REVISED DRAFT May 2005

"THE THIN FILM OF GOLD": THE LIMITS OF MONETARY COMMITMENTS IN THE FIRST ERA OF GLOBALIZATION[1]

Niall Ferguson and Moritz Schularick

Abstract

In this paper we review the hypothesis that adherence to the gold standard facilitated the access of peripheral countries to European capital markets in the first era of financial globalization. To test whether the gold standard worked as a credible commitment mechanism – a "good housekeeping seal of approval" – we have assembled the largest possible dataset covering almost the entire foreign borrowing in the London market. Our results suggest that the gold effect identified in previous studies was a statistical illusion generated principally by limited country samples. The market looked behind "the thin film of gold" not only at economic fundamentals but at political determinants of creditworthiness.

[1] We would like to thank Nitin Malla for his outstanding research assistance. We received helpful comments from Warren Coats, Wolfram Fischer, Carl-Ludwig Holtfrerich, Christopher M. Meissner, Martin Schüler, Alan M. Taylor, Marc Weidenmier, and the participants of the Berlin Colloquium on Quantitative Economic History. Michael Bordo, Michael Clemens, Trish Kelly, Christopher M. Meissner, Maurice Obstfeld, Hugh Rockoff, Nathan Sussman, Alan M. Taylor and Jeffrey Williamson generously shared data.

One of the most striking differences between the early twenty-first century and the early twentieth is that, relative to global output, capital flows from rich to poor countries are significantly smaller today than they were then [Obstfeld and Taylor, 2003a; Twomey, 2000; Schularick, 2004]. What was it that facilitated the massive net transfer of capital from the core to the periphery of the world economy before 1914? A number of recent studies have argued that the gold standard played an important role [Bordo and Rockoff, 1996; Obstfeld and Taylor, 2003b]. According to the well-known study by Michael Bordo and Hugh Rockoff, the market considered adherence to the gold standard a sign of financial rectitude – a credible commitment to "good [financial] housekeeping" – and charged, *ceteris paribus*, lower risk premia on the foreign loans of gold standard countries than on the loans of countries not on gold. In the words of another recent study: "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 favourable terms." [Obstfeld and Taylor, 2003b, p. 241]

This view has important implications for modern economic policy. In theory, policy makers in the developing world can enhance credibility in the eyes of international markets by adopting a binding policy rule such as a gold peg. This is because a strict monetary rule ties the hands of politicians who might otherwise be prone to run excessive fiscal deficits and to fund them by printing money, or simply to default on their debts. In other words, a hard currency peg can solve the problem of time-inconsistency in economic policies [Bordo and Kydland, 1996]. This, in turn, reduces the risks faced by potential foreign investors, encouraging them to lend more at lower rates. If the "good housekeeping" interpretation of the gold standard is right, then the history of the first era of financial globalization offers retrospective validation for this theory, with important implications for policy makers.

However, the "good housekeeping" argument has not gone unchallenged. The empirical evidence adduced by Bordo *et al.* was derived from relatively limited samples of

countries, skewed towards the relatively rich economies of Europe and North America, not the poor "periphery" of the world economy where credibility has tended to be a key problem. Moreover, the choice of appropriate control variables – crucial to distinguish a "pure" gold effect from improvements in economic fundamentals – has turned out to be problematic. Some authors have argued that debt burdens and economic growth had a bigger influence on pre-1914 bond spreads than monetary arrangements [Flandreau and Zumer, 2004]. Others have pointed to political factors such as colonial status, domestic stability or war as key determinants of risk premia [Ferguson, 2003a; Ferguson and Schularick, 2004].

This paper investigates whether or not the "good housekeeping" hypothesis stands up when tested with the largest possible dataset and with a number of different empirical specifications. We make two contributions. First, our sample is about three times larger than those of previous studies. The dataset we assembled by hand from historical sources covers interest rates and economic control variables for close to 60 borrowers in the London capital market between 1880 and 1913. Second, we take a closer look at the roots of the recent empirical disagreements on the existence of a gold effect. For this purpose, we reconsider and integrate methodology and datasets of previous studies. We put special emphasis on the comparability of our empirical analysis with the approach taken in the recent literature.

Our investigation proceeds in four steps. The first section reassesses the original gold standard hypothesis as well as the criticisms that have been made of it and identifies the causes of the empirical disagreements. Section 2 presents our dataset and introduces the estimation strategy. Section 3 contains the empirical heart of this paper. We first reproduce the findings of previous studies, before moving on to new estimations for our complete sample and for various sub-samples. Section 4 concludes that the gold standard hypothesis needs to be re-formulated. Our findings suggest that the market did not uniformly view gold adherence as a "good housekeeping seal of approval". As in the interwar years, the gold standard did not offer a short-cut to policy credibility. The market looked behind "the thin

film of gold".[1] In sum, we put earlier doubts on the credibility effect of the hard currency peg expressed, *inter alia*, by Eichengreen and Hausmann [1999], Ferguson [2003b] on a firm empirical basis. The search for an explanation for the low risk premia charged to developing borrowers in the sovereign bond market before World War One must go beyond monetary commitments to include not just economic fundamentals (as argued by Flandreau and Zumer [2004]) but also the political determinants of creditworthiness.

I. The "good housekeeping" hypothesis and its critics

The degree of financial integration reached before 1914 was truly impressive. In the decades before World War I, Britain exported on average between four and five percent of her gross national product abroad, while capital-importing economies could run current account deficits of even higher magnitudes for many years, even decades. Foreign investments in relation to gross domestic product (GDP) in 1913 stood at about 200 percent in Argentina, Chile and South Africa, and at or above 100 percent in countries such as Brazil, Mexico, Egypt, and Malaysia – about twice as high as the corresponding figures today [Twomey, 2000]. Moreover, the success of the first era of financial globalization was not limited to the comparatively wealthy countries in North and South America (such as Argentina, Uruguay, Chile) and Australia.[2] Southern and Eastern Europe, Africa and Asia all attracted considerable amounts of capital. British investors financed the construction of the sewerage system in Istanbul, the port in Colombo and the telegraph network in Rhodesia. About 40 percent of the total volume of British capital flows between 1880 and 1913 went to other countries than the comparatively rich settler economies. Today, by contrast, only 10–15 percent of global capital market flows reach countries classified as less developed by the World Bank.

It seems likely that this relatively high integration of global capital markets before 1914 happened because investors in rich countries did not see poor countries as being as risky

as their successors do today. The spread of globalization and the deepening of capital markets in this period was, in other words, partly due to perception of low country risks by European financial investors.[3] That the period before World War I was an era of exceptionally low country risks becomes obvious when we compare it to the current era of globalization. Between 1994 and 2004, the average yield on the most closely watched index for developing country bonds, J.P. Morgan's Emerging Markets Bond Index (EMBI), has been about 700 basis points higher than the yield on United States government bonds. Between 1900 and 1913, on the other hand, the 12 largest less-developed borrowers outside the European empires had to pay spreads of less than 200 basis points over British consols.[4] In the 1880s, however, emerging market spreads had been higher, though still not as high as today – close to 500 basis points on average. The question that has preoccupied economic historians is therefore *why* the risk premia charged by investors to peripheral countries fell so markedly in the two decades before 1914? Following the pioneering study by Bordo and Rockoff in 1996, students of the pre-World War I global financial market have looked to the spread of the gold standard to provide an explanation. Between 1870 and 1914, many countries joined the advanced core nations in making their currencies convertible to gold at a fixed rate and allowing free shipment of gold [Eichengreen and Flandreau, 1994]. At a roughly similar pace, interest rates converged between the core and the periphery; the average spread on emerging market bonds decreased to less than 150 basis points after 1910. An illustration of this process is given in figure 1.

The dominant view is therefore that the monetary regime of the gold standard played an important role in interest-rate convergence: "Faithful adherence significantly lowered the cost of loans from metropolitan Europe." [Bordo and Rockoff, 1996, p.390] After controlling for other determinants of the risk perception of investors, Bordo and his collaborators found that being on gold conferred a significant credibility bonus. Based on the experience of nine non-Western European countries and colonies, Bordo and Rockoff showed that "all other

things equal, the rate on a gold bond would be 40 basis points lower if the country were on the gold standard" [Bordo and Rockoff, 1996, p. 413]. This, they argued, was because gold standard adoption worked as a credible commitment mechanism – subject only to certain "well-understood emergencies" such as wars, after which convertibility would be restored. Gold adoption signalled to investors that countries would continue to follow prudent fiscal and monetary policies that were consistent with the long-run objective of gold convertibility. The market's preference for the gold standard thus provided an incentive to join the gold standard and stick to it, thereby contributing to the dynamic extension of the gold standard [Meissner, 2002].

The most recent test of the Bordo-Rockoff hypothesis has been carried out by Maurice Obstfeld and Alan Taylor [Obstfeld and Taylor, 2003b]. With yield data for 21 borrowers, their findings rely on a rather larger sample than that of Bordo and Rockoff. In their empirical analysis of yield spreads they find gold standard adherence to have cut spreads by up to 30 basis points before the war. An even stronger hypothesis emerges from this study: in none of the different specifications did one key economic variable, the debt-to-GDP ratio, prove statistically or economically significant. The authors conclude:

> "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 the terms of trade, seem to have mattered little, if at all."[Obstfeld and Taylor, 2003b, p.275]

In other words, the credibility effect of gold adherence was strong enough to overrule even the most important solvency indicator – the relative burden of public debt.

Other authors, however, have arrived at different conclusions. Using a dataset of 17 countries, Marc Flandreau and Frédéric Zumer "rejected the conventional view that the exchange rate regime (participation to the gold standard) mattered in facilitating the global

circulation of capital in the late 19th century." [Flandreau and Zumer, 2004, p.56] Their gold dummy was either statistically insignificant or had the "wrong" sign, suggesting that the enlargement of the gold club played little, if any, part in the interest rate convergence of the pre-1914 period. But what mattered to investors if not gold? According to Flandreau and Zumer, the answer is a combination of fiscal policy and economic "fundamentals" – to be precise, public debt service as a ratio of tax revenues, economic growth and inflation (in sum, the real debt burden).[5] The growing number of countries adopting the gold standard was ultimately a consequence of global financial integration, not its cause. Countries that had incurred huge foreign-currency denominated debt sought ways to limit the fluctuations of the exchange rate, and the gold standard provided such a mechanism. In short: "The gold standard was not the basis of the first era of financial globalisation." [Flandreau and Zumer, 2004, p. 56]

Another plausible interpretation lays more emphasis on political factors. As Barry Eichengreen and Ricardo Hausmann have noted:

> "Many of the countries that loomed large on the receiving end … were members of the British empire …These facts and not the internationalization of currencies per se, may explain their extraordinary capital market access." [Eichengreen and Hausmann, 1999, pp. 28-9]

A recent study has indeed demonstrated that British colonies enjoyed financing advantages over and above differences in economic fundamentals [Ferguson and Schularick, 2004]. After controlling for standard solvency indicators, independent countries had to pay at least about 100 basis points more in interest than colonies and dominions when they accessed the London capital market. From this it might be inferred that it was the spread and consolidation of British imperial power that drove down international yield spreads in the period before 1914.

Once again, the spread of gold can be seen as a cause rather than a consequence of financial market integration, since the gold standard was a British institution that was imposed on many British possessions as well as adopted by many countries that were informally linked to the British imperium. In a separate strand of research, Ferguson has argued that nineteenth-century investors tended to infer the prospects of financial stability mainly from political developments [Ferguson, 2003b]. Such an interpretation makes sense in the light of modern financial practice. Today, rating agencies and international banks reserve up to 50 percent of their country risk scores for political factors [Standard & Poor's, 1998]. Thus the decline in risk premia before 1914 can also be seen as a function of diminished political risk; rightly or wrongly, investors saw wars and revolutions as being less likely after around 1880 than they had been before.

How can we account for such divergent interpretations? An important part of the problem is simply the gold coding issue; quite apart from methodological differences, there are simple disagreements about when a particular country was actually "on gold". For example, it is far from clear even in the cases of well-researched economies such as Austria and Italy, both of which "shadowed" the gold standard without having fully convertible currencies. It is even harder to be sure for smaller economies for which there is less readily accessible evidence about convertibility clauses and exchange rates. There is therefore a subjective element to retrospective identifications of "on gold" and "off gold" countries, especially when these are inferred *ex post* from exchange rates.

The empirical model is, of course, crucial to determine a "pure" gold effect. In the absence of a well-specified model, the gold standard dummy may simply be a proxy for other omitted variables. The Japanese gold adoption in 1897 provides an illustration of this problem.[6] Conventional current-yield data show a reduction of more than 200 basis points between 1896 and 1897. As other fundamentals such as public debt, the budget deficit or the level of development remained by and large unchanged, a regression will give the full credit

of that reduction to the gold standard variable. However, the year of the adoption of the gold standard was also the culmination of a long process of political and economic reform in the Meiji era, the success of which was demonstrated by Japan's military victory over China in 1895. The same year saw a successful debt conversion. Arguably, these factors mattered more than the switch to gold convertibility in driving down Japanese yields.[7]

Previous studies have included quite different sets of economic control variables. Some authors have opted for a "historical" approach relying only on data available to contemporaries [Ferguson, 2001; Flandreau and Zumer, 2004]. Others have preferred a "modern" approach incorporating later data reconstructions such as GDP and ratios of public debt to GDP. The underlying methodological question is whether market risk perception should best be modeled inductively on the basis of indicators that were available to contemporaries, or deductively according to the predictions of today's economic models – on an "as if" basis, so to speak – at the risk of anachronism. The most obvious problem with studies that use GDP data is that these are not only anachronistic; they are also notoriously unreliable. Clearly, as the financial press of the period makes clear, nineteenth-century investors were looking for information on the overall productive capacity of a country. References to "national wealth" can be found regularly in contemporary financial publications. But investors had to settle with something less than modern-day GDP statistics. For a variety of reasons, then, it may be preferable to regard debt-to-revenue ratios as a proxy for debt-to-GDP ratios; not least because it is tax revenues that are directly available to pay interest and principal on sovereign debt, not necessarily GDP – and this was more true a century ago than today, because government's generally collected much smaller shares of national output through taxation.

Finally, and perhaps most importantly, there is the question of sampling. Previous studies relied on data for a relatively small number of countries (9, 17, 21), whereas between 1880 and 1914 more than sixty independent states, dominions and colonies had hard-currency

government bonds listed at the London Stock Exchange. At the same time, the samples in previous studies were by no means geographically representative, being either predominantly "Atlantic" or skewed towards the European periphery. The inclusion of colonies alongside independent countries is another important issue. It is, for example, not obvious why gold standard adoption should be assumed to have had the same impact on a British colony – where it often came as by-product of a *de facto* currency union with the United Kingdom – as on an independent Latin American state.

II. Data and estimation strategy

To solve these empirical puzzles, it is necessary to have an encompassing dataset with a broad range of control variables, including those of previous studies. With spreads of gold- or sterling-denominated sovereign bonds for 34 independent countries and 23 British colonies at annual frequency as well as almost all the economic controls used in previous studies, our dataset is the best that has yet been constructed.[8] The yield data for the period 1880–1913 were collected by hand from *The Investor's Monthly Manual* and *The London Stock Exchange Weekly Intelligence*, and refer to long-term (typically over ten years) bonds that were actively traded and had quotations for at least three years in a row. We excluded all observations with spreads of more than 2000 basis points, since all these referred to bonds that were in default for many years, full repayment of which was considered unlikely.

The bulk of the historical economic control variables was collected by hand from contemporary publications such as *The Statesman's Yearbook*, *Fenn's Compendium*, and the *Annual Reports* of the Corporation of Foreign Bondholders.[9] In addition, we used data from historical collections (such as Mitchell's volumes), whenever they were also available to nineteenth-century investors. Since we also wanted to test whether the incompatible findings of previous studies were due to the choice of anachronistic variables, our database includes

GDP estimates and related ratios.[10] We can, therefore, work with nearly all control variables found in previous studies, assuring the comparability of the analysis. Despite this effort, data are not available in all years in our panel. Nevertheless, we have nearly three times as many observations and countries as the widest-ranging previous study.

Table I summarizes our dataset. What can be seen at a glance is that the choice of the economic control variables has a strong impact on the number of observations and on the number of countries in the sample. The main reason is that GDP reconstructions are only available for a limited number of countries.

[Table I here]

Other than quantitative economic control data, we constructed a number of dichotomous dummy variables. As is conventional, we included a dummy variable for countries that were not honoring their repayment obligations, in other words defaulters. To ensure consistency, the information was taken solely from the *Annual Reports* of the Corporation of Foreign Bondholders, which contain detailed information on countries that did not pay the amounts due to bondholders.[11] Since one would expect that the market punished previous defaulters, a "memory" variable was given the value of one for ten years after a default occurred (following Flandreau and Zumer [2004]). Two political variables captured the potential effect of international and civil unrest on market risk perception. Last, but not least, we used dummies for gold standard adherence. Our baseline was the *de iure* and *de facto* coding, i.e. we coded countries on gold if convertibility was formally legislated and maintained in practice. But we also tested the sensitivity of our results to two alternative codings. First, we treated the de facto adherents as "on gold" following Flandreau and Zumer. Second, we double-checked the sensitivity of our results with the gold matrix from Meissner which again differs slightly from the first two in the timing of gold adoption.

A further challenge concerned the appropriate way to control for asset market shifts that might affect spreads over time. Two options are at hand: first, simple time-dummies that capture the spread movements over time that are not accounted for by the variation in fundamentals; second, a specification inspired by the international capital asset pricing model (CAPM), namely the correlation of individual assets with market-wide risk (with country - specific slopes or "betas"). With the latter approach, there is again a problem of anachronistic modeling. The CAPM had not been invented at the time. In addition, the empirical support for CAPM remains rather weak [Fama and French, 1992]. On the other hand, one can argue that there is no reason to believe that 19th century investors were indifferent to the systematic risk of their investments. In the interest of comparability with recent studies, we report our regressions in the CAPM specification. For this purpose, we constructed a global spread as the debt-weighted average of country spreads over the risk-free British benchmark bond known as the "consol".[12]

In our estimation strategy, we aim at comparability with previous studies. To control as much as possible for unobserved differences between countries in our panel, we stuck to a standard fixed effects model, where individual country dummies capture the effects of constant but unmeasured factors such as geography, institutions, or other economic characteristics. Like previous authors, we found strong evidence of serial and cross-sectional correlation and of heteroskedasticity in our large panel, which makes ordinary least squares (OLS) invalid. Both feasible generalized least squares (FGLS) and panel-corrected standard errors (PCSE) are alternatives. In both variants, serial correlation can be accounted for via a country-specific AR(1) term.[13] However, a possible caveat is that FGLS needs two crucial data transformations in order to produce an estimate of the unknown variance-covariance matrix of the disturbances. It is certainly superior in "asymptopia", but was found to perform poorly when applied to finite real world samples, especially if the number of countries grew large relative to the time-periods [Beck and Katz, 1995a,b]. While previous studies have

typically worked with observations for less than 20 countries over 35 to 45 years and could more safely rely on FGLS, our full sample displays observations for 57 units over 35 years. This would seem to call for the less demanding PCSE method which was found to perform well in comparable research situations and has emerged as a quasi-standard in "large N, smaller T" cross-country studies in comparative political economy. That said, we present both FGLS and PCSE estimates whenever we have concentrated on smaller sub-samples in order to benefit from the potentially more efficient coefficient estimates of the FGLS method.[14] Yet our key findings are independent of the choice of the estimation method, as will be shown below.

Expressed formally, we regress the annual risk premia, i.e. the interest rate differential between the yield of a gold (or sterling) bond of an issuer and the yield on the risk-free British consols, in a fixed-effects framework on a vector of economic controls (**X**) and the world spread (**S**):

(1) $Yield_{it} - Yield_{UK,t} = \alpha_i + \beta_i \mathbf{S}_t + \gamma \mathbf{X}_{it} + u_{it}$.

Finally, as part of our sensitivity checks, we also consider a logistic default probability – an assumption not often seen in historical research so far, but suggested by contemporary research on spread determinants [Eichengreen and Mody, 1998; Kamin and Kleist, 1999].

III. The gold standard hypothesis re-estimated

Our empirical analysis proceeded in three steps. First, we tried to reproduce the results of previous studies. The second step was to enlarge the sample to cover all 57 countries. Finally, we looked more closely at specific sub-samples.

1. Reproduction of the findings of previous studies (table II)

As our data were collected from different sources, a natural starting point was to see if we could replicate the findings of Bordo and Rockoff as well as Obstfeld and Taylor. Both studies found evidence of a significant bonus for gold standard countries of 20 to 40 basis points. Regressions (1–3) restrict our data to the Bordo and Rockoff and Obstfeld and Taylor samples. Table II shows that we were able to confirm their findings. Controlling only for gold standard membership and correlation with market risk, our data show a spread reduction of 35 to 40 basis points, almost identical to the benchmark figure Bordo and Rockoff arrived at earlier. The FGLS (2) and PCSE (3) estimation methods return very similar results.

However, these regressions omit a number of important risk determinants. As discussed above, there are two different ways to model 19th century risk perception: a modern but anachronistic version, and one relying only on historical data. We first took the modern path and denominate the debt burden, exports, the public deficit and the trade balance by GDP and include real GDP per capita (in logs) to control for the income level. Then we took the historical route, scaling the debt burden by revenues and denominating the budget deficit by total revenues, indicating how much more a country spends than collects. We applied the same logic to the trade balance. To control for openness and income level, we used exports per capita, an indicator that contemporaries are known to have relied on (though we calculate exports per capita in logs following standard econometric practice). To both the modern and the historical models we added six identical dummy variables as described above: one for defaulters and previous defaulters, two for international and civil wars, and, finally, two for gold standard adherence (conditional on default).

[TABLE II about here]

Starting with the "modern" specification, the regressions neatly reproduce the findings of Obstfeld and Taylor. (Our country sample was similar, but not identical, as we were able to add two more countries, Russia and Denmark.) Gold cuts off about 20 basis points in spreads in both FGLS (4) and PCSE (5) estimations, but is slightly below conventional significance thresholds in the second. Like them, we also obtained the result that the debt burden is insignificant in the FGLS estimation, but the PCSE estimation could be a better choice and shows a significant effect at conventional inference levels.

Using the identical sample of 18 countries, we then looked at the "historical" specification as described above. This was to see whether or not the difference between the "modern" and "historical" approach actually matters. Interestingly, regressions (6) and (7) yield almost identical results to the "modern" specification used before: gold standard membership remains worth about 20 basis points. The other coefficients also resemble their "modern" counterparts, except for the debt-to-revenue ratio, which is more unambiguously significant than debt to GDP. We interpret this as an indication that the preference of historical over modern specifications may in fact be less important than has sometimes been suggested. Both sets of indicators seem to capture the same reality behind the numbers and approximate the risk perceptions of nineteenth-century investors reasonably well.

2. Full sample regressions (table III)

Regressions (8) and (9) profit from the full wealth of our dataset, which (for the reasons given above) can be estimated only with the "historical" risk model. Given that the number of countries in the panel exceeds the time observations by far, we looked only at the PCSE estimates. The estimation offers the weakest possible support for the "good housekeeping" hypothesis. In regression (8) gold adherence is worth about 15 basis points, but is nowhere

close to statistical significance, though it is still correctly signed. In estimation (9), which limits our sample to country risks of less than 1,000 basis points, the gold effect shrinks to 6 basis points. Both regressions amply document the importance of economic fundamentals for spreads. The debt-to-revenue ratio is highly significant, both statistically and economically. The same is true of exports per capita. High exporters, it seems, enjoyed much lower spreads. Defaulters, by contrast, were heavily punished, and previous defaulters had to pay a significant premium. The deficit to revenue ratio and the trade balance seem to have played a less important role. Finally, political instability was a point of concern for investors as internal crises raised borrowing cost by about 70 basis points.

[Table III here]

Two additional regressions (10) and (11) employ a different denominator for the debt burden. First, we tried the debt service-to-revenue ratio, as advocated by Flandreau and Zumer; second, we used debt to exports to denominate the debt burden. But neither of these modifications yields a meaningfully different result from the debt-to-revenue ratio, which we preferred as the most frequently cited indicator in financial publications of the time.

Do differences in the coding of gold standard countries affect the results? We tested this by using the "de facto" gold coding from Flandreau and Zumer and the classification from Meissner. But the results hardly changed. The gold standard dummy remained correctly signed, but statistically insignificant.[15]

In short, the gold effect tends to become less and less visible the larger the sample gets. Though still correctly signed, gold is no longer significant, even if we vary the gold coding criteria. As this seems to underline the importance of the country sample, the logical next step must be to look more closely at sub-samples.

3. Different sub-samples (table IV)

An important feature of our full sample may be the presence of 23 British colonies. Colonial bonds were treated as a different asset both on account of their lower spreads and their much lower correlation with market risk [Ferguson and Schularick, 2004]. Moreover, colonies tended to have above-average trade openness. Some colonies were effectively in a currency union with the United Kingdom.

As a first step, we used a simple Chow-test to find out, whether there were significant structural differences, i.e. unequal coefficients, between independent countries and British colonies. The resulting F-statistic is far above the critical value, so that we reject the idea that both groups had equal coefficients. Regression (12) confirms that colonies were treated differently from independent borrowers when they entered the capital market. Debt and income levels did not matter for risk premia, while exports per capita have the wrong sign, implying that poorer colonies paid lower interest. The gold dummy is statistically and economically insignificant. In short, colonies could borrow cheaply because they were colonies. The monetary regime did not matter.[16]

[TABLE IV about here]

What happened when we looked only at the determinants of bond spreads of independent borrowers? In contrast to colonies, fundamentals re-appear as important drivers of risk perception (13). The effect of debt and income level on risk premia is particularly large, while the value of gold is estimated to have been 15 basis points, but again – by a large margin – statistically insignificant. The question remains why the gold effect is much weaker in our sample compared to previous smaller samples. A brief look at the list of countries we added – such as Turkey, China, Persia, Siam, the Balkan states, and, besides Mexico, a

number of smaller Latin American countries – suggests that the gold effect may lose significance as the number of capital-poor independent countries grows relative to more advanced "Atlantic" economies. Were poor countries different in that gold adherence did not bring any tangible credibility gains with international capital markets? We performed another Chow-test splitting the sample into a poor country sample and a rich country sample to see if there are structural differences between the two samples.[17] Again, we were able to reject the assumption that both groups have equal coefficients. Running a separate regression for the 22 less-developed peripheral economies in the sample finally gave a clear result: for the bulk of poor peripheral economies, adoption of the gold standard did *not* bring credibility gains. The gold variable is incorrectly signed and insignificant in any specification, whether using PCSE (14) or FGLS (15), CAPM-betas or time-dummies, *de iure* or *de facto* coding. The sign of the gold standard variable remains wrong and its impact is insignificant. The market, we infer, did not confer a "good housekeeping seal of approval" on poor peripheral countries simply because they went onto gold. Many peripheral countries tried, but few, if any, reaped the benefit of enhanced credibility supposedly associated with gold standard membership.

This, then, explains why previous studies could not agree on the importance of the gold effect. In those studies where country risk perception was modeled on the basis of GDP reconstructions, the data availability led to the selection of a relatively wealthy country sample. For the more developed (non-colonial) Atlantic economies in our sample (16), the gold standard hypothesis seems to hold; joining the gold club brought a reduction of risk premia of about 40 basis points, just as the early study by Bordo and Rockoff found. But the gold standard hypothesis vanishes if the whole population of foreign borrowers in London is taken into account. The market, it seems, did not reward gold adherence in poor countries and rich countries equally. Credibility gains associated with gold convertibility were limited to countries above a certain state of economic development.

Given the potential implications of this finding for the theory of gold as a credible commitment mechanism, we ran a number of final sensitivity checks, including some potential risk factors that have not been considered before. Regression (17) adds the share of primary products in exports, the average tariff rate and the terms of trade. The key finding remains unchanged: gold adoption did not lead to credibility gains for poor countries. We obtained the same result when we lagged the key independent variables (18), or took the dependent variable in logs (19).

IV. Policy credibility in the poor periphery

The bottom line is that, whatever its significance for relatively rich independent countries, gold adoption made little, if any, difference to the perceived country risk of two important sub-groups within our global sample: British colonies and poor independent countries. It is not clear whether the positive effects that are evident for the top third of countries on the pre-1913 income ladder should therefore be interpreted as evidence of a rule of the sort proposed by Bordo *et alia*, or as exceptions to a more general rule that monetary regimes *per se* help little to enhance credibility. What is clear is that below a certain income threshold, policy credibility remained by and large unaffected by changes in the monetary regime. What is also clear, as figure 2 documents, is that interest rate convergence was no less pronounced in the poor periphery than in the wealthier non-core economies like Italy, Spain, Sweden, Denmark, Argentina and Chile. For both groups, spreads fell by about half since the late 1890s, the absolute decrease being even larger for the poor periphery. From a global perspective, it cannot be maintained that the extension of the gold "club" played a central role in facilitating financial integration by making poor countries more attractive for foreign investors. For a poor country seeking to borrow in London at sustainable rates, we are tempted to suggest, it made more sense to become a British colony than to join the gold standard.

[Figure II about here]

Why did bond market investors apparently reward gold standard adherence in more developed countries, but disbelieve promises of "good housekeeping" in less developed countries? We propose two, mutually not exclusive, explanations. Both focus on characteristics of developing countries that reduce the probability that a commitment to a currency peg will have a durable disciplining effect on policy-making.

First, as Drazen and Masson have pointed out, credibility of policies and credibility of policy-making are two different issues. The market is unlikely to find the promise of "tough" policies equally credible in all circumstances.[18] Like Drazen and Masson, we are uncomfortable with the dogma that "tying one's hands" is automatically rewarded by the market, because it implies – wrongly in our view – that investors do not think about the likely sustainability of the "promise of self-restraint", which is highly contingent on a country's economic and political situation and prospects. Even if economic policy-makers before 1914 were more insulated from the popular pressures that came to the fore after 1918, there were still many other factors that affected the probability of their sticking to their gold-standard commitments in the face of adverse conditions. Poor countries, because of their backward economic structures, were more exposed than most rich countries to the vagaries of world agricultural markets. Agrarian lobbies, with their fondness for currency devaluations and low interest rates, were even more powerful in poor countries than in rich precisely because the interest-groups supportive of gold commitments (notably bankers and bourgeois *rentiers*) were much smaller and weaker. A rational investor had good reasons to believe that Sweden would be less likely to suspend convertibility than Siam or Venezuela.

Table V compares a number of plausible factors that contributed to the market's assessment of the "promise of self-restraint". It shows that the more advanced countries on

which gold adherence seems to have conferred a credibility bonus were also special in other respects: they were twice as open, they traded about twice as much with other gold standard countries, their exports were less dominated by primary products and they were better integrated into world markets as measured by their considerably smaller shipping distances from London. Their income levels, in other words, can be seen as a proxy for a number of other characteristics that were likely to bolster market confidence in their long-run commitments to gold. For the great majority of developing countries, however, the gold commitment was a rule that could be overthrown at relatively low cost and one that was therefore likely to be challenged. It would be surprising if it had been very credible.

[Table V about here]

Our second explanation is purely political. In the eyes of the market, the credibility gains through gold standard adoption may have been low in poor countries simply because political instability was high. In other words, where the political and social fabric of a country is still crisis-prone, its monetary regime is likely to be a second-order concern for the market. Investors in Colombian, Greek, or Persian bonds were most of the time concerned with permanent threats to internal or external security that could have ruined the credit of the country. Monetary clauses mattered much less in such cases. That the contemporary press dwelt extensively on the political developments in these countries, but rarely if ever referred to convertibility arrangements, would seem to confirm this. We cannot help feeling that if the City had been as interested in currency clauses as some have claimed, this would not have been the case.

What then were the factors that drove the global convergence of interest rates before 1914? As Flandreau and Zumer have argued, the decline in real debt burdens certainly helped to make the world an ever safer place for international lending. For the 34 independent countries in our sample, the debt burden fell on average from about 4.5 times annual revenues

in 1900 to 3.5 times in 1913. Partly because of lower interest rates, annual debt service obligations absorbed more than 20 percent of public revenues in 1900, but less than 15 percent in 1913. Yet the downward trend in real debt burdens differed markedly across regions, while the yield convergence was a more or less universal phenomenon. Without denying the positive impact of the lower debt burdens, we suggest that perceptions of country risk were changing more than can be explained purely in terms of improvements in "fundamentals". In our view, the remarkably low country risks before 1914 also owed a good deal to the political and institutional integration of the globe through formal and informal imperialism. This was because empires – and especially the British Empire – provided a number of public goods essential for the efficient working of the international capital market, notably contract enforcement, protection of creditors, credible threats to insouciant borrowers and the reduction of information asymmetries. Not even the most optimistic estimation of the gold effect comes close to the "Empire effect" enjoyed by British colonies, especially the poor African and Asian colonies [Ferguson and Schularick, 2004]. The contemporaneous reduction in country risk premia in the Caribbean has been plausibly attributed to the extension of informal American imperialism in the region following the 1904 "Roosevelt corollary" [Mitchener and Weidenmier, 2004].

V. Conclusion

The hypothesis that gold standard membership conferred a "good housekeeping seal of approval" on international borrowers before 1914 is not wholly without empirical foundation. There clearly was some kind of benefit in the form of reduced risk premia – but only for certain countries that went onto gold. Applying the full range of available empirical

techniques to our expanded sample reveals that the benefits of a gold peg were neither universal nor unconditional. It is no longer credible to claim that the globalization of the gold standard played an important role in driving down global yield spreads before World War I.[19] Poor countries that retained their independence derived little or no benefit from making a gold commitment. If the international gold standard performed any service for such countries, it was by minimizing inflation expectations in rich countries, and thus contributing to the low and stable long-term interest rates in the core that were so crucial for encouraging capital flows to the periphery. Yet even this limited vindication of the "good housekeeping" hypothesis requires qualification. In those relatively advanced countries for which the hypothesis seems to hold, the gold dummy may in reality simply be a proxy for fundamental improvements not properly captured by other covariates. Unilateral promises of exchange rate stability and of complementary economic policies may have provided additional credibility, but only in special circumstances.

In the first era of globalization, as today, the market looked beyond the formal promises of monetary rules, pricing country risk on the basis of a complex mixture of economic fundamentals and political factors such as colonial status. In this sense, it may make more sense to think of the gold standard less as a "seal of approval" and more as a kind of "thin film", behind which investors were well advised to look.

REFERENCES

Primary sources and data

Brachelli, H. F. von, Statistische Skizzen der europäischen und amerikanischen Staaten nebst den auswärtigen Beziehungen der ersteren (Leipzig: Hinrichs'sche Buchhandlung, 1887)

Corporation of Foreign Bondholders, Annual General Report of the Council of the Corporation of Foreign Bondholders (London: Council of the Corporation, 1880-1914)

Fenn, C., Fenn's Compendium (London: E. Wilson, 1893)

Fenn, C., Nash, R. L., Fenn's Compendium (London: Effingham Wilson, 1883)

Juraschek, F. von, Otto Hübner's Geographisch-Statistische Tabellen aller Länder der Erde (Frankfurt: Heinrich Keller, 1880-1914)

Nash, R. L., Fenn's Compendium (London: Effingham Wilson, 1889)

Oss, S.F. van, Fenn on the Funds (London: Effingham, 1898)

Royal Statistical Office, Statistical Abstract for the Several Colonial and Other Possessions of the United Kingdom (Statistical Abstract for the British Empire) (London: 1880-1914)

_____, Statistical Abstracts for the Principal and Other Foreign Countries (London: 1880-1914)

The Statesman's Yearbook, Statistical and Historical Annual of the States of the World (London: Macmillan, 1880-1916)

Literature

Avramov, R.,120 Years Bulgarian National Bank (1879-1999) (Sofia: Bulgarian National Bank, 1999)

Banks, A., Cross-National Time Series Database 1815-1973 (Binghamton, N.Y: 1976)

Beck, N. and Katz, J. N., "Nuisance vs. substance: specifying and estimating time-series cross-section models", Political Analysis, 6 (1995a), 1-36

____, and ____, "What to do (and not to do) with time-series cross-section data", American Political Science Review, 89 (1995b), 634-47

Bordo, M. and Kydland, F. E., "The gold standard as a commitment mechanism", T. Bayoumi, B. Eichengreen, M. P. Taylor, eds., Modern perspectives on the gold standard (Cambridge: Cambridge University Press: 1996)

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

Clemens, M. A. and Williamson, J., "Wealth bias in the first global capital market boom", Economic Journal, 114 (2004), 304-37

Denzel, M., „Finanzplätze, Wechselkurse und Währungsverhältnisse in Lateinamerika (1808-1914)", J. Schneider, ed., Währungen der Welt VII (Stuttgart: Steiner, 1997)

Drazen, A. and Masson, P. R., "Credibility of policies versus credibility of policy makers", Quarterly Journal of Economics, 109 (1994), 735-54

Eichengreen, B. and Flandreau, M., "The geography of the gold standard", J. Braga de Macedo, B. Eichengreen, J. Reis, eds., Currency convertibility. The gold standard and beyond (London: Routledge, 1994)

Eichengreen, B. and Hausmann, R., "Exchange rates and financial fragility", NBER Working Paper, No. 7418 (1999)

Eichengreen, B. and Mody, A., "What explains changing spreads on emerging market debt: fundamentals or market sentiment?", NBER Working Paper, No. 6408 (1998)

Fama, E.F. and French, K.R., "The cross-section of expected stock returns", Journal of Finance, 47 (1992), 627-54

Ferguson, N., The Cash Nexus: Money and Power in the Modern World, 1700–2000 (London: Allen Lane, 2001)

____, "The City of London and British imperialism: new light on an old question", Manuscript, Oxford University (2003a)

____, "Political Risk and the International Bond Market between the 1848 Revolution and the Outbreak of the First World War", Manuscript, Oxford University (2003b)

Ferguson, N. and Schularick, M., "The 'Empire Effect. The determinants of country risk in the first age of globalization", Development Research Institute Working Paper, Stern School of Business (New York University), No. 7 (2004)

Fieldhouse, D. K., The West and the Third World (Oxford: Blackwell, 1999)

Flandreau, M., Le Cacheux, J. and Zumer, F., "Stability without a pact? Lessons from the European gold standard, 1880-1914", Economic Policy, 26 (1999), 115-62

Flandreau, M. and Zumer, F., The Making of Global Finance 1880-1913 (Paris: OECD, 2004)

Gregory, P. R., Russian National Income, 1885-1913 (Cambridge: Cambridge University Press, 1982)

Kamin, S. B. and Kleist, K. von, "The Evolution and Determinants of Emerging Market Credit Spreads in the 1990's", Board of Governors of the Federal Reserve System: International Finance Discussion Papers, No. 653 (1999)

Kelly, Trish, “Ability and willingness to pay in the age of the Pax Britannica 1890-1914”, Explorations in Economic History, 35 (1998), 31-58

Levy, M. B., “The Brazilian public debt - domestic and foreign, 1824-1913”, R. Liehr, ed., The public debt in Latin America in historical perspective (Frankfurt: Vervuert, 1995)

López-Cordóva, J. E. and Meissner, C. M., “Exchange-rate regimes and international trade: evidence from the classical gold standard era”, American Economic Review, 93 (2003), 344-53

Maddison, A., Monitoring the World Economy, 1820-1990 (Paris: OECD, 1995)

____, The World Economy. A Millenial Perspective (Paris: OECD, 2001)

Meissner, C. M., “A new world order: Explaining the emergence of the classical gold standard”, Journal of International Economics (forthcoming)

Mitchell, B, International Historical Statistics: Europe 1750-1988 (New York: Stockton Press, 1992)

____, International Historical Statistics: The Americas 1750-1988 (New York: Stockton Press, 1993)

____, International Historical Statistics: Africa, Asia & Oceania. New York: Stockton Press, 1995)

Mitchener, K. J. and Weidenmier, M., “Empire, public goods, and the Roosevelt Corollary”, Journal of Economic History (forthcoming)

Mosley, L., “Golden straitjacket or golden opportunity? Sovereign borrowing in the 19th and early 20th centuries”, Manuscript, University of Notre Dame (2003)

Obstfeld, M. and Taylor, A. M., “Globalization and capital markets”, M. D. Bordo, A. M. Taylor and J. Williamson, eds., Globalization in Historical Perspective (Chicago: National Bureau of Economic Research, 2003a)

____, and ____, “Sovereign risk, credibility and the gold standard: 1870-1913 vs. 1925-1931”, Economic Journal, 113 (2003b), 241-75

Sarkees, M. R., “The correlates of war data on war: an update to 1995”, Conflict Management and Peace Science, 18 (2000), 123-44

Schneider, J. and Denzel, M., Währungen der Welt (Stuttgart: Steiner, 1997)

Schularick, M., “A tale of two ‘globalizations’: capital flows from rich to poor in two eras of global finance”, Working Paper, Free University Berlin (2005)

Sédillot, R., Toutes les monnaies du monde (Paris: Sirey, 1955)

Siller, J., “Deuda y consolidacion del poder en México“, 1867-1896, R. Liehr, ed., The public debt in Latin America in historical perspective (Frankfurt: Vervuert, 1995)

Standard & Poor's., Sovereign credit ratings: a primer (New York: Standard & Poor's, 1998)

Sussman, N. and Yafeh, Y., "Institutions, reforms, and country risk. Lessons from Japanese government debt in the Meiji era", Journal of Economic History, 60 (2001), 442-67

Twomey, M. J., A century of foreign investment in the Third World (London: Routledge, 2000)

NOTES

[1] The phrase is J. H. Clapham's, quoted in Sayers, *Bank of England*, vol. I, p. 9. Clapham was referring to the small size of the Bank of England's gold reserve, but the phrase is suggestive of a wider point, namely that the gold standard's credibility depended on much more than formal commitments by monetary authorities.

[2] Clemens and Williamson [2004] argue that the "Lucas paradox" was also present a hundred years ago. However, as demonstrated by Obstfeld and Taylor [2003a] and Schularick [2004], a much higher share of investment went to poor countries in those days.

[3] A more general "push-side" argument stresses the positive effects of the international gold standard on capital market integration. By decreasing exchange rate volatility in the core, the gold standard reduced uncertainty and transaction costs and led to deeper financial markets, see Bordo and Rockoff [1996] and Ferguson [2003b]. The gold standard also reduced inflation expectations and thus led to very low nominal long-term interest rate levels in the core. The focus here is on the gold standard as a commitment mechanism in the recipient countries, hence as a "pull" factor.

[4] This figure is the unweighted average of spreads on government bonds from Russia, Turkey/Turkish part of the Ottoman Empire, Brazil, Argentina, Mexico, Chile, Venezuela, China, Italy, Romania, Japan, Siam/Thailand.

[5] This interpretation is not wholly incompatible with the one put forward by Bordo and Rockoff. If gold standard adherence worked as an incentive mechanism for sound policy, it may also have contributed to improvements in fundamentals. However, doubts about the disciplining effect on policy are expressed in Mosley [2003].

[6] For a detailed discussion see Sussman and Yafeh [2001] and Flandreau and Zumer [2004, p. 24].

[7] A common problem underlying all previous (and our own) is that of regime selection. The decision to introduce a monetary regime like the gold standard may have been endogenously determined, that is, dependent on certain fundamentals that needed to be in place before a country could adopt the gold standard. The impact of gold adoption should thus be interpreted cautiously. It is not independent of other factors, "but merely a partially unconditional average benefit accruing to countries in a position to adopt the gold standard." [Obstfeld and Taylor, [2003b]. A more detailed discussion can be found there.

[8] The absence of gold or sterling-denominated bonds for France, Germany, Holland and Switzerland forced us to eliminate these four countries in order to avoid the inclusion of currency risk premia. In all, fewer than ten countries that were left out because of absent control variables. These included small Caribbean borrowers and a few colonial issuers such as Barbados and Trinidad. The group of British colonies includes the individual Australian and South African provinces before unionisation.

[9] We also rely on material collected and kindly shared by other authors, in particular on the datasets of Obstfeld and Taylor [2003b] and Clemens and Williamson [2004]. For a detailed discussion of contemporary country risk indicators see Flandreau and Zumer [2004]. See also Ferguson and Schularick [2004].

[10] A detailed description of the data can be found in the data appendix.

[11] Unlike Obstfeld and Taylor [2003b] we do not distinguish between partial and full defaulters, since we saw no objective method to classify systematically the individual cases. We reckon that the bond market would react to any payment problem.

[12] We also experimented with an unweighted average without finding any significant differences to the results stated below. The same is true for a GDP-weighted world return, which comes at the cost of a smaller sample.

[13] We also tried a common rho for all panels, but obtained similar results.

[14] Obstfeld and Taylor [2003b] as well as Flandreau and Zumer [2004] employed a fixed-effects model, while Bordo and Rockoff [1996] chose a SUR (seemingly unrelated regression) approach. The PCSE method is not only more reliable than FGLS but also superior to Kmenta's cross-sectionally heteroskedastic and timewise autocorrelated model in research applications such as ours; see Beck and Katz [1995a]. In order to save space, we chose to present neither the country-specific betas and rhos nor the up to 57 unit effects. The results are available from the authors on request.

[15] They detailed results are available from the authors on request.

[16] Most colonies in Asia and Africa switched to a gold-exchange standard shortly before or after 1900. The case of India is a well-known example. Yet some colonies like Hong Kong remained on silver throughout.

[17] We chose a GDP per capita threshold of 1,500 US-dollars (1990 prices, PPP) in 1900 according to Maddison [1995] which is roughly equivalent to one third of British GDP per capita at the time. The regressions yielded the same result when we split the sample at 2,000 and 1,000 dollars, and also a geographic split (all countries outside Western Europe and North America being classified as developing countries) led to identical conclusions about the indifference of the market to monetary commitments in poor countries.

[18] Drazen and Masson [1994], pp.736-7

[19] As noted before, this has also been the result of a recent study by Flandreau and Zumer [2004], but on the basis of a sample that covered only about one third of the countries investigated here.

TABLES AND FIGURES

Table I: Dataset

	Variable	Observations	Countries	Average	St.Dev.	Minimum	Maximum
	Spread	1449	57	236.84	280.20	7.92	1934.47
"historical"	Public debt/revenues	1386	57	4.95	3.46	0.05	23.70
	Public debt/exports	1328	57	3.99	4.64	0.00	38.74
	Debt service/revenues	820	57	0.23	0.14	0.01	0.74
	Budget deficit/revenues	1384	57	0.12	0.36	-0.59	9.60
	Trade balance/exports	1388	57	-0.24	2.37	-8.54	0.79
	Exports/population	1388	57	4.73	7.36	0.05	66.64
"modern"	GDP per capita (USD 1990)	860	30	1770	1156	299	5581
	Debt/GDP	561	20	0.72	0.62	0.03	4.26
	Exports/GDP	561	20	0.20	0.17	0.03	0.93
	Budget deficit/GDP	548	20	-0.01	0.03	-0.13	0.18
	Primary exports/total exports	838	28	0.89	0.14	0.35	1.00
	Terms of trade (percent-change)	838	28	-0.08	10.62	-59.75	71.60
	Tariff level (percent)	838	28	18.11	11.84	2.50	58.17

Sources: see data appendix.

Table II: Reproduction of the findings of previous findings

Regression	1	2	3	4	5	6	7
Sample	Bordo/Rockoff	Obstfeld/Taylor	Obstfeld/Taylor	"modern"	"modern"	"historical"	"historical"
Method	FGLS	FGLS	PCSE	FGLS	PCSE	FGLS	PCSE
Countries	7	21	21	18	18	18	18
N	238	698	698	530	530	548	548
GSxNDEF	-35.31	-36.89	-45.17	-19.30	-19.26	-21.64	-22.09
	4.17***	5.15***	2.50**	2.22**	1.45	2.79***	1.40
GSxDEF		105.76	50.18	38.06	-8.68	-26.36	-68.05
		1.26	0.62	0.26	0.06	0.20	0.51
Default		490.78	544.32	302.02	352.10		
		14.89***	14.15***	7.56***	7.55***		
Previous default				52.95	13.86		
				2.20**	0.41		
Debt/GDP				20.99	125.89		
				0.89	2.51**		
Exports/GDP				149.02	251.48		
				1.86*	1.17		
Deficit/GDP				-144.01	-204.25		
				2.20**	1.1		
Trade balance/GDP				8.86	133.79		
				0.12	0.65		
GDP per capita (log)				-139.54	-252.66		
				7.95***	5.04***		
Debt/revenue						8.81	19.80
						4.34***	4.39***
Exports/population (log)						-39.98	-37.04
						5.26***	1.69*
Budget deficit/revenues						-7.48	-52.45
						0.99	2.76***
Trade balance						17.62	40.69
						1.85*	1.41
International conflict				6.38	13.03	8.92	23.83
				0.99	1.28	1.38	2.54**
Local conflict				16.21	8.70	27.94	38.59
				0.84	0.21	1.41	0.91

*** denotes statistical significance at the 1 percent, ** at the 5 percent, * at the 10 percent level.
Note: Dependent variable is the spread over consols. Numbers in second line are z-values. Unit-effects, “betas” and country-specific rhos are not reported. Sources see data appendix.

Table III: Full sample results				
Regression	8	9	10	11
Sample	full sample	(spread<1000bp.)	full sample	full sample
Methode	PCSE	PCSE	PCSE	PCSE
Countries	57	57	43	56
N	1281	1245	783	1273
GS x NDEF	-16.09	-6.40	-10.54	-16.19
	0.90	0.52	0.55	0.9
GS x DEF	149.71	-57.48	-242.81	148.56
	1.7*	0.61	2.71***	1.69*
Default	470.65	285.85	554.56	477.37
	11.37***	10.5***	11.2***	11.51***
Previous Default	135.19	89.79	112.88	140.24
	4.55***	3.93***	3.34***	4.55***
Debt/revenues	7.31	4.05		
	2.16**	2.00**		
Debt service/revenue			207.05	
			1.92**	
Debt/exports				1.72
				0.72
Exports/population (log)	-65.70	-40.93	-61.66	-68.58
	4.05***	4.94***	2.37**	3.81***
Budget deficit/revenues	-9.88	-7.61	-44.97	-6.90
	0.62	1.9*	2.29**	0.44
Trade balance	0.56	0.07	-0.24	1.46
	0.53	0.08	0.18	1.34
International conflict	-7.01	24.36	3.06	-5.86
	0.30	1.88*	0.12	0.25
Local conflict	67.50	40.44	42.54	68.82
	2.19**	2.90***	0.97	2.20**

*** denotes statistical significance at the 1 percent, ** at the 5 percent, * at the 10 percent level.
Note: Dependent variable is the spread over consols. Numbers in second line are z-values. Unit-effects, “betas” and country-specific rhos are not reported. Sources see data appendix.

Table IV: Subsample results

Regression	12	13	14	15	16	17	18	19
Sample	British colonies	Independent countries	Poor countries	Poor countries	Rich countries	Poor countries	Poor countries	Poor countries
Method	PCSE	PCSE	PCSE	FGLS	FGLS	PCSE	PCSE	PCSE
Countries	24	33	22	22	11	16	16	16
N	519	762	448	448	314	399	399	399
GSxNDEF	-2.55	-15.14	6.97	3.25	-41.26	7.87	3.52	-0.03
	0.19	0.63	0.24	0.26	5.22***	0.32	0.14	0.66
GSxDEF		153.68	177.25	-132.30	542.25	239.50	25.98	0.12
		1.79*	0.97	0.84	6.57***	2.76**	0.26	0.87
Default		460.34	492.82	504.93	78.39	486.82	491.57	0.68
		11.07***	11.59***	16.64***	2.68***	11.21***	12.65***	9.57***
Previous Default		131.84	141.80	92.04	41.29	92.74	121.00	0.19
		4.28***	4.24***	4.84***	1.72*	3.84***	4.83***	3.37***
Debt/revenues#	1.32	8.21	16.14	12.82	3.09	13.43	5.30	0.03
	1.41	1.87*	3.58***	4.93***	1.7*	3.47***	1.97**	4.36***
Exports/population (log)	3.25	-121.10	-182.46	-73.59	-51.45	-547.82	-371.60	-1.35
	0.49	3.61***	4.01***	3.81***	7.02***	5.76***	6.02***	7.74***
Budget deficit/revenues#	8.24	-11.08	-13.37	-20.58	-0.05	-14.82	7.31	-0.02
	2.90***	0.62	0.71	1.50	0.01	0.82	1.07	0.92
Trade balance#	-1.94	5.16	42.84	30.46	13.69	-60.23	-78.47	-0.06
	3.28***	0.16	1.13	2.12**	1.49	1.68	2.29**	1.00
Primary exports						1314.26	2015.56	-0.26
						3.04***	4.16***	0.26
Terms of Trade (percent-change)#						-0.38	-0.04	0.00
						1.13	0.12	0.50
Tariff level						-3.98	-3.29	0.00
						2.61**	2.21**	1.00
International conflict	113.16	-12.57	-12.05	17.90	1.95	29.68	44.35	0.11
	6.38***	0.52	0.42	1.52	0.30	1.53	2.50**	2.55**
Local conflict		65.27	69.37	26.15	57.45	68.09	27.22	0.11
		2.10**	1.93*	1.64	1.86*	2.01**	1.30	2.29**

lagged by one year in (18). Dependent variable in (19) is the log of the spread over consols.

*** denotes statistical significance at the 1 percent, ** at the 5 percent, * at the 10 percent level.

Note: Dependent variable is the spread over consols. Numbers in second line are z-values. Unit-effects, “betas” and country-specific rhos are not reported. Sources see data appendix.

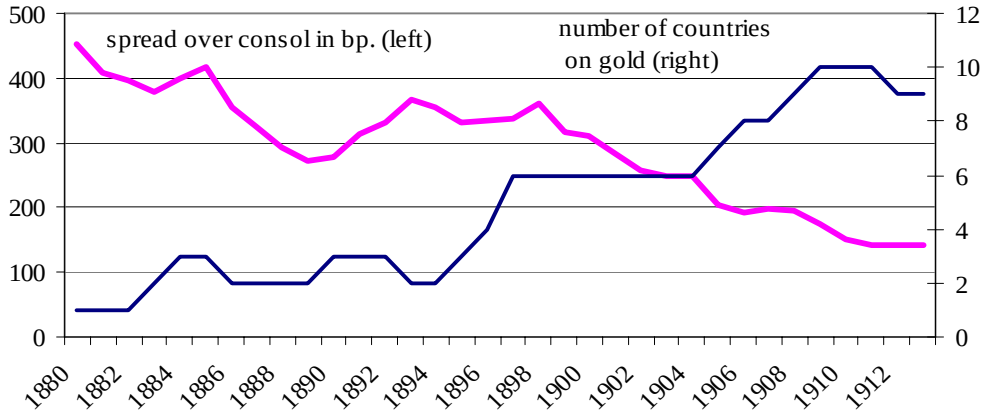
Table V: Structural indicators

Averages, 1900-1913	16 poor peripheral countries	11 more advanced countries
GDP/capita (USD 1990)	1122	2580
GDP growth, percent p.a.	2.29	3.66
Gold standard trade/total trade	0.83	0.91
Terms of trade*	10.76	8.32
Exports/GDP	0.11	0.24
Primary product exports/exports	0.92	0.81
Average tariff level (percent)	24	15
Effective distance from London**	2.89	2.00

* Standard deviation of annual changes (5-year rolling window).
** Shipping distance adjusted for transports cost.

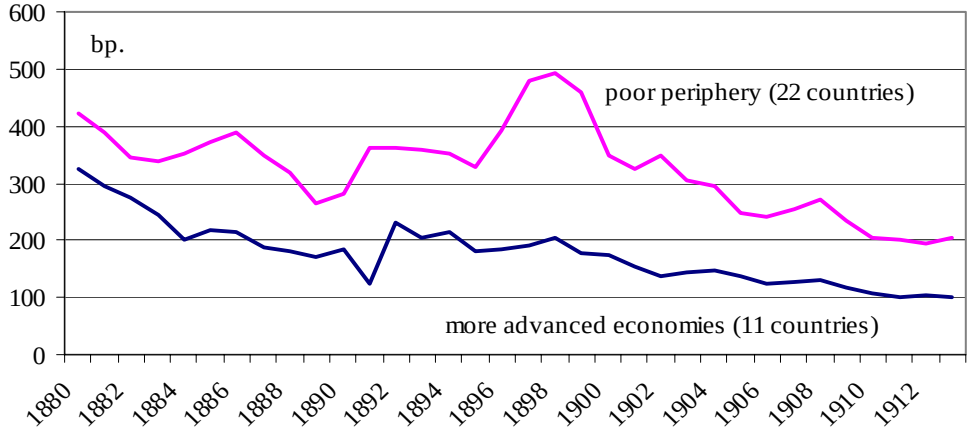
Note: Group of more advanced countries excludes the core economies UK, France, Germany, and the USA. Classification of countries according to GDP per capita level in 1900. See text and data appendix.
Sources: see data appendix.

Fig. I: Emerging markets bond spreads and gold standard adherence (1880-1913)



Note: on left-scale unweighted average of spreads on benchmark hard currency/gold bonds for 12 independent countries: Russia, Turkey, Italy, Romania, Argentina, Brazil, Mexico, Chile, Venezuela, China, Japan, Siam/Thailand; on right scale number of countries adhering to the gold standard.
Sources: see text.

Fig. II: Spread convergence in the poor periphery vs. more advanced economies (1880-1913)



Note: arithmetic average for both country groups; excludes countries in default and British colonies. More advanced economies without core economies of UK, USA, Germany, France, Netherlands, Switzerland. See data appendix.

Sources: see text.

Author affiliation

Niall Ferguson
Laurence A. Tisch Professor of History
Harvard University
Minda de Gunzburg Center for European Studies
27 Kirkland St., Cambridge MA 02138
nfergus@fas.harvard.edu

Moritz Schularick
Free University Berlin and Deutsche Bank Research
John-F.-Kennedy-Institute, Lansstr.7
14195 Berlin, Germany
moritz.schularick@db.com

DATA APPENDIX

The database constructed for this study comprises the years 1880 to 1913 at annual frequency. The data were collected from primary and secondary sources in Berlin (Staatsbibliothek), London (British Library, London School of Economics), and New York City (New York University). Our thanks go to Nitin Malla for research assistance and Wolfgang Hielscher (Staatsbibliothek Berlin) for greatly facilitating the work with numerous statistical volumes. The following financial and statistical primary sources were systematically exploited (abbreviations appear in brackets): *Investor's Monthly Manual (IMM); London Stock Exchange Weekly Intelligence (LSE)*; *The Statesmen's Yearbook (Yearbook)*; *The Annual General Reports of the Council of the Corporation of Foreign Bondholders (Annual Reports); Fenn's Compendium and Fenn on the Funds (Fenn); Statistical Abstracts for the Several Colonial and Other Possessions of the United Kingdom (Abstracts); Otto Hübner's Geographisch-Statistische Tabellen aller Länder der Erde (Hübner).*

Special gratitude is also due to Trish Kelly, Peabody College, Vanderbilt University in Nashville, Tennessee, for sharing unpublished data collected from the Corporation of Foreign Bondholders' *Annual Reports*. Additional data were gathered from historical collections, mainly from the three volumes by Mitchell (Mitchell, 1995; 1992; 1993), if the figures were also available to historical investors. For some indicators, we made use of Arthur Banks' *Cross-National Time Series Database* (Banks, 1976), which is a rich source, but unfortunately not very well documented. Prof. Banks confirmed to us in mail correspondence that all pre-1913 indicators we used for our study were originally collected from *The Statesman's Yearbook*. Prof. Banks and his collaborators converted the original series in British pounds to US dollars at an exchange rate of $5 per pound. We brought the series back to British pounds at the same conversion rate. For some countries, we were happy to rely on material collected by Michael Bordo, Michael Clemens, Marc Flandreau, Chris Meissner, Maurice Obstfeld, Hugh Rockoff, Alan Taylor and Jeffrey Williamson as stated in this appendix. We are glad to

acknowledge this generous assistance. Despite this collective effort, some gaps in the dataset nevertheless remained.

This appendix is divided in two parts. The first part contains in tabular form the complete country sample, the short description of bonds and the sources of the annual yield data. In the second part, the data sources are arranged by variable.

Appendix 1: Country sample and sources of yield data

British Empire	*Source*	*Bond*
Ceylon	IMM	4%s of 1880
Hong Kong	IMM	4% debentures (1890-93), 3.5%s (1894-1913)
India	IMM	4%s (1880-84), 3.5% (1885-1913)
Straits Settlements	IMM	4.5% of 1877 (1880-90), 3.5% (1907-13)
Canada	IMM	5%s (1880-84), 3.5% (1884-89), 3% loan 1938 (1890-1913)
British Guyana	IMM	4% (1889-1913)
Jamaica	IMM	4.5% of 1879 (1880-89), 4% (1890-1913)
New South Wales	IMM	4% bonds
New Zealand	IMM	5%s (1880-85), 4% (1886-94), 3%s (1895-1913)
Queensland	IMM	4%s
South Australia	IMM	4% ‘74
Tasmania	IMM	4% of 1878-83
Victoria	IMM	4.5% of 1879 (1880-95), 4%s (1896-1900)
Western Australia	IMM	4.5% of 1879 (1880-90), W.Austr. 4% 1881 (1891-1900)
Australia (from 1900)	IMM	4% bonds (NSW)
Gold Coast/Ghana	IMM	3% (1902-13)
Mauritius	IMM	4.5% of 1876 (1880-89), 4%s (1890-13)
Nigeria (Lagos)	IMM	3.5% (1904-13)
Sierra Leone	IMM	4% conv. bonds (1904-13)
Cape	IMM	4.5% of 1873 (1880-89), 4% Cons. (1890-1913)
Natal	IMM	4.5% of 1876 (1880-89), 4%s (1890-1913)

Orange (from 1900)	IMM	6% bonds of 1884 (1885-94)
Transvaal (from 1900)	IMM	5% scrip. (1892-99), 3% loan (1903-13)
Egypt (from 1882)	IMM	4% unified debt

Independent countries	*Source*	*Bond*
Austria	IMM	4% gold rentes
Belgium	IMM	3% of 1874 (1880-97)
Denmark	IMM	4% of 1861 (1880-84), 3% gold loan of 1894 (1895-1913)
Hungary	IMM	4% gold rentes
Italy	IMM	5% Marem. railw. 1862
Norway	IMM	4% of 1880 (1880-89), 3%s of 1888 (1890-1913)
Sweden	IMM	4% (1880-89), 3%s (1891-99), 3.5% of 1879 (1900-13)
Bulgaria	IMM	6% of 1880 (1890-1902), 6% gold loan (1902-13)
Greece	IMM	5% independence (1880-84), 5% of 1884 (1885-99), 5% of 1881 (1900-13)
Montenegro	LSE	5% loan (1910-13)
Portugal	IMM	3% of 1853 (1880-99), 3% ser. (1900-13)
Rumania	IMM	8% loan (1880-89)
Russia	IMM	4% Nicolas Railway 1867
Serbia	IMM	4% unified (1898-1913)
Spain	IMM	3% ext. (1880-82), 4% ext. (1883-1913)
Turkey	IMM	4.25% of 1871 (1880-84), 5% priority (1885-89), 5% customs (1889-99), 4% of 1891 (1900-13)
Liberia	IMM	5% ext. (1902-13)
Orange (b.1900)	IMM	6% bonds of 1884 (1885-94)
Transvaal (b. 1900)	IMM	5% scrip. (1892-99), 3% loan (1903-13)
Egypt (b. 1882)	IMM	4% unified debt
China	IMM	8% of 1874 (1880-84), 6% (1885-94), 6% gold loan (1895-99), 4.5% gold bonds (1900-13)

Japan	IMM	7% of 1873 (1880-96), 4% Sterling loan (1899-1913); additional data were kindly shared by Nathan Sussman
Persia	IMM	5% loan (1911-13)
Siam	LSE	4.5% Sterling loan (1905-13)
United States		Source: Calomiris' gold equivalent yields from Obstfeld and Taylor, (2003b).
Argentina	IMM	6% of 1867 (1880-88), 5% of 1886 (1889-1913)
Brazil	IMM	4.5% gold loan (1880-1909), 5%s (1910-13)
Chile	IMM	5% of 1873 (1880-86), 4.5% of 1886 (1887-1913)
Colombia	IMM	4.75% of 1873 (1880-96), 3% ext. (1897-99), 3%s ext. (1900-13)
Ecuador	LSE	1% new cons. (1880-90), 1% new ext. (1891-93), 4.5% new ext. (1894-96), 1% ext. (1897-99), 4% salt bonds (1911-13)
Guatemala	IMM	6% Sterling (1880-88), 4%s (1889-1913)
Mexico	IMM	3% of 1851 (1880-87), 6% (1888-99), 5% cons. Ext. (1900-1913)
Nicaragua	IMM	6% bonds (1887-99), 4% (1900-10), 6% Sterling loan (1911-13)
Peru	IMM	5% cons. (1880-89), 5.5% loan (1911-13)
Salvador	LSE	6% bonds (1891-99), 6% Sterling (1908-1913)
Uruguay	IMM	6% 1871 (1880-83), 5% unified 1883 (1884-92), 3.5% (1893-1913)
Venezuela	IMM	3% new cons. (1882-1905), 3% diplomatic debt (1906-13)

Appendix 2: Control variables

A discussion of the choice and calculation of the economic control variables used in the regressions can be found in the main text. The "raw" data behind these variables were collected from the sources listed below. More than one source is listed if several were needed to get continuous time-series. This presentational choice is dictated by the size of the dataset – we count about 25,000 data points for the "raw" series alone. Additional information is available from the authors on request.

Public debt

For all countries data on total government debt come from the Yearbook, except as follows:

New Zealand, Uruguay: sources are *Fenn* and the *Annual Reports*;

Belgium, Denmark, Norway, Sweden, USA: from Obstfeld and Taylor (2003b);

Argentina and Chile: *Yearbook*, *Annual Reports,* and Obstfeld and Taylor (2003b);

Brazil: *Yearbook*, *Annual Reports* and Levy (1995);

Egypt, Portugal, Colombia, Guatemala, Peru, Venezuela: *Yearbook* and *Annual Reports*;

Mexico: *Yearbook*, *Annual Reports,* and Siller (1995);

Ecuador, Nicaragua, Salvador: from *Annual Reports*;

Japan: *Yearbook* and *Hübner*;

Liberia: Corporation of Foreign Bondholders *Annual Reports*;

Greece, Turkey: *Yearbook* and *Annual Reports*;

China: *Yearbook* and *IMM*.

Public debt service

For the majority of countries, the data were found in the *Yearbook*. The following exceptions apply:

Brazil: Levy (1995) and Kelly (1998) ;

Egypt, Turkey, Greece: *Yearbook* and *Annual Reports*;

Argentina, Austria, Denmark, India, Italy, Nigeria, Portugal, Roumania, USA: *Yearbook* and *IMM*;

Chile, Columbia, Ecuador, Mexico, New Zealand, Nicaragua, Peru, Salvador, Uruguay: additional data from Kelly (1998).

Public revenues and expenditures

Budget figures were taken from all three volumes of Mitchell (1992; 1993; 1995) except as follows:

Orange, Transvaal, China, Siam: *Yearbook*;

Portugal, Roumania, Serbia, Colombia, Uruguay: Mitchell, *Historical Statistics*, and Banks (1976);

Montenegro, Liberia, Turkey, Persia, Ecuador, Nicaragua, Peru, Salvador from Banks (1976).

Exports and imports

Trade data were copied from Mitchell (1992; 1993; 1995) except for:

Transvaal, New South Wales, Queensland, South Australia, Tasmania, Victoria, Western Australia: *Yearbook*;

Turkey: Mitchell (1992; 1993; 1995), and *Yearbook*;

China, Siam: *Yearbook* and Banks (1976);

Liberia: *Annual Reports*;

Guatemala, Peru: from *Annual Reports*;

Persia, Ecuador, Nicaragua, Salvador: from Banks (1976).

Default and previous default

All information on default come the summary tables in the *Annual Reports* of the Corporation of Foreign Bondholders. After a debt rearrangement countries were coded as previous defaulters for the next ten years.

Gold standard

The main difficulties with respect to gold coding are treated in the text. Whenever possible we followed the coding used by Meissner (2002) by looking both at formal gold clauses *and* subsequent exchange rate stability. For Serbia and Salvador we found contradictory information and opted for the more reliable sources given below. However, we tested the sensitivity of our regressions to a change in the gold coding for these countries and found the effect minimal. British colonies without own currencies and thus effectively in a currency union with the UK were coded on gold. The West African colonies with a different legal tender besides Sterling (Nigeria and the Gold Coast) were coded on gold after the introduction of the Colonial Sterling Exchange Standard and the establishment of the West African Currency Board in 1912, an account of which can be found in Fieldhouse (1999). Coding both countries on gold throughout the period which could be justified in view of the dominant role of Sterling in international transactions did not change our results. For the majority of economies Christopher M. Meissner kindly provided exchange rate regimes for 1880-1913. His data were supplemented as follows:

India, Ceylon, Mauritius: on gold 1897-1913 from Schneider and Denzel (1991);

Straits Settlements: on gold after 1906 from Schneider and Denzel (1991);

British Guyana: colonial gold dollar pegged to Sterling according to *Yearbook*;

Bulgaria: on gold 1909-1911 from Avramov (1999);

Serbia: on gold throughout inferred from *Hübner*, and Sédillot (1955);

Montenegro: off gold throughout from Sédillot (1955);

Liberia: off gold throughout inferred from information in various issues of the *Yearbook*;

Siam: on gold 1908-1913 from Schneider and Denzel (1991), also in Sédillot (1955);

Colombia: on gold 1880-1885 found in Denzel (1997);

Peru: on gold 1902-1913 from Denzel (1997);

Salvador: on gold 1897-1912 according to Sédillot (1955);

Historical GDP data (in local currency)

Denmark, Austria-Hungary, Belgium, Norway, Spain, Sweden: from Mitchell (1992; 1993; 1995).

Argentina, Australia, Brazil, Chile, Portugal, Canada, New Zealand, South Africa, India, Japan, Uruguay, Italy: from Obstfeld and Taylor (2003b).

Russia: from Gregory (1982).

Real GDP growth and GDP per capita

Growth rates and income data in constant US-Dollars (1990, PPP) were taken from the two volumes of Maddison (1995; 2001).

Country groups

The group of 11 more advanced countries in regression (16), figure 2 and table 5 consists of Austria, Belgium, Denmark, Hungary, Italy, Norway, Sweden, Spain, Argentina, Chile, Uruguay. The poor periphery in regressions (17-19) and figure 2 includes Brazil, Bulgaria, China, Colombia, Ecuador, Greece, Guatemala, Japan, Liberia, Mexico, Montenegro, Nicaragua, Persia, Peru, Portugal, Romania, Russia, Salvador, Serbia, Siam, Turkey, Venezuela. The averages in table 5 exclude Bulgaria, Ecuador, Guatemala, Montenegro, Nicaragua, and Venezuela because of missing data.

Exchange rates

Annual average exchange rates were used to convert data in local currency to British pounds. Due attention was paid to differences between paper currency and gold rates. All series come from the volumes of (Schneider and Denzel (1991), supplemented as follows:

Austria-Hungary, Belgium, Denmark, Norway, Sweden, Greece, Portugal, Spain, Japan, United States: from Obstfeld and Taylor (2003b);

Colombia, Peru, Guatemala: from Denzel (1997);

Venezuela: from Kelly (1998);

Bulgaria, Romania, Serbia: from *Hübner*, and gold parities from Sédillot (1955).

Population

Population data for independent countries are from Mitchell (1992; 1993; 1995) and Banks (1976). Census data for the individual Australian territories, the Cape Colony, Ceylon, Egypt, the Gold Coast, Mauritius, Natal, the Orange Free State/Orange River Colony, the Straits Settlements, British Guyana, Jamaica, New Zealand, Transvaal and Hungary were found in the *Yearbook* and the *Abstracts*. Gaps between census dates were closed by linear interpolation.

Political conflict

Data for involvement in international and civil war were taken from Sarkees (2000). The latest version of the correlates of war database can be found online at: http://cow2.la.psu.edu.

Trade with gold standard countries

Data kindly supplied by Christopher M. Meissner; see López-Cordóva and Meissner (2003).

Primary exports, terms of trade, tariff levels, effective distance from London

The data come from Clemens and Williamson (2004). They are available for the following countries: Argentina, Australia, Austria, Brazil, Burma, Canada, Ceylon, Chile, China, Colombia, Denmark, Egypt, Portugal, Russia, Greece, India, Italy, Japan, Mexico, New Zealand, Norway, Peru, Serbia, Spain, Sweden, Siam, Turkey, USA, Uruguay. The effective distance from London is the transport-cost adjusted shipping distance from London.