The Making of Global Finance 1880-1913

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Final Draft, 25 May 2003

Acknowledgements

The research summarized in this monograph was initiated several years ago (in 1995). Throughout that period, it was supported, materially and intellectually, by a variety of institutions and colleagues.

First, in the course of our work we benefited from financial support from the Observatoire Français des Conjonctures Economiques (O.F.C.E.) in Paris, as well as from a variety of grants from the French Ministry of Research. It is a pleasure to acknowledge this debt.

We also received a lot of feed back from numerous colleagues who supported us through their comments, criticism, encouragement and in many other ways during this period. For their friendly advice and continued discussion we especially wish to thank Amiya Kumar Bagchi, Steve Broadberry, Michael Bordo, Forrest Capie, Filippo Ceserano, Marcello de Cecco, Daniel Cohen, Jerry Cohen, Barry Eichengreen, Luca Einaudi, Niall Ferguson, Curzio Giannini, Maria Alejandra Irigoin, Charles P. Kindleberger, Leandro Prados della Escosura, Patrick O'Brien, Jaime Reis, Albrecht Ritschl, Emma Rothschild, Anna Schwartz, Giuseppe Tattara.

The database we present here involved a massive effort. For their help with supplying directions to appropriate sources we thank Michael Bergman, Felix Butschek, Olga Christodoulaki, Jean-Pierre Dormois, Paul Gregory, Ingrid Henriksen, Lars Jonung, Anton Kausel, John Komlos, Pablo Martin Acena, Andreas Resch, Max-Stefan Schulze, Jan-Pieter Smits, Giuseppe Tattara, Bruno Théret, Jan-Luiten Van Zanden, André Villella and Vera Zamagni.

Special gratitude is due to Roger Nougaret head of the Archives at *Crédit lyonnais* for pointing out to us that the *Lyonnais*' country assessments files were possibly outstanding sources to reconstruct macroeconomic indicators. When this turned out to be the case indeed, Roger kindly and patiently made all the material we needed available for extensive periods of time, thus tremendously facilitating our efforts. As we stretched his patience and that of his team he kept helping out in the kindest way.

The help of several students is gratefully acknowledged. We especially thank Jérôme Legrain for his work on the *Statesman's Yearbook*, and Ignacio Briones for computing the exchange rate volatility indices. Juan Flores contributed by helping out with the Latin American countries. An expanded database for Latin America will shortly become available as part of his ongoing dissertation.

The present monograph was presented in a variety of places. These most prominently included the OECD Development Center seminar (Paris, April, 2002) which proved essential in bringing this project to fruition. In addition, we are grateful to participants to the Universidad Carlos III economic history seminar (Madrid, May 2002), the Humboldt Universität Departmental seminar (Berlin, May 2002), the Venice international University Summer School (Venice, September 2002), the Cambridge University "Economics and History" Lectures (Cambridge, February 2003), the Banca d'Italia economic history seminar (Rome, March 2003), and the OFCE Convergences in Economic History Seminar in Paris (April 2003). The suggestions and reactions of the audience proved most useful in fostering our thinking.

Finally, for their detailed remarks on earlier drafts we especially wish to thank Jorge Braga de Macedo and Colm Foy at the OECD Development Center in Paris.

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Presentation

The following monograph is a synthesis of a major research program on public finance and financial stability during the first era of globalization (1880-1913). It provides a contribution to the analysis of the mechanics of sovereign risk assessment and its links with international financial integration. Its main contribution is to demonstrate that the record levels of financial globalization which the period 1900-1913 enjoyed can be related to exceptionally "good" macroeconomic and policy performance in both rich and developing countries.

The monograph comprises three complementary parts. Part I contains the discussion of the findings and results as well as the policy lessons. It will be especially interesting for those looking for practical implications and policy recommendations. Part II provides more technical elements (both theoretical and empirical) which serve as the background for the macroeconomic analysis. Part III presents the database on which our findings rest. This database, which we constructed over a course of several years, is an entirely novel research tool and will hopefully benefit future research.

PART I.

Reputation and Development

"Unless we know why people expect what they do expect,
any explanation that refers to expectations as *causa efficientes* is worhtless"
Joseph Aloys Schumpeter, *Business Cycles*, 1933

What guides investors' decisions? How is shaped the market sentiment ? And how does this influence the course of global financial integration?

Economics have straightforward answers. Modern theories help identify the relevant variables researchers ought to consider when trying to explain both individual choices and aggregate outcomes at any moment of time. The theories are then 'tested' on the variables thus defined. This method is valid in any sample period, and the same models should be able to account for both present and past phenomena. Economics provides the analytical tools through which we can interpret numbers. Historians are asked to get out of the way.

This approach, arrogant as it is, has its scientific virtues. But it also has its inherent limitations. One is that it has given rise, or at least justified, to a seemingly natural division of labor between economic analysis and data gathering. On the one hand, statisticians and economic historians are supposed to collect the "relevant numbers". These numbers are then used in a later stage when models, which economists have developed deductively, are implemented. In other words numbers are little more than the fodder with which economists fatten their powerful, but somewhat paltry, theories. In effect, this state of things is somewhat disturbing if we take the vantage point of other disciplines such as physics where (apart from the sub-branch of theoretical physics) the methodology is inductive: there, it is generally recognized that the separation of observation and analysis is meaningless. We cannot see how economics could escape this principle.

There is perhaps no other context that is more apt to illustrate this simple but far reaching point than that of the perceptions, by market participants, of the quality of government policies. It is well known that in times, consensuses develop regarding the appropriate policies countries should adopt. The so-called "Washington consensus" of the 1990s, which favored

openness and liberalization was an illustration. Consensuses do matter because they help define "best practices" in policy making. It is expected that policy makers get judged on the basis of their success or failure at implementing those very policies which are taken as a test of policy success. In an affluent international financial system where countries compete to attract capital, market participants reward policy makers through lower borrowing costs and a greater supply of funds.[1] But if this is true, then certain variables should play some kind of focal role for investors who monitor policy developments. In turn, these concerns should be at the heart of policy making, since those in charge of policies will have to worry about getting these variables right. Economists and political scientists describe such situations as policy regimes.[2]

It is fairly difficult, however, to document these highly policy relevant issues from a purely abstract model. Pinning down the "relevant" variables and their influence on market perceptions (let alone how policies themselves react to this situation) is by no means easy. In effect "pure" theory is a poor guide Beliefs shape policy practices and policy practices shape beliefs. It is an established result in economic theory: forward looking expectations lead to multiple equilibriums. For our purpose here, this means that examining a given situation, or equilibrium, does not tell anything about the forces that have brought it about. The only way to sort out these difficulties is to open the black box of market perceptions and see how they determine the allocation of capital.

To make this point, this monograph considers the first large experiment of financial globalization. It occurred in the second half of the 19th century when capital flows were basically unrestrained, so that there was a potentially very high degree of capital mobility. The consensus view is that, during those years financial integration was indeed very large.

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1 .On this issue see Oman *et al.* [2003]. In addition, some other mechanisms (such as peer pressure within the European Union, or conditionality via the IFIs) complete the market mechanism, or possible compete with the market mechanism by providing extra incentives. In the European context there exists a on-going debate on the relative merits of both approaches. See Economic and Financial Committee [2003].

2 . See Krasner [1983] for a discussion of the concept of regime.

This verdict is supported by empirical evidence provided by the so-called Feldstein-Horioka measures of financial integration. These show conclusively that the late 19th century displayed a very high degree of current account openness, illustrated by a large disconnection between domestic saving and investment.[3] This integration has only recently been matched again, thus raising the possibility of many useful parallels between the "first age of globalization" (1848-1914) and the "second age of globalization" (1973-…).[4]

However, understanding the sources of international financial integration before World War I has remained a major challenge. Following a view that emerged in the interwar when contemporaries associated the dislocation of the global economic system with those of the global exchange rate system, scholars often point to the gold standard as the backbone of pre-1914 integration. The international gold standard was an informal arrangement whereby countries independently fixed the value of their currency in terms of gold or some gold-related unit and then sought to defend this parity thus creating de facto fixed exchange rate system among followers of this policy rule. As a "regime", it thus provided both a stable exchange rate environment and a number of policy prescriptions, since continued monetary expansion over and beyond what was consistent with maintenance of fixed exchange rates was over the long run incompatible with maintenance of the gold parity.

Analysts have therefore come to see the pre-1914 gold standard as the epitome of what a global policy consensus could be. The supposedly restrictive policies of the so-called "classical" gold standard have been often described as an 'ethos' or 'mentality' developed during the long boom of the late 19th century and early 20th century and acted as a disciplining device, promoting financial sobriety. As a result, the gold standard came to symbolize the mentality and patterns of conduct of the intellectual and economic elites. Policy makers

[3] . See Feldstein and Horioka [1980] for a discussion of this methodology. Bayoumi [1991] is the seminal contribution on "historical" Feldstein-Horioka coefficients. See Flandreau and Rivière [1999] for a detailed survey.

[4] . Bordo and Flandreau [2003] contrast the pre-1913 and modern periods showing that today, financial integration is a developed world phenomenon.

expected that the market would expect them to remain on gold and adjusted their behavior correspondingly. In other words, as a regime, the gold standard embeded the list of orthodox recipes that became the backbone of the policy consensus of the time. [5]

In turn, some argue this mentality played a decisive role in shaping responses to economic turmoil. Given this state of affairs policy makers were prepared to go to any length to avoid devaluation. So when crisis hit, in the interwar years, governments and leaders trained during the pre-war period reached for gold adherence as a natural panacea. This would explain the troubling persistence of deflationary policies that were sustained during most of the Great Depression, and why governments resisted the adoption of those lax policies any modern undergraduate student would recommend. As a result, gold became the millstone around the neck of national economies, helping them to sink.[6]

The reference to "mentality" is undoubtedly a radical way to solve the conundrum of expectations and policies. In any case, one should definitely ponder a bit the broader implications of this strategy, which raises questions that obviously go beyond the specific issue of the interwar crisis. All too often, "mentality" is treated as some kind of residual: that part which remains while other factors have been taken into account. Yet when "mentality" determines the very credibility of given policy actions, it becomes arguably the principal factor. It would be very helpful to have a method to identify the variables that mattered most in shaping contemporaries' beliefs. In the context of the gold standard, was it the exchange rate regime (adherence to gold), or the fiscal policy (balanced budgets), or the monetary policy (a sound currency) which people worried about? What were the weight which market participants and policy makers gave to these alternative goals? If nineteenth century orthodox writers had been asked to choose between, say, adherence to gold and fiscal balance, what would have they preferred?

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5 . Eichengreen and Temin [2000] is a typical illustration.

6 Eichengreen and Temin [2000].

A proper answer to these questions is essential given the difficulties in making piecewise comparisons between the first and the second eras of globalization. Indeed, to a very large extent, globalization today is taking place in a system of essentially floating exchange rates (at least among developed areas such as Europe, Japan, and the United States) without this constituting a major obstacle.[7] Thus if the conventional view on the sources of pre-1914 globalization is correct, and that it rested on a sustained belief on the virtues of fixed exchange rate regimes, one would have to admit that a major "paradigm shift" has occurred and that the modern drivers of globalization are radically different. For today (after it is true several decades of debate) the choice of the exchange rate regime has become a less and less distinctive *entrée* in the good governance menu list.[8]

This monograph provides a study of the roots of "credibility" during the first era of globalization. We do so by giving much attention to economic ideas regarding best policy practices. In the instance, we focus on the views of those involved in "international macro-economics" (as the subject is known today) during the years when the gold standard ethos supposedly coagulated. The goal is to develop a method that enables to study investors' thinking and behavior "in the wild" – as anthropologists say. We take as the acid test of the intuitions formalized here the ability of our methodology to make sense of the well-known but so far unexplained phenomenon of interest rate convergence that took place over the period 1875-1913 and resulted in very low interest premiums being paid by most countries in the world during the 1900s. Obviously, our objective is more ambitious : what we truly want to explain is the making of global finance.

For this purpose, a new, "grass roots" analysis is developed. That is to say, we follow an inductive approach and, rather than projecting modern theories – some would say modern prejudices – on past data, we consider the theories in use at the time under study. Archival and

7 . This point is emphasized in Bordo and Flandreau [2002].
8 . See Braga de Macedo, Cohen and Reisen [2002] for a recent survey of this matter.

secondary sources were used to reconstruct what people (both in academia and financial circles) thought good macro-economic policy management should be. This leads to formulate assumptions regarding what type of variables people ought to have considered, and in turn naturally yield itself to an empirical discussion of the validity of the behavioral model thus constructed. This obviously avoids the pitfalls of reconstructions a posteriori: we thus get a way to determine what macroeconomic indicators truly mattered and are able to debunk the myth of the gold standard ideology.

To test whether these theories influenced pricing behaviors we need to get hold of the information set that was available to contemporary investors. A vast database was therefore gathered. We constructed a sample of 16 countries over 34 years (1880-1913). It covers a wide array of nations[9] including both "capital rich" and "capital poor" countries, both European and Latin American, both South and North.[10] This database differs from existing ones in being larger (especially when it comes to capital poor countries for which figures are harder to get) and in including more variables. Unlike in other studies, this database, because it makes extensive use of archival sources, is as close as possible to the information that was monitored by contemporary investors. Collecting it also helped us to realize that the flaws of official sources (which are normally used in similar studies) were often known to observers who routinely adjusted official figures when these included known biases. Investors, we found, knew better than modern scholars working with official retrospectives, and this factor must be taken into account.

Combining our analysis of beliefs and the data thus collected, we then proceed to reconstruct, from the 'theories in use' a more meaningful and relevant picture of investors'

[9] . Argentina, Austria-Hungary, Belgium, Brazil, Denmark, France, Germany, Greece, Holland, Italy, Norway, Portugal, Russia, Spain, Sweden, United Kingdom.

[10] . The taxonomy capital poor/capital rich countries is used here for simplicity. It was suggested to us by Anna Schwartz. It is motivated by the analytical perspective adopted here: at what price can one country attract capital? In contrast to the more conventional reference to "core" vs "periphery" which is done with an eye on exchange crises. Note also that some empirical elements (such as Cameron and Bovykin [1990]) suggest that in 1913 all countries labeled as "capital rich" in this study were net creditors.

behavior under the gold standard. Given the importance that writers have given to the record of *"Belle Epoque"* to account for interwar problems, and given its parallels with today's globalization, this exercize is likely to provide a wealth of theoretical, historical, and above all, policy lessons. In particular it provides an opportunity to revisit a number of important debates on the relations between development and international financial integration. In particular, we show that technology (in the form of financial innovation) did not play a leading role in promoting the globalization of capital. Similarly, we show that simple policies that mechanically favour openness (such as free trade promotion) were not essential either. Instead, we find that the making of global finance rests on striking a careful balance between fiscal development and economic growth. The ability of states to collect resources and maintain a strong record of interest payments determines the cost at which their country can attract capital. This brings to the fore the question of governance as a key feature of financial globalization and thus brings the State back in the supposedly *laissez faire* context of the pre-1914 period, a conclusion Alexander Gerschenkron (1960) had anticipated, if in a different perspective.

It may be useful at this stage to provide the reader with a roadmap of how the remainder of the argument is organized. The next section (Section I) sets the analytical stage by relating capital integration and the cost of capital imports. It also identifies interest rates convergence as a key aspect of the integration of the pre-1914 international financial system. Section II reviews existing attempts to explain interest rate convergence. Section III outlines the weaknesses of "regime" dummies in empirical studies. Section IV provides an outline of our methodology showing that contemporary ratings of sovereign risks display a large correlation with market prices: this shows that it is possible to document perceptions from a survey of contemporary sources. Consistently, Section V surveys the theories and views regarding sound macro-economic management used by contemporaries of the pre-WWI international

financial system in order to assess sovereign risks. Sections VI and VII use the results of this survey to develop, and test, using data from an entirely new database, two alternative models explaining interest rate differentials. Results point to a ranking of the macro-economic priorities in the minds of 19th century investors that contradicts the main claims of the conventional literature on the pre-war gold standard. Section VIII solves the convergence puzzle: we outline the importance of successful development strategies in bringing about interest rate convergence. Section IX develops this later point by relating alternative rating techniques to alternative development views. Section X provides conclusions and policy lessons.

I. The Rules of Our Game: Interest Convergence and Financial Globalization

To clarify the discussion, it is useful to start from a simple analysis of the relation between sovereign risk perceptions and measures of financial integration.[11] One feature, which the first and second eras of globalization have in common, is an almost complete absence of formal barriers to the free mobility of capital. Apart from a small tax on foreign exchange transactions (motivated by financial considerations) and a measure of control on Initial Public Offerings (motivated by political consideration), portfolio reallocation, international bond circulation, etc. were basically left unhampered.[12] An abundant literature has shown that indeed, the prices of similar bonds quoted in several markets were fully arbitraged.[13]

One question to ask, however, is whether this structural situation of basically free capital mobility, was conducive of high level of financial integration, i.e. whether the actual movement of capital was effectively as large as it might have been. The possibility for capital to migrate is enough to equalize the price of identical assets in various markets. But that does

[11] . A more formal discussion of the underlying model is provided in the technical appendix.
[12] . See Flandreau and Rivière [1999] for a discussion of 19th century « Tobin taxes ». Fishlow [1989] is one of the best available surveys of late 19th century global bond markets.
[13] . The study by Neal [1990] is a pioneer. It remains unrivalled.

not mean that large swings of capital take place. The analytical workhorse to address whether capital did move are the Feldstein-Horioka measures of financial integration already alluded to.[14] Intuitively, their rationale is that a low correlation between domestic saving and investment reveals a situation where investment is not constrained by domestic resources: this is tantamount to saying that the degree of financial integration is high. Therefore, to track the ebbs and flows of global finance, these measures compute cross-section correlation coefficients between saving and investment ratios, for a given sample of countries and for a given year: the lower the correlation, the higher the integration. The resulting series of correlation coefficients capture the evolution of financial integration.

While many authors have pointed out the apparent similarity between coefficients computed for recent periods and for one century ago (with a period of deglobalization coinciding with the Great Depression[15]) few have noted that international financial integration fluctuated quite widely, even within periods reported as characterized by average "high" financial integration, such as the pre-1914 period. Consensus estimates, for instance, show progresses of international financial integration in the 1880s, followed by a brutal interruption in the early 1890s. Integration resumed after 1895, and progressed again afterwards, surpassing the levels of the late 1880s.

A priori several factors might have accounted for that. Technological improvements can be brushed aside as secondary factors at best: had they truly mattered, the progresses of financial integration should have been much more regular than they were, and reversals should not have occured. The type of factor which we favor here, and which this monograph will document in detail, is the market perceptions regarding the quality, or "soundness" of borrowing countries – and especially the perceptions regarding sovereign risk. Indeed, there is a simple, intuitive relation between the premium a given country has to pay in order to attract

[14] . See Feldstein and Horioka [1980].
[15] . e. g. Obstfeld and Taylor [1998].

foreign capital and the degree of financial integration it achieves. Suppose that starting from a situation of low perceived sovereign risk, a given country is suddenly rated as much more risky (because it cannot balance its budgets, because it experiences a revolution, or a war, or for any other reason). The supply of external capital will dry up and the country will now have to rely exclusively on domestic resources to fund domestic investment.[16]

The previous simple analysis predicts that, on average, a positive association between the yield premium of borrowing countries and the degree of international financial *dis-integration* should be observed. The lower the risk premium paid by capital poor nations, the more financially integrated the world is. This relation can in turn serve as the basis for a straightforward test that will illustrate the relevance of the approach we adopt here. Figure 1 compares our measures of financial integration and the yield premium on a pre-1914 "Emerging Markets Bond Index".[17] The correlation between the two lines is striking, and perceptible for both trends and cycles. A first wave of financial integration (decline of saving-investment correlation coefficients) took place in the 1880s. It was accompanied by a corresponding decline in yield premiums. This trend is interrupted in 1890 when Argentina defaulted and caused the fall of the Baring house. The yield premiums ratcheted up and remained high later when again yield premiums receded. They stood at record lows after 1900 when international financial integration was maximum.

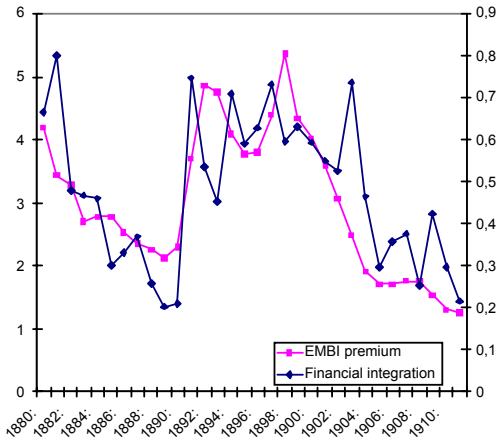
Several implications from the previous findings must be pointed out: first, the process of financial globalization before WWI was not linear. Rather, it did fluctuate a lot. This means that in a general context of free international capital mobility (or to put it differently, in the absence of formal capital controls), the actual degree of international financial integration (and thus the extent to which the international system avails itself of the benefits of

16 . See technical appendix for a formal discussion of the underlying model.

17 . The EMBI is just the average yield premium on capital poor countries for a given year. Alternative weighing techniques do not change the basic message.

globalization) may vary a lot.[18] Finally, it seems that these variations are tightly related to the perceived risks of lending to "emerging" economies, since the interest premiums borrowing countries face are a measure of their perceived default risks. In summary, borrowing costs and financial integration may be seen as the two sides of the same coin: they obey to the same laws of motion.

Figure 1. Emerging markets premiums and global financial integration



Source: Flandreau-Rivière [1998] and authors' database.

Beyond the cyclical fluctuations discussed above, the evolution of yield premiums in the period under study also displays a clear downward trend. This massive interest rate convergence is perhaps the most striking financial phenomenon of the late 19th and early 20th centuries. It is illustrated on figure 2, which depicts the reduction in interest rate spreads that occurred between 1880 and 1913 with respect to the UK interest rates. The figure compares the reduction of spreads in terms of the initial spreads. As can be seen, the greater the initial spreads had been, the greater the convergence that was achieved on the eve of WWI.[19] This result, moreover, is visible for both capital poor and capital rich countries – albeit the

[18] . Bayoumi [1990] must be credited for having been the first to point out that financial integration is not only the result of formal capital controls. He referred to the possibility of "endogenous behavior" acting as a barrier to international financial integration.

[19] . For recent discussions of the question of interest rate convergence see Foreman-Peck [1985]. This pattern is also discussed in Eichengreen [1996], Flandreau, Le Cacheux, Zumer [1998], and MacKinnon [1996].

phenomenon is perhaps more striking for the former than the latter. Italy for instance, enjoyed a roughly 300 basis points reduction of its borrowing rates relative to Britain between 1880 et 1913.[20]

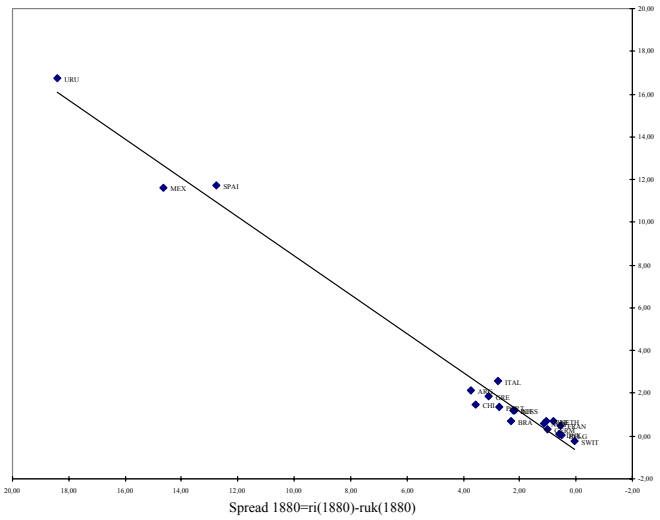
In view of the questions with which this work deals, the decline of yield premiums means that, after 1900, the risks of lending abroad were perceived as significantly smaller than they had been in the past: in other words, everything happened as if contemporaries felt the world was becoming a much safer financial place. Recent crises have provided some *a contrario* evidence that lower premiums for "emerging markets" mean a smoother financing of these countries' current accounts by the capital market, and the same should basically apply to any other country. It is thus tempting to relate the well-known financial stability of the early 20th century to the lower risk premiums countries faced throughout the world.

This suggests a straightforward interpretation of financial globalization before World War I: the progresses of integration after 1900 might be seen as a result of gradual rightwards shifts of the supply curve of capital arising from successive reductions in lending premiums, in turn supporting ever rising levels of capital movements: a large literature has shown that the export of capital peaked in those years –British capital exports for instance reaching at some point 10% of her national income. In other words one view would be that after the mid 1890s, the global capital market became friendly to the borrowing country, which could begin to exploit to their full extent the benefits of free capital mobility.[21]

Figure 2. Conditional convergence of yield spreads 1880-1913

20 . Interest rates are constructed using securities listed in the Paris or London stock markets Sources used: *Le Rentier* and *The Economist*. Arbitrage ensured that for any security quoted in both markets differences were negligible. Uruguay, Mexico and Chile were added to the complete list of countries provided in the appendix.

21 . See Cairncross [1953] for a discussion of British foreign lending. Ford [1964] discusses the ebbs and flows of capital between Britain and Argentina. For a discussion of the welfare gains/costs of foreign lending see MacCloskey [1970].



Source: authors computations, 17 countries.

The careful analyst, however, may point out that the correlation exhibited in Figure 1 could work in the other way round: suppose that "animal spirits" lead for no sound reasons to an increase in capital exports. This is likely be the case if, as suggested by Kindleberger [1989], financial markets both domestic and international, are driven by "manias". [22] In this case regardless of "true" risks, the supply curve of capital still shifts to the right thus causing yield premiums to decline. The association depicted in Figure 1 is still there, but the causality is reversed. In this case, financial integration proceeds randomly as a result of mood changes and drives the fluctuations in yield prices. Thus the question: what drove the process of financial integration? Obviously, if we are able to identify empirically the variables that were driving risk premiums, we shall be in a better position to sort out the causality and thus provide an interpretation of the sources of pre 1914 "globalization".

[22] . See also Eichengreen [1995] for arguments along similar lines. An early version of this view was the thesis of the "declining morality" of the market place which developed after 1900. At that date, some observers deplored that markets were becoming insufficiently discriminating. This thesis was developed by former leaders of underwriting syndicates, such as the Rothschilds who saw their market power in underwriting erode as competition grew. In their eyes, borrowers got better terms only because of intensified pressure among lenders (Ferguson [1999]).

II. WORSHIPING MAMMON

The usual suspect for explaining pre-1914 financial globalization is the gold standard. This system, initially adopted only by Britain (1821), Portugal (1854) and a few German towns, gradually expanded over the second half of the 19th century. A first wave took place during the 1870s, after France unofficially put an end to bimetallism.[23] The process stalled in the early 1890s and a partial reversal was observed as some countries that had in the past operated or shadowed a gold standard experienced exchange crises. Propagation resumed in the late 1890s and early 1900s. The final outcome was the fairly brief period 1900-1913, when most of Western Europe, the Americas and portions of Asia were on gold. The episode, a landmark of global exchange rate stability, became known as the "heyday" of the gold standard.[24] Most later observers were quick to relate the record highs of financial globalization of the early 20th century with the fact that this was also the time when the gold standard's geographic scope was maximum. A regime had spread, borrowing premiums had declined, and capital markets had globalized. No worry that it all ended up in a bloodbath: a powerful myth was born.

The "gold standard heyday" nostalgia casts a long shadow on 20th century monetary thinking, and this shadow extends till the most recent developments of macroeconomic history. The conventional view is that "it is of course common knowledge that British investors viewed securities issued by countries *not* on the gold standard as riskier than those of countries that were"[25]. In other words, countries on gold did pay lower interest rates. If this is true, then the decline in interest differentials may be seen as resulting from the spread of the gold standard.[26] The imperative of product differentiation has led to marginally different

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[23] . Flandreau [1996], [2003].

[24] . See Eichengreen and Flandreau [1997] for a historical account and review of arguments. Early skeptics of the virtues and reality of the gold standard include Nogaro [1940] and Triffin [1964].

[25] . Madden, [1985], p. 255.

[26] . This notion may be found at the heart of recent discussions of pre-1914 financial globalization, such as Eichengreen [1998], McKinnon [1996], Bordo and Rockoff [1996], Obstfeld and Taylor [2002] and [2003], Williamson and Clemens [2001]. If product differentiation has led various authors stress various aspects of the process, a basic consensus can nonetheless be identified. It is this consensus which we review here.

formulations of the underlying economic mechanism. But the basic point is everywhere the same. Some prefer to emphasize the incentives associated with gold adherence: being on gold "signaled" a commitment to "good" macroeconomic policies: this is the popular "good housekeeping seal of approval story".[27] Others stress that gold adherence provided greater capital market integration through exchange rate stability: the gold standard reduced transaction costs and uncertainty.[28] As a result they have portrayed the spread of the gold standard as supporting a transition from "autarky" in the 1870s to "integration" after 1900.[29] But be it improved reputation, reduced uncertainty, or both, gold adherence is assumed in all cases to have shifted the supply curve of foreign capital to the right, and is as a result associated with the decline of interest rate premiums and financial integration.

The workhorse of this literature is gold standard "dummies" used to capture the effect of gold adherence on borrowing terms.[30] The pioneering work of Bordo and Rockoff [1996] reported that participation to the so-called gold "club" was associated with a reduction of marginal borrowing rates of about 50 per cent basis points. Strikingly, gold adherence in their study as well as in subsequent similar ones has always been the only relevant variable from the point of view of statistical significance.[31] In view of the problems discussed in this monograph, these findings are a natural starting point. They place us exactly where we want to begin, i.e. at the heart of an empirical investigation of the existence of a policy consensus during the first era of globalization. If floating was, before WWI, associated with substantially higher borrowing rates, one may understand why governments, concerned with securing the

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27 . This view was pioneered by Bordo and Rockoff [1996].

28 . Obstfeld and Taylor [2002] and [2003].

29 . Clemens and Williamson [2001].

30 . As matter of fact, so strong is the notion that global economic integration before WWI had everything to do with gold adherence that the use of gold dummies to capture greater integration is turning into an industry. See Taylor et al. [2002] and Lopes-Cordova and Meissner [2000] for examples of the use of gold dummies in the context of international trade.

31 . See Obstfeld and Taylor [2003] who consider a broader range of possible variables than Bordo and Rockoff do, and report depressingly negative results beyond the effect of gold. Since they explain this in reference to a possible endogeneity problem with gold adherence capturing all the information from the other variables, they can be seen as basically siding with Bordo and Rockoff.

best possible terms for their own loans, inadvertently succeeded in building a harmonious international financial architecture by all moving to gold.[32] The gold standard and its rewards would be the invisible hand that provided for "spontaneous" global harmony.

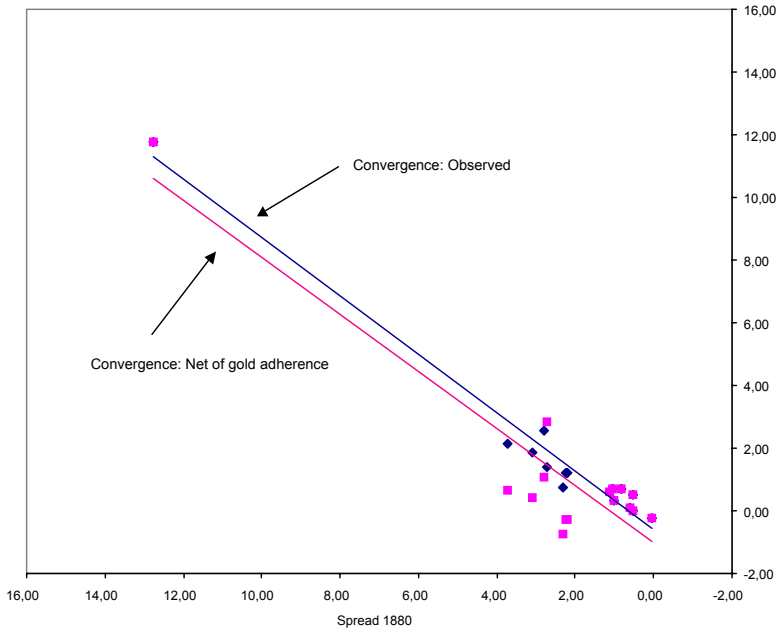
It can quickly be shown however, that this story is partial at best. To see why, suppose that we give it full credit and seek to measure the contribution of gold adherence to interest rate convergence. The rewards of gold adherence must have been extraordinary to account for the dramatic convergence observed in Figure 2: for several countries the reduction in borrowing premiums was of several hundreds basis points in Figure 2. This in itself should invite caution. A conservative estimate of the contribution of the gold standard to interest rate convergence is obtained by computing the correlation between interest rate convergence and the adoption of the gold standard.[33] Results show an estimated 148 basis points reduction associated with gold adherence. This is large, significant, and this beats earlier results. However, that does not mean that the spread of the gold standard "explains" much of the process of interest rate convergence. To show this, Figure 3 compares the actual interest rate convergence with the residual convergence (that is, convergence net of the contribution of gold adherence). The little diamonds correspond to actual convergence, while the little squares correspond to residual convergence. The two overlap when the corresponding country was either always on gold, or never on gold throughout the period: then adoption of the gold standard cannot explain anything. We then fit two lines that compare actual and residual convergence: they barely differ. The conclusion is that the gold standard "explains" only a

[32] . We consider here, for simplicity, that floating is during the period 1880-1913 the only alternative to gold adherence. We are aware that there were some countries that operated convertible silver standards (such as India). But with the end of bimetallism in 1873, silver adherence essentially amounted to a free float (see Eichengreen and Flandreau [1993] and Flandreau [2003]).

[33] . Technically, the model used here uses as a left hand variable is the premium a given country had to pay above Britain's interest rates on a given year. The right hand variable is an index variable reflecting whether or not the country was on gold during that year. Country specific controls are also included. The results of this regression can be found in the appendix. Since no other variable is included, we can be sure to obtain estimates that, if anything, exaggerate the effect of gold adherence. Recall that the other macroeconomic variables considered by Bordo and Rockoff (1996) and Obstfeld and Taylor (2003) turned out to be non significant.

tiny fraction at best of the convergence of interest rates, and thus only a fraction of financial globalization.

Figure 3. No Golden Handshake



Source: authors' computations, see text.

It is easy to understand why: there were indeed countries, which floated in the 1880s or 1890s and then adopted a gold standard (Argentina, Brazil, Russia). It is true that these countries did experience interest rate convergence. But there were also countries that left the gold standard in the early 1890s (such as Portugal) or that never quite adopted it (such as Spain). Yet these also followed a pattern of interest rate convergence.[34] Finally, we also have countries, which stayed on gold throughout the entire period under study, but nonetheless experienced interest rate convergence. Thus, what the evidence shows beyond the shadow of the doubt, is that before 1914, there was a process of interest rate convergence at the same time as the gold standard spread. Because of this and because those countries that were always on gold tended also to be richer and more developed than the rest of the sample (so

[34] . See Reis [1996] and Braga de Macedo et al. [2001] for a discussion of the Portuguese experience. See Martin Acena [2000] for a discussion of the Spanish one. Chile could be added to the list of the non-gold, yet convergence countries.

that they tended, *ceteris paribus*, to face lower borrowing rates) gold adherence turns out to be, *on average*, statistically associated with lower borrowing rates across countries and time. But that does not mean that this regime was the invisible hand behind financial integration in the first great era of globalization.

III. Religion and other dummies

In addition, the use of gold dummies raises numerous methodological questions, which are not easily sorted out, almost never discussed. This situation is nonetheless worrying given the relevance, from the vantage point of policy recommendations, of obtaining sound interpretations of the economic significance of the correlation between certain regimes (such as gold adherence) and certain outcomes (such as lower rates for sovereign bonds).

The fact is however that something that appears as simple as identifying periods of gold adherence is truly problematic. There were countries that switched to gold without formally announcing it, and others that adopted a gold peg *de facto* way before adopting it *de jure*. Apart from England, most countries had various forms of the gold standard that did not imply compulsory gold convertibility. Instead, they relied on various exchange rate targeting schemes. Years of gold adherence are thus typically identified "ex post" by looking for periods when the exchange rate was stable enough to be consistent with the notion that the gold standard prevailed in those years. Years of adoption of the gold standard are for their part identified by pinpointing successful exchange stabilization programs. Almost by definition, both exchange rate stability and successful stabilization programs tended to be associated with a better environment, a better reputation, the absence of any major economic or political problem. It should not come as a great surprise that such backgrounds were associated, on average, with lower borrowing rates. There is therefore a risk that gold adherence is really a proxy for something else.

For policy reforms tend to come in clusters. The deliberate development policies implemented in the late 19th centuries in countries whose leaders wanted to emulate Western success, such as the so-called "Meiji Revolution" of 1868 in Japan or the "Witte System" (1892-1903) in Russia typically involved wide ranging changes in trade, financial, budgetary policies. New institutions were created, such as "modern" central banks that mimicked the organization of their Western counterparts.[35] In many cases, these transformations involved more symbols than content, more publicity than substance, since they were all made with an eye on their effects on financial market perceptions.[36] Of course publicity could work, but it could also fail. This makes it typically difficult to disentangle the contribution of individual factors.

A good illustration of the pitfalls that this situation creates for research is provided by the Japanese experience. After the Meiji revolution of 1868, Japan undertook a long string of reforms that began with the abolition of the Feudal System and consolidation of property rights in 1873 and culminated with the adoption of the gold standard in 1897. This latter reform was also accompanied by many other changes, including a move to trade liberalization.[37] A casual look at the Japanese yield premia shows a dramatic decline after 1897. Some researchers concluded that the gold standard had acted as a kind of IMF badge of good behavior.[38] Upon closer scrutiny, however, it does not seem that the decline of yield premiums after 1897, of which a large part is spurious, means much.[39] 1897 was one of these over-determined years: the adoption of the gold standard was truly the conclusion of a gradual transformation that provided both a legal and a political infrastructure to develop Japan's integration in the international economy. As one contemporary Japanese lawyer explained in

35 . See Conant [1896], Lévy [1911].
36 . On Russia's « cosmetism » see Conant [1896].
37 . On Japan's development policies, see Rosovski [1961]. On its external borrowing see Suzuki [1990].
38 . Sussman and Yafeh [1999] and [2000].
39 . As was sometimes the case, the adoption of the gold standard was accompanied by a debt conversion. The implication is a repurchase of outstanding obligations at par, and their reissue at a lower price. This means that standard estimates of the yields which rely on the classic coupon/price formula are biased.

French to the benefit of the international public, the main short term effect of the Meiji "Revolution" of 1868 had been to secure *domestic* property rights. It was only later that the basis for the rights of *foreigners* was reinforced, through the removal of a number of regulations pertaining to the country's former "trading post" status.[40] These later transformations were only completed in 1897 and thus coincided with the adoption of the gold standard. Moreover, it could be said that 1897 also followed Japan's victory over China, and marked this country's emergence as a regional power. The war had furthermore endowed Japan with a substantial indemnity which it collected in London and left there as a collateral for future loans. Thus the "adoption of the gold standard" coincided with so many other changes (political, diplomatic and institutional) that little can be said about its specific "effects": given the historical overlap of events, there is just no way to tell.[41]

The point we are making is that interpreting the significance of "dummy variables" capturing institutions, regimes, and their likes, is always difficult. Properly identifying the contribution of culture, ideologies – more generally consensuses – to expectations and credibility is a daunting challenge. Discussion of this old problems in the social sciences is usually associated with the work of Max Weber and his famous suggestion (precisely made during the period under study) that some cultures (or religions) might provide better development conduits than others.[42] The rampant debate on the role of cultural beliefs alluded to in the introduction of this monograph has often led social scientists to face the temptation of building a comprehensive theory of human development that would relate beliefs and economic performance. Macroeconomics never fully escaped this spell. The period of growing "nationalism" after 1873 witnessed an expansion of theories that related what was

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[40] . Tomii [1898].

[41] . It might also be added that the adoption of the gold standard was truly part of a broad international public relation operation. Not incidentally, Count Matsukata Masayoshi's famous *Report on the adoption of the gold standard* (1899) was written in English. There is a danger that modern economists be the last victims of late 19th century PR campaigns. On the symbolic role of gold adherence for 19th century developers, see Gallarotti [1995].

[42] . Weber, [1904]. Weber argued that the Protestant ethic was more favorable to development.

called "races" or religious beliefs, and national economic records. It was common, among academic economists and statisticians to relate such things as the management of public finances with cultural features. According to one Baxter, a leading British statistician writing in 1870, there was a sharp divide between the "Latin" tendency to be impervious and to the virtues of thrift displayed by "Anglo-Saxons". According to him:

> "The reduction of National Debts has been practiced by few nations […] All of these are Anglo-Saxon and Teutonic or Scandinavian nations. […]. The Latin Nations by contrast are injuring their industrial prospects by the recklessness with which they are plunging into debt". [43]

The analysis of monetary arrangements was subjected to similar claims. For instance, in the midst of the European debate on bimetallism vs. the gold standard, one German economist argued:

> "Without insisting further on the historians' theory, who, calling nations to their tribunal, emphasize the ascent of Germans and decline of Latins, [one] may remark that the ideas supporting bimetallism are especially French, or adopted by those nations that get easily lured by the seductions of the French spirit" [44].

Today, the despise of Latin finance is still well alive: to give just one example, the late Rudiger Dornbusch, was fully up to the 19th century standard when he suggested as a millennium resolution:

> "Abolish southern currencies […] Nobody can put faith in something called a Turkish lira *because lira is bad and Turkey does not make it better*". [45]

Explaining such reminiscences would take us well beyond the boundaries of serious economics. But the point is that relying on appearances, even when they seem justified by economic models involves a serious danger to develop a mistaken interpretation of the

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43 . R. Dudley Baxter, [1870], p. 125-126. he goes on arguing:

44 . Bamberger, *Deutsche Rundschau*, october 1877. Quoted by Cernuschi, 1878, *La diplomatie monétaire* en 1878, p. 90. Bamberger was a prominent German politician and authorized writer, whose role in the unification of Germany and subsequent adoption of the gold standard was paramount. He was a leader of the liberal party whose goals conflicted with Bismarck's objectives of centralization. See Koehler [1995].

45 . "Millenium Resolution: No more funny money", Financial Times, Jan 3rd 2000

relation between beliefs, institutions, and performance. This problem might be illustrated by looking at some bizarre aspects of the classification provided by Baxter: for instance, he put French speaking Belgium in the "Anglo-Saxon and Teuton" group, while German speaking Austria was included in the Latin one. The most probable interpretation is that there were more "Latin" among the "bad guys", more "Anglo-Saxons and Teutons" among the "good guys", so that problem countries became Latin *honoris causa*, and vice versa. Obviously, Baxter was doing just the same as those who draw conclusions from the significance of gold dummies: a lot of countries went on gold at the same time when interest convergence occurred. But many countries did not change their exchange rate policy and yet experienced convergence.

Moreover, it is not always in the writings of theoreticians that we find the insights that are most useful to decisions makers. The fact is that the "racialist" theories of macroeconomic performance were not developed by people with a direct role in the market mechanism. In effect financial economists were generally critical of such views. For instance, Paul Leroy-Beaulieu a staunch liberal economist and teacher of generations of public finances analysts, devotes space and energy in each edition of his famous handbook *Sciences des Finances* to outline what he calls the flaws of the racialists' "too absolute claims, presented with considerable exaggeration".[46] As for the international banking and finance community, its culturally heterogeneous origin, made it a more reluctant prey of racialist theses. Yet bankers and financiers were the relevant intermediaries in the process of globalization of capital. They were the ones who played an essential role in the pricing of sovereign risks. This suggests that we should look at the nexus of actual analyses, formal or qualitative, rules of thumb, applied theories, and operational research which this category of intermediaries developed in order to guide actual decision making. What needs to be done therefore, is to determine the

46 . Leroy-Beaulieu [1899], Tome II, p. 629. Leroy-Beaulieu was the editor of the French counterpart to *The Economist*, *L'Economiste Français*.

macroeconomic variables that were of concern to the investors of the time. Only if this is properly done, can the effect of gold adherence on borrowing terms be adequately measured, or the trade-off faced by policy makers when deciding to tie their currency to gold be assessed.[47] In other words, we want to look carefully at what we suggest to call the "theories in use".

IV. Micro Motives and Macro Behavior

> "The price of public securities is, with good reasons, considered as the exact measure of the degree of trust which national credit deserves"[48]:

These words come from a letter sent in 1868 by James de Rothschild to the Austrian finance minister Beust. In this letter, the international financier advised the policy maker on the dangers, for Austrian credit of implementing a contemplated capital levy, show that any notion of risk premiums "increasingly becoming [after 1870] an indicator of credit worthiness" [49] is questionable to say the least. As early as in the first half of the 19th century, investors understood that the fluctuations of government securities could be put in relation to the vicissitudes of a nation's credit worthiness. The equation had in fact been identified in a much earlier time. As early as in 1824, Laffitte, a leading French banker, had provided the following definition of the market place: [50]

> "[Financial markets are] the thermometer [and the] grand jury of European capital. [It is] where States' credit is ranked […] just like individual credit is ranked according to wealth, probity and intelligence".

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47 . We consider here, for simplicity, that floating is during the period 1880-1913 the only alternative to gold adherence. We are aware that there were some countries that operated convertible silver standards (such as India). But with the end of bimetallism in 1873, silver adherence essentially amounted to a free float (see Eichengreen and Flandreau [1993] and Flandreau [2003]).

48 . James de Rothschild, 2 June 1868. Quoted in Gille [1967].

49 . Clemens and Williamson [2001].

50 . Laffitte [1824], p. 41-2. For similar views coming from the other side of the Channel, see Ferguson [1999].

Such is our starting point: bond prices (or equivalently the corresponding yields premiums or default probabilities) may be seen as the left hand side variable of an implicit equation through which investors priced sovereign risks as a function of a number of variables. This equation is therefore an excellent tool to identify the determinants of reputation and study the market perceptions of government policies before WWI. Once its existence in the minds of investors has been recognized, it is possible, by retrieving the information available at the time to back up these variables and their influence on bond prices. Moreover, in contrast with conventional studies, the selection of candidate variables is not made from the vantage point of a modern analyst, but by adopting the perspective of a contemporary observer.

Before we move to this in the next sections, it is useful to give some insights on the relevance of this approach. In an earlier study, which is a direct source of inspiration for the ideas pursued in this monograph, one of us examined the sovereign rating techniques developed by *Crédit lyonnais*, a French deposit bank with an investment banking arm.[51] *Crédit lyonnais*, created on 1863, became the leader of a majority of syndicated sovereign bond issues in the Paris market between 1890 and 1914. To guide its policies, the bank had set up in the early 1870s a formal economic research department. After 1890, in direct response to the Baring crisis' implication that investors had potentially misjudged Argentinean bonds, the size and scope of the research department expanded dramatically.[52] Under pressure from the bank's management, it started to develop systematic measures of state solvency. In other words, the bank sought, by relying on economic reasoning, to identify a number of relevant parameters, which it then monitored.

An 1898 internal document provides what is perhaps one of the first instances of formal sovereign rating. A number of spreadsheets constructed at that date show countries grouped in

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51 . Flandreau [1998]. This research was a source of inspiration for the work of Tomz [2001], to whom we communicated some of our data. On the history of Crédit lyonnais, see Bouvier [1963].

52 . See Flandreau [1998] for data on the budget and number of employees of the research department.

three risk categories: category I, the highest credit, category II, the intermediate credit, and category III, the poorest credit. For each country, performance parameters are also reported. If we consider that the bank used an implicit "formula" to rank countries in alternative groups, and if we consider that this formula exploited the information on the performance parameters, we can retrieve the weight of each parameter in the formula.[53]

The information one may retrieve from similar exercises depends on the extent to which individual ratings and market consensuses coincide. The *Lyonnais* was only one bank – if a huge one and for international investment, hugely important – and it was only French. What did other investors and intermediaries think? And what about its British, German, Belgian, or Swiss, counterparts? To address this question, the individual grade can be compared with the premium a country had to pay when it sought to borrow abroad. Figure 4 does this by comparing *Lyonnais*' grades with market premiums in 1898. The grades were computed using the implicit formula estimated on the basis of the information contained in the Lyonnais tables.[54] It shows a close association between the individual ratings and "consensus opinion" as reflected by market premiums.[55] Because of archival limitations,[56], the econometrics are bound to be somewhat crude.[57] Nevertheless, the high correlation between individual ratings and market prices suggests that individual views may be treated as representative of global opinions.[58] Therefore, looking at what investors looked at can explain a lot about prevailing

53 . Since we know to what group each country belonged – and the intermediate variables contemporaries monitored – we can assess the weight that each variable had on the ranking.

54 . Flandreau [1998].

55 . Obviously, some discrepancies are to be expected, since these ratings, which the *Lyonnais* kept secret and used to advise its clientele of depositors, were meant to signal some investment opportunities that had been underestimated by the market.

56 . We only have one instance of formal rating, while there is ample suggestion that such exercises were routinely made.

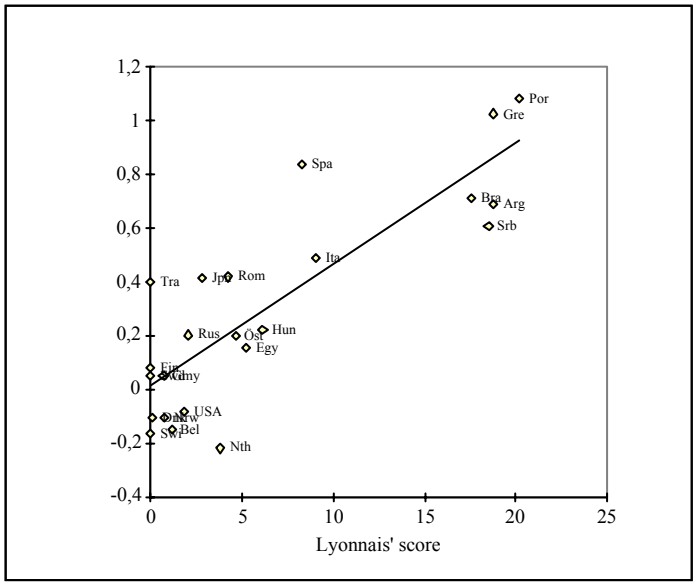
57 . For instance the third group comprised in 1898 mostly countries that were, hade recently been, or were about to be in default: while this motivated a general grading to "junk" status by Lyonnais economists (explaining the virtually vertical axis in which we find Portugal, Greece, Brazil, Argentina, and Serbia) the market nonetheless discriminated within junk countries depending on default settlement prospects, motivating potentially very different yield premiums, while the rating procedure tends to downplay idiosyncrasies among defaulters.

58 . Correlations coefficients are 0.82 for spread vs grade and 0.84 for log spread vs grade.

views about macroeconomic management. And history becomes a guide to understand the making of global finance.

To a large extent Figure 4 is the entire monograph in a nutshell: it shows that it is possible to work out inductively, from contemporary sources, a number of hypotheses regarding market perceptions of sovereign risk, and then to test using bond prices and macro data whether these views are consistent with the pricing of sovereign debt.

Figure 4. Individual beliefs and market opinion



Source: See text. Lyonnais scores computed from Flandreau [1998] using an ordered probit model. A low grade means a low risk. Without loss of generality, grades were rescaled so that each country's get a grade between 0 (=Finland) and 1 (=Portugal). Yield spreads computed from monthly bond prices in Paris and London (figures collected from *Le Rentier* and *The Economist*).

While this strategy is perfectly natural, it nonetheless implies a fundamental reversal with standard approaches. It thus deserves some elaboration. In contrast with the conventional approach that relies on Friedman's "as if" clause (according to which one should try to guess what the market thought, using modern theoretical insights and modern economic concepts), we seek to infer the pricing of risks from an analysis of *actual* perceptions. We thus suggest to build on the reconstruction, from the direct observation of the beliefs of contemporaries, of how the market operated, and how it weighted risks: the goal is to derive the "model of the

world" which was on the mind of contemporary investors, and then use the techniques of economics to see whether such a model was indeed reflected in pricing behaviour. To us, this approach is the only practical one to study the features of a macroeconomic "orthodoxy" and more broadly in fact, the question of expectations which, as already emphasized, do play a decisive role in allocating wealth globally.

Thus the basic intuition of this paper is to make the best of the limitations of case studies and transform those limitations into an asset. What we look for, is a direct route from microeconomic beliefs to aggregate behaviour, as reflected in bond prices. And following this route, we argue requires combining both historical insights and economic methods. From history, we borrow the need to investigate carefully contemporary views before we derive a general model of investors' perceptions. But history by itself would not be able to bring us to sufficiently robust lessons on which to base policy prescriptions. Any attempt to infer a general view from one individual source is of course bound to fail, and replication cannot help.[59] The appropriate technique is not to add on top of a selected reading list a whole library of supporting books. When it comes to the proof, we turn to the universal techniques of economics: that is, taking as left hand side variables the price of government bonds and as right hand side variables those suggested by an exploration of individual sources, we examine whether the beliefs identified in archives can be read from the data. In the end, our approach, if not conventional, is nothing else from a methodological point of view than good old "Cliometrics": the application of the tools and method of economics to investigate history.[60]

59 . Of course, our understanding from actual reading of other sources is that individual analyses such as Lyonnais' were widely shared by the market.

60 . Cliometrics was pioneered by Nobel Price winners Robert Fogel and Douglas North among others.

V. WHAT'S ON MAN'S MIND: THEORIES IN USE

There, our road crosses beaten tracks. The 19th century notion that sovereign rates spreads are a measure of underlying default risks has made its way through the 20th century and into 21st century economics. Some formal refinements have taken place, but the basic intuition that interest rate spread may be explained (or modelled) by a variety of factors remained.[61] As a result, recent work has investigated this relation. On top of the gold adherence variable generally – if inappropriately – favored by researchers, other factors, such as macroeconomic fundamentals, institutions or politics, have been considered.[62] These alternative views need not be exclusive. Macroeconomics might have played a role, just like institutions and politics. Economists were not long before succumbing to the temptation: that of organizing "horse races" and see what view 'works best'.[63] The danger is the emergence of a cheap industry of mass production whose only limit would be data availability. Our discussion of the role of theories in use in determining perceived risks strongly warns against the inefficiency losses of investing one euro in this sector.

As a matter of fact the "alternative views" on the determinants of bond spreads are closely related to one another. We need to get clear indications of the way people gathered and processed information in order to interpret properly regression output. The problem surfaces when explanatory variables are selected. Relying on a mix of more or less rigorously specified models and constrained by historical data availability, researchers make compromises that are often far from satisfactory. Consider as a characteristic example the debt-to-GDP ratios. Their use was pioneered by FLZ [1998] to show that fundamentals mattered in the eyes of investors.

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61 .Formally $R_{it}-R_{ukt}=\alpha_i+\beta X_t+\omega_t$. A refinement of the model is the use of the capital asset pricing formula (CAPM). It is employed by Bordo and Rockoff [1996] and Mauro, Sussman and Yafeh [2002]. Note that from the point of view of the "theories in use", it is safer to stick to the most parcimonious model and do not complicate matters by relying on later theoretical developments, such as the CAPM.

62 . Flandreau, Zumer and Le Cacheux [1998] pioneered the "structuralist" view which holds that macroeconomic variables were strongly correlated with bond spreads. Ferguson and Batley [2000] have developed a "political" view according to which political events were the drivers of spreads in the 19th century.

63 . Obstfeld and Taylor [2002] and [2003] are prototypes.

This was later followed by Obstfeld and Taylor [2002] and [2003]. But the debt to GDP ratios have one big shortcoming : As contemporaries were well aware, the nominal debt is a poor measure of true indebtedness: the true burden of the public debt depends on the interest rate at which the debt is issued, not on its nominal amount.[64] In fact, contemporaries fully realized this and consistently preferred alternative measures. In line with the methodology advocated above, one should start from the evidence that can be gathered on contemporary beliefs and information and identify what were the relevant variables for market participants. Of course, Debt-to-GDP ratios might have been correlated with something people were looking at.[65] But they were definitely not what people were looking at. In other words, the proper route we advocate here is to identify first the variables that were on people's mind, and then dutifully gather them from contemporary sources. Only when this is done, can we start investigating, from what the data tell us, what "mattered" most in determining bond prices.

Consistently, this section is devoted to survey 19th macroeconomic doctrines: as we proceed to show, debt sustainability was the key variable influencing credit worthiness, first because it was a proximate determinant of the probability of a debt default, and second because most other variables (macroeconomic, institutional, political, or other) could be reduced to a public finance problem. In other words the debt burden was a kind of universal unit to which other risks could be reduced.

a. The debt burden and default risk

[64] . Consider the situations of Japan and Argentina around 2000. While the debt burden of Japan was around 125% of GDP, that of Argentina stood at about 45%: and yet it is in Argentina that a crisis occurred. The reason is, that no debt burden can be properly assessed if one does not take into account the corresponding "annuity". Japan borrows at cheap rates while Argentina faced huge premia. The result is that the actual burden supported by Argentina was much larger than that supported by Japan standing at respectively 10% and 4.3% of GDP. In the end, Argentina turned out to be the more vulnerable country. [Source : OCDE, Etudes économiques, Japon and Moody's Investors Service 2002].

[65] . That's how we interpret their significance in FLZ [1998]. In a similar vein, the historical GDP numbers were not literally available to contemporaries, since they are typically late reconstructions. But they are nonetheless correlated with variables that were available to contemporaries.

When we examine pre-1914 discussions of the factors influencing the probability of default, we immediately come across a considerable concern for what was referred to as the "debt burden". Applied economists and statisticians emphasized the volume of public debts and market participants echoed this concern. Baxter's [1871] work to which we already referred devotes long sections to the matter. Leroy-Beaulieu's handbook has a full chapter on it.[66] Mulhall's [1896] statistical dictionary provides a long entry. Such was also the case of *Fenn's Compendium*, the British investor reference book, which started being published in the 1830s. For good measure, the *Lyonnais* rating techniques gave a lot of emphasis to the debt burden.[67] Measures of the debt burden were also reported in the *Investor's monthly manual*, a companion publication to *The Economist*. Finally, the conference reports of the *Société Internationale de Statistique* (between 1887 and 1913) provide several introductions to these problems due to Alfred Neymarck.[68]

For contemporaries, the main concern was not to prove that debts mattered (everybody understood they did) but to make sure that their weight would be properly assessed. This involved identifying the best measure of indebtedness and finding a proper benchmark to which it could be compared. Baxter, for instance, describes four available methods.[69] In broad terms, a ratio had to be computed: choosing the proper numerator proved quite uncontroversial. For the reasons discussed above, the nominal debt was considered as an inappropriate measure. Instead, the annual burden on the public debt was preferred. Public debts typically comprising instruments with a very long maturity, the annual interest service, referred to as "the annuity", varied little from year to year and therefore accurately reflected how much cash had to be paid out annually.

66 . Leroy-Beaulieu [1878], Vol. 2, Chapter XIV "Des moyens d'évaluer le poids des dettes publiques".
67 . Flandreau [1998].
68 . See e.g. Neymarck [1913].
69 . Baxter [1871].

The identification of the denominator raised more questions. Baxter's fourth and "most perfect" method related the interest service on the public debt to "the gross income of the population".[70] As Baxter recognized, this approach (analogous in essence to computing debt service-to-GDP ratios) stumbled on the difficulty to obtain reasonable estimates of national income, or rather, to use a contemporary word, "wealth".[71] The problem would not be fixed until WWI.[72] The consensus view thus became that national income or national wealth estimates were "of a nature more conjectural than scientific, and the subject of much criticism".[73] The prevailing opinion was that "general adoption of such a method had to be left for an age of more complete statistical knowledge".[74]

Faute de mieux, a cheap denominator could be population, which was typically well documented. But even users of this method systematically pointed out its obvious limitations[75]. Two alternative benchmarks thus emerged. One, which was more widespread and is obviously the conventional one around 1900, was to compare the debt service to government resources. We will refer to it as the "Tax test". Those who argued in favor of this ratio emphasized that it closely captured default risks since it focused on the ability of a given State to service its obligations. The result was an hypothetical relation between probability of default and the variable thus measured. In Leroy-Beaulieu's words, for instance:

> "The lower this ratio, the more likely the State is to pay without difficulty the interests on the public debt […] By contrast, when the share [of interest service] in the total budget

70 . Baxter [1871], p. 5.

71 . This is because contemporaries sought to capitalize income flows (e.g., income from land) in order to reach an evaluation of the value of the corresponding assets.

72 . And this despite Mulhall's pioneering work. In effect, Mulhall's optimistic numbers for Argentina (Mulhall [1887]) were held responsible for fuelling excessive enthusiasm. The publications of the Société Internationale de Statistique contain pioneering contributions to the modern art of GDP estimation.

73 . Leroy-Beaulieu, vol 2, p. 575. A similar caution is visible among Lyonnais economists (see Flandreau [1998]).

74 . Baxter [1871], p. 8. and the various issues of the Bulletin de la Société Internationale de Statistique.

75 . Baxter [1871], Théry [1887], Haupt [1896], Canovai [1898] are caracteristic examples.

is very high, one can fear that the slightest accident shall put the government in a situation where it is impossible to fulfill its promises".[76]

The other approach was to compare the annuity on the public debt to exports. We find a brief description and defense of it in the "Introduction" to the 1889 edition of *Fenn's Compendium* which refers to it as the "Trade test". Because of its lesser scope, and because reference to it disappears in the 1890s, we shall leave this method aside for a while and focus on the Tax test instead. In a later section however, we return to the matter and discuss the economic significance of alternative methods from the vantage point of economic development.

b. Renegotiation and Memory

The burden of interest service was also a crucial variable when a default occurred. Unilateral default was always followed by a renegotiation period during which creditors sought to persuade governments to resume interest payment. During this period, the ratio that *ought* to have been serviced assumed tremendous importance since it closely measured the creditors' bargaining power: any *increase* in the virtual debt burden reduced for them the likelihood of a palatable settlement. Any *decrease* had opposite consequences.

Once a default had been settled, a new, reduced, interest service was agreed upon. The country now faced a lower debt burden. But this new ratio truly reflected a worse performance than appeared. It is therefore likely that there would be people in the market who would remember this and inflict a penalty to previous defaulters. In effect, the *Lyonnais*' ratings show that those low debt burden countries whose "good" prospects had resulted from a failure to meet their obligations, were mechanically downgraded into the infamous "group III" of "junk" nations: the low burden had been achieved not through policy efforts but

[76] . Leroy-Beaulieu [1878], p. 578. A similar view prevailed in Crédit Lyonnais studies and in many other places. See Flandreau [1998].

through repudiation. The debt burden, be it hanging or not, ought to have weighed much on countries' perceived prospects.

c. Fiscal and monetary variables

Investigation of contemporary sources shows that fiscal and monetary variables played at best a secondary or indirect role, operating through the debt burden rather than having an effect of their own. Consider fiscal balance first: *Lyonnais*' studies did list fiscal performance (computed as average deficit for a five year period thus approximating a "structural" measure) alongside with debt burden measures. But they put little emphasis on it, and its measure made a tiny contribution to overall grades. This can be easily understood, recalling that the key issue from the point of view of investors was determining whether enough resources could be pledged against the commitments of interest service. From this perspective, a deficit only meant, through intensified borrowing, a marginal increase in the interest service in proportion to the resulting increase in the outstanding debt: if growth or taxation grew quicker than the public debt, deficits did not matter. In other words, it was only in case of structurally persistent deficit over a long time period that fiscal performance began to become a worry. But then, its influence was nothing else than that of an increased debt burden.[77]

Something similar occurred with monetary factors. The financial press did document in much detail note issues, central banks reserves, exchange rate fluctuations and the exchange rate regime. Yet it is not clear from contemporary investors' perspective that these variables had an autonomous influence on perceived risks.[78] Strictly speaking, faithful adherence to

[77] . In a famous study of England over the 18th and 19th century, Barro [1987] found a statistically significant link between deficits and interest rates. During the period under study however, deficits were mostly motivated by wars and thus surrounded by much uncertainty. If current deficit signal future ones, their effect on risk premiums can be substantial since agent discount the consequences of increased indebtedness.

[78] . So that their influence on rating seems to have been heavily discounted – something which econometric investigations of *Lyonnais* ratings confirmed. For a study of the "monetary files" at *Crédit lyonnais*, see Flandreau [2003].

gold as an intrinsic virtue received very little attention in the pre-WWI period.[79] One does sometimes come by quotes praising the gold standard as a superior regime, but such quotes typically belong, at best to the more metaphorical kind, at worst to the religious-maniac type documented in Section III. Given the record that was available to contemporary investors, floating currencies tended to display poorer performances in terms of both economic development and financial probity: the capital rich countries of Western Europe had a much better record of gold adherence than the capital poor members of the periphery. But that did not mean that floating in itself translated into downgrades: the "intermediate" group in *Lyonnais* risk tables included both floating and fixed exchange rate countries, without float appearing as an aggravating factor.

Thus, other things being equal, exchange rate depreciation only mattered to the extent that it happened as a result of a monetary expansion that created a burden of state liabilities that would have to be paid back. A country that had experienced recurrent public finance problems and had financed those through money printing or central bank advances often ended up with a depreciating currency. Return to the pre-float parity required repurchasing the excess issues of paper money or paying back the overdraft to the bank of issue. A standard way to do this would be to issue a stabilization loan. [80] Since this loan would add to the debt burden, a good measure of the "opportunity cost" of floating was to consider that the excess money issues were part of the debt burden. Since floating currencies were often currencies that had experienced "excess issues" it is not surprising that inconvertibility would entail a discount. But this discount must have been small.[81]

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[79] . For instance, in the standardized country score-cards it produces the *Crédit lyonnais* had a special entry for the "monetary regime": but upon closer inspection, it appears that it is the legal (nominal) regime which was recorded there, and not the actual one!

[80] . The analogy between this way or reasoning and the so-called tax based theory of money is striking. Its empirical success, when used on 19th century data (Calomiris [1990]), may be understood in this respect.

[81] . In effect, both the *Lyonnais* and *Fenn's Compendium* suggested that inconvertible paper money be added to the debt burden as a virtual liability: A table provided by the 1889 edition of *Fenn's compedium* has an asterisk for Austria-Hungary, Italy, Russia, Argentine, Brazil that reads "depreciated paper currency estimated to entail a

Similarly, there could be occasional comments that portrayed a large foreign exchange reserve as a buffer against currency flight. A one hundred per cent cover ratio (as in countries like Russia after the turn of the century) protected in principle against a currency run, just like modern currency boards are supposed to do. However, foreign loans could provide to governments in need such a cover. The insurance against exchange rate volatility could always be purchased by the fiscally sober. In the end, the gold reserve was no better guarantee than a sound policy, since it would be made available to the sound country.[82]

d. Currency clauses and default risk

There was one instance, however, when floating could magnify public finance problems. Namely, floating could be hazardous when the country had a large external debt denominated in foreign currencies and the exchange rate *depreciated*. Then, depreciation could translate into servicing difficulties. This was because depreciation led to an increase in interest service that was not necessarily matched by an increase in nominal tax resources since taxes revenues lagged behind[83]: between 1890 and 1898, Argentina, Portugal, Greece, and Brazil would all be brought into what may be called 'liquidity' crises through that very channel. The danger was fully understood by contemporary observers. As early as in 1878, Leroy-Beaulieu was warning against the risks of currency depreciation when the debt is denominated in foreign currency. His case in point was Russia:

> "In the 1876 Russian Empire budget the amount devoted for the interest service on the public debt was set to 108,418,000 rubles […]. By itself, this number was not very large […] since it represented only 19 p. 100 of expenditure. However, this weight is most heavy because it has almost entirely been collected abroad. It therefore varies with the course of exchange. In periods of crises it is likely to rise dramatically. Thus it is inconvertibility which makes the debt burden most importune and painful. Suppose that

5 per cent burden on these countries". This is evidence of a debt burden significance of monetary variables (*Fenn*'s, p. xv).

[82] . On contemporaries views on the inefficiency of the cover ratio, see Flandreau [2003].

[83] . This result was rediscovered more recently. It is known as the Tanzi effect (Tanzi [1980]).

following concerns or political dangers, or because of adverse economic circumstances, the paper ruble, which is legal tender in Russia depreciates by 20p. 100. This is a 20 p. 100 increase in the arrears of the public debt". [84]

This point brings back the question of the exchange rate regime – but through a quite different channel than the incentive story referred to in Section II. If a fixed exchange rate was to some extent good news for public credit, it was not through some signaling effect that would have impressed upon investors' beliefs, but through a quite material, and down to earth mechanism whereby exchange rate depreciation impacted the soundness of public finances. By contrast, sustained defense of the parity protected against the perils of a run on the public debt, which in turn brings back to the question of fiscal abstinence. Of course, if the external debt was tiny, or if it were denominated in domestic currency, much of the problem disappeared. The challenge, here again, was to be fiscally sober.

e. The role of politics

Politics, domestic and international, obviously mattered in the eyes of contemporary investors. It is in the essence of political crises to create uncertainty, and it is in the essence of uncertainty to drive financial markets down. As long known wars were bad financial news, and caused violent fluctuations of bond prices, and the same holds for domestic conflicts such as uprisings or civil wars. Because investors discounted the effects of political news on the debt burden, they were bound to factor in the consequences of wars, since these always ended up affecting sustainability of public finances. Armed conflicts increased military expenditures, and led governments to borrow.[85] As a result, they were typically followed by

84 . Leroy-Beaulieu [1878] 2nd edition, Vol. II, p. 579-80. Similarly, the reports on public finances in the *Stateman's Yearbook* were careful to distinguish between domestic and foreign liabilities. In the *Lyonnais* archives, we find ample evidence that economists worked hard to sort out the contribution of exchange rate variations to changes in the burden of the public debt For this purpose, they tried to isolate the domestic and external debts, and used it to assess the change in interest service that would result from a given depreciation of the exchange rate

85 . Barro [1987]

increased debts. And thus when a conflict erupted, investors computed the costs of alternative outcomes to which they in turn sought to attach probabilities.[86]

The direct effects of wars on public finance were compounded by the spread of War Indemnities as a routine procedure for the victor to finance the war "ex post": the history of the 19th century is paved with these policies: the indemnity of Austria to Prussia in 1866, of France to Germany in 1871, of China to Japan in 1895, to name just the most famous ones. The result was that while the victorious country solved any pending its public finance problems, the defeated would long bear the scars of an increased debt burden that would damage its borrowing terms, and thus in one way or another, its capacity to grow.[87]

On the other hand politics also mattered through reputation : we have evidence that contemporaries carefully monitored the political regime. Douglas North and Barry Weingast's now famous analysis of the British Glorious Revolution of 1688 has popularised the so-called "New Whig" interpretation of the role of democratic institutions (such as Parliaments) is fostering credibility. Because Parliaments committed the Sovereign to pay back public debt, they improved borrowing terms and facilitated economic development.[88] The fact is that such views, be they right or wrong, were perfectly standard one century ago. To illustrate this we can quote Laffitte's [1825] statement that the credit of a given state is indeed "ranked according to its wealth" but also "to the institutions that guarantee it". Similarly, Leroy-Beaulieu's [1899] argues: [89]

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86 . This way we find applied economists trying to assess the fiscal implications of the 1898 military conflict between Spain and the United States. Their conclusion was that the financial imbalance between the two countries suggested that the war would be short or the Spaniards crazy. This led the economist to rightly forecast a short conflict. Credit Lyonnais Archives DEEF 82505.

87. *The Economist* complained in 1873 that such a procedure could involve serious dangers if it were to become a routine.

88 . North and Weigast [1989]. See also the 2000 special issue of the Journal of Economic History. For a contrarian view, see O'Brien [2002].

89 . Leroy-Beaulieu [1899], p. 630 (6th edition of *Sciences des Finances*). The first two editions did not include the qualification on "discipline". Leroy-Beaulieu explains that he added it because the French experience suggested to him that « *un certain régime parlementaire brouillon et subversif est une cause de gaspillage effréné* » (id. P. 630).

> "A parliamentary regime functioning in certain conditions of discipline […] and a firm commitment to established institutions are of course guarantees against financial prodigality".

Finally in 1863, Adolph Wagner, an Austrian economist emphasized that a precondition for issuing a long terme (perpetual) debt, was a constitution:

> "It is not only about financial or material, but more about political guarantees. Only in a constitutional state founded on the rule of law, where an effective and independent control of public finances is in place, there is the guarantee for well ordered public finances and a trustworthy public debt and only here will it be possible to resort to the most rational and healthy form of public debt, the perpetual debt."

It would not take much effort to provide a boring enumeration. We should not, therefore, be very surprised to find the financial press, as well as those bankers dealing with sovereign risk devoting much time to deciphering the logic of alternative political regimes and understanding the implications of given events. *The Economist* always commented political developments with an eye on their implications for foreign investors. In the archives of *Crédit lyonnais*, we find a wealth of notes discussing the situation of the main political parties, analysing – as in the case of Russia - the risk of potential crises that could threaten the interests of foreign bondholders, and tables describing the principal coalitions running governments.[90] Yet unlike what Ferguson and Batley have claimed – and at the risk of repeating ourselves - it is not clear that politics constituted an independent factor shaping market views: rather, in a system where debt sustainability is in the end the key variable determining credit-worthiness, politics can turn out to have an impact on credit through their influence on debt dynamics: politics is the machinery through which the books are balanced or not; And once more, we fall back on our feet with the debt service featuring as a crucial variable.

90 . For a reprint of Russia's political risk analysis see Politique Etrangère.

VI. Empirical Evidence: Interest Spreads and the Debt Burden

The previous survey of contemporary beliefs provides conclusions that are at odds with the modern literature and its considerable (some would say disproportionate) attention to exchange rate regimes. Our conclusions suggest that contemporaries mainly focused on debt sustainability variables. Investors believed in the debt burden (measured as the ratio between the debt service and tax revenue) as the key factor influencing debt sustainability – that is, in assessing the likelihood of a continued payment of the coupon. And in this view of the world, the money supply, foreign exchange reserves, fiscal deficits, and politics were mostly intermediary variables. The point now is: can we prove it numerically?

a) The model

In line with the discussion in the previous Section, we consider four groups of explanatory variables. First we have the "structural" factors. Our structural factors are those that were monitored by contemporary investors. Debt-to-GDP ratios were left aside, and the interest service to tax revenue was used instead. The presumption is that this variable was strongly significant and had a large, positive effect on the level of interest spreads.

Other structural variables monitored by investors and thus collected by us included the circulation of banknotes, the central bank reserves, exports, population, and the fiscal deficit. From the spreadsheets we investigated we get a flavour of the kind of ratios people contemplated: the central bank cover ratio, the deficit to revenue ratio, exports per head.[91] Likely effects of these ratios on spreads might be postulated from contemporary accounts: a high cover ratio should reduce spreads, and so should a high degree of trade openness[92]; by

[91] . We also tried the exports to reserve ratio. This was suggested by some comments in the *Lyonnais* archives. Results are reported in the appendix.

[92] . While cross sectional measures of trade openness can rely on trade per head, in a given currency unit at a given point in time, panel comparisons require to use a benchmark that controls for prices. But contemporaries did not construct uniform price indices. We thus normalized the ratio of exports per head of country i at date t by dividing it by the British ratio of exports per head at date t. . Technically we consider:
[Exports(i,t)/population(i,t)]/[Exports(UK,t)/population(UK,t)]

contrast a high deficit should increase them. The point however is that such ratios were considered of secondary importance, and we don't expect them to drive much of the results.

Finally, to capture the feed back from exchange risk to default risk we introduced an asymmetric measure of exchange rate volatility which takes the average *depreciation* experienced by a given country in a given year. This measure enables to distinguish between instances of exchange depreciation and instances of appreciation. A volatile but appreciating currency is not bad news – from the vantage point of the service of external obligations – while a volatile but depreciating currency is.[93]

The second group of variables includes reputation factors. As argued, countries with a recent experience of default got downgraded. Investors with memory should have discounted the bonds of a country with a default record, and at the same time should have reduced the penalty as time passed. The notion would be that once a settlement had occurred, markets would be prepared to take again the bonds of the defaulter, but at a lower price than they would have done other things being equal.

In addition, during the period of renegotiation that typically followed a unilateral default, bonds were likely to trade at lower prices than otherwise owing to the obvious uncertainty. While investors based their assessment of creditworthiness (the probability to recoup the capital and interest) on the basis of the "counterfactual" or "virtual" service (i.e. the interest that ought to have been paid), they most certainly also factored in the renegotiation itself as an aggravating factor, as long as a settlement was not reached.

The third group comprises political variables. Their identification raises a number of problems. Unlike for the debt burden, there does not seem to have been any simple consensus definition of what "good" institutions were (beyond the general notion that a well ordered, representative, Parliament was preferable to a cruel autocracy), let alone any index to quantify

[93] . We report in the table the effect of a 0.1% average depreciation over one year, i.e. a 1.2% average depreciation over the year.

good institutions: reconstructing these will always suffer from the observer's bias. Identifying political regimes using modern criteria would obviously not do, and getting a precise idea of how people related institutions and performances seems difficult. Moreover, because of a relative lack of genuine changes of political regime over the period under study for individual countries, one must give up any hope to identify anything using time controls. To complicate matters further, we should point out that political regimes were also broadly associated with economic regimes: faithful adherent to the gold standard, before 1895, were typically Western European Parliamentary systems countries (with the possible exception of Italy). Again, identification might prove difficult.

Given the lack of consensus on the theoretical relation between political systems and creditworthiness, we decided to use a simple criterion. Namely, we focused on the percentage of the population that was enfranchised. We know from contemporary accounts that estimates of the enfranchised population were in the information set of 19th century investors. Moreover, the broadening of the electoral body had been a recurrent request of the left throughout the nineteenth century, and there is evidence that investors closely monitored its progresses. Some scholars have suggested that the limitation of democracy was a basis of the credibility of the pre-1914 gold standard. This predicts a negative association.[94] We will let the data decide: however, our presumption is that contemporaries thought differently and associated democratic institutions with higher credibility. There is evidence that foreign investors encouraged borrowing countries to adopt parliamentary systems. For instance, the Russian finance minister Kokovtsov recounts in his memoirs that after the so-called October Manifesto of 1905, French bankers pressed Russian authorities to give large powers to an elected Douma. They went as far as suggesting that this was a condition for continued

94 . Eichengreen [1992].

lending.[95] Finally, on top of the proportion of the people that voted, we considered a wealth of dummies capturing political events such as wars and uprisings. A complete list of these variables can be found in the appendix.

Last and to a very large extent, least, gold adherence is introduced in the regressions. In the general framework used here, we can test whether adherence to gold had any effect on interest rate spreads, and if so, by how much.[96] Close enough is understood here to mean "within the gold points".[97] We find the conventional defence that "changing the precise timing does not alter the results" more a matter of concern than of comfort, and will therefore not make it ours. If we do not feel compelled to defend further the logic of this variable, it is because we feel a limited liability toward it. As shall be seen, its contribution is in any case marginal.

b) Empirical evidence

To begin with, we examine the simplest conceivable model where the variable to be explained is the interest rate spread (country i's interest rate minus UK's interest rate) and the explanatory variables are those reported in the previous section. The memory effect of a past default is captured as an asymptotically decaying penalty to be paid on top of borrowing rates.[98] A dummy variable corresponding to the period of renegotiation is also used, since the uncertainty surrounding any debt renegotiation is likely to be considered as an extra cost. The political variables are as described above. We include gold adherence.

The results we report here (Table 1) are simple estimates of the sensitivity of interest spreads to explanatory variables when they are all included together. Alternative estimates are

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95 . Kokovtsov [1933], I., 55-62.

96 For each country, the period of gold adherence is taken from FLZ (1998) with a few additions and adjustments. The list is reported in the data appendix.

97 . Our criterion for gold adherence was whether the exchange rate remained close enough to the parity during at least 6 consecutive months for a given year.

98 . The effect we considered is $0.5^{n\theta}$ where n is the number of years since settlement with bondholders. This is similar to the formula used by Eichengreen and Portes [1998]. The normal procedure is to perform a grid search to estimate the memory parameter θ. That is what we did in preliminary investigations. However, all regressions consistently pointed to a parameter in a close range of 0.1 implying a fairly long memory effect: one quarter of the initial effect is still being felt after 10 years. In a later stage, the memory effect was restricted to be equal to $\theta = 0.1$ thus allowing easier comparisons of regression output across equations.

reported and discussed in the technical appendix.[99] Because capital does not flow freely from one country to the other one – something nineteenth century economists called the 'disinclination of capital to migrate' and which is today known as the 'home bias' – it is useful to document results for alternative groups of nations separately. We therefore provide results for the entire sample, capital rich countries and capital poor countries. Similarly, since there might have been some changes between periods in the stability of coefficients, we report in the technical appendix results for sub-periods.

Table 1 points to a number of findings. It outlines the overarching importance of the debt burden. The implication here is that on average, a 10% rise of the debt burden (i.e. a rise of the debt service from 20% to 30% of government revenue) increased borrowing rates by about 70 to 80 basis points. This is in contrast with the other explanatory variables such as the cover ratio, the deficit ratio, or the openness ratio which get much less credit. While generally correctly signed[100], they bear little impact on interest rate spreads and are rarely significant a consistent finding across groups of countries. We take this as supporting of the approach suggested here: namely, this result shows that the interest burden was an essential variable for investors to look at: it was what drove perceptions on macroeconomic stability.

Default variables are also strongly significant. When debt re-negotiation occurred, spreads went up by about 500 basis points. Then, once a settlement was reached, a penalty of about 90 points was paid the first year, and still 45 basis points 10 years later. In other words, just as we observed it in the study of individual ratings, markets did remember. Combined with the significance of the debt burden, this result is fully consistent with the rating formulas

99. Several other estimators we computed are also of interest, if a more academic one. We will nonetheless occasionally refer to them, for they often shed an interesting and complementary light to the evidence reported in the bulk of the study. We report the "pooling" estimates in the appendix. By contrast the "between" estimates which focus on cross sectional average patterns are not relevant here since they typically overlook dynamics.

100 . Note however the results for the deficit to revenue. The limited significance of deficits variable is in contrast with other results in the literature (e.g. Barro [1987]). When they were included without the debt burden measures, however, deficits were found to matter in a number of regressions. This is fully consistent with the interpretations developed in this paper.

discussed in previous sections: in the end, the debt burden, and debt default appear to explain most of the variance of interest rate spreads.

The significance of previous defaults in determining borrowing conditions may also help to reconcile the intuitive notion that investors should remember with the popular claim that market do not remember: while there is indeed a penalty for defaulting, this penalty turns out to be, over the medium run of a smaller order of magnitude than the savings associated with amount of the debt that has been repudiated. In other words, there was a clear incentive for governments not to repudiate their debt, but this incentive was too small to act as a systematic deterrent.

Table 1. Determinants of interest spreads

	ALL COUNTRIES	CAPITAL RICH	CAPITAL POOR
1.Structural factors :			
- Interest service/Revenues	7.751 (8.50)	4.144 (6.18)	7.677 (5.35)
- Reserves/banknotes	-0.286 (-0.96)	0.223 (1.34)	-0.402 (-0.83)
- Exports/Population	0.601 (1.59)	-0.160 (-1.41)	2.279 (1.95)
- Deficit/Tax revenues	0.725 (3.16)	0.319 (1.71)	0.747 (2.21)
- Exchange rate volatility	0.997 (1.14)	2.825 (1.97)	1.310 (1.05)
2.Reputation factors :			
- Default	4.836 (21.66)	-	4.917 (15.48)
- Memory	0.703 (2.56)	-	0.667 (1.62)
3.Political variables :			
- Franchise	-2.427 (-1.77)	-0.839 (-2.17)	-7.232 (-1.39)
- Political crises	F=3.797 (*)	F=4.15 (*)	F=1.889 (*)
4. Gold adherence:	0.056 (0.32)	-	0.099 (0.38)
Adj. R2	0.854	0.585	0.798

Number of Observations : 480. Not shown are the country-specific constants. (*) F-test significant at 5%.

Table 1 shows the exchange depreciation variable being non-significant. Results reported in the appendix, for alternative specifications show it with more significance and generally with greater effects for capital poor countries: these were the ones which were more vulnerable to "twin" crises because of the large exposure of their foreign currency denominated debt, as argued in the previous section. In fact, as shown in the appendix, the introduction of the political crises dummies swamps the significance of the exchange rate

vulnerability variable. This is quite understandable but also very important, since exchange crises are often triggered by political crises. In other words financial crises and exchange rate vulnerability were often magnified by domestic political uncertainty which appears to be the one significant factor on top of the debt burden and debt default. By contrast, the extension of the suffrage does not show up in the regressions reported. Note, however, that it is significant in some of the regressions shown in the appendix and will again surface when we consider an alternative model.

Finally, we see that the gold variable is never significant. In fact, as shown in the appendix its effect is not stable across equations, especially when we consider various groups or even more strikingly sub-periods (then it sometimes come up with the "wrong" sign). Gold adherence only works well when we give it some kind of monopoly power. However, when we consider it in competition with a few other variables, especially with the debt default variables, but also the political crises variable, its effect declines or vanishes.[101] The gold dummy might just be telling us, when it comes out with the "expected" negative and significant sign, that a country in crisis is a country in crisis.

VII. THRESHOLDS OF CONFIDENCE

Did contemporaries see the world as linear? In the previous section, we assumed they did. Yet as observed, the effect of the debt burden on spreads does vary quite substantially across groups of countries. One gets persistently higher sensitivities of the interest spread to the debt burden for capital-poor than for capital-rich countries (compare columns in Table 1). Figure 5 shows why we get these results. A pooled scatter plot of the interest spread in terms of the debt burden displays an obvious exponential relation. The line for the capital rich countries is almost flat, while that for capital poor ones is steep. One possible interpretation is that there

[101] . Moreover, this takes place even before we introduce exchange rate depreciation. Some might argue that this is an unfair way to get rid of the gold dummy. But note that our exchange depreciation variable is an asymmetric measure. It needs not be correlated with gold adherence, unlike volatility.

was a difference of behaviour among investors towards alternative groups of nations. For instance capital poor countries need to rely on foreign investors who are arguably less informed than domestic ones. This information asymmetry might have generated a "lemon premium", that is, a greater compensation for the risk they undertook, other things being equal.

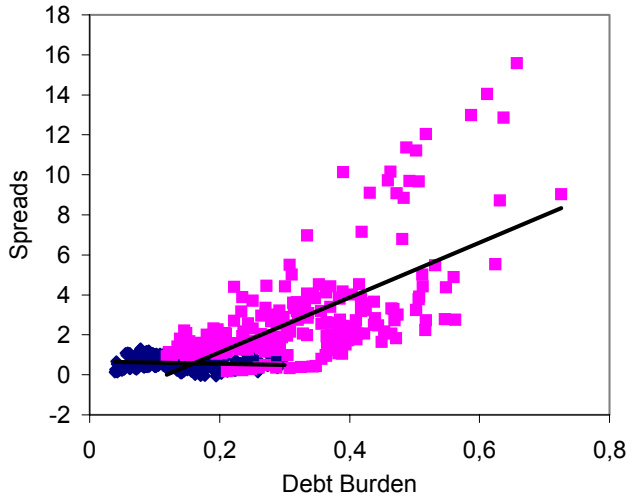
Table 2. The debt burden: descriptive statistics

	Mean Interest burden	Standard error	Minimum	Maximum	Number of observations
All countries	23%	13%	3.9%	72%	464
Capital rich	14%	7%	3.9%	30%	220
Capital poor	32%	12%	12%	72%	244

Source: see database.

Note however that in Figure 5 the respective clouds for each group of country do not overlap. This is because the typical interest burden of a capital rich nation is much smaller than that of a capital poor nation: respective averages stand at 14% of revenue for the first group and at 32% for the second one. But then it is easy to see that the debt burden does not matter in the same way depending on how close one is to default.

Figure 5. Elasticity of spreads to the interest burden: capital poor vs. capital rich



Source: authors' computations

A 1% increase of the interest service when service stands at 1% of government revenue is not quite the same thing as a 1% increase when the interest service stands at 99%. In other words there are good reasons to believe that the sensitivity of the interest spread to the interest burden might not have reacted in a linear fashion to variations of the debt burden. There is evidence that contemporaries thought in terms of thresholds. Experts such as Leroy-Beaulieu argued[102]:

> "Whenever the interest service to government revenue ratio is larger than 35%, the greatest prudence is in order, although creditors can still feel reasonably confident. Above 45% the situation starts looking bleak. But when one reaches 55 or 60%, the slightest problem shall induce the opening of negotiations with creditors".

Similar notions abound in other contemporary sources. According to *Lyonnais* economists with around 1900[103]:

> "No sovereign bankruptcy has ever occurred with this ratio standing below 40%".

102 . Leroy-Beaulieu [1878], p. 581.

103 . "D'après nos études, jamais aucun Etat n'a manqué, en temps de paix à ses engagements tant que ces proportions ont été inférieures à 40%", DEEF73324

These thresholds appear to have been treated as common knowledge: in 1904 for instance, a paper published in the *Economic Journal* discussed the sustainability of Russian finances in view of these thresholds presented as generally acknowledged rules: [104]

> "[In effect Russia can even] double the annual amount of the annuity for the public debt before touching the limit *deemed to be dangerous for a State's creditors, such as may be held to come between 33 and 40 per cent. of the annual Budget*".

The notion that the sensitivity of interest rate premiums changed as the debt burden went through successive thresholds is intuitive enough.[105] In effect, the above quotes suggest that contemporaries reasoned in terms of default probabilities, rather than in terms of interest rate spreads. It is default probabilities that they related to the debt burden and other explanatory variables. We therefore suggest to use an alternative specification where the variable to be explained is not R_{it}-R_{ukt} (the yield premium of country i at date t) but π_{it} the default probability. The relation between the two is straightforward – and as it turns out, non-linear.[106] Yet can be seen in Figure 6 a pooled scatter plot of the probability of default in terms of the debt burden does display a linear pattern: formal tests on the stability of coefficients across sub-groups can confirm this impression. In other words moving from yield premiums to default probabilities enables to linearize the relations under study.

Finally it is possible to back up the theoretical relation between the debt burden and interest rate spreads. This is shown in Figure 7, which is constructed using the elasticity of default probability to the debt burden reported in Table 2. As seen Figure 7 displays resemblance with Figure 5. Because the British rate is an argument for the default probability,

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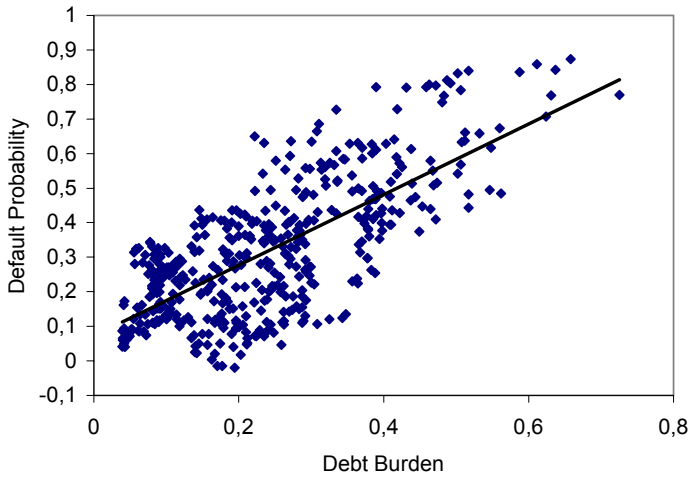
104 . Our italics. Raffalovich [1904], p. 626-627

105 . FLZ [1998] relate this to the concept of "market discipline". But while the case for non-linearities in the data is strong, its methodological implications are complex. There is much less consensus about non-linear models than about linear ones. FLZ [1998] provide alternative estimates of non linear forms were also shown to perform better than linear specifications. FLZ rationalize the non-linearity from a constant renegotiation model, where all the debt is short term, so that an increased debt burden translates into an increased default risk which feeds back on to the debt burden. One problem with this model, however, is that, as argued elsewhere, 19th century debts were typically long term, and each period only brought a marginal addition to it.

106. Calling πit the probability of default we must have (barring risk premiums which could be included in the model) $(1+R_{it}).(1-\pi_{it})+ \pi it.0=1+R_{ukt}$ (for simplicity we assume that all the capital and interest are lost in case of default). Therefore πit=(Rit-Rukt)/Rit.

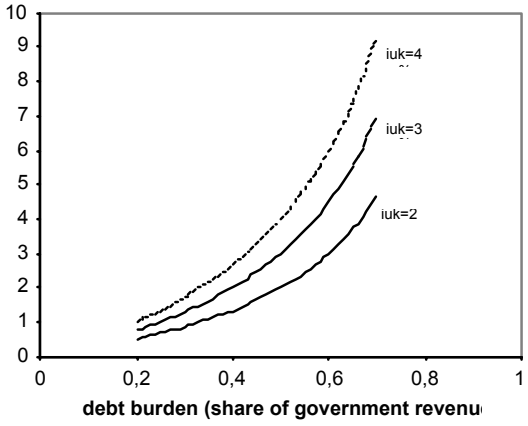
various [??] are obtained corresponding to various British rates. Ceteris paribus, spreads inverse when British rate increases. It also suggests that the sensitivity of interest spreads to the debt burden rises markedly when the debt burden approaches 40% of tax revenues: and thus the non-linearity and contemporaries comments about threshold effects.

Figure 6. The interest burden and default probabilities



Source: authors' computations.

Figure 7. The debt burden and the interest rate spread



Source: authors' computations: see text

Table 2 reports estimates of the elasticity of the default probability in terms of alternative explanatory variables. The methodology is the same as before. Results generally confirm, sharpen and refine earlier findings. Once again, the debt burden stands out as a powerful factor determining the probability of default. Moreover, its effect now works homogeneously across country groups: the gap between the effect of the debt burden on capital rich and capital poor countries is considerably reduced. The overall elasticity of the probability of default to the debt service is of about 1: a ten per cent increase in the interest service raises the probability of default by 0.1. It can be broken down into elasticities for sub-groups whose difference is non-significant (respectively 0.8 to 1.039), since the model now works more homogeneously across groups.

The effect of the other structural variables (reserve ratio, exports ratio, and deficit) is again small or non-significant even if again generally correctly signed. The significance of the exchange depreciation variable is somewhat on the border line. Again challenged because we take into account political crises.[107] The message is that the dangerous exchange crises were often coupled with political crises. The default variables again show up with large effects. Re-negotiation is again significant: it is associated with an understandable .25 to .20 risk of losing the capital. The memory effect does show up again as a strong signal for future default, increasing it by 0.17 the first year.

Table 3. Determinants of default probabilities

	ALL COUNTRIES	CAPITAL RICH	CAPITAL POOR
1.Structural factors :			
- Interest service/Revenues	0.847 (10.60)	0.889 (4.31)	0.741 (7.19)
- Reserves/banknotes	0.014 (0.53)	0.080 (1.76)	-0.021 (-0.60)
- Exports/Population	0.016 (0.48)	-0.032 (-1.02)	0.134 (1.60)
- Deficit/Tax revenues	0.001 (0.07)	0.095 (1.86)	-0.015 (-0.61)
- Exchange rate volatility	0.143 (1.89)	0.801 (2.04)	0.163 (1.82)

[107] . This is reminiscent of the recent literature on exchange rate and political regimes. See Freeman, Hays and Stix [1999]. See appendix for individual parameter estimates.

2.Reputation factors :			
- Default	0.164 (8.49)	-	0.178 (7.78)
- Memory	0.134 (5.61)	-	0.110 (3.70)
3.Political variables :			
- Franchise	-0.548 (-4.64)	-0.302 (-2.85)	-1.301 (-3.48)
- Political crises	F=3.088 (*)	F=4.83 (*)	F=1.928 (*)
4. Gold adherence:	-0.040 (-2.61)	-	-0.028 (-1.54)
	-	-	-
Adj. R2	0.859	0.527	0.758

Number of Observations : 480. Not shown are the country-specific constants. (*) F-test significant at 5%.

The only substantial change with the previous results is that the extension of the suffrage does reduce quite substantially the probability of default. The effect of an increase of the enfranchised population from 0 to 25% (as would typically be obtained through extending the suffrage to the adult male population at the turn of the century) reduces the probability of default by a considerable 0.125. This is consistent with the contemporaries' notion, alluded to earlier, that Democracy and Parliaments were seen as a source of greater stability, since they put checks and controls on the Sovereign. But this also raises some intriguing questions in view of more recent research: if anything, our findings suggest that it is the expansion of Democracy, not its restriction, that promoted financial stability during that period, by facilitating international borrowing through lowered premiums. This contradicts the widespread view that the repression of democracy facilitated the operation of the pre-1914 international monetary system by making the external adjustment easier.[108]

Finally, gold adherence again shows up as a border line variable which is non-significant when more explanatory variables are included. The residual effect we find is fully consistent with the view that a floating currency penalized countries to the extent that investors understood that the excess paper money would have to be absorbed through international loans. Gold adherence was a rewarding badge to wear. If one wanted to minimize the cost of borrowing, a low debt burden, a commitment to timely payment of coupons, a swift settlement if default occurred, more democracy, political and diplomatic stability were much

108 . For a pioneering formulation of this hypothesis, see Eichengreen [1992]

more relevant things to do than continued adherence to the gold standard. Investors were able to see through the veil of monetary regimes.

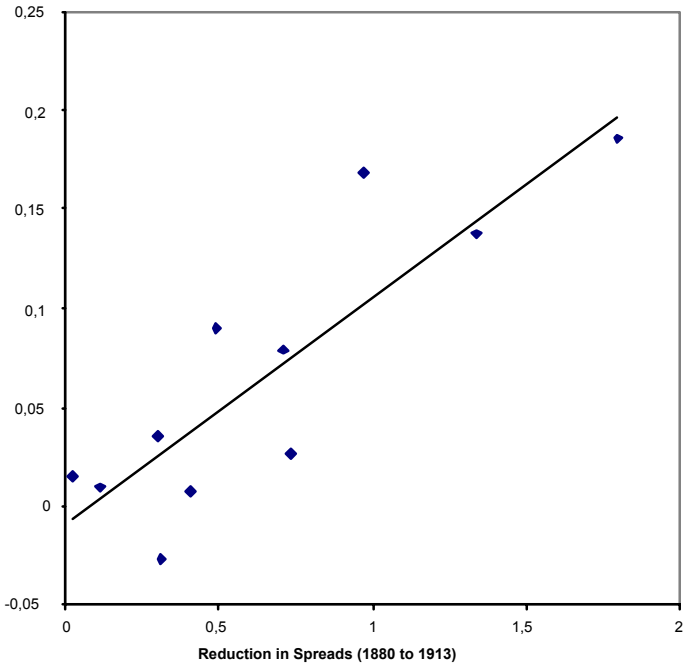
VIII. CONVERGENCE EXPLAINED

We are now in a position to put together our findings and provide a comprehensive interpretation of the convergence of interest rates before WWI. As abundantly documented in previous sections, the backbone of long term interest rate movements was fluctuation in debt burdens. But if this is the case, then the convergence of yields premiums before WWI must have been related to a dramatic reduction of those very debt burdens. Figure 8 below illustrates this by showing the association between interest rate convergence (reductions in interest spreads) and improved debt sustainability (reduction in debt burdens).

The chart, which focuses on non-defaulters in order to purge the data from possible biases in favour of our claim[109], does indeed display a striking association between the two processes. Specifically, we find that, on average, a reduction of the debt burden by 5% (e.g. a reduction of the interest service from 20% to 15% of tax receipts) does reduce the interest spread by 50 basis points. To summarize, the story we tell is that investors monitored debt burdens and these were reduced dramatically. They thus concluded that the world was turning into a much safer financial place, and became increasingly more eager to lend abroad. Such is, we argue, the reason for the astonishing degree of financial integration reached before WWI.

Figure 8. Lower, Safer

[109] . Countries initially on the verge of crisis of with a very high burden tend to have the highest interest premiums. They are the one for which the convergence and debt reduction is most striking.



Source: See text and data appendix.

Fully documenting why debt burdens declined would take us somewhat beyond the boundaries of the present monograph which focuses on the supply side (the market mechanism) more than on the demand side (governments' borrowing policies). Some remarks are nonetheless in order. The dynamics of the debt burden can be broken down into a list of elementary components. One the one hand is the annual interest service, which increases as new additions to the public debt are made. On the other hand we have tax revenues, which can themselves be decomposed in growth, scope of taxation (the extent of the tax base) and inflation. A higher growth rate, an increased taxation, or a higher inflation, all reduce the debt burden, other things being equal.[110]

[110] . Recall that if B is the debt burden, we have B=S/Tax, where S is the interest service and Tax the tax revenue. Neglecting the role of exchange rate changes, this can be rewritten as B=S/(Y.T.P) where Y is real income, T is the tax rate, and P the price level. We finally have $\Delta B/B=\Delta S/S-[\Delta Y/Y+\Delta T/T+\Delta P/P]$, where we recognize the growth rate, the change in the tax rate, and inflation.

Figure 9 provides a decomposition of the sources of the reduction in debt burdens. It displays the annualised average growth rates of the various components of the debt burden dynamics: the debt service, the growth rate, the increase in taxation and inflation.[111] Factors that deteriorated (i.e. increases) in the debt burden show up with a negative sign. As can be seen, in many cases, the reduction in debt burden was not driven by a decline of public debts. The gross debt service kept rising across time for most countries in the sample. In fact, public debts often kept rising throughout most of the period under study.[112] The point, however, is that their effects were more than compensated by the dynamics of the other items. If we leave aside inflation as a mostly exogenous variable during the period under study[113], we end up with the extension of the tax base and growth as the main drivers of international financial integration. As can be seen, however, the extension of the tax base remained quite limited. In the end, it is therefore growth that was the main offsetting factor for the increase of public debts. Its is growth, therefore which given what we have shown was the *modus operandi* of financial markets one century ago, caused international financial integration. This conclusion shows that the favourable economic performance of the period under study has been an essential driver of the process of globalization.

The conclusion is that the first large era of globalization was successful not because it displayed a particularly high commitment of government to sound finances. From that respect the period was just as unexceptional as any other period. Rather, the success came because the period was characterized by a fairly remarkable record in terms of economic growth. This is a serious qualification of the conventional view that the period owed a lot to the gold standard "ethos" as it moves us away from the realm of financial and monetary rules to

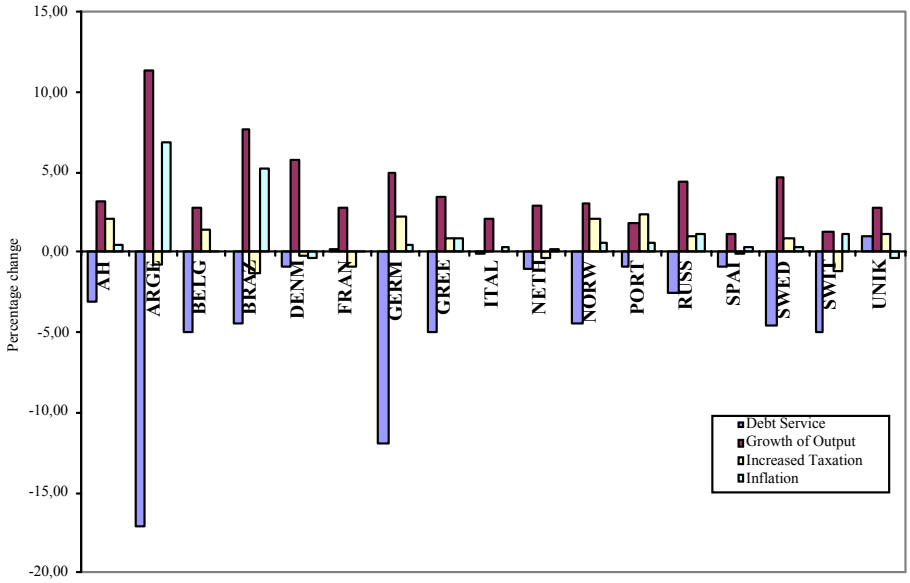
111 . For simplicity (i.e. to keep the chart legible) we have omitted the contributions of default and exchange rate depreciation.

112 . FLZ [1998] show that deficits accumulated at a higher rate after 1900 than before.

113 . Gold adherence implies that the money supply is set exogenously by gold discoveries. The price level then becomes endogenous (see Barro [1983]). Note that the contribution of inflation to the decline of debt burdens was large as emphasized by FLZ [1998].

problems of development. The next question, of course, is to determine whether contemporaries realized that or if instead they only mechanically priced sovereign risk through the abstract formula we identified. In the next section we discuss this issue and in particular explore the relations between risk perceptions and development policies.

Figure 9. Convergence: a decomposition



Source: authors' computations from formula in note 112. Time span is 1884-1912 for Argentina, 1885-1912 for Russia, 1881-1912 for Norway and Sweden, and 1899-1912 for Switzerland. Period is 1880-1912 for all other countries.

IX. Developmental Consequences

The previous conclusion has brought to the fore a crucial element. Our interpretation of the mechanics of interest rate convergence underlines the importance of growth and development in achieving a sustained reduction of borrowing risks. This is of course quite natural since over the long run, the ability to service the public debt is ultimately related to the adoption of policies that foster economic development. In this section, we argue that, consistently, there is

a one for one correspondence between the assessment of sovereign risks and contemporary thinking on development strategies. In other words having shown that gold adherence played little role in shaping pre-1914 reputations, we need to elaborate on the stuff of which they were made. As a result, this section returns to the risk assessment techniques reviewed in Section V and discusses the economics of the "Trade test" and "Tax test" which respectively weighed the debt burden against national exports and government revenues. As shall be seen, these alternative criteria corresponded to successive views on governance and development. While the trade test emphasised exports promotion (and thus *laissez faire*) the tax test stressed efficient fiscal and economic management (and thus to some extent government intervention). The watershed that caused the emergence of the tax test as a norm, we will argue, was the 1890 Baring crisis, which revealed the importance of good fiscal governance.

a) Openness, development and the Trade Test (1848-1889)

The 1889 edition of *Fenn's Compendium* provides the most articulate presentation of the Trade test. The editor, Robert Lucas Nash, explains its rationale by arguing that trade openness was the single most important variable to denote prosperity:[114]

> "There is perhaps no better test of a nation's wealth than its foreign trade for, as a rule, countries which are rich have those things which other nations covet, and countries which are poor have not."

Just like what would exist for the Tax test, Nash further suggested that there were thresholds that would enable to identify delinquent countries. Reasoning in terms of the "volume of the debt" which he computed by capitalizing the interest service annuity using a 5% interest rate, Nash identified a danger zone lying above 4 (equivalent to a ratio of the debt service to exports equal to 20%):[115]

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[114] . *Fenn's Compendium*, pp. xix-xx.

[115] . Introduction, Fenn's Compendium, edition of 1889, pp. xix and xx. Nash capitalized the annuity on the public debt using a uniform rate of 5% to generate a "true" measure of the public debt. In order to go from this

> "Wherever […] the annual exports approach, or exceed the volume of the debt […] the position of the National creditor must be one of as absolute security as it is possible to obtain. Further than this, no defaulters are to be found even amongst those States where it would take two or three years' purchase of total exports to cover the net indebtedness. But it is where as recently was the case with Spain, there were £ 500,000,000, against £ 20,000,000 of exports (twenty-five years' purchase), that the defaults have in the long run occurred".

Good and bad performers were listed according to this criterion as summarized in Table 4. The suggested benchmark of 4 identified a clean cleavage between "capital" rich and capital poor nations (with the exception of France). By and large, the safest countries were the North Western European industrialized countries while the risky ones included the European Southern and Eastern borders, and Latin America.

The Trade test obviously rings echoes of the basic postulates of the Washington Consensus alluded to in the introduction. Its source of inspiration can be easily identified. It originates in the intellectual consensus that took hold of European industrial elites the 19th century and dates back to Adam Smith: free trade was seen as the most powerful growth engine. Policies that represented moves away from it were castigated.[116] The Repeal of the Corn Laws in 1846, the campaigns of *The Economist*, the need after 1848 to recycle the gigantic increase in the money supply which resulted from the California Gold Discoveries[117], and finally, the eventual success of the ideas of liberal economists on the Continent (the so-called free trade epidemic) paved the way for a drastic acceleration of European trade. Available figures suggest that it grew in the 1850s and 1860s at about three times the rhythm economies expanded.[118] By the mid-19th century, this emphasis on trade promotion was driving the

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measure of the debt to the annuity, one only needs to divide through by a factor of 20. The corresponding threshold in terms of the more conventional interest service is that this latter must not exceed 20% of annual exports.

[116] . See Irwin [1998] for a stimulating intellectual survey.

[117] . On the interactions between trade expansion and bullion discoveries, see Flandreau [2003].

[118] . Bairoch [1995] places the expansion of European trade at about 5 to 6 %.European economies grew at 1-2%

process of European economic integration.[119] As argued by Kindleberger [1988], free trade became – in the European context - a central feature of economic modernization programs.[120]

Table 4. The Trade Test (from Fenn's Compendium [1889])

	1. Net debt capitalized at 5% (millions of £)	2.Net Debt Per Head : (1)/population (£)	3. Annual Exports Per Head : nominal exports/population (£)	4. Ratio (3)/(2)
United Kingdom	396	10.58	7.50	1.41
Austria-Hungary[(i)]	**465**	**11.36**	**1.75**	**6.49**
Belgium	63	4.11	16.65	0.25
France	**986**	**23.90**	**3.48**	**6.88**
Prussia [(ii)]	180	0.00	4.75	0.00
Greece	**28**	**14.65**	**1.73**	**8.49**
Italy	**430**	**13.25**	**1.45**	**9.14**
Netherlands	52	10.11	17.95	0.56
Norway	5	1.13	2.95	0.38
Portugal	**79**	**16.75**	**1.21**	**13.81**
Spain	**202**	**11.73**	**1.63**	**7.22**
Sweden	11	0.68	2.91	0.23
Russia	**535**	**4.91**	**0.75**	**6.55**
Argentine Republic	**85**	**21.40**	**4.00**	**5.35**
Brazil	**98**	**7.30**	**1.58**	**4.63**

Source: (1), (2) and (3) from Fenn's Compendium, 1889, p. XV. The net debt is obtained by discounting liabilities backed by assets (railways etc.) from total interest payments. The resulting interest payment on the public debt is then capitalized using a uniform 5% interest rate. (i)Fenn's Compendium reports Austria and Hungary separately for debt but aggregated for trade. We aggregate debt numbers to permit comparisons. (ii) Fenn's Compendium apparently lacks data for Germany, and Prussia might be understood as a proxy (note alphabetical ordering which we respect here). It is not clear to what trade (German? Prussian?) the number in column (3) refers.

This process in turn gave way to a wave of capital exports.[121] In effect, evidence suggests that there was a tight association during those years between trade integration and capital flows.[122] Countries signed trade treaties at the same time they solicited foreign financial markets. And financial markets were found willing to provide, on account of the belief that these policies would inevitably result in greater economic development.[123]

Therefore, the trade test can be understood as a way to identify good policies through their revealed effects. For a given country, a proportionately modest trade revealed a deliberate attempt to repress the "natural" tendencies towards international specialization.

119 . Bairoch [1976].

120 . The emphasis on Europe is important here. As argued by Bairoch [1995], free trade remained a distinctly Western European phenomenon in the 19th century.

121 . See Jenks [1927] for British capital exports, Cameron [1961] for French capital exports.

122 . See Cameron [1960]. Flandreau [2001] shows the association between trade treaties, monetary arrangements and financial interdependencies.

123 . On the role of opinions in the mid-19th century free trade epidemic, see Kindleberger [1988].

These "artificial restrictions" were by themselves an indication of deficient development strategies. Therefore, other things being equal, the debt burden of a country with a large trade was lighter than that of a similar country with a small trade, because it suggested that the former followed better policies than the latter.

b) The Tax test and Financial Development (1890-1914)

After 1890 however, reference to the Trade test disappears from subsequent editions of *Fenn's Compendium* as well as from the related literature. By contrast, we start finding more and more references to the Tax test. This we argue, reflected a change in development views and strategies.

As economic historians noted long ago, the 19th century's later developers in Southern or Eastern Europe displayed a tendency to use the State as an engine to promote economic development. This is traditionally associated with Gerschenkron's thesis on economic development[124] Typically, public loans were used to fund infrastructure building: roads, canals, railways. The Tax test, by many aspects, seems to have been tailored for such countries: while public projects typically increased the interest service over the short run, they also improved prospects for future revenues, and thus led to an eventual upgrading of fiscal resources through two different channels. First, to the extent that State projects were well run and well managed, they generated a flow of "dividends" that alleviated or annihilated the corresponding debt service.[125] Second, infra-structure building spurred growth and regional specialization. These changes improved public finances, by increasing and broadening the tax base thus favouring the collection of government revenue. The point is that States that actively promoted domestic development undertook steps, which immediately affected the behaviour of the Tax test.

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[124] . Gerschenkron [1960]. This is the so-called « relative backwardness thesis ».

[125] . In other words, even a loss-making railway, provided that it did not cost more to run than it brought in income, reduced the net service of the corresponding debt. Consider for instance a railway line that involves an annual coupon payment of R, operating costs of C and an income of I. Provided I>C, then part of the debt burden is offset.

In this respect the Tax test was a way to focus on the success of government policies. It led observers to consider the efficiency in the collection of taxes, to track the effects of centralization, corruption, or of the training of training of tax collectors on fiscal performance,[126] to study the effects of financing development through alternative taxes, custom duties, excises, income taxes, stamp duties. The management of State companies and monopolies could also be monitored through the tax test since their creation and operation affected the behaviour of both the interest burden and government revenues. In other words the Tax test was a mean to better understand the operation of the fiscal machinery.

Starting in the late 1880s, we find extensive evidence of attention to these problems in contemporaries' accounts. One typical illustration was the frequent attempts to discount "reproductive investment" from the public debt.[127] As recognized by many observers establishing rigorous accounts of the debt burden, which would in addition enable to discriminate between productive and unproductive debts was both tremendously difficult and tremendously important.[128] Sorting out technical these problems became a major challenge for investors who devoted much time and energy to the matter. Such concerns became a key feature of *Crédit lyonnais* country reports, inevitably leading to comments on the relative

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126 . 19th century observers were only rediscovering things which at been at the heart of early experiences of economic development, beginning with the British experience. As Brewer [1989] and O'Brien [2002] emphasized, the beginnings of the Industrial Revolution in Britain, in the 18th century, had been tightly associated with deep transformations of the fiscal machinery. The creation of a comparatively efficient tax bureaucracy enabled successive British governments to rely on abundant resources that in turn permitted to both borrow extensively and build a reputation for a strong willingness to pay back creditors.

127 . See Flandreau [1998] for a discussion. Mulhall [1889] and Fenn's Compendium [1889], among others are early illustrations. In a recent paper Kelly [1999] reports evidence that the composition of public debts did matter in determining market access.

128 . On these difficulties, see Fenn's Compendium [1889], p. xvi, xvii. "The question then arises, To what extent are these [public debt burdens] covered by reproductive works? Taking the heaviest debt per head on the entire list – that of Queensland – we find that it has been raised to the extent of some £15,000,000 for railways, £ 750,000 for telegraphs, £ 1,500,000 for harbours and navigations, £800,000 for roads and bridges, and £ 1,000,000 for loans to municipalities […] for local water supply and other works, or together £19,000,000 out of a total of £25,000,000 bonds issued; and if to these items were added the money absorbed by immigration expenses and public buildings, we should find practically the whole of the debt had been contracted for works of utility, even if some of them are not directly reproductive. […] We are scarcely, however, entitled to write off blindfold the whole of this outlay upon public works […] It has been impossible […] to deal with accounts of all countries […] and in the Table of net Indebtedness [which we give below showing the true burden of public debts] there may in some case be assets which have not been fully allowed for."

abilities of States to promote national development. The reports of the Council of Foreign Bondholders carefully discounted productive debts from total debts.[129] The point is that the Tax test led to discussions of governance.[130]

In other words, in blatant contradiction with the popular belief that the late 19th century system rested on *laissez faire*, we find that, during most of the period under study, the assessment of default risks was rooted on a view of economic prowess that placed much emphasis on the ability of governments to manage their economy in a way that would in turn foster their own fiscal resilience. From that respect, "good" policies were those that were successful in striking a balance between fiscal development and national economic growth.

c) The Argentine crisis as a watershed

Thus the point we are making is that while the Trade test corresponded closely, both in timing and in spirit to the first phase of 19th century globalization (1848-1889), which mostly involved a process of Western European integration, the Tax test fitted best the experience of later developers, with their experience of "hands on" governments (1889-1913).[131] It would of course be tempting to stress the opposition between the Trade test and the Tax test. However, this would be somewhat inappropriate since both criteria were not mutually exclusive. Results in Sections VI and VII display evidence that openness mattered. Supporters of the Trade test, such as *Fenn's Compendium* did also acknowledge that the quality of public spending was highly relevant. Finally, for all practical purposes, a stable empirical relation does exist, for a

[129] . It is no surprise, therefore, that Crédit lyonnais economists sought to develop a systematic way to sort out "true" government revenues from gross numbers. As a result, the measure of the debt burden, which they monitored subtracted from the interest service the net income from public companies. This in turn enabled them to assess the value of government assets. The next stage, of course was to make pair-wise comparisons of the efficiency of alternative governments.

[130] . As reported by Lyonnais economists, the Austrian state railways were known to be much more profitable than their Hungarian counterparts. This shows that it is not enough to know the purpose of a given public project in order to assess its quality.

[131] . The chronological boundaries are obviously somewhat arbitrary. While we emphasize here the Baring crisis as a watershed, other timings could be considered. In particular, the period 1873 to 1889 is clearly one during which both criteria were used in combination.

given country, between taxation and openness [132] In the appendix, we report results from regressions using either criterion.[133] As shown, the explanatory power of the two criteria is very similar, when we consider the overall sample.

To highlight the differences between both tests, Figure 10 provides a cross section of the scores obtained by the countries in the sample in 1888.[134] As can be seen, a relation does exist between the two tests, explaining their comparable overall record. The shaded rectangle, which is the intersection of the "danger zones" according to both tests captures the usual suspects: by alphabetical order, Argentina, Greece, Italy, and Portugal. Brazil and Spain are on the border. Note however that, three high risk countries are found to lie on the right of the adjustment curve: Argentina, Brazil, and Greece. Together with Portugal (a looming disaster according to both tests) these countries were the ones that went bust in the 1890s. In other

words, while being recognized as high hazard by both criteria, these three countries had bleaker prospects according to the Tax test. [135]

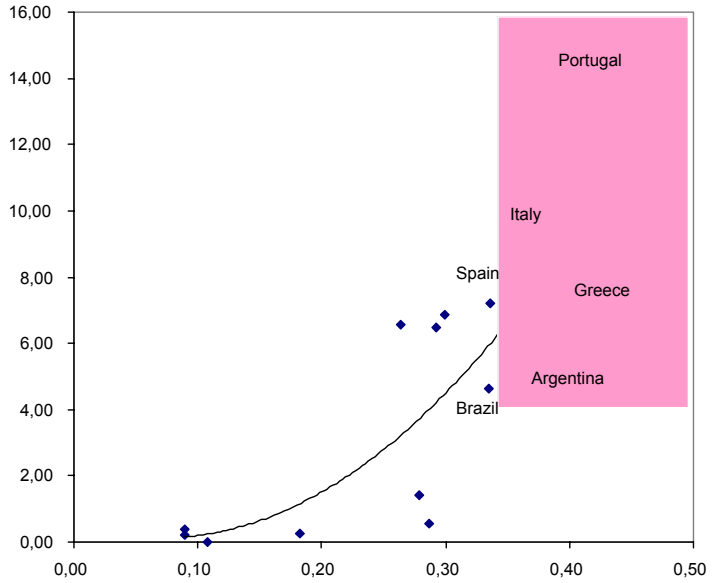
Figure 10. Trade and Tax test in 1888

[132] . If trade and taxations are fractions of national income, they should display a fixed proportion for each given country, and thus give very similar results when fixed effects are introduced in the regression. Moreover, if as suggested by Rodrik [1998] there is a tight positive association between government size (tax revenues as a share of GDP) and openness (trade as a share of GDP) then the two variables should be perfect substitutes in all regressions. Note that we did not uncover, on the basis of our empirical sample, the relation discussed by Rodrik.

[133] . Strictly speaking the trade test performed here does use the annuity on the public debt (interest service) not the capitalization of this annuity at a uniform rate of 5% as suggested by Fenn's Compendium. It is clear however that the two measures are essentially substitutes.

[134] . This is the last pre-crisis year for which Fenn's compendium provides figures for the trade test.

[135] . Note that Spain which was the most recent experience of default in the 1880s displayed when it collapsed a Tax test of about 0.47 (comparable to Portugal 1888) but a Trade test standing at 25 (*Fenn's Compendium* [1889], p. xvii). In that case, it is the Trade test which rang the emergency signal.



Source: database and Fenn's Compendium as reported in Table 4.

We argue that, as a matter of fact, the Argentine collapse, in 1890, was a watershed which caused the emergence of the Tax test as a key criterion. To see this, we seek to predict what ought to have been the interest premiums paid by Argentina in the 1880s on the basis of the relation between debt burdens and interest spreads as it emerged after the crisis. Specifically, we estimate the basic model on the period 1900-1913 using both the Trade test and the Tax test, and then simulate the spreads one gets according to each criterion. The result is shown on Figure 11 where the observed spread is compared to the spread that is simulated using the trade test and the Tax test alternatively. As can be seen, the Trade test fits quite well the actual rate, suggesting that such a criterion was indeed used in the 1880s. The Tax test by contrast shows how much the markets would have charged if they had priced the Argentine debt as they did in the 1900s. As seen, this alternative formula predicts an interest spread that is substantially higher and tends to increase as the crisis approaches: in 1889, it reached 200 basis points. The obvious conclusion is that a greater emphasis on the Tax test might have

possibly led to a limitation of Argentine borrowing. The subsequent crises in Greece, Portugal, and Brazil, may therefore be understood in this light. The Argentine collapse led investors to monitor more carefully public finances and debt burdens. They realized that some countries, while possibly very open (Brazil), had deeply deficient fiscal systems. This wake up call led investors to reconsider the hierarchy of risks in the light of Argentina problems. The *Crédit lyonnais*, for one thing, began carefully measuring interest burdens. The Council of foreign bondholders did the same. When the "bad performers" – according to this criterion – found themselves in trouble and sought to borrow, they did not find capital and collapsed.[136]

If this interpretation is sustained, we can understand the decline of popularity of the Trade test and growing use of the financial burden method hereafter.[137] This analysis underlines the links between assessment of sovereign risks and development views. It suggests that the international financial markets of the 19th century, while rewarding trade openness, became increasingly concerned about the very quality of financial policies. In the end, everything happened as if capital mobility had magnified the focus on individual financial achievements, and led investors to realize that international economic integration created hazards.[138] As globalization extended its reach beyond the boundaries of Western Europe to the broader world, people realized that integration in these regions had been rooted on a much deeper fabric than the mere focus on trade openness had incorrectly suggested. This in turn gradually provided a new definition of what "good" policies were: in this light the importance of a

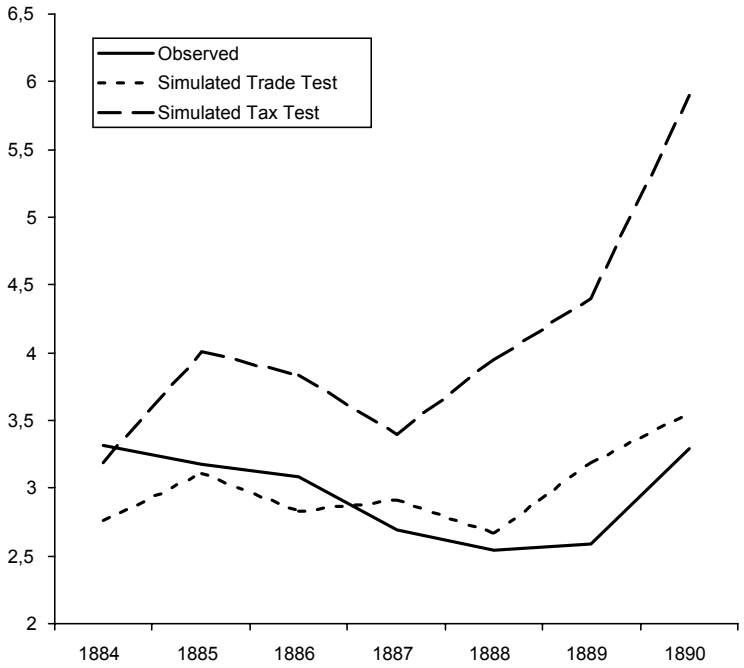
136 . This conclusion may help to reconcile recent seemingly conflicting conclusions in the literature. While Trinner [2001] argues that there was contagion from Argentina to Brazil, Mauro et al. [2002] maintain there was none. They reach this conclusion by emphasizing that investors of the time were able to focus on "fundamentals". This claim is in conflict with contemporary accounts who emphasized the "reverberation" of the Argentine crisis (see Conant [1895] and Flandreau [2002]). On the other hand the word "reverberation" suggests that the transmission of the crisis went through the perceptions of the money center (see Calvo [2001] for a discussion of the potential role of money centers in transmitting financial instability). Obviously, our analysis suggests that if a crisis leads to some rescaling of the "fundamentals" then the conclusion of Mauro et al. [2002] need not be taken as evidence against "contagion".

137. Interestingly, this conclusion fits squarely with the findings of a vast literature that has documented both the effect of recent financial crises on ratings and the reverse impact of ratings on crises. See e.g. Cantor and Packer [1996], Eichengreen and Mody [1998], Kamin and von Kleist [1999], Reinhart [2002], Kräussl [1999], Reisen and von Matzlan [1999].

138 . See Calvo [2003].

sound fiscal machinery (an old feature of modern European States) was magnified. What were needed to deal with globalization, people understood, were appropriate financial policies such more than the simple pursuit of free trade: our epoch, it seems, is only relearning this lesson.

Figure 11. Forecasting disasters: Alternative measures



Source: see text. Fixed effects model estimated for the period 1900-1913. Simulation using the Argentine data from appendix.

X. POLICY LESSONS AND CONCLUSIONS

Our analysis has led to a number of important findings. It is now time to review them, to provide analytical conclusions and to derive some policy lessons.

This monograph has sought to trace the roots of global financial integration in the first "modern" era of globalization. We showed that this integration, as measured by standard indicators was not a monotonic process. A first wave of financial integration had been

observed in the 1880s, and a second one was displayed during the 1900s. This finding rules out the existence of a driving role of improvements in financial technology.[139]

Our interpretation, instead, focused on supply factors – perceptions by investors of the quality of the policies that borrowing countries followed. These perceptions shaped views regarding what were the relevant parameters people ought to monitor. As a result, investors "priced" government actions on the global capital market. This is because government securities were traded at levels that reflected the degree of trust they inspired. A deterioration of sovereign risk due to the perceived deterioration of that country's macroeconomic policies led investors to charge a premium for new loans, thus limiting the extent to which countries got access to international capital. This was especially problematic for developing countries, or as we called them "capital poor" countries since for them access to international finance was paramount. In other words, one important conclusion here is that it is not enough to implement a formal removal of capital controls in order to achieve a high degree of financial integration. The liberalization of the capital account is at best a necessary condition for integration, but it is not a sufficient one. Reputation is the true driver.

The interpretation of the sources of financial integration we put forward here underlines the importance of domestic policies in actually facilitating the global circulation of capital. In other words we answer the debate on whether financial integration is the result of government policies or of some "endogenous" market behaviour by emphasizing the role of market processes.[140] This is in sharp contrast with the reading of globalization put forward by Obstfeld and Taylor [1998], and according to which policies affecting financial openness (removal of capital controls etc) drive the ebbs and flows of international financial integration. We showed here that policies reducing the *perception* of risks by market are the

[139] . This is obviously in contrast with the logic of financial integration as it has been achieved historically in *national* contexts. There, institutions and financial technology have been shown to play an essential role. See e.g. Davis [1980].
[140] . See Bayoumi [1990].

true forces in facilitating the circulation of capital. The globalization of capital is facilitated by the adoption of "good" domestic policies much more decisively than by the removal of legal barriers to financial exchange.

From the point of view of developing countries, this points to an essential lesson. Because sovereign debt acts is in the front line when investors set a benchmark for the risk of lending to any given country, the way it is assessed is liable to play a decisive role in determining the amount of foreign capital any given country may attract. This decisive element of the logic of international financial integration has, surprisingly been entirely neglected in recent discussions of international financial integration.[141] And yet the recent troubles in which developing countries find themselves when they seek to attract foreign capital suggests that such forces prove decisive.

To identify the perceptions that were relevant for late 19th century investors, this monograph gathered material from individual sources in order to establish a list of potential candidates. Relying on a new database collected from primary sources, we sought to test whether the economic perceptions of the time were indeed reflected in "market prices". Specifically we sought to relate alternative measures of default risk to such variables as the debt burden, the cover ratio of the central bank, the deficits ratio, trade openness, default, past default, political regimes and political crises, exchange rate regimes. Two alternative models were considered. One sought to explain interest rate differentials with England (model I). The other sought to explain default probabilities (model II). In both cases the right hand side variables were the candidates identified above. Model II was shown to be preferable in many respects since it provided an elegant way to handle the fact that there are some "threshold effects", i.e. that markets get the jitters when some performance parameters deteriorate.

[141] . See see e.g. O'Rourke and Williamson [2000] and Clemens and Williamson for characteristic illustrations.

Our empirical findings show a hierarchy among explanatory variables. First, we rejected the conventional view that the exchange rate regime (participation to the gold standard) is what mattered in facilitating the global circulation of capital in the late 19th century.[142] Our results demonstrate that such a conclusion flawed. It can only result from misspecification and mis-measurement. That is, its significance in earlier studies, comes from a general neglect of other variables which we showed people monitored carefully, as they should have. In our results participation to the gold standard, even when statistically significant in determining borrowing terms, is found to be only marginally so and has a small effect. Moreover, it explains a mediocre part at best of the convergence of interest rate spreads after 1900 and of the resulting capital market "globalization". The gold standard was not the basis of the first era of financial globalization.

Our second important finding is that the debt burden is the one key variable that determined market access. To a large extent, it is because the debt burden captured and summarized many macroeconomic features. Provided that a country had a low debt burden, it could finance without problem its deficit – and we found that the deficit often did not show up as a significant variable. Provided that a country had a low debt burden, it could borrow reserves to shore up its currency – and we found little effect if any for the exchange rate regime.

That monetary regime variables did not show up as significant while the debt burden did suggests that to a large extent, there was a disconnection, even before WWI, between the exchange rate regime and globalization.[143] It is only when countries suffered from "original sin" i.e. when they were unable to borrow in their own currency[144] and thus accumulated a large currency exposure, that the exchange regime could matter. Exchange crises when

[142] . Bordo and Rockoff [1996], Sussman and Yafeh [1998], Taylor and Obstfeld [2001] and [2002].
[143] . A finding which was emphasized by Bordo and Flandreau [2002].
[144] . On the so-called "original sin", see Eichengreen and Hausman [2002]. On its historical aspects, see Flandreau and Sussman [2002].

countries had a large debt denominated in a foreign currency could be deadly. This led countries to find ways to mitigate the fluctuation of their exchange rates, or to seek to reduce their exposure to currency risk by encouraging the development of deep domestic markets in which foreigners could come. Of course hard pegs could also be an option, and it was significantly adopted in some countries such as Russia. But then, gold adherence of the currency board type did not act as a signal for good policies, but as an insurance against the so-called "twin crises". The point is that the choice of the exchange rate regime was more a consequence than a cause of globalization. This conclusion is still valid.

Other important results which were identified en route included the costs of default: a renegotiation was an awfully costly exercise that basically shut the market down for defaulters until a settlement was reached. This was achieved by pushing borrowing premia to sky rocketing levels. This occurred because a renegotiation was an impending signal that at least part of the capital was about to be lost.[145] We also found that markets did remember for a long time the experience, a finding which seems to contradict received wisdom that former defaulters are able to tap again the capital market soon after default. What our results show, however, is that this comes at a price. This shows both the merits and the limitations of the market mechanism as a mean for providing discipline. Defaulting entails costs, and nothing prevents a sovereign country from "choosing" to bear those costs. Investors treat default as a probability, and increase this probability when previous default has occurred. If at this new, higher price a country is nonetheless willing to borrow, so be it. One cannot expect from the bond market more than what it can provide: penalties. The extent to which such penalties and punishments are conducive of stability would require to investigate the demand side, which this study has left out. But the persistence of problems in global finance is evidence that

[145] . This occurred quite apart from formal procedures whereby bondholders formally prevented defaulting governments from getting access to capital markets: Flandreau [2003]

market incentives might not be enough. For strict controls term to formal rules, as European governments know.

This brings us to the political variables, which were found to have a clear role. First, political crises such as wars or domestic unrest were clearly detrimental to a country's credit. Interestingly their inclusion typically dampens the effect of exchange rate uncertainty, suggesting that a lot of the exchange crises that were meaningful for investors were in fact the result of political crises, which thus deteriorated all economic prospects. Quite importantly we also found a tight association between the extent of democracy and borrowing terms. This was especially perceptible for the capital rich Western European countries whose interest rates are found to have reacted strongly to the extension of the size of the enfranchised population. In contradiction to the popular notion that markets like autocracy because it eases the external adjustment, we found that markets like democracy, because they worry to get their money back. And the fact is, that the period under study was bounded by two major default that had followed excesses of autocracy – not excesses of democracy: these were, of course, the 1793 French default, and that of Russia, in 1917. In the end, the conclusion may well be that the smooth adjustment under the gold standard period was facilitated by the extension of democracy.

One correlate of the overarching importance of the debt burden is that interest rate convergence between 1880 and 1913 occurred because countries were able to achieve a substantial reduction of these burdens. Our conclusion is therefore that the root of pre-1914 financial globalization was the improved prospects concerning the sustainability of public debts.

Once we start viewing things from the vantage point of the drivers of globalization, a clearer picture of what "good" policies are starts to emerge. We found that beyond a number of important transitory factors (such as the gold discoveries of the 1890s which spurred

inflation in the 1900s) the reduction of public debts was not achieved through fiscal balance but rather through economic growth. This, we argued, shows the importance of development policies in fostering international financial integration – a principle that was fully understood by both market participants and governments one century ago.

Furthermore, we showed that, one century ago, the international consensus regarding growth policies experienced an evolution, which is not without parallel with the more recent experience. The global consensus that prevailed before the Baring crisis was heavily influenced by the experience of Western European economic development. This experience had put trade openness at the centre of views on development and debt sustainability. The experience of financial crisis in Argentina changed a bit priorities and led to formalize a new consensus on the relations between public finances and debt sustainability. From that date on, and therefore during most of the period under study, a greater emphasis was put on the quality of fiscal machineries. In several nations, States began undertaking a considerable role in economic development. Fiscal success and economic success became so tightly intertwined that measures of a country's capacity to service its debt came to closely follow its economic performance – and its vicissitudes tightly reflected the success of that country's development strategies.[146]

The important lesson here is that the successful management of international financial integration rests heavily not so much on simple policy advices regarding the desirability to "open" or "close" individual economies to the international winds. In the last analysis, the broader institutional, political, financial policies prove much more important. There can be no sensible route to globalization – in fact no route at all – that does not put first the problem of development. The lack of international integration may slow down growth. But the lack of growth in emerging markets will jeopardize globalization. The interwar economic difficulties

[146] . Our conclusions are in clear contrast with the conventional emphasis (see e.g. Williamson and O'Rourke [2001]) on trade openness as the main source of pre-1914 convergence. This monograph has shown that pre-1914 financial convergence had much more different origins than has been argued so far.

should serve as a reminder: to bring back the golden age of the pre-1914 globalization, a number of contemporaries recommended to bring back the gold standard. But with debt burdens at record highs as a result of the war and growth hampered in the 1920s by desperate attempts to achieve drastic adjustments, and in the 1930s by the Great Depression, there could be no other outcome than rising interest premiums and de-globalization. The collapse of the interwar was written in the equations this monograph uncovered.

As navigators always knew: a fair sea, and a good ship are equally important for a successful journey.