NBER WORKING PAPER SERIES

THE "THIN FILM OF GOLD": MONETARY RULES AND POLICY CREDIBILITY IN DEVELOPING COUNTRIES

Niall Ferguson
Moritz Schularick

Working Paper 13918
http://www.nber.org/papers/w13918

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
April 2008

We would like to thank Nitin Malla, Anna Heinrich and Marit Wehner for excellent research assistance. We received helpful comments from Michael Bordo, 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. All remaining errors are our own. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

The "Thin Film Of Gold": Monetary Rules and Policy Credibility In Developing Countries
Niall Ferguson and Moritz Schularick
NBER Working Paper No. 13918
April 2008
JEL No. F2,F33,F36,N10,N20

ABSTRACT

This paper asks whether developing countries can reap credibility gains from submitting policy to a strict monetary rule. Following earlier work, we look at the gold standard era (1880-1914) as a "natural experiment" to test whether adoption of a rule-based monetary framework such as the gold standard increased policy credibility. On the basis of the largest possible dataset covering almost sixty independent and colonial borrowers in the London market, we challenge the traditional view that gold standard adherence worked as a credible commitment mechanism that was rewarded by financial markets with lower borrowing costs. We demonstrate that in the poor periphery -- where policy credibility is a particularly acute problem -- the market looked behind "the thin film of gold". Our results point to a dichotomy: whereas country risk premia fell after gold adoption in developed countries, there were no credibility gains in the volatile economic and political environments of developing countries. History shows that monetary policy rules are no short-cut to credibility in situations where vulnerability to economic and political shocks, not time-inconsistency, are overarching concerns for investors.

Niall Ferguson
Harvard University
Minda de Gunzburg Center for European Studies
27 Kirkland Street
Cambridge, MA 02138
and NBER
nfergus@fas.harvard.edu

Moritz Schularick
Free University Berlin
John-F.-Kennedy-Institute, Lansstr.7-9
14195 Berlin, Germany
moritz.schularick@fu-berlin.de

Monetary policy can be used to achieve short-term objectives such as boosting economic activity, lowering unemployment or financing budget deficits. If the market anticipates policy makers' temptation to resort to surprise actions and doubts the commitment to sound policies, it will rationally demand to be compensated for this risk. In an environment of low policy credibility, interest rates will be higher than they ought to be. This is a short version of the well-known time-inconsistency theorem of monetary policy first pointed out by Kydland and Prescott (1977) and elaborated by Barro and Gordon (1983). On the other hand, if policy credibility is high, the expectations of the public remain well anchored even in the face of adverse conditions as markets will not expect policy makers to put medium-run macroeconomic stability at risk. Achieving and maintaining policy credibility is hence a crucial task for monetary policy-makers around the world.

While the advantages of credibility are evident, it is much less clear how credibility can be built in developing countries whose economies are often subject to shocks and have little reputational track record to build credibility on. A theoretically appealing solution in such cases is to pre-commit policy to a binding rule. Such a policy rule would tie the hands of politicians who might otherwise be prone to use monetary policy for short-run gains in output or to run excessive fiscal deficits. In this line of thought, the adoption of a currency board or a comparable rule-based framework would reduce the risks faced by investors, encouraging them to lend more at lower rates. In particular, policy makers in the developing world could enhance credibility in the eyes of international markets by importing stability from abroad (Velasco, 2000). In the past decade developing countries have often been advised to opt for a 'hard peg' or a free float to avoid the credibility pitfalls of intermediate currency regimes (Calvo and Mishkin, 2003).

Bordo and Kydland were the first to argue that in the first era of financial globalization, between 1880 and 1914, the gold standard worked as a binding policy rule (Bordo and Kydland, 1995) – subject to certain contingent escape clauses. The testable hypothesis derived from this

new interpretation of the gold standard was that countries that had adopted the gold standard should, *ceteris paribus*, have been charged lower interest rates in the international capital market. A well-known empirical study confirmed this proposition (Bordo and Rockoff, 1996). The key finding was that the market considered adherence to the gold standard as a sign of financial rectitude – a credible commitment to "good [financial] housekeeping" – and charged lower risk premia on the foreign loans of gold standard countries than on the loans of countries not on gold. Lower risk premia in turn went hand in hand with massive capital flows from the center to the periphery (Obstfeld and Taylor, 2004; Schularick; 2006). Another recent study by Obstfeld and Taylor summarises this view of the gold standard as a successful policy rule:

> Gold was apparently a good enough seal of approval by itself, and risk was priced without much reference to public debt levels, the terms of trade, or whether the country was part of the British Empire. (Obstfeld and Taylor, 2003b, p. 260)

However, until now the empirical defense of rule-based solutions to credibility problems comes mainly from economic history. Contemporary tests of the credibility effects of hard pegs have brought mixed results. While Carlson and Valev (2001) underline the positive effects in the case of Bulgaria, other authors have pointed out that the effects vary according to political and economic conditions (Guidotti and Vegh, 1999; Mulino, 2002; de la Torre et al., 2003; Blomberg et al., 2005).

In this paper, we shall test the hypothesis that the gold standard era demonstrates the beneficial effects of rule-bound monetary policy, using a new and comprehensive data set. Our particular emphasis will be on developing countries, where credibility problems tend to be most acute and where policy advice is most problematic. The present paper hence relates closely to two strands of the recent literature in international economics. First, we aim to contribute to the debate on the credibility of hard currency pegs in developing countries (Carlson and Valev, 2001, Feuerstein and Grimm, 2006; Blomberg et al., 2005). Second, we also reconsider the role of the gold standard and other factors as the drivers of financial globalization and massive capital

flows from rich to poor economies before 1914 (Ferguson, 2004; Flandreau and Zumer, 2004; Clemens and Williamson, 2004; Mitchener and Weidenmier, 2005; Ferguson and Schularick, 2006). Our key question is: Did the gold standard indeed work as a monetary policy rule with significant positive effects on policy credibility in the periphery?

We follow previous studies by looking for credibility effects in country risk premia in the international market before and after adoption of the gold standard.[1] We regress country risk premia on a series of economic and political indicators for creditworthiness and look to a gold standard variable to determine whether gold adoption had statistically significant effects on the risk perception of international investors. The paper makes a number of new contributions to the debate.

First, we have assembled the most comprehensive database to date covering almost the entire universe of developing country borrowing in the London capital market before 1914. Our sample is about three times larger than those of previous studies. The dataset, which was assembled by hand from contemporary publications, covers interest rates and economic control variables for close to sixty borrowers in the London capital market between 1880 and 1913. In contrast to previous datasets that focused on the narrower Atlantic economy, ours allows us to pay special attention to the experience of developing countries (as defined by their relative state of economic development). Second, we reconsider, integrate and move beyond the methodology of previous studies. We are able to reproduce some earlier results, but also cover two neglected issues. We single out countries that moved from a paper standard to gold, as opposed to "switching" from silver (or bimetallism) to gold. We also ask if the market rewarded gold adherence not immediately, but only after a period of successful adhesion. Third, while ensuring comparability of our econometric approach with previous studies, we propose to move beyond

[1] An analysis of the interest rate spread between foreign and local currency bonds can be found in Mitchener and Weidenmier (2007). Their (preliminary) results suggest that local and foreign rates did not converge after gold adoption, hence currency risk remained prominent. However, the assumption of identical default risk on local and international debt is debatable.

standard static panel models and estimate a dynamic system generalized methods of moment (GMM) model, which allows us to model risk-perception as a Bayesian updating of country risk while taking account of potential endogeneity of some regressors.[2]

Our investigation proceeds in four steps. The first section reviews the original hypothesis that adherence to the gold standard worked as a credible commitment mechanism and describes the criticisms it has encountered. 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 some previous studies, before moving on to new estimations for our complete sample and for various sub-samples of developed and developing countries. Our findings here suggest that the market's assessment of gold standard adherence as a "good housekeeping seal of approval" varied between country groups. Most importantly, there is no evidence that the gold standard offered a short-cut to policy credibility for the poor periphery. While we confirm a modest gold effect in the core economies, in developing countries the market looked behind "the thin film of gold".[3] Section 4 asks why gold standard membership did not work as credible commitment mechanism in the periphery. We argue that in view of the economic and political instability of poor economies the market anticipated that the rule was not likely to be sustained in view of adverse economic and political circumstances. Section 5 concludes that earlier doubts on the credibility effect of the hard currency peg expressed, *inter alia*, by Eichengreen and Hausmann (1999), Ferguson (2003b), and Flandreau and Zumer (2004) were partly justified. The 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 but also the political determinants of creditworthiness.

---

[2] An exception here are Obstfeld and Taylor (2003) who estimated a model using the Arellano-Bond difference estimator, whereas we propose the newer system estimator by Arellano and Bover (1995) who alleviates some of the shortcomings with regard to instrument validity using the difference estimator.

[3] 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.

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). About 40 percent of the total volume of British capital flows between 1880 and 1913 went to countries other 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 (Schularick, 2006).

It seems likely that the spread of globalization and the deepening of capital markets in this period was, in other words, at least partly due to perception of low country risks by European financial investors.[4] Following the pioneering study by Bordo and Rockoff in 1996, students of the pre-World War I global financial market have argued that the credibility (and hence risk-reducing) effects of hard-currency pegs were part of the success story. 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

[4] 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.

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). 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, 2003).

Another 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 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. Moreover, Obstfeld and Taylor find that the credibility effect of gold adherence was strong enough to overrule even the most important solvency indicator – the relative burden of public debt:

> 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)

Other authors, however, have arrived at different conclusions. Using a dataset of 17 mostly European 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.[5] 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

[5] However, Flandreau and Zumer include a variable for exchange rate volatility. It is not implausible to assume that this variable was highly correlated to the gold standard variable.

burden).[6] In their study on the impact of colonial affiliation on risk perception, Ferguson and Schularick (2006) also found no significant risk reduction attributable to gold standard adherence. Mitchener and Weidenmier (2007), too, found little evidence that gold standard adherence lowered the currency risk implied by differences between interest rates on local and foreign currency denominated debt.

How can we account for such divergent empirical interpretations? Three possibilities come to mind. An important part of the problem could simply be 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 specification could also be at the roots of disagreements. In the absence of a well-specified model including an appropriate set of control variables, 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.[7] 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 the same, 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

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

victory over China in 1895. The same year saw a successful debt conversion. Arguably, these factors could have mattered more than the switch to gold convertibility in driving down Japanese yields.[8]

Previous studies have included quite different sets of 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.

Finally, and perhaps most importantly, there is the question of sampling. Previous studies relied on data for a relatively small number of countries – nine in the case of Bordo and Rockoff, 17 for Obstfeld and Taylor, 21 for Flandreau and Zumer) – whereas more than sixty independent states, dominions and colonies had hard-currency government bonds listed at the London Stock Exchange between 1880 and 1914. At the same time, the samples in previous studies were geographically diverse, being either predominantly "Atlantic" (Bordo and Rockoff) or skewed towards the European periphery (Flandreau and Zumer). 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

[8] 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). Yet in many respects the question whether a tangible economic benefit from gold adoption could be derived for the relatively large pool of countries whose economies fulfilled the basic prerequisites for gold standard adoption remains interesting in its own right. In practice, a rule bound monetary regime is often implemented under dire circumstances, so that the problem of regime selection could be less prevalent.

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 most comprehensive that has yet been constructed.[9] 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 in the secondary market and had quotations for at least three years in a row.[10] The bulk of the historical economic control variables was also 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.[11] We used some data from modern statistical compilations (such as Mitchell's volumes), but only when those were also available to nineteenth-century investors. However, since we also wanted to test whether the incompatible findings of previous studies were due to the choice of "historical" vs. "modern" indicators, our

[9] 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.

[10] In line with previous studies, we excluded all observations with spreads of more than 1000 basis points, since all these referred to bonds that were in default for many years, full repayment of which was considered unlikely.

[11] 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 (2006).

database also includes modern GDP estimates and related ratios.[12] 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]

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

Table I: dataset

Variable	N	Countries	Average	St. dev.	Minimum	Maximum
Country risk premium	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 (%-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.

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.[13] Since one could 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 capture the potential effects of international war and civil unrest on market risk perception.

There are two different approaches when it comes to coding dummies for gold standard adherence: *de iure* and *de facto* membership. In the first instance, we regarded countries as being "on gold" only if convertibility was formally legislated as well as maintained in practice. But we also tested the sensitivity of our results to two alternative codings. First, following Flandreau and Zumer, we also counted the *de facto* adherents as being "on gold". Second, we double-checked the sensitivity of our results with the gold matrix from Meissner (2005), which gives slightly different dates for gold adoption.

A significant 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 such movements in global risk appetite over time that are not accounted for by the variation in country fundamentals; second, a specification inspired by the international capital asset pricing model (CAPM), namely the correlation of individual assets with the 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 nineteenth-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.[14] For this purpose, we constructed a global

[13] 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.

[14] However, simple time-dummies lead to almost identical results. The distinction is more problematic with regard to colonies which had very "low betas", see Ferguson and Schularick (2006).

spread as the debt-weighted average of country spreads over the risk-free British benchmark bond known as the "consol".[15]

Finally, we moved beyond previous analyses in two ways. First, we focused specifically on countries that went on the gold from a previous paper standard. Following the time-inconsistency literature, one could expect a larger credibility gain arising from a switch from paper to gold than from silver to gold. Second, we introduced a "probation variable" in order to see if the market rewarded gold adherence only in the case of faithful compliance over time. We experimented both with three- and five-year periods, but obtained similar results and therefore present only the results for the five-year probation period.

In our econometric approach, our overarching goal was to ensure comparability with previous studies. To control for heterogeneity in our panel, we opted for a standard fixed effects model, where individual country dummies capture the effects of time-invariant but unmeasured economic characteristics such as geography or culture. Like previous authors, we found evidence of serial correlation and heteroskedasticity in our large panel, which makes ordinary least squares (OLS) problematic. 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.[16] Both estimators generally yield similar results, but we chose to present the potentially more robust PCSE estimates, as the number of groups is large relative to the number of years in our full sample (58/33). In such cases, FGLS produces overconfident test statistics (Beck and Katz, 1995a,b).[17] However, the key findings of this paper are

---

[15] 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.

[16] We also tried a common AR(1) for all panels, but obtained similar results.

[17] Obstfeld and Taylor (2003b) as well as Flandreau and Zumer (2004) employed a fixed-effects FGLS model, while Bordo and Rockoff (1996) chose a SUR (seemingly unrelated regression) approach. 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). 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; see Beck and Katz (1995a). We thoroughly tested both variants but the core findings

independent of the FGLS/PCSE estimation methods. As part of our sensitivity checks, we also considered 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).

In our baseline model, we regressed 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**):

$$\text{Yield}_{i,t} - \text{Yield}_{UK,t} = \alpha_i + \beta_i \mathbf{S}_t + \gamma \mathbf{X}_{i,t} + u_{i,t} \quad (1)$$

To test the robustness of our analysis we also estimated a dynamic panel model. By integrating the lag of the dependent variable *(s)* this allowed us to model country risk perception as a Bayesian updating process. Deviations from steady state country risk can persist longer than in classical AR(1) models. However, because fixed effects models with lagged dependent variables bias OLS estimates, we opted to use a generalized methods of moment (GMM) framework. This allowed us to address the potential endogeneity of some regressors by using internal instruments.

---

do not materially change. In order to save space, we chose to present only the PCSE estimates. In addition, neither the country-specific betas and rhos nor the up to 57 unit effects are shown. All additional results are available from the authors on request.

The system GMM estimator, introduced by Arellano and Bover (1995), combines the standard set of equations in first differences with suitably lagged levels as instruments, with an additional set of equations in levels with suitably lagged first differences as instruments.[18] We examined the validity of the internal instruments (Hansen test) and tested for serial correlation of the error term. The dynamic panel regression model of the first order takes the following form:

$$\text{Yield}_{i,t} - \text{Yield}_{UK,t} = \alpha s_{i,t-1} + \beta_i \mathbf{S}_t + \gamma \mathbf{X}_{i,t} + u_{i,t} \quad (2)$$

III. The gold standard hypothesis re-estimated

Our empirical analysis proceeds in three steps. First, we aim to reproduce the results of previous studies. The second step is to enlarge the sample to cover all 58 countries. Finally, we look more closely at sub-samples of developed and developing economies.

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

As our data were collected from a number of different sources, a natural starting point is to see if we can 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 (1–2) restrict our data to the Bordo and Rockoff and Obstfeld and Taylor samples. Table II demonstrates that we are able to confirm their findings. Controlling only for gold standard membership and correlation with market risk, our data show a spread reduction of 30 to 40 basis points, almost identical to the benchmark figure Bordo and Rockoff arrived at earlier.

[18] We use the "xtabond2" routine in Stata written by Roodman (2005). The one-step robust estimator is applied, two-step estimation yielded analogous results.

However, these regressions omit a number of important risk determinants. As discussed above, there are two different ways to model nineteenth-century risk perception: a modern but anachronistic version, and one relying only on historical data. We first took the modern path and denominated the debt burden, exports, the public deficit and the trade balance by GDP and included 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's government spent than collected. 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 calculated exports per capita in logs).

[Table II about here]

Table II: reproduction of the results of previous studies

Regression	1	2	3	4
Sample	BR (1998)	OT (2003)	"modern"	"historical"
R-square	0.79	0.77	0.88	0.83
Countries	7	21	20	20
N	218	679	577	577
GS x non-default	-31.65	-44.57	-18.25	-15.51
	2.76***	2.85***	1.69*	1.25
Default		294.27	355.26	333.27
		10.53***	10.55***	9.54***
Previous default			24.37	45.17
			2.21**	1.75*
Debt/GDP			32.88	
			1.23	
Exports/GDP			134.22	
			3.33***	
Deficit/GDP			-123.54	
			1.25**	
Trade balance/GDP			126.69	
			0.32	
GDP per capita (log)			-186.1	
			6.48***	
Debt/revenue				5.54
				1.55
Exports/population (log)				-49.33
				3.34***
Budget deficit/revenues				-11.58
				0.84
Trade balance				50.61
				2.43**
International conflict			11.04	16.31
			1.25	1.93*
Local conflict			29.25	47.68
			0.99	1.51

*** statistical significance at the 1 percent, ** at the 5 percent, * at the 10 percent level.
Note: Prais-Winsten regression with correlated panels corrected standard errors (PCSE). Dependent variable is the spread over consols. Numbers in second line are z-values. Unit-effects, “betas” and country-specific rhos are not reported, but available on request from the authors. For sources see data appendix.

Starting with the “modern” specification (3), the regressions again 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, but is only slightly above conventional significance thresholds. Using the identical sample of 20 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 (4) yields a similar result to the "modern" specification used before: gold standard membership remains worth about 15 basis points. The other coefficients also resemble their "modern" counterparts. 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)

Regression (5) profits from the full wealth of our dataset, which (for the reasons given above) can be estimated only with the "historical" risk model. The estimation offers the weakest possible support for the "good housekeeping" hypothesis. In regression (5) gold adherence is worth about eight basis points, but is nowhere close to statistical significance, though it is still correctly signed. The estimation amply documents the importance of economic fundamentals for spreads. The debt-to-revenue ratio is 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 clearly a point of concern for investors as internal crises raised country risk by about half a percentage point.

[Table III here]

Table III: full sample results

Regression	5	6	7	8	9	10
Model	Static	Static	Static	Static	Dynamic	Dynamic
Observations	1294	786	1294	1294	1249	1249
Countries	58	45	58	58	58	58
R-squared	0.84	0.86	0.84	0.83		
Spread (t-1)					0.65***	0.66***
					5.99	5.80
GS x non-default	-7.54	-1.91	-6.75		-8.34	
	0.78	0.15	0.66		0.53	
GS x default	-95.09	-25.51	-93.25		-148.90**	
	1.56	0.45	1.53		2.40	
GS-paper x non-default				-10.88		21.31
				0.87		1.51
GS-paper x default				-95.21		-84.01
				1.55		0.95
GS memory			-5.14	-4.18		-19.84
			0.61	0.42		0.98
Default	235.08***	230.49***	234.41***	234.40***	314.40***	299.60***
	8.59	6.58	8.56	8.53	4.26	3.80
Previous Default	82.69***	91.69***	82.16***	82.10***	85.60**	77.53**
	3.92	3.87	3.91	3.89	2.32	2.19
Debt/revenues	5.57**		5.61**	5.52**	0.83	1.694
	2.41		2.42	2.36	0.13	0.29
Debt service/revenue		60.54				
		1.43				
Exports/population (ln)	-42.86***	-64.30***	-41.96***	-41.49***	-3.72	-0.15
	4.96	5.91	4.79	4.71	0.70	0.03
Budget deficit/revenues	-2.27	-17.02	-2.23	-2.216	13.34	12.96
	0.65	1.55	0.65	0.65	1.58	1.56
Trade balance	-0.05	-0.14	-0.09	-0.112	1.15*	1.02*
	0.06	0.22	0.12	0.14	1.72	1.74
International conflict	4.29	22.04	3.99	4.026	33.93***	32.13***
	0.36	1.51	0.39	0.34	2.78	2.58
Local conflict	47.64***	63.35***	48.54***	48.71***	24.10	18.41
	3.21	4.46	3.32	3.25	1.16	0.85

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

Note: Dependent variable is the spread over consols. Prais-Winsten regression with correlated panels corrected standard errors (PCSE) in static model. Numbers in second line are z-values. Unit-effects, "betas" and country-specific rhos are not reported, but available on request from the authors. Robust one-step Arellano-Bond system GMM dynamic panel estimation in dynamic specification. Robust z-values are given in second row. For the system GMM estimation we treated the debt ratio, the budget balance and default as weakly exogenous, and all other variables are weakly exogenous. We use the entire lag structure for instrumentation, i.e. starting from the (t-2) lag of the difference for the levels equation, and the (t-1) lag of the level for the difference equations. Arellano-Bond test for AR(2) in first differences. For sources see data appendix.

Regression (6) employs a different denominator for the debt burden, namely the debt service-to-revenue ratio, as advocated by Flandreau and Zumer (2004). But this modification does not yield 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 and less affected by endogeneity than the debt service ratio. 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 remains correctly signed, but statistically insignificant.[19]

The following regressions look at two potentially important omissions in the previous literature. First, regression (7) adds a "probation dummy", to see whether the market rewarded god standard adherence only after a period of faithful compliance with the rules. The result is unconvincing, both statistically and economically: Even after five years of rule-bound monetary policy, the credibility effects as measured by country risk spreads were tiny and statistically not robust. Regression (8) focuses on countries that joined the gold standard from a paper standard and excludes those that simply "switched" from silver or bimetallism to gold. The idea is that the credibility effects associated with a "hard peg" might already have been reaped with the adoption of silver convertibility (Mexico and India being the most prominent examples) so that the gold effect might be more obvious in countries that made the transition directly from paper to gold. However, the results documented in table III do not support this idea. We find a statistically insignificant 10 basis points reduction in country risk for economies that adopted gold coming from a paper standard.

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

Regressions (9) and (10) present a different model, namely a dynamic panel model which includes the lagged dependent variable as a regressor and hence models country risk perception as a Bayesian updating process. By using internal instruments, we were also able to control for the potential endogeneity of some of the regressors such as the debt ratio. Despite the different estimation strategy the results are consistent with our previous results. According to the GMM estimation (9), gold standard adherence has a slight positive effect of around eight basis points, but again fails to pass standard significance tests. In the case of countries that made the transition directly from paper to gold (10), the effect becomes slightly negative, adding more doubts to the robustness of the "good housekeeping" argument.

In sum, while we were able to reproduce earlier findings of a gold effect using previous smaller samples, the gold effect tended to become less visible in our much larger country sample. Though still correctly signed, the gold dummy was no longer significant, even when we varied the gold coding criteria or looked only at countries that made the paper-gold transition. As this seems to underline the importance of sample selection, the logical next step was to look more closely at sub-samples.

3. Individual sub-samples (table IV)

An important feature of our full sample may be the presence of twenty-three 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, 2006). Some colonies were effectively in a currency union with the United Kingdom. Moreover, colonies tended to have above-average trade openness, as well as British-style fiscal and legal institutions.

As a first step, we used a 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 (11) 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.[20]

[TABLE IV about here]

[20] 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.

Table IV: subsample results

Regression	11	12	13	14	15	16
Sample	British colonies	Independent countries	Independent DCs	Independent LDCs	Independent countries	Independent LDCs
Model	Static	Static	Static	Static	Dynamic	Dynamic
Observations	514	780	366	414	749	395
Countries	23	36	13	22	35	22
R-squared	0.71	0.84	0.82	0.86		
Spread (t-1)					0.62***	0.58***
					6.03	4.98
GS x non-default	-5.05	-2.29	-50.31***	9.44	-4.25	11.51
	0.42	0.18	3.21	0.54	0.19	0.44
GS x default		-95.87		-120.18*	-143.40**	120.10**
		1.55		1.88	2.39	2.01
Default		225.27***	247.56***	234.97***	309.70***	291.90***
		8.19	4.16	7.58	4.07	3.50
Previous Default		76.51***	100.02**	81.29***	86.41**	89.89***
		3.59	2.16	3.53	2.51	2.68
Debt/revenues	1.21	5.41*	4.67	10.17***	-1.78	5.69
	1.25	1.74	0.92	2.64	0.24	1.01
Exports/population (ln)	4.17	-88.85***	-54.67***	-132.65***	-9.95	-5.07
	0.63	6.21	2.91	6.16	1.09	0.28
Budget deficit/revenues	8.48***	-2.76	1.06	-3.05	12.08	6.08
	2.98	0.75	0.12	0.81	1.32	0.96
Trade balance	-1.98***	45.31**	49.17*	62.34**	23.49	48.74
	3.36	2.38	1.94	2.48	1.14	1.31
International conflict		0.27	2.14	1.92	21.41**	29.22**
		0.02	0.28	0.12	2.05	2.07
Local conflict		43.66***	38.25	45.91***	20.26	13.48
		3.07	0.68	3.17	1.02	0.64
AB-test (p-value)					0.55	0.59
Sargan test (p-value)					0.44	0.57

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

Note: Dependent variable is the spread over consols. Prais-Winsten regression with correlated panels corrected standard errors (PCSE) in static model. Numbers in second line are z-values. Unit-effects, "betas" and country-specific rhos are not reported, but available on request from the authors. Robust one-step Arellano-Bond system GMM dynamic panel estimation in dynamic specification. Robust z-values are given in second row. For the system GMM estimation we treated the debt ratio, the budget balance and default as weakly exogenous, and all other variables are weakly exogenous. We use the entire lag structure for instrumentation, i.e. starting from the (t-2) lag of the difference for the levels equation, and the (t-1) lag of the level for the difference equations. Arellano-Bond (AB) test for AR(2) in first differences. Sources see data appendix.

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 in regression (12). The effect of debt and income level on risk premia is particularly large, while the value of gold is very small and again – by a substantial margin – statistically insignificant. The question hence 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.

4. Developed vs. less-developed economies (table V)

Were poor countries different in that gold adherence did not bring any tangible credibility gains in the eyes of 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. Countries with a GDP per capita of less than one third of the UK were classified as poor developing countries.[21] Again, a Chow-test led us to reject the assumption that both groups have equal coefficients.

We were now left with two groups, consisting of 16 relatively developed independent countries (DCs), mainly belonging to the "Atlantic" economy, and a group of 22 independent, but less developed countries (LDCs) from Eastern Europe, Latin America, and Asia. Running a separate regression for the 16 developed countries in the sample, we found a surprising result. For the developed (non-colonial) economies, the gold standard hypothesis seemed to hold:

[21] The GDP per capita threshold is 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.

joining the gold club brought a statistically highly significant reduction of risk premia of up to 50 basis points, just as the early study by Bordo and Rockoff had found. Yet a separate regression for the 22 less developed countries yielded an equally clear result: Adoption of the gold standard did not bring credibility gains. The gold variable was incorrectly signed and insignificant in any specification, whether we used a static (14) or dynamic specification (15), CAPM-betas or time-dummies, *de iure* or *de facto* coding. The market, we infer, did not confer a "good housekeeping seal of approval" on poor peripheral countries merely because they adopted the gold standard. 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.[22] 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 hypothesis of gold as a credible commitment mechanism and potential policy implications for developing countries, we finally looked more closely at the determinants of risk pricing in the poor periphery, including some potential risk factors that had not been considered before. In particular, we focused on countries that transitioned directly from paper to gold. Regression (17) includes all poor economies, sovereign states and colonies, while regression (18) restricts the sample to independent developing economies. It can be seen from table V that, in both cases, gold standard adherence had no effect on country risk. There is virtually a zero-impact in the first regression, and in the

[22] Our results in table 2 above show that the different modelling of risk pricing (modern vs. historical) does not drive the results.

second gold adherence even takes the "wrong" sign. Regression (19) 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 took the dependent variable in logs (19).

Last but not least, we again moved beyond previous models by specifying dynamics models for all LDCs (including poor colonies) and independent LDCs. Both dynamic models confirm the results obtained before (18), namely that the gold standard coefficient is not only insignificant, but also takes on a positive sign. In sum, rule-bound monetary policy as implied by gold standard adherence did not convey tangible credibility benefits on poor countries.

[Table V here]

Table V: policy credibility in the periphery

Regression	17	18	19	20	21	22
Sample	all LDC's	non-colonial LDC's	non-colonial LDC's	non-colonial LDC's	all LDC's	non-colonial LDC's
Model	Static	Static	Static	Static	Dynamic	Dynamic
Observations	745	412	300	300	706	386
Countries	36	22	13	13	36	22
R-squared	0.84	0.86	0.87	0.99		
Spread (t-1)					0.58***	0.57***
					5.00	4.88
GS-paper x non-default	-0.62	17.26	19.91	0.052	18.08	32.41
	0.03	0.84	0.80	0.72	1.37	1.47
GS-paper x default	-103.60*	-117.60*			-105.6	-108.4
	(.65	1.82			1.60	1.54
GS memory	-6.00	-4.53			-29.99	-30.51
	0.53	0.22			1.30	1.03
Default	241.10***	235.50***	329.20***	0.63***	299.10***	289.10***
	7.68	7.67	10.10	8.54	4.08	3.47
Previous default	83.95***	80.75***	114.20***	0.15**	92.29**	87.23***
	3.67	3.53	4.91	2.50	2.48	2.59
Debt/revenues#	8.81***	10.32***	18.58***	0.05***	1.63	5.97
	2.72	2.71	4.66	4.93	0.25	1.00
Exports/population (ln)	-49.83***	-133.0***	-123.4***	-0.44***	-2.29	-4.73
	4.49	6.07	4.88	6.74	0.38	0.27
Budget deficit/revenues#	-2.24	-3.01	0.11	-0.01	10.35	6.26
	0.61	0.77	0.02	1.18	1.44	0.98
Trade balance#	-0.14	62.68**	-20.10	0.21***	1.17*	46.94
	0.15	2.47	0.78	3.22	1.78	1.22
Primary exports			-538.00	-0.40		
			1.11	0.39		
Tariff level			-0.25	-0.002		
			0.22	0.90		
Terms of Trade (percent change)#			0.39	-0.0009		
			1.14	1.22		
International conflict	3.25	1.93	15.37	0.09**	34.24**	27.57**
	0.22	0.12	1.07	1.96	2.39	2.06
Local conflict	50.11***	46.33***	61.07***	0.09*	29.09	22.37
	3.23	3.03	2.99	1.88	1.46	1.22
Arellano-Bond test (p-value)					0.21	0.64
Sargan test (p-value)					0.62	0.54

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

Note: Dependent variable is the spread over consols. Prais-Winsten regression with correlated panels corrected standard errors (PCSE) in static model. Numbers in second line are z-values. Unit-effects, "betas" and country-specific rhos are not reported, but available on request from the authors. Variables market # are lagged by one year in (16). Dependent variable in (17) is the logarithm of the spread over consols. Robust one-step Arellano-Bond system GMM dynamic panel estimation in dynamic specification. Robust z-values are given in second row. For the system GMM estimation we treated the debt ratio, the budget balance and default as weakly exogenous, and all other variables are weakly exogenous. We use the entire lag structure for instrumentation, i.e. starting from the (t-2) lag of the difference for the levels equation, and the (t-1) lag of the level for the difference equations. Arellano-Bond test for AR(2) in first differences. Sources see data appendix.

IV. Policy credibility in the poor periphery

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 questionable 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 al.*, or as exceptions to a more general rule that monetary regime-changes by themselves do little to enhance credibility. Below a certain income threshold, policy credibility remained by and large unaffected by changes in the monetary regime. 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.

Why did bond market investors reward gold standard adherence in more developed countries, but disbelieve promises of "good housekeeping" in less developed countries? We propose two explanations that are not necessarily mutually exclusive. 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 (1994, 736) have pointed out, the credibility of policies and the credibility of policy-making are two different things. The market is unlikely to find the promise of "tough" policies equally credible in all circumstances. 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 popular

political pressures than would be the case after 1918, other factors remained 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 shocks – to the vagaries of world agricultural markets, sudden changes in terms of trade and growth trajectories. 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 quite likely to be challenged in a crisis. It would be surprising if it had been very credible.

[Table VI about here]

Table VI: economic fundamentals periphery vs. core

Sample averages	16 peripheral countries	11 advanced countries
GDP per capita (USD 1990)	1122	2580
Average GDP growth, percent p.a.	2.29	3.66
Trade with gold standard countries/total trade	0.83	0.91
Terms of trade*	11	8
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	2.01
Years of internal or external conflict	3.88	0.61

* Standard deviation of annual percentage changes. ** Shipping distance adjusted for transports cost (pre-Panama canal).

Note: Group of advanced countries excludes the UK, France, Germany, and the US. Classification of countries according to GDP per capita level in 1900. See text and data appendix.

Sources: see data appendix.

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. As political conflict is typically more heated, the rules of the political game are rewritten much more often in poor countries than in developed ones. Yet if constitutions change frequently, investors have good reason not to put too much faith in the durability of one particular law that requires monetary policy to follow a strict rule. 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 would seem to be confirmed by the fact that the contemporary British press dwelt extensively on the

political developments in these countries, but rarely (if ever) referred to convertibility arrangements. We cannot help feeling that, if the City had been as interested in currency clauses as some have claimed, financial journalists would have written a good deal more about them.

Our results suggest that the potential time-inconsistency of monetary policy was not the dominant concern of investors in developing countries before 1914. Their vulnerability to economic and political shocks was far more important. The same may apply today, in the most recent era of globalization. Feuerstein and Grimm (2006) have shown in a recent article that a hard exchange rate peg is not the optimal monetary solution if vulnerability to shocks, not time-inconsistency, is the dominant problem. As policy can react to shocks only after a delay, even the threat of a shock can make the abandonment of the peg more likely *ex ante*. In a similar vein, Guidotto and Veigh (1999) have argued that the credibility of hard pegs falls quickly after an initial stabilization period as the underlying economic weaknesses come to the fore again. Although theoretically appealing at first glance, our empirical results show that pre-committing policy to a binding rule was also not a good remedy for the economic ills developing countries faced in the first era of globalization.

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. 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 merely be a proxy for fundamental improvements not properly reflected by other covariates; or it may merely capture the effect of relatively low transaction costs. Unilateral promises of exchange rate stability and of complementary economic policies may have provided additional credibility, but only in special circumstances.

By applying the full range of available empirical techniques to our expanded sample of sovereign and colonial borrowers, we have shown that there were no benefits of going on gold for the majority of less developed economies before the First World War. 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. In the last era of globalization, as today, investors priced 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 wise to look. The key historical lesson from the "natural experiment" of the gold standard era is that in the poor periphery – where policy credibility is a particularly acute problem – rule-bound monetary policy did not result in credibility gains. In volatile economic and political environments, monetary policy commitments are no short-cut to credibility. Vulnerability to economic and political shocks, not time-inconsistency, were and remain the overarching concerns for international investors.

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

Arellano, M and O. Bover (1995). "Another Look at the Instrumental Variable Estimation of Error-Components Models." Journal of Econometrics 68 (1): 29-51.

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

Berger, H., Jensen, H., and Schjelderup, G., "To peg or not to peg? A simple model of exchange rate regime choice in small economies", Economic Letters 73 (2001), 161-167

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

Blomberg, S., Frieden, J. and Stein, E., "Sustaining Fixed Rates: The Political Economy of Currency Pegs in Latin America", Journal of Applied Economics 8, No. 2 (2005), 203-225.

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

Calvo, G. and Mishkin, F., "The Mirage Of Exchange Rate Regimes For Emerging Market Countries", Journal of Economic Perspectives 17/4 (2003), 99-118

Cameron, G., Gai, P., and Tan, K. Y., "Sovereign Risk in the Classical Gold Standard Era", Economics Series Working Papers 258, University of Oxford, Department of Economics. (2006)

Carlson, J. and Valev, N., "Credibility of a New Monetary Regime: The Currency Board in Bulgaria", Journal of Monetary Economics, 47/3 (2001), 581-594

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

De la Torre, A., Levy Yeyati, E., and Schmukler, S., “Living and Dying with Hard Pegs : The Rise and Fall of Argentina's Currency Board”, Policy Research Working Paper Series 2980, The World Bank (2003)

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)

Feuerstein, S. and Grimm, O., "On the Credibility of Currency Boards", Review of International Economics, Vol. 14, No. 5 (2006), 818-835

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)

Guidotti, P. and Vegh, C., "Losing Credibility: The Stabilization Blues", International Economic Review, Vol. 40, No. 1 (1999), 23-51

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, vol. 66 (2005), 385-406

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)

Mitchener, K. J. and Weidemeier, M., "Country Risk, Currency Risk, and the Gold Standard", Working Paper, (2006)

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

Mulino, M., "Currency boards, credibility and crises", Economic Systems, vol. 26 (2002), 381–386

Obstfeld, M. and Taylor, A. M., "Globalization and capital markets", M. D. Bordo, A. M. Perrier, P. and Amano, R., "Credibility and Monetary Policy", Bank of Canada Review, (Spring 2000), 11–17

Roodman, D. (2005). "XTABOND2: Stata module to extend xtabond dynamic panel data estimator." http://ideas.repec.org/c/boc/bocode/s435901.html

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)