated in gold or in sterling. Most of our yield-to-maturity data come from the Global Financial Data (GFD) source and pertain to bonds traded in London. When GFD did not report appropriate data for gold or sterling-indexed bonds, however, we collected it ourselves from contemporary journalistic sources, in a few cases resorting to yield quotations from the New York market.

Figure 1 offers an overview of our yield data over the full period 1870–1939. The mean bond spreads over London for two subsamples (the Core and Empire subset and the Periphery Nonempire subsets) are presented in the top and bottom charts respectively, and each is surrounded by a measure of dispersion, a band equal to plus or minus two standard deviations.[2] The units are percentage points and the scales are deliberately the same on the two charts.

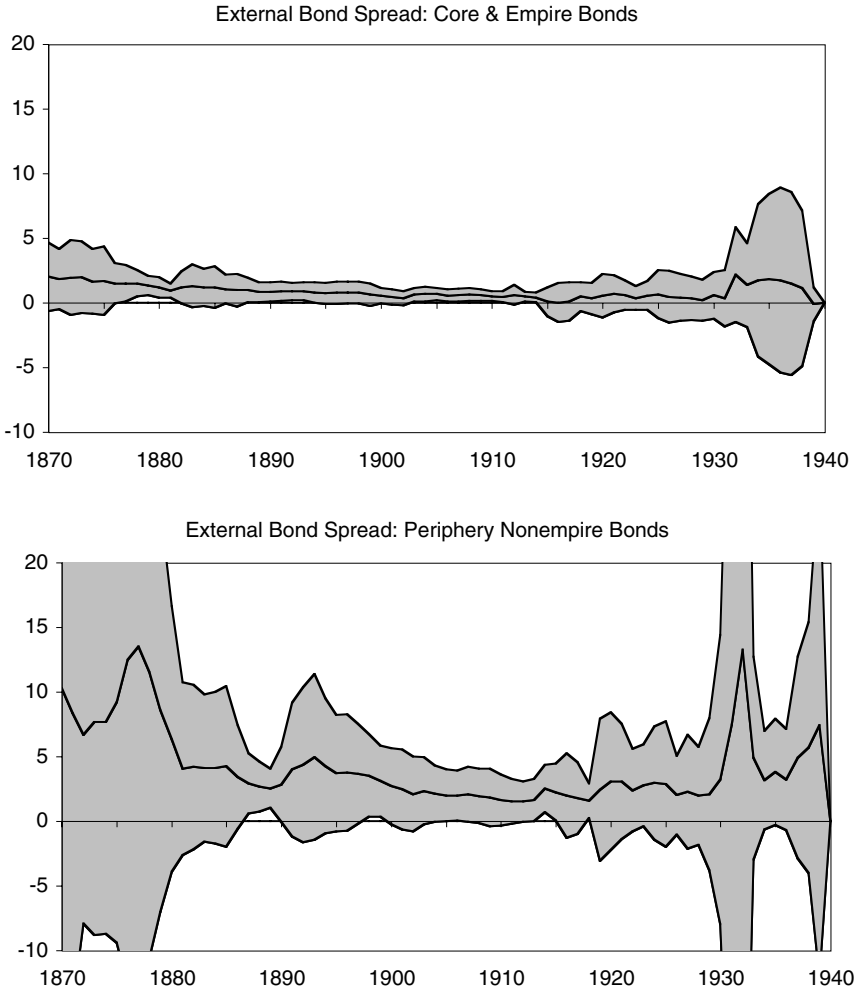
The differences between the two subsamples are very striking: the core had much smaller country risk than the periphery, as expected. Core and empire countries usually had interest rates within one or two percentage points of Britain's, at least from 1880 to 1930. The periphery could have spreads as large as five, ten, or even twenty percentage points, the latter spread usually tantamount to being in default.

The figures also show some similarities, once we normalise for this scale difference. Both core and periphery experienced a convergence in bond spreads up to 1914. For both country groupings we observe good deal of volatility in the interwar years, when spreads widened, but there appears to have been some convergence during Britain's brief interwar return to gold, 1925–31. We seek to understand the gold standard's role in these two convergence episodes.

Our empirical analysis allows public indebtedness to play a role in determining borrowing spreads. Macroeconomic variables correlated with gold-standard adherence, such as public debt, might be responsible for the apparent pre-1914 benefits of going on gold, or might mask such benefits after the World War One. Before the war, countries on gold may have had more disciplined fiscal policies, lower public debt, and hence more favorable treatment by the bond markets. On the other hand, countries that inflated away their public debts in the early or mid-1920s would have been unlikely to rejoin gold at prewar parity, making high public debts and a return to gold at par positively correlated variables. In these circum-

[2]The core countries are Australia, Belgium, Canada, Denmark, France, Germany, New Zealand, Norway, Sweden, and the United States. The empire countries are Australia, Canada, India, New Zealand, and South Africa. The periphery nonempire countries are Argentina, Austria (or Austria-Hungary), Brazil, Chile, Finland, Greece, Hungary, Italy, Japan, Mexico, Portugal, Spain, Turkey (or the Ottoman Empire), and Uruguay.

Figure 1: London bond spreads, core and periphery, 1870–1940



Notes: See text and appendix. *Source*: Global Financial Data and other sources.

stances, one major concern is that failing to control for public debt could lead us to overestimate the prewar benefit of gold standard adherence and underestimate the postwar benefit of returning to gold at the prewar exchange rate. A contribution of the paper is its collection and use of historical series on the public debts of a large number of borrowing countries. We also consider the effects of the terms of trade, potentially a major determinant of creditworthiness and especially so for the borrowers in our sample that are primary commodity exporters.[3,4]

This paper's findings reinstate conventional wisdom concerning the low credibility of the interwar gold standard. We largely confirm the Bordo-Rockoff (1996) findings on the pre-war gold standard, notwithstanding a larger country sample and the inclusion of a wider set of macro-fundamental determinants of spread. Before the First World War, gold standard adherence was an effective credibility signal that shaved up to 30 basis points from a country's external public borrowing cost. The interwar results below, however, suggest that in the 1920s, returning to gold at prewar parity no longer was enough to soothe international investors. After World War One, there was no significant "good housekeeping" effect of returning to gold at prewar parity. At best, it was the countries returning to gold at depreciated levels that gained. Moreover, public debt and Empire membership were important

[3]Bordo and Rockoff (1996) examined the effect on borrowing spreads of the public deficit relative to GDP, a flow variable, but found it to be statistically insignificant. Our experiments with the deficit variable led to the same negative conclusion. If we wish to assess solvency, however, the stock variable, public debt, seems preferable. Based on a specification that includes public debt, Flandreau et al. (1998) find prewar spread effects of gold-standard adherence similar in size to those reported by Bordo and Rockoff (about 35–55 basis points). We discuss the relation between our results and those of Flandreau et al. below.

[4]The discussion of omitted fiscal variables points to a deeper identification problem in any attempt to pinpoint a "pure" yield effect of gold standard adherence. Countries' decisions over the monetary regime are in most cases endogenously determined, and without controlling for a broad range of economic and political variables, one cannot know whether bond spreads are being driven by gold adherence *per se* or by the domestic economic circumstances that facilitate adherence or force suspension. We therefore urge extreme caution in the interpretation of our estimated spread "effects" of the gold standard. We can legitimately infer from them, not a gold impact that is independent of other economic factors, but merely a partially unconditional average benefit accruing to countries in a position to adopt the gold standard. During both of the eras we study countries able to adopt gold by and large did so, and we believe that our results do provide a valid approach to understanding how the credibility of gold commitments changed after the First World War. In our empirical examination of the interwar period below, we attempt to control in a crude way for the global disruptions forcing gold standard departures starting in 1929. We hope to address explicitly the regime selection problem in future work, although analysis is complicated by the very diverse scenarios through which various countries have adopted or left the gold standard at different times. Meissner (2002) models empirically the spread of the prewar gold standard.

determinants of borrowing spreads after World War One, though not before.

2 Five suggestive cases

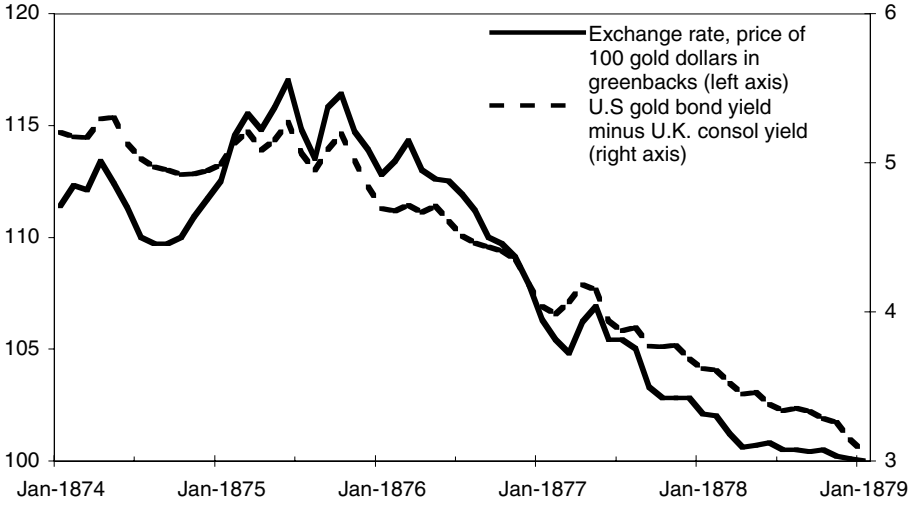
Case studies are suggestive but not definitive; we present five for purposes of illustration. Ultimately, careful examination of a broader range of cases would be a useful complement to the more aggregative econometric analysis that we carry out in the next section.

In the United States the Resumption Act came into force in January 1875. The Act legislated a return to a unified gold-backed currency on January 1, 1879. To assess the effect of gold standard adherence on United States government bond spreads, we must account for the fact that the return to gold was anticipated well in advance. One way to do so is to track simultaneously the exchange rate. In Figure 2 we show the paths over time of the price of gold in terms of the floating paper greenbacks issued to finance the Civil War, as well as of the relative yield on gold bonds – specifically, Macaulay's (1938, A218) gold railroad bonds – relative to the London consol yield. The announcement that greenbacks would be redeemed at par nearly four years later obviously was not credible early in 1875. Rather than falling, the greenback price of gold initially rose. Only later in that year did the greenback begin its appreciation toward par.[5] The concomitant decline in the bond spread is impressive – around 200 basis points.

Argentina returned to the gold standard on October 31, 1899, nearly a decade after abandoning gold in the Baring Crisis. Starting in 1891, the country embarked upon a deflationary policy so as to be able to resume gold convertibility at an unchanged parity, even though the currency utimately was pegged at a devalued rate (see della Paolera and Taylor, 2001). Figure 3 shows how both the exchange rate and the borrowing spread over London behaved: both moved strongly together over the 1890s, suggesting that expectations of resumption and borrowing costs were indeed strongly interrelated. When Julio Roca, a strong advocate of the gold standard, was re-elected to the presidency in the fall of 1898, the currency appreciated sharply and the spread over British borrowing costs fell, eventually dropping further as the restored gold standard endured. Roca announced the return to gold before congress on May 25, 1899 and resumption occurred six months later. By the end of 1902 Argentina's external borrowing spread was nearly 200 basis points lower than when Roca came to power.

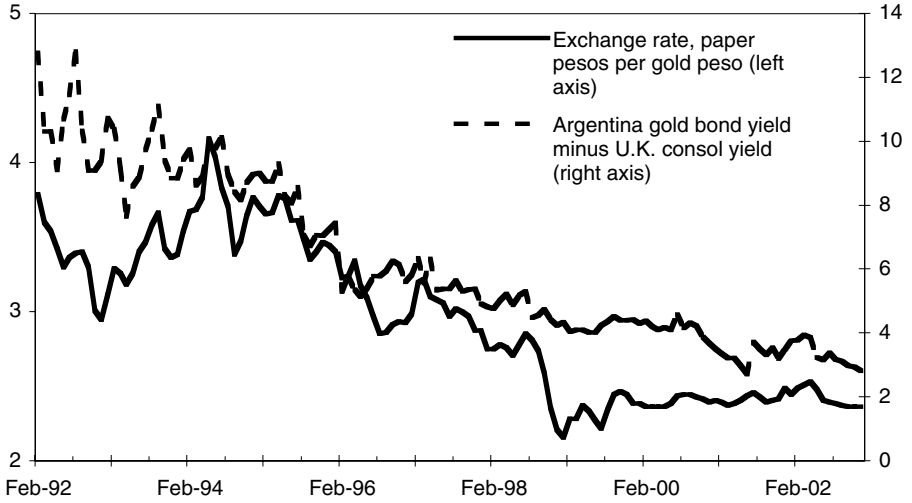
[5]For discussions of the period, see Mitchell (1908) and Barrett (1931). Smith and Smith (1997) formally analyse exchange-rate dynamics prior to resumption.

Figure 2: United States resumption in the 1870s



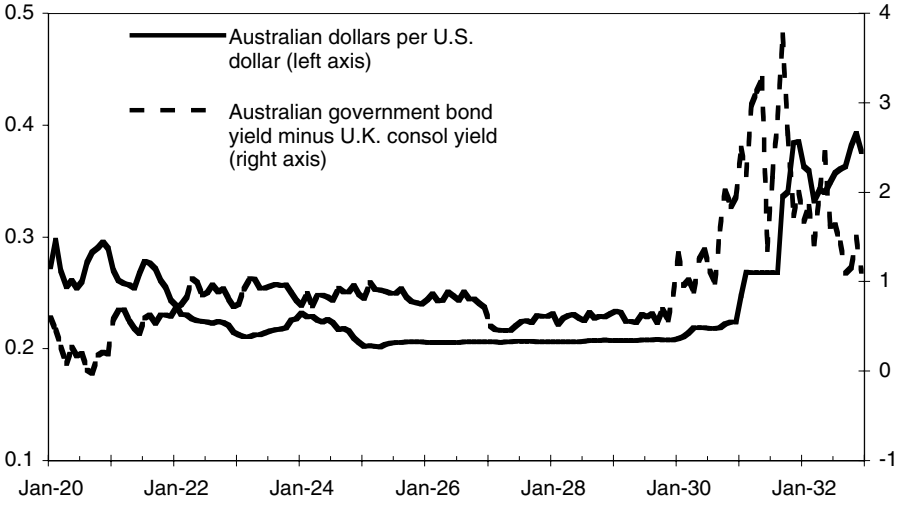
Notes: See text and appendix. *Source*: Global Financial Data and other sources.

Figure 3: Argentine resumption in the 1890s



Notes: See text and appendix. *Source*: Global Financial Data and other sources.

Figure 4: Australian resumption in the 1920s

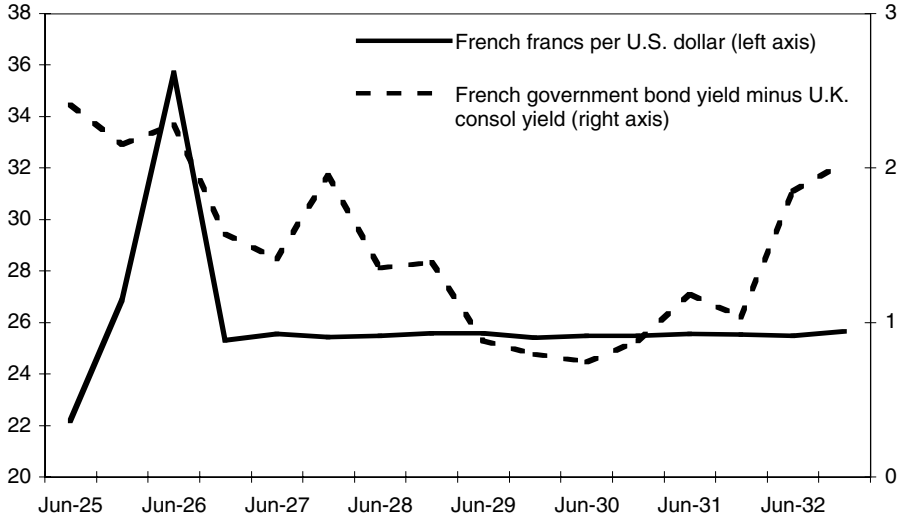


Notes: See text and appendix. *Source*: Global Financial Data and other sources.

Argentina's brief return to gold at the prewar parity, lasting from August 1927 and December 1929, had no such dramatic effect on its foreign borrowing costs. The spread over U.K consols changed hardly at all over the period 1926–28. The striking contrast with the previous resumption epsiode is consistent with the view that Argentina's brief interwar gold standard had a much smaller beneficial effect on the public finances than its prewar counterpart.

Australia's experience in the 1920s resembles that of Argentina, as shown in Figure 4. Australia returned to gold at the same time as Britain (April 1925); like Britain, it returned at the prewar parity. The decline in the government's borrowing cost (relative to London), however, was delayed and rather small. Australia effectively left gold at the start of 1930, well before Britain's departure on September 19, 1931 ended the interwar gold standard. Australia's abandonment of gold was forced by severe economic problems originating in sharp falls in the prices of its commodity exports (Eichengreen, 1992, 232–36). The borrowing spread over London rose sharply after Australia went off gold, but it had already begun to rise in December 1929, the month before the country effectively left the gold standard. The spread increase clearly was driven by fears of default that quickly forced the country to curtail gold convertibility, not by a progressive abandonment of gold *per se*. Thus, for Australia also, the interwar gold standard was less successful than its prewar predecessor in instilling confidence in foreign investors.

Figure 5: French resumption in the 1920s



Notes: See text and appendix. *Source*: Global Financial Data and other sources.

France's interwar return to gold offers a contrast to the two preceding cases; however, France returned to gold at a sharply devalued parity. The return occurred in stages, and Figure 5 shows how the exchange rate (franc price of dollars) and the external borrowing spread over London covaried. Raymond Poincaré formed a government in July 1926 as the franc reached a low point, driven by a crisis of public deficits and inflation. As a result of the fiscal consolidation measures that the Poincaré government immediately introduced, the franc appreciated sharply and finally was pegged in December 1926. In the period leading to this *de facto* embrace of gold – by then, sterling along with the dollar was linked to the metal – the external borrowing spread over London dropped sharply. This response lends support to Sargent's (1993) thesis that Poincaré's consistent fiscal and monetary reform package enjoyed great credibility in the eyes of the financial markets. That is not the end of the story, though. As Figure 5 shows, France's *de jure* adoption of the gold standard on June 25, 1928 was followed by a further large decline in the borrowing spread. France remained on gold long after Britain departured, and one sees that in 1932 its borrowing spread over London paper rocketed upward as the worldwide depression progressed. But for this important case of a country returning to gold at a devalued parity, adherence coincided with a large decline in the cost of foreign borrowing through September 1931.

Obviously such evidence can be suggestive only, as it fails to control for several

potential determinants of spreads, so we now turn to a more formal statistical analysis of a broader sample of countries.

3 Econometric analysis

We now proceed with a formal comparative analysis of sovereign borrowing risk in the prewar and interwar periods. Following Bordo and Rockoff (1996), we investigate the relationship between the dependent variable country risk, measured by the bond spread over London (measured in percentage points per annum), $\text{SPREAD}_{it} = \text{YIELD}_{it} - \text{YIELD}_{U.K.,t}$, and selected macroeconomic policy variables that could play a role for country i and time t. One such variable is gold standard adherence, measured by dummy variables: GS_{it}, which takes the value 1 if on date t country i is on gold at any parity, GSPAR_{it}, which takes the value 1 if on date t country i is on gold after 1914 at its prewar parity, and GSDEV_{it}, which takes the value 1 if the country is on gold at a devalued parity after 1914.

Some countries in our sample were at times in full or partial default pre-1914, or in full default at some point during the interwar gold standard. Obviously this status would raise borrowing spreads, so we introduce the dummy variables DFLT1_{it} for countries in full default and DFLT2_{it} for countries in partial default. More subtly, we would expect a the market's view of the value of gold standard adherence to depend on whether a country is in full compliance with its debt contracts. Thus, all gold standard adherence dummies enter our regressions in the form $\text{GS}_{it} \times \text{NODFLT}_{it}$ and $\text{GS}_{it} \times \text{DFLT}_{it}$ (where for this purpose we do not distinguish between full or partial default). We look to the coefficient of $\text{GS}_{it} \times \text{NODFLT}_{it}$ for gold standard credibility effects. Our prior is that such effects would show up less weakly, if at all, in the cases represented by $\text{GS}_{it} \times \text{DFLT}_{it}$, that is countries already in default should not reap a reward for remaining on gold (and indeed may be punished).

The appendix gives details of our coding procedure, which of necessity involves somewhat subjective judgements even for such an apparently clear-cut variable as gold-standard adherence. Several countries (notably Spain and Italy before 1914) spent many years posturing as "shadow" members of the gold standard – fixing and defending their exchange rate, yet not fully embracing gold convertibility or other "rules of the game." In the classifications of many scholars this leads to a delicate decision as to whether such cases should be treated as on or off gold (see, e.g., Martín Aceña, 2000; Fratianni and Spinelli, 1984). The situation during the interwar period is murkier still. After World War One, many countries first

stabilised their currencies *de facto* with respect to gold, moving only gradually toward the *de jure* embrace of gold standard rules. Similarly, exits from the gold standard starting in 1929 sometimes were accomplished in piecemeal fashion, a first step often being some sort of formal or informal government control over gold outflows. Indeed, the tendency of governments to tinker with the interwar gold standard is a key reason scholars have viewed its credibility as being limited. Our classification corresponds largely to *de jure* gold standard adherence, as we describe in the appendix.[6]

We also include the lagged inflation rate, $\text{INFL}_{i,t-1}$. Because many countries operated on fractional gold backing, this variable could be important as a way for markets to detect slippage in gold standard commitments by governments, for example, at the start of episodes of overvaluation that might lead to reserve loss followed by eventual suspension and debt crisis. In addition, we examine the effects of lagged public debt levels, measured by the ratio of nominal debt to nominal output, $\text{DEBT}_{i,t-1}$. Typically the available data are for central government debt. Lagged debt is included to allow for the possibility that markets might impose more severe credit conditions on highly indebted governments, where, *ceteris paribus,* default risk is higher.[7] Country fixed effects are used to capture constant but unmeasured political, economic, institutional, or geographic features of individual countries (for example, location on the "periphery").

We add several more economic variables often seen in country risk studies. The first is EXPGDP, a measure of the export to GDP ratio, which reveals the capacity of the country to earn the foreign exchange needed to service externally-held debt. This indicator is commonly used as a risk measure today by emerging market credit analysts. LOGY, a measure of real income per capita (relative to the

[6]Our interwar dates, although generally in agreeement with those of Officer (2001), contradict in a number of cases the annual codings reproduced in Eichengreen (1992, 188–90).

A general problem with the type of coding we use is that reinstatement of gold was in some cases anticipated (recall the last section), with some fraction of the beneficial spread effects possibly front-loaded. In that case our estimates of the benefit of gold adherence could be biased downward. One way to deal with the problem within this paper's framework might be through anticipatory dummies. In our view, however, the diverse circumstances of countries' paths back to gold warrant a case-by-case analysis with more detailed macroeconomic and political control variables than are available for broad cross-sectional work. This we leave for future research. In cases such as that of interwar France, for example, one would ideally disentangle the benefits of gold from those of the Poincaré stabilisation measures that made *de jure* resumption possible two years later.

[7]Bordo and Rockoff (1996) use the gap between money growth and real output as their measure of monetary laxity, but, even if we do not assume a stable velocity, the outcome variable INFL can serve as an adequate measure of excess money supply growth.

sample mean), serves as a catch-all variable that proxies for all manner of social, political, institutional and financial developments along the road to modernisation that might make a country a better credit risk. In some of our specifications we also control for the terms of trade (LTOT) and for international and civil wars (WARINT, WARCIV).[8]

Like Bordo and Rockoff, we find it necessary to account for global interest rate shocks that affect spreads in all markets in a given year. To do this, following the logic of the "international CAPM" model, we include (with a country specific slope, or "β") a measure of "market risk" in the form $\text{SPREAD}_{W,t} = \text{YIELD}_{WORLD,t} - \text{YIELD}_{U.K.,t}$, where this term is the GDP-weighted average world spread over the "safe rate" (London) for the countries in the sample at time t.[9]

Using pooled annual data for a large sample of countries, the basic fixed-effects regression equation is then of the form

$$\text{SPREAD}_{it} = \alpha_i + \beta_i \text{SPREAD}_{W,t} + \gamma X_{it} + u_{it}, \tag{1}$$

where typically the vector X includes gold standard adherence, the lagged debt ratio, lagged inflation, and possibly other control variables.

Such a specification can be rationalised in a model where the government's bond rate reflects the central rate plus a default premium, and in which new government borrowing depends on the current interest rate. In that case, the regression coefficients are reduced-form coefficients incorporating the government's incentive to borrow less when the rate charged is high, but they nonethless indicate whether the gold standard and macro fundamentals affected perceived risk. When we discuss "effects" of explanatory variables on the spread below, we refer to the reduced-form regression coefficients.[10]

[8]Real income per capita (at PPP prices) and the export ratio were included in the pre-1914 country risk analysis of Flandreau et al. (1998).

[9]We experimented with other ways to control for time specific asset market shifts, such as simple time dummies, but the results appear robust.

[10]Suppose that

$$\text{SPREAD}_t = a + b\text{DEBT}_t + cZ_t + v_t,$$

where the variables Z_t are various solvency indicators. Furthermore, suppose that new government borrowing depends negatively on the spread,

$$\Delta\text{DEBT}_t = -d\text{SPREAD}_t + w_t.$$

Then the reduced-form equation for the spread is

$$\text{SPREAD}_t = \frac{a}{1+bd} + \frac{b}{1+bd}\text{DEBT}_{t-1} + \frac{c}{1+bd}Z_t + \frac{bw_t + v_t}{1+bd}.$$

For the dependent variable SPREAD, due care must be taken in constructing measures of country risk to ensure that the bonds in every case are properly comparable across countries. We want SPREAD to capture the effects of default risk only, and not the effects of the potential exchange rate changes that are inherent in bonds' differing currency denominations. In this case, since we are using Britain as the base country, we elect to focus only on government bonds of long maturity (greater than five years, and usually at least ten) and payable in gold or sterling. It is therefore necessary to eliminate the polluting effects of Britain's departures from the gold standard – from August 1914 to April 1925 and from September 1931. Hence, we focus on only two periods: a prewar period based on annual December yields from 1870 to 1913, and an interwar period based on June yields from 1925 to 1931. This affords us up to 44 observations in the time dimension for the prewar sample, and up to seven for the interwar sample.

To construct SPREAD we then need bond yields for each country, also payable in gold or sterling, from which we can subtract the consol yield. Finding them is not always an easy task. Because, ideally, our test requires a gold or sterling bond as quoted in London, data construction requires considerable caution. It is a well-known problem that in standard secondary sources, the attributes of a particular bond issue are not always readily apparent.

Bordo and Rockoff (1996) split their samples into gold bonds and paper bonds, finding little effect of gold standard adherence on the yields of bonds payable in domestic paper. Care is needed because many paper bonds in fact contained gold clauses or exchange clauses, which (if enforceable) would have allowed creditors to extract payment in specie or hard currency if the debtor devalued. This condition was frequently stipulated for borrowers with poor reputations for fiscal and monetary stability. Then as now, such borrowers suffered from "original sin" – that is, an inability to issue debt denominated in one's own currency. Only a handful of countries have been capable of own-currency borrowing in the last two centuries (Rousseau and Sylla, 2003). The history of nineteenth and early twentieth century bond issuance is only now being fully explored to give us some insight into the constraints that faced borrowers with respect to details of contracts, including denominations of debt issue (Bordo, Meissner, and Redish, 2002; Flandreau and Sussman, 2002).[11]

[11] If a government's gold standard commitment had been permanent, noncontingent, and completely credible, then its paper bonds would have been "as good as gold" and any fall in external borrowing costs would have been inherited by the paper bonds. It therefore may seem puzzling that Bordo and Rockoff could not detect gold standard effects on paper yields. If countries' exchange

A great many data on bond yields are contained in the reference Global Financial Data (GFD), of which we make extensive use. For our purposes, however, we sometimes found it necessary to corroborate the type of bond quoted in GFD using bond manuals such as *Kimber's Record* and other sources. In many cases, the bond yields quoted in GFD failed to satisfy our requirements, being only domestic rather than London quotations, or possibly yields denominated in domestic currency, and this eliminated several countries from our database (such as Denmark in the prewar years and Spain in the interwar years). We treated the United States during the 1870s just as Bordo and Rockoff (1996) did, using Charles Calomiris's series on gold equivalent yields, for a period in which the terms of payment were in doubt (Bordo, Meissner, and Redish, 2002). Countries like Belgium, France and Germany – which issued debt in domestic currency – had to be omitted in the prewar sample, but we were able to find interwar data on appropriately denominated Belgian and French bonds traded in New York and on the German Dawes Loan as quoted in London. Missing data were often a problem too. Some of the gaps in GFD, especially in the interwar years, could be filled by consulting newspapers such as the *Investor's Monthly Manual* (for a London quote) or, as a last resort, the *Wall Street Journal* (for New York quotes on gold-linked bonds). Full details of the construction of the yield data are in the appendix.

Other complications affect our use of historical bond yield data. The compiler of the GFD source, Bryan Taylor, warns in the documentation (September 2000) that: "For riskier issues, such as Latin American countries, not only was there a risk that coupons could be eliminated, but that the entire issue could go in default. At that point, the implied yield becomes meaningless, and any yield over 10% before World War Two should be treated as implying that the issue was in default on either coupon, on principal, or on both." Because our model is intended to capture country risk under conditions with a positive probability of full repayment, once an issue actually is in default we might expect its yield to be volatile indeed, and perhaps far removed from any simple linear prediction given by a model of the form (1). Such defaults were not uncommon in our data, and in some cases spreads

rate commitments lacked credibility, why not their commitments to repay gold-denominated debt at par? Prewar gold standard conventions, however, allowed for suspension in the event of certain contingencies (notably, wars) provided resumption took place at the previous gold parity (Bordo and Kydland, 1995). Thus, paper bonds might entail some shorter-term exchange risk even for countries following conventional gold standard rules, whereas gold- or sterling-denominated bonds were supposedly payable in the currency of denomination regardless of the issuing government's circumstances. The different behavior of indexed and paper yields certainly warrants further investigation. Cook (2002) discusses the case of Russian bonds.

grew to 20, 30 or even 60 percentage points on some issues, implying prices of less than 10 percent of par value. Although such steep discounts on bonds affect only a small part of our sample, we discuss below the steps we can take to ensure that these types of observation do not bias the regression estimates.

The gradual convergence of bond spreads evident in Figure 1 warns us that the dynamics of evolving country risk might not be simple. In particular, the figure suggests high levels of persistence or serial correlation in bond spreads, and it is easy to imagine why. Bond spreads are a function of reputation, which in capital markets, as in any other repeated game, cannot be built overnight. Instead, one's reputation in the previous period is likely to have a substantial influence on one's reputation today. In our empirical results we present two alternative estimates based on different approaches to modelling of the persistence in spreads. One way is to impound all of the persistence in the error term, using an AR1 model. Another way is to use a lagged dependent variable model, so that spreads themselves follow a partial adjustment process towards long-run equilibrium.

3.1 Prewar findings, 1870–1913

As a cross check we begin our analysis with a simple attempt to replicate the findings of Bordo and Rockoff (1996), who used a sample of just seven countries in the prewar era, Argentina, Australia, Brazil, Canada, Chile, Italy and the United States. Based on pooled data for gold bonds (267 observations), their headline number for the impact of the gold standard on country risk was presented as follows:

> Indeed, if we were to single out one number to represent our findings with respect to the significance of the gold-adherence dummy it would be 40 basis points.... In other words, all other things equal, the rate on a gold bond would be 40 basis points lower if the country were on the gold standard. Other factors, perhaps related to regional preferences, undoubtedly also played a role in determining country-risk premia. But our analysis suggests a willingness to commit to the gold standard was an important determinant of risk premia established in the London capital market. (Bordo and Rockoff, 1996, 413.)

We are in broad agreement with this conclusion. Regression 1 of sectionsection 1 shows that our data, some of it from different sources, enables us to duplicate the Bordo-Rockoff finding on their country sample. We have slightly longer time series that yield 308 observations for the Bordo-Rockoff countries, but we find, as

they did, that adopting the gold standard was worth a statistically significant reduction in spread. At 30 rather than 40 basis points, our estimated effect is somewhat smaller than theirs, but still economically important. As Bordo and Rockoff noted, strong serial correlation in this context renders ordinary least squares (OLS) invalid, so like them we employ an AR1 specification, allowing for possibly different autoregressive parameters in each member of the panel.[12] That is we estimate an equation of the form (1) under the assumption that $u_{it} = \rho_i u_{i,t-1} + \epsilon_{it}$ and ϵ_{it} are white noise disturbances. The estimated ϵ_{it} appear highly heteroskedastic, so we also correct for country-specific values of the error variances $\sigma^2_{\epsilon_i}$.

Here, and throughout this section, the β_i coefficients are not shown to conserve space but they also accord with expectations and past results, being higher in "riskier" peripheral countries. Country fixed effects, which are reported, are high for peripheral countries such as Brazil (235 basis points), Italy (144), Argentina (206), and Chile (169), but lower for the core western offshoots, Australia, Canada, and the United States (87, 23, and 1 basis point, respectively).

Regression 2 now expands this analysis substantially by using our augmented data set covering more than 20 countries from 1870 to 1913. The sample size here increases by a factor of nearly three, to 892 observations. The estimated effect of the gold standard remains statistically significant but is now estimated at about half the Bordo-Rockoff number, or 20 basis points.

In Regression 3 we add full and partial default to the model. Countries in full default had spreads 165 basis points higher, and the effect is highly significant. Partial defaulters seem to have been penalized far less. Adding default variables brings the gold standard effect down further, however, to a (still statistically significant) 14 basis points.

This last result does not appear to be an artefact of a few badly-behaved outliers in the data. Specifically, when we exclude observations with very high spreads (over 2,000 or 1,000 basis points) as in Regressions 4 and 5, we find that the effect of the gold standard remains statistically significant but is only 16 to 17 basis points. The estimates of full default costs are affected, because our very high spread observations typically correspond to default situations.

Our broader aim is to consider the role of additional country characteristics in determining country risk. Since certain geopolitical features of countries remained

[12] Unlike Bordo and Rockoff (1996), we do not employ SUR models, but we have explored SUR results for limited samples and find the results broadly similar. However, the larger cross-section size in our later regressions calls for a large parameter set in the unrestricted error covariance matrix under SUR, sometimes too large a set for the available degrees of freedom. In all of our tables, the country coefficients identified vertically along the left are the country-specific intercepts.

Table 1: Country risk and the gold standard, 1870–1913

Sample	(1) Bordo Rockoff	(2) All	(3) All	(4) SPREAD <20	(5) SPREAD <10
Observations	308	892	892	877	852
GS×NODFLT	-0.30(2.34)	-0.20(2.61)	-0.14(1.96)	-0.17(2.32)	-0.16(2.21)
GS×DFLT	-0.14(0.38)	1.06(3.49)	0.12(0.40)	0.02(0.08)	0.07(0.23)
DFLT1	—	—	1.65(6.72)	1.81(7.59)	1.21(5.72)
DFLT2	—	—	0.12(0.51)	0.14(0.60)	0.26(1.20)
ARG	2.06(4.44)	1.99(4.21)	1.83(4.41)	1.83(4.35)	1.89(4.63)
AUS	0.87(5.56)	0.76(6.60)	0.70(6.25)	0.74(6.44)	0.72(6.41)
AUT	—	0.49(1.87)	0.49(1.87)	0.49(1.87)	0.49(1.87)
BRZ	2.35(5.36)	1.99(3.20)	2.20(8.22)	2.20(8.56)	2.15(6.64)
CAN	0.23(1.42)	0.12(1.02)	0.06(0.54)	0.10(0.80)	0.08(0.70)
CHL	1.69(5.38)	1.68(5.40)	1.65(6.49)	1.65(6.01)	1.63(5.74)
EGY	—	-0.39(0.63)	-0.41(0.83)	-0.37(0.75)	0.26(0.54)
GRC	—	-6.40(3.17)	-6.10(3.28)	-0.66(0.38)	2.31(1.32)
IND	—	0.28(1.24)	0.30(2.00)	0.28(1.48)	0.27(1.44)
ITA	1.44(7.08)	1.42(7.49)	1.48(9.82)	1.46(8.91)	1.45(8.81)
JPN	—	2.08(7.34)	2.17(5.52)	2.12(6.28)	2.10(6.31)
MEX	—	-3.46(1.16)	-3.25(1.17)	-0.40(0.44)	-0.32(0.30)
NOR	—	0.44(3.91)	0.38(3.49)	0.41(3.72)	0.40(3.65)
NZL	—	0.54(2.89)	0.48(2.60)	0.51(2.76)	0.50(2.70)
PRT	—	1.45(1.05)	1.01(0.77)	0.96(0.73)	0.96(1.25)
RSA	—	1.03(4.56)	0.97(4.33)	1.00(4.45)	0.99(4.41)
SPA	—	-2.52(1.73)	-1.95(1.56)	-1.41(1.24)	-0.20(0.41)
SWE	—	0.56(4.09)	0.50(3.54)	0.53(3.82)	0.51(3.88)
TUR	—	0.28(0.60)	0.24(0.49)	0.28(0.56)	0.25(0.55)
USA	0.01(0.03)	-0.12(0.49)	-0.16(0.60)	-0.14(0.53)	-0.16(0.61)
URU	—	-1.63(1.03)	-1.88(1.26)	-1.84(1.23)	-1.17(0.98)
Empire	—	0.39(2.80)	0.35(2.91)	0.38(3.07)	0.47(3.93)
Nonempire	—	-0.12(0.38)	-0.09(0.33)	0.50(2.32)	0.82(4.43)
Difference	—	0.51(1.55)	0.44(1.49)	-0.12(0.52)	-0.35(1.69)

Notes: Dependent variable is SPREAD. Estimation is by panel FGLS with heteroskedastic panels and country-specific AR(1) correction. Country-specific β_i and ρ_i are not reported; z-statistics are shown in parentheses. Empire and nonempire show average fixed effect for the group.
Sources: See text and appendix.

fairly constant in this period, a natural place to start is by examining the country fixed effects for clues. And since Britain is being used as the reference country in the analysis, an important feature to examine would be any special country-specific links to Britain. An obvious criterion is membership in the British Empire.

Ever since Marx and Hobson, students who view history through the lens of political economy – whether from left, right or centre – have regarded imperialism as a leading vehicle on the road to economic globalisation. Its epitome, the British Empire, is seen as, amongst other things, a privileged economic zone in both trade and capital markets. Empire connections among countries are believed to have conveyed some distinct advantages to would-be borrowers in London. Davis and Huttenback (1986) and Edelstein (1981) have suggested that Empire membership meant a lower cost of capital to both public and private sectors in this era.

Taking the argument further, Ferguson (2002) places these ideas in the context of a broader political and financial history and claims support, on economic if not on other grounds, for his case that the British Empire was a global public good:

> My hypothesis is that empire – and particularly the British Empire – encouraged investors to put their money in developing economies. The reasoning is straightforward. Investing in such economies is risky. They tend to be far away and more prone to economic, social and political crises. But the extension of empire into the less developed world had the effect of reducing such risks by imposing, directly or indirectly, some form of European rule. In practice, money invested in a *de iure* British colony such as India (or a colony in all but name like Egypt) was a great deal more secure than money invested in a *de facto* "colony" such as Argentina.
>
> This effect should be – and is – quantifiable. There are two ways of posing the crucial question. First, did the existence of the British Empire make investors more willing to put their money into poorer countries than they would otherwise have been? More precisely, did being a British colony reduce the cost of borrowing for a country? The hypothesis here is that it did, because being a colony implied a no-default guarantee. This was arguably a better "seal of good housekeeping" even than membership of the gold standard, though most British colonies had both. (Ferguson, 2002, 12.)

Here, one contrast to the Bordo and Rockoff (1996) claim is quite explicit. Empire, not the gold standard, was what really counted for attracting capital in large

quantities at low cost, though the two forces need not have been mutually exclusive and, indeed, were positively correlated. To settle the debate econometrically, however, requires careful controls for these and other risk determinants.

It is imperative, then, that we consider the "Empire effect" in our analysis. The question is whether countries within the Empire enjoyed preferential access to the market, and we interpret that to imply that, all else equal, Empire countries should exhibit a smaller fixed effect than others. This can be studied by looking at each individual intercept in the regression. Or, for a summary comparison of the two groups, we can ask whether the mean fixed effect in the empire group was less than the mean in the nonempire group. The mean fixed effect for each group is shown in the bottom panel of Table 1, together with the t-statistic for the estimated mean (where the null is a zero mean).

Our results are not too favorable to the idea of an "Empire effect" during the so-called Age of High Imperialism. In Regressions 2 and 3 even the sign is wrong. In the possibly more robust regressions (4, and 5) the sign is correct, and Empire membership seems to be worth anywhere from 12 to 35 basis points as a point estimate; but this was possibly little more valuable than going on gold – and, unlike the effect of gold, this impact is not statistically significant.[13]

A detailed look at some of the fixed effects reveals some of the problem cases. Consider Regression 5. In the nonempire group only some countries (once we include the effect of being on gold) paid a large risk penalty, namely Argentina (173 basis points), Brazil (199), Chile (147), Greece (215), Italy (129), Japan (194), and Portugal (80). Others appear to have paid no premium at all. Yet even the richest country in the world (by some measures) and Empire member Australia had to pay a statistically significant risk premium of 56 basis points, while South Africa's burden was 83 basis points.[14]

The reasons for Australia's plight are easy to guess, given the severe and enduring consequences of the widespread defaults associated with the 1890 crash and subsequent depression, which crippled Australia's banks and dented the country's reputation in the London market (see Davis and Gallman 2001). The Australian results show that, even if empire borrowers were proof against outright sovereign

[13] A "strong" test of the Empire hypothesis would be to also require the β coefficients to be zero for Empire members. That would imply that their returns did not co-vary with changes in the global spread – in other words, that they were "safe" assets like the British consol itself, up to a white noise error. But this hypothesis is very decisively rejected. Although the β coefficients are not reported in the tables to conserve space, these results are available from the authors on request.

[14] These estimates are 16 basis points less than the reported intercepts because we also include the effect of going on gold.

default, they were not proof against a severe economic crisis. Some narrative evidence seems to back this up, as British and empire issues were not always viewed as pure substitutes by outside observers with a keen eye on the determinants of risk premia.[15]

Conversely, even some peripheral nonempire countries such as Uruguay (which was well within "contagion range" of Argentina and Brazil) seemed not to have been penalised in capital markets despite being outside the formal empire. Empire status was neither necessary nor sufficient for preferential access to the London market. Much seemed to depend on other aspects of the behavior of the borrower – for our purposes, an unobservable.

The preceding regressions do not yet add a number of plausibly important control variables. In Table 2 we use the full data set to check the robustness of the preceding results to additional controls for debt ratios, inflation, relative income per capita, the terms of trade, and other variables. Regression 1 in Table 2 adds DEBT and INFL to the spread equation. As we noted in the introduction, the omission of DEBT in particular could very plausibly lead to biases.[16] We are now restricted to a much smaller sample than in Table 1, since our new variables DEBT and INFL are not available for all countries in all years. From a maximum of 892 observations, we are now down to 563. For this pre-1914 sample, the gold standard seal of approval is highly significant (conditional on no default) in all of the regressions (and estimated to between 26 and 28 basis points).

Perhaps surprisingly, DEBT is not significant in Regression 1, neither economically nor statistically, although INFL is and both variables are correctly signed. The gold standard commitment appeared strong enough that markets could rely

[15]For example, during the Japanese government's internal debate over investing foreign reserves during the mid-1890s, the finance minister asked "Are the public bonds of the Indian Government as safe and reliable as those of England itself?" (Matsukata, 1899, 221).

[16]Flandreau et al. (1998) argue that a major factor driving the evident convergence of bond spreads after the early 1890s and through 1914 is worldwide inflation resulting from gold discoveries, a factor that caused both an unexpected reduction in countries' ratios of public debt to nominal GDP and a more widespread adherence to the gold standard. For the pre-1914 period, Flandreau et al. investigate borrowing spreads over London using a country sample different from that of Bordo and Rockoff (1996) and an econometric specification encompassing the public debt ratio to GDP as well as gold standard adherence. Unlike us, they find a strong positive effect of public debt on borrowing spreads even under the classical gold standard (and even in a linear model of spread determination). Unfortunately, we have not been able to obtain their complete data set, which includes some "European peripheral" countries with highly indebted governments, so we cannot say for sure whether differences in the country sample drive the discrepancy in results. The Flandreau et al. estimates of the value of gold standard adherence before 1914 are, as we noted above, similar to those that Bordo and Rockoff find.

Table 2: Country risk and the gold standard, 1870–1913: Additional controls

	(1)	(2)	(3)	(4)
Observations	563	563	563	563
GS×NODFLT	-0.26(3.71)	-0.28(4.15)	-0.27(4.05)	-0.27(3.98)
GS×DFLT	-0.18(0.50)	-0.24(0.68)	-0.25(0.71)	-0.28(0.82)
DFLT1	0.89(3.96)	0.95(4.31)	0.94(4.28)	1.03(4.67)
DFLT2	0.44(2.09)	0.41(1.99)	0.41(1.95)	0.41(1.97)
DEBT	0.13(1.60)	0.09(1.18)	0.09(1.10)	0.08(1.06)
INFL	0.35(2.42)	0.35(2.44)	0.36(2.45)	0.36(2.48)
LOGY	—	-0.46(4.34)	-0.45(4.32)	-0.46(4.34)
EXPGDP	—	—	-0.11(0.24)	-0.08(0.17)
LOGTOT	—	—	-0.11(1.03)	-0.11(1.03)
WARINTL	—	—	—	0.01(0.22)
WARCIV	—	—	—	0.28(1.03)
ARG	0.35(0.60)	0.75(1.29)	0.77(1.31)	0.78(1.33)
AUS	0.69(4.88)	1.11(5.92)	1.12(5.59)	1.11(5.53)
AUT	-0.27(0.72)	-0.20(0.59)	-0.18(0.51)	-0.19(0.53)
BRZ	1.13(1.59)	0.81(1.23)	0.81(1.22)	0.87(1.37)
CAN	0.02(0.16)	0.41(2.51)	0.43(2.35)	0.42(2.30)
CHL	1.49(5.70)	1.55(5.81)	1.59(5.88)	1.58(5.92)
EGY	0.37(1.47)	-0.05(0.22)	0.01(0.03)	-0.01(0.04)
IND	0.42(3.30)	-0.13(0.71)	-0.12(0.64)	-0.13(0.68)
ITA	1.42(5.67)	1.40(6.61)	1.41(6.68)	1.40(6.64)
JPN	0.04(0.10)	-0.23(0.72)	-0.26(0.81)	-0.27(0.82)
NOR	0.33(1.88)	0.40(2.61)	0.43(2.39)	0.42(2.34)
NZL	-0.11(0.49)	0.38(1.42)	0.43(1.41)	0.42(1.38)
PRT	1.33(0.99)	1.14(0.86)	1.16(0.87)	1.14(0.86)
SPA	-1.33(2.04)	-1.23(1.84)	-1.23(1.86)	-1.21(1.84)
SWE	0.35(1.63)	0.66(2.72)	0.70(2.83)	0.69(2.78)
USA	0.27(2.27)	0.64(4.13)	0.64(4.02)	0.64(3.96)
URU	-1.83(1.14)	-1.69(1.09)	-1.69(1.09)	-1.69(1.10)
Empire	0.28(2.63)	0.34(3.38)	0.37(2.69)	0.36(2.62)
Nonempire	0.27(1.26)	0.33(1.58)	0.35(1.59)	0.35(1.60)
Difference	0.00(0.02)	0.01(0.05)	0.03(0.12)	0.02(0.07)

Notes and Sources: See Table 1.

on debt repayment. Inflation, however, was viewed with alarm. In an interesting twist, we also find that the Empire thesis is again rejected, but for a more powerful reason. In this smaller subsample, all countries could expect, once on gold, to converge to the British bond yield. Full default now draws a smaller penalty than in Table 1, and partial default a larger one, with both effects now statistically significant.

Regression 2 through 4 successively add real GDP per capita, the export ratio, the terms of trade, and war dummies to the specification. None of these changes affects the conclusions about public debt, inflation, or default status. The export ratio is correctly signed, as are the terms of trade (which are defined so that an increase in LOGTOT is an improvement, a rise in the country's price of exports relative to imports). Perhaps surprisingly, neither variable is significant. Likewise, indicators of war are correctly signed but their coefficients are small and insignificant. In all specifications in Table 2, the "Empire effect" is found to be statistically indistinguishable from zero based on the difference between the mean fixed effects.

For a final sensitivity check we adopted a different specification than any employed in the literature so far, and one that might be more robust since it does not depend on such strong assumptions. First, we augment the model (1) to include a lagged dependent variable, so that we estimate

$$\text{SPREAD}_{it} = \alpha_i + \phi(L)\text{SPREAD}_{it} + \beta_i \text{SPREAD}_{W,t} + \gamma X_{it} + u_{it}, \qquad (2)$$

where $\phi(L)$ is a polynomial in positive powers of the lag operator L. We retain fixed effects and possible serial correlation. This choice of model could be justified on a number of grounds. Lagged-dependent variable models can be hard to distinguish from the previous AR1 models we have used, but they might better approximate bond market behavior if agents employ Bayesian updating of country risk. In that setting, today's predicted risk is a linear combination of lagged risk and today's new information. Thus, deviations from steady state risk may persist for a long time, whereas in the simple AR1 model the fitted value adjusts immediately and only the error term has persistence.

Naturally, such a flexible form as this calls for a different estimation strategy. Panel fixed effects with lagged dependent variables induce bias in OLS estimates, and the solution is to use the generalised method of moments (GMM). We employ the Arellano and Bond (1991) one-step dynamic panel estimator, treating the world risk and gold standard variables as exogenous, and the lagged debt and inflation terms as endogenous but predetermined. The model is estimated in differences

using at least twice lagged levels of the endogenous variables as instruments. Selected results are shown in Table 3, and, despite the very different estimation strategy, they show a basic consistency with the message from Tables 1 and 2.[17] The long-run effect of the gold standard on country risk ranges from 28 to 93 basis points (conditional on no default) and is of mixed significance, though we suspect numbers at the lower end of this range are more likely. Except for the default variables, the other variables' coefficients usually are statistically insignificant, and they are not always correctly signed.

Like Bordo and Rockoff (1996), we conclude overall that the main significant policy determinant of country risk in the prewar period appears to have been gold standard adherence. Gold was apparently a good enough seal of approval by itself, and risk was priced without much reference to public debt levels, inflation, or whether the country was core or periphery, empire or nonempire.

3.2 Interwar findings, 1925–31

Most narrative accounts of the transition from the classical gold standard to the interwar period stress one key difference: the rebuilt gold standard was a pale imitation of its predecessor. It did not long endure, and seemed to lack both credibility and stability. As Temin (1989, 33) remarks, "The combination of changed conditions and some policy choices of the 1920s … created great strains in the operation of the interwar gold standard."

The key question is whether such a regime change can be detected in the data. To that end we repeat the previous country risk modelling exercise for the period 1925–31. One difficulty here is that after 1914, many countries suspended and then resumed the gold standard at new, devalued parities that partially expropriated prior bondholders. In a conventional view of reputation (Bordo and Kydland 1995), devaluation would be viewed with suspicion by markets, and fear of such reactions prompted some governments to deflate in order to restore prewar parities – Churchill's pursuit of $4.86 is perhaps the most famous example. To account for differential market treatment of par maintainers and par adjusters, we use the policy dummy variables GSPAR and GSDEV described at the start of this section, as suggested Bordo, Edelstein, and Rockoff (1999). A second difficulty is that whereas previously we had up to 44 observations per country in the time dimension, we now have at most 7; it is therefore unwise to estimate country-specific autoregressive

[17] In these regressions, preliminary analysis indicated the need for two lags to ensure no second order residual autocorrelation.

Table 3: Country risk and the gold standard, 1870–1913: GMM estimates

	(1)	(2)	(3)	(4)
Observations	641	546	546	546
Sargan	438.7(0.00)	467.3(0.00)	549.2(0.00)	542.8(0.00)
m_2	-0.16(0.88)	1.34(0.18)	1.03(0.30)	1.08(0.28)
SPREAD(t-1)	0.72(20.30)	0.70(20.80)	0.72(21.78)	0.73(21.79)
SPREAD(t-2)	-0.31(9.61)	-0.35(11.17)	-0.31(10.19)	-0.31(10.19)
GS×NODFLT	-0.55(2.44)	-0.31(1.80)	-0.18(1.15)	-0.16(1.03)
GS×DFLT	0.52(1.15)	0.55(1.65)	0.74(2.25)	0.75(2.25)
DFLT1	1.02(3.74)	1.40(7.26)	1.41(7.63)	1.44(7.74)
DFLT2	0.18(0.56)	0.53(2.30)	0.39(1.88)	0.46(2.07)
LOGY	-1.48(1.83)	-0.96(1.71)	-0.31(0.60)	-0.24(0.47)
DEBT	—	0.10(0.70)	-0.06(0.52)	-0.03(0.23)
INFL	—	0.14(0.44)	0.11(0.36)	0.16(0.53)
EXPGDP	—	—	0.35(0.35)	0.46(0.45)
LOGTOT	—	—	-0.12(0.41)	-0.10(0.36)
WARINTL	—	—	—	-0.10(0.55)
WARCIV	—	—	—	0.62(2.00)
Long-run coefficients				
GS×NODFLT	-0.93	-0.47	-0.31	-0.28
GS×DFLT	0.88	0.85	1.26	1.28
DFLT1	1.72	2.16	2.39	2.46
DFLT2	0.30	0.81	0.65	0.78
LOGY	-2.50	-1.48	-0.52	-0.41
DEBT	—	0.15	-0.11	-0.05
INFL	—	0.22	0.19	0.28
EXPGDP	—	—	0.60	0.78
LTOT	—	—	-0.20	-0.18
WARINTL	—	—	—	-0.18
WARCIV	—	—	—	1.07

Notes: Dependent variable is SPREAD. Estimation is by GMM using the Arellano-Bond method. Country-specific β_i are not reported and t-statistics are shown in parentheses. "Sargan" is the Sargan test of overidentifying restrictions, distributed χ^2. m_2 is the Arellano-Bond test that average autocovariance in residuals of order 2 is 0, distributed asymptotically $N(0, 1)$. The one-step estimator is used, (GS, DFLT1, DFLT2, LTOT, WARCIV, WARINTL) are treated as exogenous, and (DEBT, INFL, EXPGDP, LOGY) are treated as endogenous. See text for details.
Sources: See text and appendix.

parameters ρ_i, so we adopt a specification with $\rho_i = \rho$ for all countries. For the same reason we do not attempt attempt a heteroskedasticity correction.

Tables 4 and 5 can be directly compared with Tables 1 and 2. Table 4 shows the interwar analysis for the full sample, 167 observations, with no additional controls. Regression 1 in Table 4 suggests that unconditionally (that is, without reference to the restoration of the prewar parity), the gold standard had a statistically significant 45 basis point effect on spreads (for a nondefaulter). Regression 2 partitions the GS dummy to account for postwar devaluations. (No countries that returned to gold at par defaulted.) According to these estimates, countries returning to gold at the prewar parities gained in reduced spreads, but countries like France that returned after devaluing gained more – 62 basis points for devaluers versus 38 for parity keepers. Adding the full default dummy (there are no partial defaults in our interwar sample) changes nothing, and the variable itself is incorrectly signed and insignificant.

These findings run contrary to the Bordo-Edelstein-Rockoff empirical results. Echoing the conventional wisdom of interwar policymakers, they found that sticking to the prewar parity was rewarded by markets with a continued (and large) discount on borrowing costs of over 100 basis points. But in their analysis, countries that resumed at a devalued parity gained nothing, as their credibility was damaged.

What could possibly explain our result – a reversal of the classic ideology – according to which the market rewards devaluers better than parity keepers? The result is not so far fetched when markets try to assess which promises actually can be kept. In this respect, our findings support the theoretical conclusion of Drazen and Masson (1994) that policymakers may hurt rather than enhance their credibility through policies that appear "tough" in the short term but are too draconian to be sustained for long. These initial results are far from conclusive, of course, but the question certainly warrants further research.

Our findings are so obviously at variance with the results of Bordo-Edelstein-Rockoff that some explanation is needed. The contrast could be ascribed to differences in concept (use of secondary-market bond yields, mostly in London, versus new issue yields in New York) and differences in estimation method. Of these features in our empirical approach, the first, at least, seems necessary if we are to make comparisons on an equal footing with the prewar period and Bordo and Rockoff (1996). For the same reason an autoregressive correction of some sort would seem essential, although Bordo, Rockoff, and Edelstein (1999) used simple OLS. One reason for their choice, we think, was an unfortunate feature of Cleona Lewis's interwar data on New York bond issues: these were primary issues, so not

Table 4: Country risk and the gold standard, 1925–31

	(1)	(2)	(3)	(4)
Observations	167	167	167	167
GS×NODFLT	-0.45(4.90)	—	-0.45(4.91)	—
GS×DFLT	0.25(0.60)	—	0.49(0.97)	—
GSPAR×NODFLT	—	-0.38(3.53)	—	-0.38(3.54)
GSDEV×NODFLT	—	-0.62(3.72)	—	-0.62(3.73)
GSDEV×DFLT	—	0.02(0.04)		0.27(0.50)
DFLT1	—	—	-0.24(0.84)	-0.25(0.89)
ARG	0.31(1.01)	0.26(0.85)	0.31(1.01)	0.26(0.85)
AUS	1.05(3.48)	1.04(3.48)	1.05(3.49)	1.04(3.49)
AUT	1.47(4.67)	1.65(4.82)	1.47(4.68)	1.65(4.84)
BEL	1.66(4.96)	1.94(4.83)	1.66(4.97)	1.94(4.84)
BRZ	2.24(7.19)	2.39(7.23)	2.24(7.21)	2.39(7.25)
CAN	0.38(1.25)	0.36(1.19)	0.38(1.26)	0.36(1.19)
CHL	0.41(1.02)	0.70(1.52)	0.41(1.02)	0.70(1.53)
DNK	-0.66(1.99)	-0.77(2.22)	-0.66(1.99)	-0.77(2.22)
EGY	1.08(3.42)	1.02(3.21)	1.08(3.43)	1.02(3.21)
FIN	0.88(2.67)	1.15(2.94)	0.88(2.67)	1.15(2.95)
FRA	0.79(2.40)	1.05(2.70)	0.79(2.40)	1.05(2.71)
GER	2.44(7.74)	2.61(7.63)	2.44(7.76)	2.61(7.65)
HUN	3.26(10.34)	3.43(10.03)	3.26(10.37)	3.43(10.05)
IND	1.60(4.77)	1.50(4.35)	1.60(4.78)	1.50(4.36)
ITA	2.41(6.13)	2.68(6.03)	2.41(6.14)	2.68(6.04)
JPN	1.51(4.88)	1.46(4.73)	1.51(4.89)	1.46(4.75)
NZL	0.62(2.04)	0.61(2.02)	0.62(2.05)	0.61(2.03)
NOR	-0.42(1.27)	-0.51(1.50)	-0.42(1.27)	-0.51(1.51)
PRT	0.13(0.42)	0.11(0.36)	0.13(0.42)	0.11(0.36)
RSA	0.79(2.51)	0.73(2.31)	0.79(2.52)	0.73(2.32)
SWE	0.15(0.49)	0.09(0.28)	0.15(0.49)	0.09(0.28)
TUR	3.30(10.94)	3.30(11.06)	3.38(10.65)	3.38(10.81)
USA	-1.03(3.26)	-1.09(3.44)	-1.03(3.27)	-1.09(3.45)
URU	2.83(9.15)	2.77(8.96)	2.83(9.17)	2.77(8.98)
Empire	0.92(6.51)	0.88(5.97)	0.92(6.53)	0.88(5.99)
Nonempire	1.20(9.96)	1.29(9.36)	1.21(10.01)	1.30(9.41)
Difference	-0.29(1.96)	-0.41(2.27)	-0.29(1.99)	-0.42(2.31)

Notes: Dependent variable is SPREAD. Estimation is by panel OLS with homoskedastic panels and a common AR(1) correction. Country-specific β_i are not reported; t-statistics are shown in parentheses. Mean empire and mean nonempire show average fixed effect for the group.
Sources: See text and appendix.

every country had a bond issue every year, leading to gaps in the time series, and hence the impossibility of an AR1 correction. A more subtle difficulty, which our approach confronts, is an inherent problem of sample selection bias when using primary-issue data of Lewis's kind. Countries tend only to float bonds when they are creditworthy, so this yields a biased sample, as noted earlier. In contrast, by using secondary market data from London, we can track countries in all years, whatever their predicament.

But we cannot stop here, and Table 5 adds additional controls. In Regressions 1 and 2 the coefficients of GSDEV × NODFLT and GSPAR × NODFLT change relatively little compared to the previous table. In contrast to the prewar results, public debt now has a statistically significant positive effect on borrowing costs. This is a second key contrast with the classical prewar gold standard. All four regressions in Table 5 indicate that although the markets cared very much about public debt during the interwar period. For example, a coefficient of 1.18 on DEBT in our table (Regression 1) means that a 10 percentage point increase in a country's debt to GDP ratio would be expected to raise country risk by 11.8 basis points. Inflation, however, has a small effect and is of uneven statistically significance in the table. Regressions 2 adds a control for the level of development, which turns out to have a significant negative effect on spreads. Once again, we caution that the interpretation of the LOGY variable is unclear since it could be a proxy for various institutional, economic or other factors affecting risk. In all regressions, the default variable is puzzingly of the wrong sign, although the estimate is not very significantly different from zero.

Regression 3 adds exports (incorrectly signed and significant) and the terms of trade. The terms of trade have the right sign and are highly statistically significant. Adding them to the specification is quite important, as that change results in coefficients on GSDEV × NODFLT and GSPAR × NODFLT that are much closer to zero (but with GSDEV still more influential than GSPAR for the spread). Indeed, the effects of returning to gold at par is now statistically insignificant. This effect is largely due to the presence in our sample of several commodity exporters – including Australia, Argentina, and Uruguay – that departed from gold before Britain did so in September 1931. These countries were driven off gold in part by adverse terms of trade developments (Kindleberger 1986), and they experienced huge increases in their spreads over London as they freed their currencies. Regressions 1 and 2 in Table 5 implicitly give the gold standard "credit" for preventing those post-departure spread increases – which in reality were caused not by departure *per se*, but by the terms of trade and other shocks that made the gold standard unsustainable. Conversely, stronger terms of trade supported the gold standard in

Table 5: Country risk and the gold standard, 1925–31: Additional controls

	(1)	(2)	(3)	(4)
Observations	164	164	136	136
GSPAR×NODFLT	-0.34(3.61)	-0.26(2.79)	-0.14(1.36)	-0.09(0.80)
GSDEV×NODFLT	-0.60(4.18)	-0.56(4.00)	-0.34(2.08)	-0.33(2.03)
GSDEV×DFLT	0.74(1.21)	0.20(0.32)	0.09(0.14)	0.03(0.05)
DFLT1	-0.83(1.74)	-0.77(1.67)	-0.62(1.35)	-0.62(1.37)
DEBT	1.18(3.30)	1.08(3.12)	0.84(2.08)	0.95(2.34)
INFL	0.14(2.00)	0.15(2.18)	0.10(1.36)	0.10(1.32)
LOGY	—	-1.50(3.32)	-1.76(0.53)	-1.87(3.83)
EXPGDP	—	—	0.52(3.61)	0.32(0.32)
LOGTOT	—	—	-0.69(2.80)	-0.74(3.00)
WARINTL	—	—	—	-0.60(1.69)
ARG	-0.20(0.67)	0.65(1.67)	0.57(1.39)	0.59(1.45)
AUS	-0.83(1.33)	0.34(0.48)	0.59(0.77)	0.50(0.66)
AUT	1.47(4.92)	2.17(6.10)	—	—
BEL	1.00(2.22)	2.22(3.92)	1.59(2.32)	1.69(2.49)
BRZ	2.09(6.95)	1.04(2.43)	0.39(0.75)	0.29(0.57)
CAN	-0.06(0.22)	1.02(2.38)	1.08(2.42)	1.12(2.55)
CHL	0.40(1.00)	0.73(1.81)	0.36(0.82)	0.35(0.80)
DNK	-1.12(3.52)	0.09(0.19)	0.08(0.17)	0.12(0.24)
EGY	0.35(1.04)	-1.40(2.24)	-1.87(2.72)	-2.07(2.99)
FIN	0.99(2.91)	1.26(3.73)	0.96(2.37)	1.00(2.50)
FRA	-0.35(0.65)	0.76(1.22)	0.81(1.17)	0.76(1.12)
GER	2.91(7.40)	3.86(8.11)	3.68(7.20)	3.74(7.38)
HUN	3.33(10.17)	3.45(10.84)	—	—
IND	0.98(2.88)	-0.97(1.43)	-1.56(2.16)	-1.81(2.47)
ITA	2.06(4.79)	2.47(5.72)	—	—
JPN	0.92(2.94)	0.63(1.99)	0.44(1.31)	0.67(1.88)
NZL	-1.50(2.17)	-0.23(0.30)	0.11(0.13)	0.05(0.06)
NOR	-1.04(3.05)	-0.50(1.37)	-0.63(1.65)	-0.68(1.80)
PRT	-0.51(1.64)	-0.72(2.33)	-0.69(2.12)	-0.77(2.39)
RSA	0.21(0.65)	-0.15(0.45)	—	—
SWE	-0.17(0.59)	0.69(1.84)	0.67(1.72)	0.70(1.82)
TUR	1.08(1.83)	0.26(0.41)	0.34(0.53)	0.26(0.41)
USA	-1.32(4.71)	0.16(0.31)	0.35(0.63)	0.40(0.73)
URU	1.82(4.66)	2.89(5.82)	3.10(5.58)	3.05(5.50)
Empire	-0.14(0.42)	-0.23(0.70)	-0.33(0.87)	-0.44(1.15)
Nonempire	0.74(3.73)	1.23(5.09)	0.80(3.01)	0.81(3.08)
Difference	-0.89(3.91)	-1.46(5.22)	-1.13(3.78)	-1.26(4.09)

Notes and Sources: See Table 4.

commodity exporting countries. Thus, the terms of trade variable soaks up some of the apparent benefits of going on gold, which in reality derived from beneficial external conditions. Regression 4, which adds a war dummy, leaves the main conclusions intact. There were some benefits from returning to gold at a devalued parity (slightly over 30 basis points) and essentially none from returning at par; public debt and the terms of trade mattered.

Based on the apparent futility of returning to gold at par, the bottom line for the interwar period could then be summed up as: the gold standard strikes out but the Empire strikes back. Table 5 suggests that the value of being in the Empire was much higher than being on gold, and much higher than it had been prior to the war. Based on the analysis of mean fixed effects, an Empire member might have expected a borrowing discount of anywhere between 89 and 146 basis points.

This finding makes intuitive sense. Prior to World War One, the long trend of globalisation in the world economy and a convergence on a set of more or less liberal economic policy principles (a kind of "London consensus") had placed economic actions at centre stage in the minds of market actors. The sudden specter of total war, the shock of political instability and revolution, the rise of belligerence in the core economies, and a general air of noncooperative policymaking could well have changed the weight given to various signals in the world bond market. Suddenly, the safe haven of Empire investments might have looked more attractive, just as the gold standard began to lose its glitter. And, more generally, this interpretation sits comfortably with the conventional wisdom that the world economy as a whole was becoming increasingly organised along regional, bilateral, or imperial lines in the interwar years, due to preferential policies in both trade and finance. For example, after the onset of war, in the 1910s and 1920s, Britain began to curtail nonempire access to the London capital market and by the 1930s the British Empire had become a heavily protected trading zone under the auspices of the Ottawa accords.

In a further sensitivity check, Table 6 reports GMM estimates for the lagged-dependent-variable model of spreads. (Now, with some initial observations dropped, GSDEV $\times$ DFLT and DFLT become identical.) Using the Arellano and Bond (1991) one-step dynamic panel estimator once again, we find results broadly consistent with the AR1 estimates from Tables 4 and 5, although standard errors are much higher – which is perhaps no surprise given the shortness of the interwar panel and the loss of one cross-section due to differencing. Here, returning to the gold standard at the prewar parity appears to have yielded no reduction in spreads, but parity devaluation yielded a long-run risk reduction somewhere around 10 to 30 basis points, an effect that is in some cases economically significant but never is statistically significant. Debt generally was punished by the markets, with the

estimated effects in this table even higher than before. Inflation appears not to matter much but the terms of trade remain correctly signed and significant. Also in the GMM interwar regressions in Table 6, we find, as before, that higher income per capita reduced spreads.

To summarise, by the late 1920s the market's approach to risk pricing had changed dramatically. If markets rewarded gold adherence at all, they did so only when the adoption of gold was based upon a realistically competitive exchange rate. In addition, policymakers faced a world in which the mere word of their commitment to the gold standard was no longer good enough – now creditors also wanted to see the books. In a final contrast with the prewar era, interwar creditors looked at the terms of trade to judge how well a country could earn the export revenue needed to service foreign debt.

4 Conclusion

In the sovereign bond market before 1914, the gold standard did indeed confer a "seal of approval," whereas two key macro fundamentals, the public debt and terms of trade, seem to have mattered little, if at all. Apparently adherence to gold, in and of itself, was sufficient to enhance market credibility during that era. Membership in the British Empire was neither a necessary nor sufficient condition for preferential access to London's capital market before 1914. The results accord with historians' views on the high degree of economic globalisation attained before the First World War.

For the interwar period, a return to gold after devaluation seems to have been more credible, notwithstanding the arguments that led Britain and other countries to return to gold at par. Indeed, returning at par yielded essentially no benefit, and only a return after devaluation (as in the case of France) was beneficial. Moreover, for core and periphery countries alike, high public debts were punished, suggesting that policymakers' room for maneuver had been curtailed. In the troubled interwar environment, Empire membership emerged as an important qualification for lower borrowing costs. Lenders now scrutinized ther terms of trade in order to assess debt sustainability.

Our results suggest that the interwar gold standard was less credible than its pre-1914 predecessor. It remains to reconcile these results fully with findings such as those of Hallwood, MacDonald, and Marsh (1996) that indicate a credible gold standard during the late 1920s, at least in the short-term bond markets. Perhaps the bond markets adopted a longer perspective under which protracted adherence

Table 6: Country risk and the gold standard, 1925–31: GMM estimates

	(1)	(2)	(3)	(4)
Observations	132	132	110	110
Sargan	29.15(1.00)	36.30(1.00)	31.28(1.00)	37.00(1.00)
m_2	0.01(0.99)	0.53(0.59)	0.49(0.63)	0.48(0.63)
SPREAD(t-1)	0.32(2.43)	0.10(0.70)	0.07(0.49)	0.13(0.96)
GSPAR×NODFLT	0.07(0.58)	0.02(0.17)	0.07(0.59)	0.10(0.80)
GSDEV×NODFLT	-0.19(1.00)	-0.28(1.46)	-0.07(0.33)	-0.06(0.30)
DFLT1	0.43(0.82)	-0.01(0.02)	-0.06(0.11)	-0.04(0.07)
LOGY	-1.25(1.54)	-1.22(1.66)	-1.70(2.25)	-1.78(2.37)
DEBT	—	2.03(2.30)	2.07(2.41)	1.68(2.03)
INFL	—	-0.36(0.47)	-0.10(0.15)	-0.26(0.39)
EXPGDP	—	—	0.37(0.26)	0.72(0.51)
LOGTOT	—	—	-0.61(1.98)	-0.71(2.33)
WARINTL	—	—	—	-0.75(1.87)
Long-run coefficients				
GSPAR×NODFLT	0.10	0.02	0.08	0.12
GSDEV×NODFLT	-0.28	-0.31	-0.07	-0.07
DFLT1	0.64	-0.01	-0.06	-0.05
LOGY	-1.85	-1.35	-1.83	-2.05
DEBT	—	2.25	2.22	1.94
INFL	—	-0.40	-0.11	-0.30
EXPGDP	—	—	0.40	0.84
LOGTOT	—	—	-0.65	-0.82
WARINTL	—	—	—	-0.86

Notes and Sources: See Table 3.

to unchanging gold parities seemed less probable than short-term adherence. The question certainly deserves further research, but our findings on bond markets serve to illuminate how different the interwar global capital market was from its antecedent, the classical gold-standard regime of 1870–1914. Evidently the global convergence in the bond market prior to 1914 was replaced by quite different, less integrative forces after 1914.

Finally, if we seek lessons from the past, our results have some implications for today's attempts to gain capital market credibility through the use of pegged exchange rates. It is clear that the post-World War One political developments that rendered interwar exchange-rate commitments less credible have not receded in the meantime. Thus, policymakers should not expect to gain market credibility even through seemingly irrevocable exchange rate commitments. Absent robust fundamentals and complementary economic and institutional reforms, efforts to forswear discretionary exchange rate changes are of questionable value.

Appendix

The database covers the period 1870 to 1939 at an annual frequency. The core countries are defined as Australia, Belgium, Canada, Denmark, France, Germany, New Zealand, Norway, Sweden, and the United States. The empire countries are defined as Australia, Canada, India, New Zealand, and South Africa. The peripheral countries are defined as Argentina, Austria (and Austria-Hungary), Brazil, Chile, Egypt, Finland, Greece, Hungary, India, Italy, Japan, Mexico, Portugal, South Africa, Spain, Turkey, and Uruguay. The base country for yields is the United Kingdom. Before World War One, Turkey refers to the Ottoman Empire and Austria denotes Austria-Hungary (and there are no independent data for Hungary). There are missing data for most variables.

Exchange rate

Exchange rate versus the U.S. dollar from Bordo and Schwartz (1997) and Global Financial Data (GFD), except as follows.

Argentina: from della Paolera and Taylor (2001).

Chile: 1870–79 annual average from Braun et al. (2000).

Gold standard

The gold standard dummy variable is equal to one when a country is on the gold standard, otherwise zero. The gold standard parity dummy (GSPAR) is equal to one when a country rejoins gold after 1914 at parity that is the same as the previous one. The gold standard

devalued dummy (GSDEV) is equal to one when a country rejoins gold at parity after 1914 that is devalued relative to the previous one. (There are cases where countries rejoined gold at a *re*valued parity, such as India in the 1920s, but these are not coded in any special way.)

Prewar coding. Data are from Meissner (2002), available for all countries in all years, except as follows:

Argentina: On gold for 1899–1902 (see della Paolera and Taylor, 2001).

Belgium: Off gold in 1926 (see Eichengreen, 1992, 168 et seq.).

India: Off gold 1870–97 following Hawtrey (1947) and Eichengreen (1992) and based on exchange rate volatility.

Uruguay: On gold for 1885–99 (Luis Bértola, private communication; we have no exchange rate data for Uruguay prior to 1885 to verify adherence).

Interwar coding. As discussed in the text, the interwar coding of gold standard adherence involves greater subjective judgment than for the prewar period. In addition, because we use June observations for the interwar period, annual summaries of adherence are patently insufficient; we must know the month, and in some cases the day, of entry to or exit from the gold standard. We do not attempt to distinguish among various degrees of adherence, that is, gold bullion standard, gold coin standard, or gold exchange standard. In most cases, however, we demand not only that a currency be stable *de facto* in terms of gold, but that it be convertible *de jure*, with the free import and export of gold allowed by the issuing country. Countries on gold are considered to leave the gold standard if they prohibit cross-border gold flows or impose other exchange controls, even if they do not simultaneously devalue or float their currencies.

The dates that we use for the interwar transitions to and from the gold standard are as shown in Table 7. Our sources are as follows:

Argentina: Brown (1940, 401 and 893).

Australia: Eichengreen (1992, 192 and 235).

Austria: *Federal Reserve Bulletin*, August 1928, 562 and Brown (1940, 926).

Belgium: Brown (1940, 426) and Yeager (1976, 359).

Brazil: The "on gold" date is for *de facto* adoption of a gold peg through a currency reform law. See Fritsch (1988, 122). The departure date, from Fritsch (p. 156), is the day on which the Banco do Brasil withdrew foreign exchange support. Fritsch (p. 122–23) explains that the currency reform law provided for a phased transition from *de facto* to *de jure* convertibility, with the date of *de jure* credibility left open and dependent on the level of government gold holdings. Brazil left gold, however, before the transition was completed. Because Brazil's adherence to gold was codified in legislation, we use the date of passage as our "on gold" date.

Canada: Shearer and Clark (1984, 282 and 297) and Brown (1940, 396 and 906).

Chile: Brown (1940, 396 and 912).

Denmark: Lester (1939, 200) and Brown (1940, 1075).

Table 7: The interwar gold standard

	On Gold	*Off Gold*
Argentina	Aug. 1927	Dec. 1929
Australia	April 1925	Jan. 1930
Austria	March 1925	Oct. 1931
Belgium	Oct. 24, 1926	March 1935
Brazil	Dec. 18, 1926	Dec. 7, 1929
Canada	July 1, 1926	Jan. 1929
Chile	Jan. 11, 1926	July 1931
Denmark	Jan. 1927	Sept. 1931
Egypt	April 1925	Sept. 1931
Finland	Dec. 31, 1925	Oct. 1931
France	June 25, 1928	Sept. 26, 1936
Germany	Oct. 1924	July 1931
Hungary	April 1925	Aug. 1931
India	March 1927	Sept. 1931
Italy	Feb. 26, 1928	Dec. 1934
Japan	Jan. 1930	Dec. 1931
New Zealand	April 1925	April 1930
Norway	May 1928	Sept. 1931
Portugal	July 1, 1931	Oct. 1931
South Africa	April 1925	Jan. 1933
Sweden	March 1924	Sept. 1931
Uruguay	Jan. 1928	Dec. 1929
United States	June 1919	April 1933

Egypt: The "on gold" date is inferred from the exchange rate's behaviour against sterling, as reported in GFD, and Britain's date of adherence to gold. See Rifaat (1935). The "off gold" date is from Brown (1940, 1075).

Finland: Brown (1940, 396 and 1075).

France: Yeager (1976, 329 and 362). We treat France as being off gold during June 1928.

Germany: Brown (1940, 469) and Yeager (1976, 340).

Hungary: Eichengreen (1992, 192) and Brown (1940, 1198).

India: Brown (1940, 839 and 1075).

Italy: Brown (1940, 951), Kindleberger (1986, 162), and Yeager (1976, 360).

Japan: Yeager (1976, 330) and Brown (1940, 1075).

New Zealand: Yeager (1976, 323, n. 30) and Brown (1940, 1075).

Norway: Lester (1939, 213) and Brown (1940, 1075).

Portugal: *The Economist*, June 6, 1931, and Brown (1940, p. 1075).

South Africa: Yeager (1976, 323, n. 30) and Brown (1940, p. 1075).

Sweden: Yeager (1976, 323, n. 30) and Lester (1939, 229).

Uruguay: *De facto* adoption inferred from Officer (2001) and the exchange rate's behaviour, as reported in GFD. December 1929 date for gold abandonment from Brown (1940, 893) and Kindleberger (1986, 89), though the currency was allowed to depreciate below par in April 1929. According to a private communication from Luis Bértola, Uruguay never returned to gold after August 1914; instead it simply pegged the exchange rate. Brown's account suggests, however, that contemporaries viewed Uruguay, like its larger neighbor Argentina, as being effectively on gold, and we take that view in our coding. In the text we discuss how our results change if Uruguay is considered to be off gold throughout 1925–31.

United States: Brown (1940, 207–8 and 1075).

Yield

See discussion in the text. Yield on long-term gold or sterling government bonds (at least ten years) measured typically by the coupon-price ratio, with definitions and sources as follows, based on London quotations where available.

Argentina: 1884–1913 from della Paolera (1988). 1914–34 from Nakamura and Zarazaga (2002).

Australia: From GFD. The bonds quoted are the N.S.W. 5% Terminable 1874/1902 (1870–87); N.S.W. 4% funded Stock 1912 option (1887–1900); all N.S.W. and Commonwealth issues maturing in more than six months (1901–15); 5.25%, 5.5% and 5% bonds (1920–40). Australian prices are used from 1875 to 1887, and from 1894 to 1915.

Austria: From GFD. For pre-WWI Austria-Hungary the bonds quoted are the Gold 5s (1879–1915); for interwar Austria the bonds quoted are the 6s of 1923–43 (1923–32) quoted in London and payable in sterling.

Belgium: No prewar yields (except in domestic currency). 1925–33 from the *Wall Street Journal*. The bond is the 7% of 1955 quoted in New York.

Brazil: From GFD. The bonds quoted are the 5s (1870–86); the Gold 4.5s (1887–99); the 4.5s of 1883 (1900–13); the 5s of 1912 (1914); and the Funded 5s of 1914 (1915–37).

Canada: From GFD. The bonds quoted are the 5s (1860–73); the 4s of 1910 and 1935 (1874–1924); and the Gold 5s of 1952, the latter quoted in New York (1925–40).

Chile: 1870–1918 From GFD. The bonds quoted are the 6s (1870–74); the 5s (1875–86); the 4.5s (1887–1918. 1919–33 from *Investor's Monthly Manual, The Times,* and *The Economist*. The 4.5% Bond of 1886 is used between 1919 and 1930. Thereafter the 6% Loan of 1929–62. Both debt instruments were issued in London and were payable in sterling.

Denmark: 1919–33 from *Investor's Monthly Manual, The Times,* and *The Economist*. The bond quoted is the 3% Sterling Loan of 1897–1948. This bond was issued by the Danish government in London and was payable in Sterling.

Egypt: From GFD. The bonds quoted are the Unified Stock (1870–1931), which had a variable coupon rate of 7% through March 1877, 6% through June 1882, and 4% from July 1883 until 1931.

Finland: 1991–1917 from GFD. 1919–33 from *Investor's Monthly Manual, The Times,* and *The Economist*. The bond quoted is the 6% Sterling Loan of 1923–63. This was issued in London and its associated payments were made in sterling pounds.

France: No prewar yields (except in domestic currency). 1925–33 from the *Wall Street Journal*. The bond is the 7% of 1949 quoted in New York.

Germany: No prewar yields (except in domestic currency). 1925–38 from GFD. The bond quoted is the 7% Dawes Loan of 1924.

Greece: From GFD. The bonds quoted are the 5s of 1824/1879 (1870–86) and the Monopoly 4s (1887–1924).

Hungary: Not included before WWI; see Austria. From GFD. The bond quoted is the 7.5% Dawes Loan of 1924 (1924–39).

India: From GFD. The bonds quoted are the 5s of 1880 (1870–73); 4s of 1888 (1874–80); 3.5s of 1931 (1881–1940).

Italy: 1919–30 from *Investor's Monthly Manual* and *The Times*. The bond quoted is the Maremmana Railway Bond issued in London and payable in sterling pounds.

Japan: From GFD. The bonds quoted are the 9s (1870–72); the 7s (1873–97) converted to 5s (1898–99); the Sterling 4s (1900–23); and the 6s of 1924 (1924–38).

Mexico: From GFD. The bonds quoted are the 3s (1870–88); the 6s (1889–99); and the External Gold 5s of 1899 (1900–32).

New Zealand: From GFD. The bonds quoted are the 5s (1870–80); 4s (1881–94); 3s of 1945 (1895–1914); no data available from 1914 to 1924; 3.5s of 1940 (1925–27); 5s of 1946 (1928–32); 4s of 1952–55 (1933–36); and 3.5s of 1953–57 (1937–40).

Norway: 1870–1918 from GFD. The bonds quoted are the 4.5s, (1876–80), 4s (1881–86), 3.5s (1887–92) and 3s (1893–1918). 1921–31 from *Investor's Monthly Manual, The Times,* and *The Economist*. The bond quoted is the 6% Loan of 1921. The bond was issued in London and payable in sterling pounds.

Portugal: From GFD. The bonds quoted are the consols, which had a variable coupon rate of 3% through October 1895, 1% from November 1895 through 1902, and 3% thereafter; no data for 1903, 1920–21, and 1928–30. Data are fourth quarter for 1931–32. June 1929 and 1930 observations from *Investor's Monthly Manual* and *The Times*, coupon-price ratio. In July 1924 the Portuguese government unilaterally decided to pay all its foreign currency debt in escudos except to foreign holders of its debt.

South Africa: From GFD. The bonds quoted are the Cape Colony 4.5s and 4s (1884–1913); Union of South Africa 4s and 4.5s (1914–21); and the Union 5% Inscribed Debt

(1922–40).

Spain: From GFD. The bonds quoted are the 3s (1870–80) converted into 1s (1881), to 4s (1882–1913). Part of the 4% perpetual exterior debt of 1882 was payable in foreign currency but only at a fixed exchange rate as written in the bond. This deal was only available to non-Spaniards. After 1913 we have no data, as all bond quotes are in domestic currency.

Sweden: 1919–33 from *Investor's Monthly Manual, The Times,* and *The Economist*. The bond quoted is the 3.5% loan of 1908. This bond was issued by the Swedish government in London and was payable in Sterling. The corresponding price is quoted in the *Investor's Monthly Manual* (1919–29) and *The Economist* (1930–33).

Turkey: 1870–1918 from GFD. The bonds quoted are the 6s of 1854 (1870–76); the 4.25% External Tribute Bonds (1877–1913); and the Unified 4% Bonds (1914–18). 1919–33 from *Investor's Monthly Manual, The Times,* and *The Economist*. The bond quoted is the Government 4% Unified Debt of 1903–1962. This bond was issued in London and its payments were payable in sterling pounds.

United Kingdom: From GFD. The bond quoted is the consol.

United States: 1870–1914 the Calomiris gold rate from Bordo and Rockoff (1996). 1914–39 from GFD. The bonds quoted are the 4s of 1925 (1915–1916); the 4% Liberty Bonds (1917–18); and the Federal Reserve Board's 10–15 year Treasury Bond index (1919–39).

Uruguay: 1870–1918 from GFD. The bonds quoted yielded 6% through 1884, 5% from 1885 through February 1893, and 3.5% thereafter. 1919–29 from *Investor's Monthly Manual, The Times,* and *The Economist*. The bond quoted is the Government 5% Gold Bond of 1914 until 1922 and then the 5% External Loan 1919. This debt instrument was issued in London and the associated payments were made in sterling pounds.

Exports

Exports in U.S. dollars from the collected volumes of Mitchell (1992, 1993, 1995) as collated by Estevadeordal, Frantz, and Taylor (2003). Converted to local currency using the exchange rate.

Public debt

Total central government debt, unless otherwise stated. From Bordo and Jonung (1996) for the years 1870–1913, and from United Nations (1948) for 1914–39, supplemented as follows.

Argentina: 1884–1913 from della Paolera (1988).

Australia: from Barnard (1987).

Austria: Austria-Hungary 1880–1912 from series provided by Niall Ferguson based on data collected by Marc Flandreau (unpublished).

Brazil: 1880–1910 consolidated (federal state and municipal) foreign debt in pounds sterling from IBGE (1990) and domestic debt in contos from Levy (1995).

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).

Egypt: 1876–1913 from data provided by Niall Ferguson based on Crouchley (1938). Interwar UN data is foreign debt only 1924–29, but the domestic debt (included after 1928) was negligible.

Hungary: Interwar UN data is foreign plus domestic long-term debt only 1924–28, but the domestic short-term debt was negligible.

India: From Reserve Bank of India (1954).

New Zealand: From Lloyd Prichard (1970).

Portugal: From Valério (2001, Table 9.7).

Spain: From Barciela and Carreras (1989, Table 10.31).

Turkey: 1925–28 from Tezel (1982).

Uruguay: Unpublished data from Reto Bertoni, kindly provided by Luis Bértola, and based on the official data from *Anuarios estadísticos.*

Nominal GDP

From the collected volumes of Mitchell (1992, 1993, 1995), collated or augmented by Bordo and Schwartz (1997) and GFD, supplemented as follows.

Argentina: 1884–1939 from della Paolera and Ortiz (1995).

Austria: Austria-Hungary 1880–1913 data provided by Niall Ferguson based on data collected by Marc Flandreau (unpublished).

Belgium: Interpolations for missing data in 1925–26, 1928–29, and 1931–33.

Egypt: From Yousef (2002).

France: From Jones and Obstfeld (2001).

Greece: Missing data 1924–26 from backcast of 1927–29 trend.

Hungary: 1924 based on 1925–26 trends in real GDP per capita and inflation, as below.

India: From Goldsmith (1983).

New Zealand: 1870–1933 from Hawke (1975); 1934–39 from Lineham (1968).

Portugal: From Nunes, Mata, and Valério (1989).

Spain: From Prados (2002).

Uruguay: 1870–1936 real GDP from Bértola (1998), inflated using a price deflator, and then rescaled and linked to the series from Bertino and Tajam (2000).

Real GDP per capita

From Maddison (1995), supplemented as follows, and interpolated as necessary.

Argentina: 1884–1939 using GDP from della Paolera and Ortiz (1995) and population Vázquez Présedo (1971–76) scaled to the Maddison 1913 benchmark.

Austria: Austria-Hungary 1880–1913 from Schulze (2000) scaled to the Maddison 1913 benchmark, using population weights for Austria and Hungary.

Belgium: 1870–1913 estimate constructed from real GDP index and consumer price index, scaled to the Maddison 1913 benchmark.

Chile: From Braun et al. (2000), scaled to the Maddison (1995) 1913 benchmark.

Egypt: From Yousef (2002), scaled to the Maddison (2001) 1913 benchmark.

Portugal: From Nunes, Mata, and Valério (1989), scaled to the Maddison (2001) 1913 benchmark.

Uruguay: Real GDP from same sources as nominal GDP; population from Maddison (2001) for 1870 and Mitchell (1993) for 1900–39; scaled to the Maddison (2001) 1913 benchmark.

Inflation

Calculated as the rate of change of the consumer price index. From Bordo and Schwartz (1997) and GFD, supplemented as follows.

Argentina: 1870–79 from Irigoin (2000); 1879–84 from Cortés Conde (1989); and 1884–1939 from della Paolera and Ortiz (1995).

Austria: Austria-Hungary 1880–1913 an implicit deflator of GDP, based on nominal GDP as above and real GDP from Schulze (2000).

Brazil: Use implicit GDP deflator.

Chile: From Braun et al. (2000).

Egypt: Use an implicit deflator of GDP, based on nominal GDP as above, and real GDP from Yousef (2002).

India: From Goldsmith (1983).

New Zealand: 1870–1914 use an implicit deflator of GDP, based on nominal GDP as above, and real GDP from Maddison (1995).

Portugal: From Nunes, Mata, and Valério (1989).

Uruguay: Use an implicit deflator of GDP, from same sources as nominal GDP

Government deficit as a fraction of GDP

From Bordo and Schwartz (1997), supplemented as follows.

Australia: 1871–79 deficit calculated as change in public debt as above. Nominal GDP as above.

Austria: Austria-Hungary 1881–1912 deficit data provided by Niall Ferguson based on data collected by Marc Flandreau (unpublished). Austrian interwar deficit calculated as change in public debt as above. Nominal GDP as above.

Belgium: Deficit calculated as change in public debt as above. Nominal GDP as above.

Chile: From Braun et al. (2000).

Egypt: Deficit calculated as change in public debt as above. Nominal GDP as above.

Hungary: Interwar deficit calculated as change in public debt as above. Nominal GDP as above.

India: Deficit from Reserve Bank of India (1954). Nominal GDP as above.

New Zealand: 1890–1939 deficit from Lloyd Prichard (1970). Nominal GDP as above.

Mexico: Deficit calculated as change in public debt as above. Nominal GDP as above.

Portugal: From Valério (2001, Table 9.3). Nominal GDP as above.

South Africa: Deficit calculated as change in public debt as above. Nominal GDP as above.

Spain: From Barciela and Carreras (1989, Table 10.25). Nominal GDP as above.

Default

Dummy variables equal to one when a country is in a state of full (DFLT1) or partial (DFLT2) default, or in either state (DFLT). From unpublished data from Tomz (2001) kindly provided by Michael Tomz.

Terms of trade

Deviation of log terms of trade from the panel mean (LTOT). From unpublished data kindly provided by Jeffrey G. Williamson from his ongoing tariff project, except:

Belgium: 1880–1940 from Bordo and Schwartz (1997).

Chile: 1870–1939 from Braun et al. (2000).

Finland: 1870–1939 from Hjerppe (1989).

War

Involvement in a major interstate war (WARINT) or intrastate war (WARCIV), respectively, where major means that the state suffers more than 2,000 fatalities. From the Correlates of War 2 (COW2) database (http://cow2.la.psu.edu/). See Sarkees (2000).

References

Arellano, M., and Bond, S. R. (1991). 'Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations.' *Review of Economic Studies*, vol. 58, pp. 277–97.

Barciela López, C. and Carreras, A. (1989). *Estadísticas históricas de España: siglos XIX–XX*. Madrid: Fundación Banco Exterior.

Barnard, A. (1987). 'Government finance.' In *Australians: Historical Statistics* (W. Vamplew, ed.). Broadway, New South Wales: Fairfax, Syme & Weldon.

Barrett, D. C. (1931). *The Greenbacks and Resumption of Specie Payments, 1862–1879*. Cambridge, Mass.: Harvard University Press.

Bertino, M., and Tajam, H. (2002). 'El PBI de Uruguay.' Instituto de Economía, Facultad de Ciencias Económicas y de Administración, Universidad de la República, Montevideo, Uruguay. http://www.iecon.ccee.edu.uy/histo/PBIindice.htm.

Bordo, M. D., Edelstein, M., and Rockoff, H. (1999). 'Was adherence to the gold standard a "good housekeeping seal of approval" during the interwar period?' National Bureau of Economic Research no. 7186, Working Paper Series (June).

Bordo, M. D., and Jonung, L. (1996). 'Monetary regimes, inflation, and monetary reform: An essay in honor of Axel Leijonhufvud.' In *Inflation, Institutions, and Information: Essays in Honor of Axel Leijonhufvud* (D. Vaz and K. Velupillai, eds.). London: Macmillan.

Bordo, M. D., and Kydland, F. E. (1995). 'The gold standard as a rule: An essay in exploration.' *Explorations in Economic History* , vol. 32, pp. 423–64.

Bordo, M. D., Meissner, C. M., and Redish, A. (2002). 'How "original sin" was overcome: The evolution of external debt denominated in domestic currencies in the United States and the British Dominions, 1800–2000.' Rutgers University (June). Photocopy.

Bordo, M. D., and Rockoff, H. (1996). 'The gold standard as a "good housekeeping seal of approval".' *Journal of Economic History*, vol. 56, pp. 389–428.

Bordo, M. D., and Schwartz, A. J. (1997). 'Monetary policy regimes and economic performance: The historical record.' Working Paper Series no. 6201, National Bureau of Economic Research (September).

Braun, J., Braun, M., Briones, I., Díaz, J., Lüders, R., and Wagner, G. (2000). 'Economía chilena 1810–1995: estadísticas históricas.' Documento de Trabajo no. 187, Pontificia Universidad Católica de Chile, Instituto de Economia (Enero).

Brown, W. A., Jr. (1940). *The International Gold Standard Reinterpreted 1914–1934*. New York: National Bureau of Economic Research.

Cook, L. D. (2002). 'Did the classical gold standard reduce the price of capital for Russia?' Center for International Development, Harvard University (February). Photocopy.

Crouchley, A. E. (1938). *The Economic Development of Modern Egypt*. London: Longmans Green.

Davis, L. E., and Gallman, R. E. (2001). *Evolving Financial Markets and International Capital Flows: Britain, the Americas, and Australia, 1865–1914*. Cambridge: Cambridge University Press.

Davis, L. E., and Huttenback, R. A. (1986). *Mammon and the Pursuit of Empire: The Political Economy of British Imperialism*. Cambridge: Cambridge University Press.

della Paolera, G. (1988). 'How the Argentine economy performed during the international gold standard: A reexamination.' Ph. D. dissertation, University of Chicago.

della Paolera, G., and Ortiz, J. (1995). 'Dinero, intermediación financiera y nivel de actividad en 110 años de historia económica argentina.' Documentos de Trabajo no. 36, Universidad Torcuato Di Tella (December).

della Paolera, G., and Taylor, A. M. (2001). *Straining at the Anchor: The Argentine Currency Board and the Search for Macroeconomic Stability, 1880–1935*. Chicago: University of Chicago Press.

Drazen, A., and Masson, P. R. (1994). 'Credibility of policies versus credibility of policymakers.' *Quarterly Journal of Economics*, vol. 109, pp. 735–54.

Edelstein, M. (1981). 'Foreign investment and empire 1860–1914.' In *The Economic History of Britain Since 1700*, vol. 2, (R. Floud and D. McCloskey, eds.). Cambridge: Cambridge University Press.

Eichengreen, B. J. (1992). *Golden Fetters: The Gold Standard and the Great Depression, 1919–1939*. Oxford: Oxford University Press.

Eichengreen, B. J. (1996). *Globalizing Capital: A History of the International Monetary System*. Princeton, N.J.: Princeton University Press.

Estevadeordal, A., Frantz, B., and Taylor, A. M. (2003). 'The rise and fall of world trade, 1870–1939.' *Quarterly Journal of Economics*, vol. 118. Forthcoming.

Ferguson, N. (2001). *The Cash Nexus: Money and Power in the Modern World, 1700–2000*. New York: Basic Books.

Ferguson, N. (2002). 'Globalization with gunboats: The costs and benefits of the British Empire revisited.' Jesus College, Oxford (April). Photocopy.

Flandreau, M., Cacheux, J. L., and Zumer, F. (1998). 'Stability without a pact? Lessons from the European gold standard, 1880–1914.' *Economic Policy*, vol. 26, pp. 115–62.

Flandreau, M., and Sussman, N. (2002). 'Old sins: Exchange clauses and European foreign lending in the 19th century.' Institut d'Études Politiques, Paris (July). Photocopy.

Fratianni, M., and Spinelli, F. (1984). 'Italy in the gold standard period, 1861–1914.' In *A Retrospective on the Classical Gold Standard, 1821–1931* (M. D. Bordo and A. J. Schwartz, eds.). Chicago: University of Chicago Press.

Fritsch, W. (1988). *External Constraints on Economic Policy in Brazil, 1889–1930*. Pittsburgh, Pa.: University of Pittsburgh Press.

Goldsmith, R. W. (1983). *The Financial Development of India, 1860–1977*. New Haven, Conn.: Yale University Press.

Hallwood, C. P., MacDonald, R., and Marsh, I. W. (1996). 'Credibility and fundamentals: Were the classical and interwar gold standards well-behaved target zones?' In *Modern Perspectives on the Gold Standard* (T. Bayoumi, B. J. Eichengreen and M. P. Taylor, eds.). Cambridge: Cambridge University Press.

Hawke, G. R. (1975). 'Income estimation from monetary data: further explorations.' *Review of Income and Wealth*, vol. 21, pp. 301–07.

Hawtrey, R. G. (1947). *The Gold Standard in Theory and Practice*, 5th ed. London: Longmans Green.

Hjerppe, R. (1989). *The Finnish Economy 1860-1985: Growth and Structural Change*. Translated by R. Walker. Helsinki: Bank of Finland.

IBGE (Fundação Instituto Brasileiro de Geografia e Estatística) (1990). *Estatísticas históricas do Brasil: séries econômicas, demográficas e sociais de 1550 a 1988*. Rio de Janeiro: IBGE.

Jones, M. T., and Obstfeld, M. (2001). 'Saving, investment, and gold: A reassessment of historical current account data.' In *Money, Capital Mobility, and Trade: Essays in Honor of Robert Mundell* (G. A. Calvo, R. Dornbusch, and M. Obstfeld, eds.). Cambridge, Mass.: MIT Press.

Kindleberger, C. P. (1986). *The World in Depression, 1929–1939*. Revised and enlarged edition. Berkeley and Los Angeles: University of California Press.

Lester, R. A. (1939). *Monetary Experiments: Early American and Recent Scandinavian.* Princeton: Princeton University Press.

Levy, M. B. (1995). 'The Brazilian public debt: Domestic and foreign, 1824–1913.' In *The Public Debt in Latin America in Historical Perspective* (R. Liehr, ed.). Frankfurt am Main: Vervuert.

Lewis, C. (1938). *America's Stake in International Investments*. Washington, D.C.,: The Brookings Institution.

Lineham, B. T. (1968). 'New Zealand's gross domestic product, 1918–1938.' *New Zealand Economic Papers*, vol. 2, pp. 15–26.

Lloyd Prichard, M. F. (1970). *An Economic History of New Zealand to 1939*. Auckland: Collins.

Macaulay, F. R. (1938). *The Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*. New York: National Bureau of Economic Research.

Maddison, A. (1995). *Monitoring the World Economy*. Paris: OECD.

Maddison, A. (2001). *The World Economy: A Millennial Perspective*. Paris: OECD.

Mamalakis, M. J. (1978–89). *Historical Statistics of Chile*, 6 vols. Westport, Conn.: Greenwood Press.

Martín Aceña, P. (2000). 'The Spanish monetary experience, 1848–1914.' In *Monetary Standards in the Periphery: Paper, Silver, and Gold, 1854–1933* (P. Martín Aceña and J. Reis, eds.). New York: St. Martin's Press.

Matsukata, M. (1899). *Report on the Adoption of the Gold Standard in Japan*. Tokyo: Government Press.

Meissner, C. M. (2002). 'A new world order: Explaining the emergence of the classical gold standard.' National Bureau of Economic Research no. 9233, Working Paper Series (October).

Mitchell, B. R. (1992). *International Historical Statistics: Europe, 1750–1988*. New York: Stockton Press.

Mitchell, B. R. (1993). *International Historical Statistics: The Americas, 1750–1988*. New York: Stockton Press.

Mitchell, B. R. (1995). *International Historical Statistics: Africa, Asia & Oceania, 1750–1988*. New York: Stockton Press.

Mitchell, W. C. (1908). *Gold, Prices, and Wages under the Greenback Standard*. Berkeley: The University Press.

Nakamura, L. I., and Zarazaga, C. E. J. M. (2003). 'Banking and finance, 1900–35.' In *Argentina: Essays in the New Economic History* (G. della Paolera and A. M. Taylor, eds.). Cambridge: Cambridge University Press. Forthcoming.

Nunes, A. B., Mata, E., and Valério, N. (1989). 'Portuguese economic growth 1833–1985.' *Journal of European Economic History*, vol. 18, pp. 291–330.

Obstfeld, M., and Taylor, A. M. (2003). 'Globalization and capital markets.' In *Globalization in Historical Perspective* (M. D. Bordo, A. M. Taylor, and J. G. Williamson, eds.). Chicago: University of Chicago Press.

Officer, L. H. (2001). 'Gold standard.' In *EH.Net Encyclopedia* (R. Whaples, ed.). October 1, 2001 URL http://www.eh.net/encyclopedia/contents/officer/gold.standard.php.

Polanyi, K. (1944). *The Great Transformation*. New York: Rinehart.

Reserve Bank of India (1954). *Banking and Monetary Statistics of India*. Bombay: Reserve Bank of India.

Rifaat, M. A. (1935). *The Monetary System of Egypt*. London: George Allen & Unwin.

Rousseau, P. L., and Sylla, R. E. (2003). 'Financial systems, economic growth, and globalization.' In *Globalization in Historical Perspective* (M. D. Bordo, A. M. Taylor and J. G. Williamson, eds.). Chicago: University of Chicago Press.

Sargent, T. J. (1993). 'Stopping moderate inflations: The methods of Poincaré and Thatcher.' In *Rational Expectations and Inflation*. Second edition. New York: Harper-Collins.

Sarkees, M. R. (2000). 'The Correlates of War Data on War: An Update to 1997.' *Conflict Management and Peace Science* 18 (no. 1): 123–44.

Shearer, R. A., and Clark, C. (1984). 'Canada and the interwar gold standard, 1920–35: Monetary policy without a central bank.' In *A Retrospective on the Classical Gold Standard, 1821–1931* (M. D. Bordo and A. J. Schwartz, eds.). Chicago: University of Chicago Press.

Smith, G. W., and Smith, R. T. (1997). 'Greenback-gold returns and expectations of resumption, 1862–1879.' *Journal of Economic History*, vol. 57, pp. 697–713.

Temin, P. (1989). *Lessons from the Great Depression*. Cambridge, Mass.: MIT Press.

Tezel, Y. S. (1986). *Cumhuriyet döneminin ıktisadi tarihi, 1923–1950*, 2 ed. Ankara: Yurt Yayınları.

Tomz, M. (2001). 'How Do Reputations Form? New and Seasoned Borrowers in International Capital Markets.' Paper presented at the 2001 Annual Meetings of the American Political Science Association, San Francisco.

United Nations (1948). *Public Debt, 1914–1946*. Lake Success, N.Y.: United Nations.
Valério, N., ed. (2001). *Estatisticas históricas portuguesas*. Lisbon: Instituto Nacional de Estatística.
Vázquez-Presedo, V. (1971–76). *Estadísticas historicas argentinas*. 2 vols. Buenos Aires: Ediciones Macchi.
Yeager, L. B. (1976). *International Monetary Relations: Theory, History, and Policy*. Second edition. New York: Harper & Row.
Yousef, T. 'Egypt's growth performance under economic liberalism, 1885–1945: A re-assessment using new GDP estimates.' *Review of Income and Wealth*. Forthcoming.