Quis custodiet quem? Sovereign Debt and Bondholders’ Protection Before 1914

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Abstract

The half-century before World War I has been characterized as the first age of global capital export. The sheer size of international capital flows during this period required an appropriate institutional basis to provide for the \textit{ex ante} incentive alignment of foreign borrowers, as well as for the \textit{ex post} governance of international debt contracts. These were all the more significant in a market were sovereign immunity often blocked the normal legal procedures for the enforcement of contracts. The analysis in this paper is focused on the role and significance of the bondholders’ organizations for the regular governance of this market. There has been a recent renewal of interest in the topic of bondholder protection during the first era of globalization. For some authors, much can be learned from this type of institutional arrangements, namely in the context of the problems of collective action and aggregation of bondholders in case of sovereign default. However, a correct assessment of the potentialities of bondholders’ self-help organizations is not complete without further inquiry on three important dimensions, namely, the degree of institutional variation that characterized these organizations, the strategic interaction between them, and their \textit{ex ante} consequences for the observed patterns of investment in sovereign debt. Some implications of these points are developed in the context of a formal framework, and confronted with some qualitative and quantitative evidence.

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1 Introduction

The half-century before World War I has been characterized as the first age of global capital export. An era during which Europe played the role of the “banker to the world” (Feis 1930, Woodruff 1966). The sheer size of international capital flows during this period required an appropriate institutional basis to provide for the ex ante incentive alignment of foreign borrowers, as well as for the ex post governance of international debt contracts (see Table 1).

These were all the more significant in a market were sovereign immunity often blocked the normal legal procedures for the enforcement of contracts, and where the apportioning of responsibilities between the sovereign defaulters, the underwriting banks, and the bondholders themselves was not entirely clear. This problem of “common agency” is obviously not a thing of the past, as the current dealings between Argentinean bondholders, the banks that sold them the bonds, and the defaulting government should remind us. In 1891, as in 2001, the problem of “who should watch whom” still remains open. Indeed, the topic of the pre-1914 international financial architecture has recently attracted considerable attention in the literature in connection to its alleged resonance to the current debate on the problems of emerging markets.1

The following pages describe a research project on the institutional underpinnings of the first period of globalized capital markets (roughly 1870-1913). It concentrates on the role and significance of the organizations of bondholders’ protection for the regular governance of the market. Quite a lot has been written on the epitome of such organizations, the British Corporation of Foreign Bondholders. However, as I will try to make clear, there has not been enough research on two important dimensions, namely, the degree of institutional variation that characterized these institutions, and the strategic interaction between them. One of the aims of the project within which this paper is included is to integrate the Continental European bondholders’ organizations (especially in France and Germany) into the evaluation of the role of this type of institutional arrangement.

According to the classical estimates of foreign capital stocks for this period, “Europe” can be almost reduced here to the three leading capital exporting countries, viz., Britain, France and Germany.

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1 On this see the recent panel on “New Approaches to Resolving Emerging Market Financial Crises” at the 2003 Meeting of the American Economic Association, and Eichengreen (2003). Many of the problems and policies there discussed do have the distinct flavor of similar 19th century predicaments.
Indeed, by the eve of World War I, these three countries concentrated about three fourths of the world total foreign investment (see Table 2).

[Table 2 about here.]

Other “stylized facts” of European foreign investment during this period include: the leading position of British capital, often near to half of the total, the late emergence of German capital, and the different structural composition of foreign investment by the three main European economies. In this latter respect, it is usually remarked the contrast between the predominant orientation of German and French investment towards government-sponsored securities in European outlets (see Table 3), and the preference of British investors for private applications in the New World and Empire.

[Table 3 about here.]

From my research so far, I am also convinced that a case could be made for connecting the structure of the financial architecture at the three main European capital markets, and the patterns of European capital exports. Since Fishlow’s (1985) distinction between “developmental” and “revenue” finance, not much work has been done in this topic, and the time might be ripe to reopen the debate.

The text is organized as follows. Section 2 presents a selective review of literature, both theoretical, and historical. The emphasis is placed in identifying the topics that attracted most research, and also those which can gain from the study of the history of financial markets. Section 3 develops partially these topics into a first attempt at a formalized argument. Some of the empirical implications of the analysis are then confronted with preliminary empirical results in section 4. Three types of evidence are offered in this section: on the probability of default, on the settlements of defaults, and on the patterns of foreign investment. Section 5 concludes.

As will become obvious from the frequent mention to the preliminary or suggestive nature of some of the results, this paper constitutes a cross-section taken from a project still in development. For that matter I expect the comprehension of the reader.

2 Literature review

2.1 Theoretical framework

The study of sovereign debt and of its renegotiation following default has attracted quite a lot of attention, no doubt a reflection of the importance of the values at stake. In the necessary limited space I have to review this literature, I will follow the framework set by Tirole (2002) to integrate some of the main theoretical contributions of the past 20 years or so.

According to this author, the main peculiarity of sovereign borrowing lies in its structure as a problem of common agency coupled with the sovereign immunity of the principal. The former creates a lending externality, which cannot be amended by the same responses devised for corporate borrowing, because of the immunity of the debtor. Tirole identifies three levels of externalities: in contracting, in collective action, and from heterogeneity of claims. Because no individual lender has to internalize the impact of
its lending upon other creditors of the same debtor, there is a potential for overlending (contracting).
Collective action externalities are likely to occur in monitoring the debtor’s behavior, as well as in
organizing an ordered framework for renegotiation in case of distress. Finally, there is the potential for
antagonism between holders of different claims on the same debtor.\(^2\)

Because of the hazards mentioned, *lending externalities* also tend to dilute the borrower's incentives
for timely repayment, thereby aggravating the potential moral hazard problem of any debt contract.
That, notwithstanding all these inconveniences, the sovereign debt market has not only survived but
indeed known periods of rapid expansion, led the literature to establish the conditions under which
sovereign borrowing could be sustained in equilibrium. In other words, a sanctioning device was needed
to align the interests of borrowers to those of lenders.

The contribution that probably started this line of inquiry was due to Eaton and Gersovitz (1981),
who characterized the debt contracts as equilibrium outcomes sustained by a reputation mechanism
based on trigger strategies. Bulow and Rogoff (1989) noted that such mechanism required too much
commitment from the part of lenders, and that the punishment strategies were not renegotiation-
proof. They derived instead a model where pure reputational sanctions (i.e. embargoes on future
loans) could not sustain an equilibrium with debt. This is basically the outcome of relaxing the perfect
commitment of lenders, and of introducing competition from other potential lenders, who could, under
certain conditions, recontract with the defaulting borrower. A corollary of this result was the need for
some form of exogenous third party enforcement of lender seniority rights, such as political intervention
or trade sanctions by the government of the lenders’ country. Rose and Spiegel (2002) have found
suggestive evidence for the role of international trade as a mechanism for sovereign debt repayment, in
the postwar period.\(^3\) Although disagreeing with Bulow and Rogoff on the enforceability of these types
of direct sanctions, Tirole (2002) also sees as solution to the problem of common agency the creation
of an external “delegated monitor”, responsible both for monitoring countries and for renegotiating
defaults.

More recently, Kletzer and Wright (2000) emphasized that Bulow and Rogoff (1989) had also as-
sumed a non renegotiation-proof commitment on the part of the entrant lenders to insure the borrower
under the new contract. Nevertheless, without assuming any commitment on the part of the lenders or
borrowers, they were able to prove that sovereign credit transactions are enforceable in equilibrium “un-
der the anarchy that characterizes international financial transactions”, i.e., under pure reputational
sanctions.\(^4\) Wright (2002) has a model in the same spirit, where debt repayment can be sustained in
equilibrium not by the debtors’ reputation but by the incentives of lenders to collude and to punish
countries in default. He develops Kletzer and Wright’s (2000) ”cheat the cheater” strategies in the

\(^2\)The classic example is the conflict between share and debt-holders, in the corporate context. Although, in the period
I am studying, governments frequently took responsibility for the international liabilities of formally private corporations
(especially railroads), this type of conflict is of less practical relevance. Nonetheless, antagonisms between holders of
different loans often occurred, namely because of concurrent claims to the security provided by the same mortgaged
revenues.

\(^3\)For the impact of “supersanctions” for the governance of the pre-1914 period see the interesting studies by Mitchener

\(^4\)Kletzer and Wright (2000: 622).
context of syndicated bank lending. He concludes that the incentives for banks to cooperate decrease with the number of banks in the market. From which it follows that the benefits from increased competition between lenders may not be efficient, if it dilutes the incentives for cooperative punishment of defaulters. His model, however, is tailored to sovereign bank lending, which differs in some important respects from bond lending. On the one hand, the ownership of claims tends to be more dispersed than in bank lending - certainly the case before 1914 -, which raises an additional problem of aggregation of claims. And, on the other, the menu of contracts that individual bondholders can offer the sovereign borrower is smaller than in the case of banks.\(^5\)

A related strand of literature has focused on the definition of the best \textit{ex post} mechanisms for ordered renegotiation. “Best” means in this context, as Tirole (2002) comments, the institutional design that is more renegotiation-friendly without being borrower-friendly. That is, the mechanism that minimizes the deadweight costs of delayed agreements and eventual sanctions, but doesn’t aggravate the moral hazard problem. The debate here has essentially converged into two polar positions: the market-based adoption of collective active clauses (CACs), or the larger intervention of multilateral organisms, as the IMF, in the coordination of crises’ resolution. According to Eichengreen, Kletzer and Mody (2003), the adoption of CACs could be beneficial for emerging countries with good credit rating, whereas it would be perceived as increasing the moral hazard problem (and hence the interest rate spreads) for countries with relatively poor credit. Compared to the alternative of increased IMF intervention, for instance along the Sovereign Debt Restructuring Mechanism (SDRM), as proposed by Krueger (2002), CACs would offer a feasible alternative to the enforceability problems of the SDRM. Despite that advantage, the authors also acknowledge that the provision of CACs is not a complete solution for an ordered restructuring of sovereign debt, because they fail to solve the problem of aggregating the bondholders, especially if owning different classes of securities. As already suggested by Eichengreen and Portes (1989), aggregation would be facilitated under the recreation of institutions similar to the bondholders’ protective committees, which were common namely before 1914.

\subsection{2.2 Historical literature}

The literature on sovereign debt and default before World War I forms an extensive corpus, which cannot be summarized in here. Suffice is to remember that it includes broad comparative studies - the most helpful still probably being Feis (1930), Borchard (1951), and Wynne (1951) -, national studies from the perspective of capital exporting countries, and a myriad of national or regional literature on borrowing countries.\(^6\) My survey will then, of necessity, be very selective. I organized it along three main topics of interest to my research.

\(^5\)These contracts are, precisely, at the core of Bulow and Rogoff’s (1989) negative result.

\(^6\)Omitting contemporary and national sources, I have found particularly useful the following references: Cairncross (1953), Hall (1968), and Stone (1999) for British capital exports; Lévy-Leboyer (1977) for France; Barth (1995), Pohl (1977), and Schaefer (1993) for Germany; Veenendaal (1996) for the Netherlands; and Dawson (1990) and Marichal (1989) for investments in Latin America.
2.2.1 Financial architecture

The first such topic is the architecture of financial markets. This is hardly unexplored territory, and it remains the focus of ongoing attention in the literature. Nonetheless, I find that the literature has largely overlooked a number of interesting questions.

One of them is the implicit agency relation that related the investment bankers or large universal banks responsible for underwriting the sovereign debt, and the self-created bondholders’ organizations for the *ex post* governance of that debt, especially in case of default. Flandreau (2003) describes a market fraught with information asymmetries to which banks tried to adapt through forms of “relationship banking”. In practice, this meant that banks abstained from competing for clients among sovereign debtors, because reliable information on the financial solvency of governments was a strategic asset costly to acquire. Hence:

> Rather then having all bankers competing on all issues, and thus tending to under-invest in information gathering, relationship banking provides extra incentives for each banker to take a close look at his client (Flandreau 2003: 36).

Contemporaries didn’t necessarily appreciate these nuances. With respect to France, Eugène Letailleur, writing under the alias of “Lysis” was strongly critical of the “hunting preserves” of the five big French banks:

> As foreign loans are extremely coveted by banks owing to their high returns, competition, and rivalry would threaten at each instant to destroy the consortium between our great banks, unless they set up a *modus vivendi* between them. Each bank then has its own clientele of foreign states; it has its influence zones. We call it its “hunting preserve” (Lysis 1908: 105).

No matter which of these interpretations better approaches reality, the stable long-term relationship between banks and their foreign clients certainly gave the former an important information advantage over other market participants. One such category of principals were the bondholders that acquired the sovereign debt underwritten and placed in the European markets by the banks. The increasing importance of the underwriting activity for big European banks meant a number of restrictions on the banks’ intermediation between their two classes of clients, i.e., the sovereign governments and the private bondholders. In particular, because there was an obvious value in keeping a good reputation in the markets, it seems natural to expect that banks would have interest in selling bonds of governments they knew to be in a sustainable financial path, while shunning the placement of securities of insolvent sovereigns.

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7 Going no further then the 1980s, I can mention the classical study by Fishlow (1985), together with the more recent contributions of Portes (2000), Flandreau (1998 and 2003), and Mauro and Yafeh (2003).

8 It will be noticed the complementarity of this analysis to that of Wright (2002) - relationship banking provides an extra incentive for banks not to defect from punishing defaulters.

9 This is actually how Cairncross (1953) describes the hierarchy of the London merchant bankers, who only competed for the issue of securities of new borrowers, and where the old houses usually avoided dealing with impuicuous and risky governments. See also Jenks (1927: 288).
This might be so, but as in any agency relation, the asymmetry of information should have led to problems of moral hazard. The frequency of defaults coupled with very high premia charged on the bonds of risky borrowers seem to support this interpretation.\(^\text{10}\) Again Letailleur goes further in accusing the big banks of misleading the French public into investing its savings in overpriced foreign government securities, on which no reliable information actually ever transpired to the market (before the predictable default, that is). Rudimentary rules for information disclosure on new emissions of securities, and the lack of independence of the majority of financial press, directly or indirectly dependent from the main banks and issue houses also contributed to indulge the credulity of individual investors.\(^\text{11}\)

The fairly pessimistic judgment of Letailleur was later taken on face value by authors that sought an explanation for the apparent incapacity of the French investment market to anticipate (and take adequate protective measures) the widespread postwar default on Central European government debts. This is obviously an unfair criticism to French investment, which could hardly have anticipated the coming and consequences of such a perturbation as World War I.\(^\text{12}\)

2.2.2 A case for institutional diversity

Bondholders early tried to organize to face these hazards, namely through the constitution of ad hoc committees to protect their interests against defaulting governments. However, the temporary and improvised nature of these organizations reduced their effectiveness. They faced high administrative costs in gathering a minimum number of bondholders to finance the committees; they had trouble in dealing credibly with the defaulting governments, since they could not make their agreements binding for individual bondholders; they often lacked enough financial resources and information on debtor countries, and they were also subject to manipulations by the same banking firms and brokerage houses that issued the bonds.\(^\text{13}\)

Many of these problems were solved with the creation of permanent organizations of bondholders, set up with an appropriate endowment of funds and information to sustain the activities of the committees created to deal with individual cases of default. The first of such organizations was the British Corporation of Foreign Bondholders, created in 1868, and incorporated in 1873. She was closely tracked by the equivalent Dutch organization, the Vereeniging voor den Effecthandel, incorporated in 1876. Other countries took longer to adopt this innovation, namely, France and Belgium in 1898, Switzerland in 1912, Germany in 1927, and the US in 1933.

The creation of bondholders’ organizations appears to have had a positive effect on the governance of the sovereign debt markets. Two indicators attest to that: the number of countries in default and the

\(^{10}\)For an analysis of the evolution of risk spreads see Mauro, Sussman and Yafeh (2002).

\(^{11}\)For an abstract of official requirements on the contents of the prospectuses for the emission of new securities, on the several European exchanges, see Yovovich (1918). As for the control of the press, Lysis (1908: 34-35) has abundant references to the French case. See also Colinet (1913: 134).

\(^{12}\)For references to Lysis’s “prophetic” warnings see Cairncross (1953: 224), or White (1933: 278-79).

\(^{13}\)Cf. the report presented by Eugène Lacombe, vice-president of the French bondholders’ association to the Congrès international des Valeurs mobilières of 1900, reprinted in ANPFVE (1900).
total amounts in default, which decreased significantly since the late 1870s; and the average duration of default that fell from about 14 years (1821-70) to 6.3 (1871-1925), according to Suter (1992: 91).

These improvements notwithstanding, contemporaries frequently complained about the imperfect sanctioning of sovereign defaults. Alfred Neymarck, the influential statistician and financier of the turn of the century, pleaded for a more ambitious solution to the problem: “These disasters imperiously call for a reformation of international credit and, to obtain it, we need that all governments come to an agreement among them to take the initiative”.14 By which he meant a combination of financial regulations (the deposit of bonds by the borrowing governments - to be forfeited in case of default) and the creation and international enforcement of a code of “public financial law”.15 Although less ambitious than Neymarck, even the officials of the bondholders’ organizations recognized the need for a better solution. Hyde Clarke, secretary of the Council of Foreign Bondholders complained, in 1878, about the abandonment by the Foreign Office of the protection of the interests of British citizens, which could have been achieved at no great cost:

The blockade of a port, the occupation of a custom house until the receipts provided an indemnity, or the arrest of a Government vessel, would, in many cases, put a stop to the proceedings of some of the offenders, and be an example to the others...The mercantile interests of this country are never in favour of war, but they feel sensibly the great disadvantages they are placed under in most parts of the world in contrast with the care shown for the mercantile protection of other countries (Clarke 1878: 334)

Despite his influential position, Hyde Clarke’s ideas were not representative of all the membership of the Corporation of Foreign Bondholders. Indeed, the topic of the relationship that the Corporation should keep with the political authorities had been debated in its original meeting, where the majority had concluded that bondholders’ private interests should not be let to interfere with the general diplomatic relations between countries (Jenks 1927, Ronald 1935).

On a more pragmatic tone, Eugène Lacombe, vice-president of the French bondholders’ association noted that as hardly any foreign bonds were floated outside of four major European countries - Britain, France, Germany, and Belgium - , “It would therefore be enough for these four nations to form an agreement such that all borrowing countries would be obliged to accept the conditions demanded from them”.16

Although different national bondholders’ committees often cooperated, this measure of “agreement” was also never reached.

Two other problems afflicted the workings of foreign bondholders committees, even when supported in permanent organizations: the differing interests of bondholders, brokers, and underwriters, and the potential conflicts with other national committees. As regards the first problem, from a theoretical viewpoint, it does seem strange that the agents (the banks and brokers) should sometimes sit in a

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14 Neymarck (1905: 138).
15 This is another example of the reemergence of similar solutions to persistent problems: cf. the proposal for a new Sovereign Debt Restructuring Mechanism by Krueger (2002).
16 ANPFVE (1900: 39).
majority in the organization set up to protect the interests of the principals (the bondholders), during the settlement of defaulted bonds. This conflict was originally illustrated in the first organization of the British Corporation of Foreign Bondholders, in 1868. The intention to constitute a self-standing organization of bondholders met then with the objections that it might be perceived as thwarting the action of the great financial houses, and that foreign governments might react adversely, again damaging the position of the issue houses. In conformity, the latter had to be co-opted into the Council in a manner that elicited their support and assuaged their mistrust.

In what seems to be a direct consequence of the 1868 power distribution, the British Corporation of Foreign Bondholders was accused, during its first two decades of existence, of yielding too much to the pressure of the issue houses:

> a powerful influence is exercised upon bondholders by the issuing houses, who find it practically impossible to do fresh business with the borrowers while the default lasts, and who are, therefore, naturally anxious that some sort of settlement be arrived at, more especially as settlements of the kind yield substantial pickings in the way of commissions, are frequently followed by new loans (Economist, no. 55 1897: 1624)

In 1898 the Corporation was reorganized by an act of Parliament that took heed of these problems by ruling for a minority of representatives of issue houses in the governing body of the Corporation (Ronald 1935).

It is now interesting to remark that similar hazards and conflicts of interests found different solutions in the organization of the equivalent European bondholders’ organizations. Such differences were so marked that they could have affected the outcome of the ex post governance of sovereign debt, and through it, even the ex ante incentive alignment between prospective borrowers and alternative lenders.

Dutch protective committees emerged as an outgrowth of other organizations – the Kantoren –, originally brokerage associations for the placement of foreign bonds (namely to take care of paperwork). In case of default, the brokers (usually, but not necessarily, the members of the original Kantoor) or the Amsterdam Stock Exchange Association took upon themselves to gather a critical mass of certified bondholders to create a committee, which could credibly negotiate a settlement with the debtor.

Similar preoccupations to those vented about the British Corporation led to the creation of the Vereeniging voor den Effecthandel, in 1876, which accepted as members individual bankers, stockbrokers and their staffs (with businesses in Amsterdam).

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17 This point was appreciated by contemporary writers such as Manchez (1900: 24), Wuarin (1907: 252-53), and Colinet (1913: 309).
18 For accounts of the founding process of the Corporation of Foreign Bondholders see Borchard (1951: 203-11) or Ronald (1935).
19 The statutes of the US Foreign Bondholders Protective Committee would go even further by excluding from its board of directors anyone “who within the five years preceding has had any interest, direct or indirect, in any corporation, company, partnership, bank or association which has sold, or offered for sale any foreign securities” (cit. in Winkler 1933: 174).
20 According to Veenendaal (1996: 82-83) the Dutch investors were the first to widely use these organizations, and the financial reputation they acquired led other countries, namely Britain, to copy their model.
The organization of the French *Association Nationale des Porteurs Français de Valeurs Etrangères*, on the other hand, looks closely under the control of the big French banks, and the privileged stockbrokers at the Parisian *Parquet*. Despite some agitation for the constitution of a similar organization to the Corporation of Foreign Bondholders, private investors were usually content to pressure the Paris *Bourse* in intervening on their behalf. The *Association* was only established, in 1898, by the Paris stockbrokers chamber, under commission of the finance minister. Like its British counterpart until 1898, the French Association attracted criticisms for pressuring bondholders to accept too low settlements, and also (unlike the British organization) for its subservience to the political objectives of the French government. Contrary to the Corporation of Foreign Bondholders, the *Association* didn’t conceal its privileged relations with the French government:

> The relations that it entertains with the public powers don’t make it at all an official institution; it keeps the full and complete independence of its acts... But the *Association* receives from the Government a precious support, an exclusive support. It has been declared that the French interests in arrears abroad will only be considered if they employ the *Association* as intermediary. (ANPFVE 1900: 4)

A conspicuous case of discontent with the *Association* is illustrated by the journalistic agitation against the terms of the 1900 conversion of Spanish foreign debt. The *Association* was blamed for lack of determination in its dealings with the Spanish government and the other national bondholders committees, and for sacrificing the interests of the bondholders to political pressure from the French finance minister (Manchez 1900).

An even more extreme example of banking control is given by pre-war Germany, where issuing banks considered as their responsibility the protection of the interests of their clients, and acted in isolation or organized in special committees. The pressure, namely in the press, for the creation of a similar organization to the British or French associations foundered in the opposition and rivalry of the big issue houses. The only big German bank that consistently promoted the creation of an independent bondholders’ organization was the Deutsche Bank, under the influence of its director Georg Siemens. Between 1875 and 1891, on at least 3 occasions, he tried to interest the German financial system in the project, but to no avail. According to Barth (1995: 102) the blocking opposition came from the Disconto Gesellschaft and the banking house S. Bleichröder, who feared having their interests represented by an organization led by their main rival. Despite the lack of support, Siemens formed in 1890, in partnership with the banker Jacob S. H. Stern from Frankfurt, the *Deutsch-Amerikanische Treuhand-Gesellschaft*, whose purpose was thus described by Siemens:

> The new institute will pay special attention to the representation and protection of the interests of German owners of North American securities. The new institute has its origin in the consideration that an expert and strong representation of German interests in the above mentioned area [the US] is of increasing significance, and that, as in other

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21 About this agitation cf. Lewandowski (1896).

European countries, also in Germany it is convenient to create a standing organization for these purposes.\textsuperscript{23}

The concentration on the American market was associated to the substantial financial interests of the Deutschen Bank in American railways, namely the Northern Pacific Railroad Co. Later, the object of the society was enlarged, with a corresponding change in name to \textit{Deutsche Treuhand-Gesellschaft}. Again in 1898, while explaining to the general assembly of the bank the difficulties in coming to a settlement with the Argentinean provinces, Siemens repeated his opinion about the inferior institutional solution then in practice for the protection of bondholders:

These outcomes have reminded us again of how regrettable it is that our business world has not decided to create an institute corresponding to the English Council of Foreign Bondholders. As of today, the owner of foreign bonds or stock is merely dependent, with respect to the defense of his interests, from the tact and energy of the emission house. If the latter goes out of business, or for some reason behaves passively, so is the former easily subjected to inconsiderate treatment or even exploitation by the borrower.\textsuperscript{24}

Despite its success in coordinating German interests in the restructuring of some foreign securities, the society did not outlive its creator and main enthusiast, in its original purpose. By the early 1900s, the \textit{Deutsche Treuhand} had effectively been converted into an auditing firm.\textsuperscript{25} Moreover, the protection of bondholders' interests through self-standing organizations seems to have been more of a personal project of Siemens that didn't resonate in the wider circles of German banking, or even within the Deutschen Bank itself. Arthur Gwinner, Siemens's successor ahead of the Deutschen Bank seemed to be less prepared to compromise the financial interest of the bank to the protection of individual bondholders. A particularly telling example of this change of strategy is given by the negotiations for the unification of the Turkish debt, in early 1903. The project, supported by the Deutschen Bank and the Banque Imperiale Ottomane met with considerable opposition from the Council of Foreign Bondholders and the administration council of the \textit{Dette Publique Ottomane}.\textsuperscript{26} In order to forestall a possible blocking opposition to the project, Gwinner used the financial network of the Deutschen Bank to prevent the gathering of a German assembly of bondholders of Turkish debt, and even to have his interests represented in the general assembly of the British bondholders. In exchange for a share in the placement or the service of the new debt, he personally contacted several German, French, Dutch, and Italian banks to put pressure on their national bondholders, and also to gather a sufficient amount of bonds with which to endow one or more straw men, who would be present at the general assembly, in the quality of British bondholders, to vote in favor of the project.\textsuperscript{27}

\textsuperscript{23}Cit. in Helfferich (1923: II, 248).
\textsuperscript{24}Deutsche Bank - Geschäftsbericht of 1898.
\textsuperscript{25}It survived until today as the KPMG. Among the successful interventions of the \textit{Deutschen Treuhand} were American railways, Argentinean provincial debts, Spanish bonds, an Italian bank, and a Guatemalan electricity company.
\textsuperscript{26}At stake was the perception that the income saved from the unification would be released to guarantee the investments of the Deutschen Bank in the Baghdad railroad. The British bondholders therefore required as compensation an increase in the interest to be served on the new debt.
\textsuperscript{27}All the process is kept in the historical archive of the Deutschen Bank, files HADB - OR 1301 and HADB - OR 1302.
Finally, Belgium had, since 1898, two bondholders associations – one located in Antwerp, and that largely followed the organization of the British and French equivalents, and another in Brussels that followed the “German” model of only gathering banks involved in the protection of the interests of their clients.\textsuperscript{28}

In face of this evidence, I find it justified to identify three broad categories of bondholders’ protective organizations, which crossed national borders, and changed within countries throughout time. The first was the constitution of \textit{ad hoc} committees to deal with each individual default, the common solution before the creation of permanent organizations, starting in Britain in 1868. The second was the indirect representation of bondholders’ interests by the banks who had issued the foreign securities of the defaulting sovereign, the standard German practice. And, finally, the third would be the model of permanent and independent bondholders’ organizations that could potentially represent all bondholders owning a minimum stake of any foreign securities. For future reference, I will refer to them as \textit{ad hoc}, indirect, and corporation of foreign bondholders’ types of representation, respectively.

As the model of the next section tries to precise, the nature of these institutional arrangements should have impacted upon the outcomes of the renegotiation of sovereign defaults. I believe that a case should be made for the consequences of institutional diversity, over and beyond the synthetic measures of average duration and debt relief computed by Suter (1992).

\textbf{2.2.3 International coordination}

A further implication of institutional diversity is the relevance of the topic of strategic interaction, whenever different types of bondholders’ representation were involved in the negotiation of the same settlement, as was often the case after 1870. The literature again appears to overlook this point. Mauro and Yafeh (2003), based on statements from the reports of the Corporation of Foreign Bondholders, conclude that cooperation between national committees usually prevailed both during the punishing (by blocking the access to international refinancing to defaulting governments), and the renegotiation stages. However, this opinion is hard to square with the evidence, quoted by the authors themselves, about the conflicts of interests between creditors of different nationalities, especially in the case of Latin American countries. These countries often resorted to practices of selective defaulting (usually on all or some of the bonds held by European creditors), without affecting their ability to get new credits, especially in the US. That such schemes were successful is an indication, for the authors, that the “willingness to pay” of these countries was more important than their “ability to pay”, to use Kelly’s (1998) expressions. In other words, trade links and international political relations counted more than bondholders’ coordination. Notice that this later proposition is in agreement with the theoretical results of Bulow and Rogoff (1989).

Even though these are legitimate hypotheses, I don’t think that the argument has been convincingly established for the pre 1914 period. A first remark is that the bulk of the anecdotal evidence comes

\textsuperscript{28}Colinet (1913: 149-50).

\footnotesize{Not surprisingly, there was a complete inversion of positions, with Bleichröder pressing for the convocation of a general assembly of German bondholders. Barth (1995: 208) mentions the supra normal profits of the banking syndicate in the deal, with the banks even buying the old bonds in the market to win from the very generous exchange price.}
from the official statements of the bondholders committees (by which is usually meant the British Corporation of Foreign Bondholders) themselves. Beyond the obvious problem of the selection of information that the Corporation of Foreign Bondholders chose to make public in its reports, there’s still the fact that the materials from the other national bondholders organizations have not been systematically used. A comparative study, founded on the direct archival evidence (and not only on official publications) of the individual default settlements should allow to better grasp the underlying interactions between national committees. This should further our understanding on how important the degree of communication between committees actually was, and how much it affected the efficiency of debt settlements, either by delaying the final agreement, or by precipitating settlements under the threat of separate deals. More can also be learned on the origin of such disputes, be it different portfolio composition (namely in terms of types of securities), different strategies for settlement and compensation of borrowers, or simply, different bondholders’ reserve prices. In fact, plenty of evidence on the impact of conflicts of interests between different committees for the settlement of sovereign defaults, has already been collected in the works of such classic authors as Feis (1930) and Wynne (1951), but also in more recent research, e.g., Aggarwal (1996), Barth (1995), and Schaefer (1993), not to mention numerous monographies dedicated to national cases.

It should also be noticed that it is likely to emerge a relation between the nature of international conflicts of borrowers and the distinct mechanisms of the agency problem alluded above. In particular, one would expect a systematic difference in time horizons between committees dominated by issue houses, and committees where the influence of the latter had been constrained. The formal model below departs from this very insight. This by itself would go a long way in explaining a number of deadlocks and delays, or, at least, to affect the final settlement, depending on whether the best way to model this bargaining process is with incomplete or complete information, respectively.

Aggarwal (1996) chose the latter alternative, allegedly because he “found that actors involved in debt games during the play phase seemed to have an accurate sense of their opponents’ payoffs”.

Aggarwal (1996) also models the debt renegotiation problem as a simultaneous-move normal-form game, while collapsing all intertemporal implications of the players’ choices into a measure of “goodwill”, which he defines as “a summary variable that...serves as a repository for the potential penalties within a round and concern for possible situational change in future periods”.

On the contrary, because I am persuaded of the pervasiveness of the moral hazard and agency problems described above, the model of section 3 will be derived under a dynamic environment of complete but asymmetric information.

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29 Aggarwal (1996: 544). The author also considers that only models of complete information are empirically testable, a point convincingly dismissed by Tomz (2001).

30 Aggarwal (1996: 562). A similar device had been adopted by Lindert and Morton (1989), although, in the latter case, the authors caution that the payoffs of the one-shot game should be seen as lifetime present discounted values of future payoffs.
3 A model of debt recontracting under moral hazard

3.1 General description

In the following I derive a simple model that tries to combine the contributions already existent in
the literature about the impact of different *ex post* mechanisms for renegotiating sovereign debt with
a stylized dynamic framework. Indeed, it is my impression that, despite Kletzer (2003), there is still a
gap between the dynamic constant renegotiation models of Bulow and Rogoff (1989) and Kletzer and
Wright (2000), and the static analysis of the relative merits of collective and unanimous action clauses.

The model has the structure of an infinitely repeated two-stage game with complete but imperfect
information. Asymmetric information leads to a typical problem of moral hazard where the principal
(the bondholders or their representatives) try to create an optimal incentive scheme for the agent, i.e.,
the sovereign state.

Whenever a default occurs, bondholders and the sovereign go over a two-stage process of renego-
tiation. In the first stage, the sovereign makes an unilateral offer of settlement. The likelihood that
bondholders accept this offer depends on the probability that they can form a qualified majority that
goes with the agreement irrespective of any dissenting minority, and also on the type of organizations
created by bondholders to represent them in the negotiations with the sovereign.

In case the offer of settlement is not accepted the game enters in a second “punishment” stage, in
which bondholders boycott the access of the sovereign to international financing until it returns to
the fulfillment of its contractual obligations vis-à-vis its international creditors. The length of the
punishment is endogenous and depends on the underlying parameters of the model. After the end of
a punishment period, the two parties return to their “cooperative” behavior, i.e., bondholders buy the
sovereign’s bonds, and the latter repays them according to the promised schedule. Once a new default
occurs, the play goes back to the two-stage renegotiation.

The rest of the text within this section is organized as follows. Subsection 3.2 describes the determi-
nation of the optimal duration of punishment without settlement. Going up one stage in the game tree,
3.3 and 3.4 are then occupied with the two determinants of acceptance of a settlement - the formation
of a majority, and the types of bondholders’ organizations, respectively. The section ends, in 3.5, with
some empirical implications of the analysis.

3.2 Second stage: regime-switching model

Assume that an agreement could not be found between the sovereign and its several bondholders
for an orderly restructuring of the defaulted bonds. In that case, both parties will suffer costs from
disagreement. These costs have several formulations in the literature, namely, financial embargoes
(Kletzer and Wright 2000), direct sanctions (Bulow and Rogoff 1989), or pure time costs from delay
to reach the ultimate settlement (Kletzer 2003, Eichengreen, Kletzer, and Mody 2003). In my model I
will follow the latter simplified version, but endogeneizing the delay \( t \) by means of a regime-switching

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31 This is precisely the structure of the reputational equilibrium proved by Kletzer and Wright (2000), although I adopt
here a simplified version.
model. In this context, \( t \) will be the optimal duration for the punishment phase derived from the equilibrium strategies of the non-cooperating sovereign and bondholders.

### 3.2.1 Environment

The sovereign country needs to borrow an amount \( I \) per period by selling an equivalent value of its bonds to foreign bondholders. For simplicity, I assume that all debt has maturity of one period and serves an amount \( R \) for interest and repayment of principal.\(^{32}\)

The sovereign’s per period resources are then determined by a production function \( f(I, \theta_t) \) which also depends on the stochastic realization of a parameter \( \theta_t \), which can take either a “high” (\( \theta \)) or a “low” (0) value.\(^{33}\) At the beginning of each period, bondholders and sovereign alike don’t know the value of \( \theta_t \), but it’s common knowledge that the stationary probability mass function of \( \theta_t \) is simply: \( \Pr(\theta_t = 0) = \gamma \). At the end of the period only the sovereign is informed of the value of \( \theta_t \).

If \( \theta_t = 0 \) the sovereign defaults on its contractual debt service \( R \) because \( f(I, 0) - R \) is below a minimum surplus \( \ell \), required by the sovereign. This is equivalent to say that the sovereign enjoys limited liability because of its sovereign immunity.

The sovereign may also choose to default even when \( \theta_t \) has a “high” realization because bondholders cannot ascertain the value of \( \theta_t \). In order to adapt for this typical moral hazard problem, I follow Kletzer and Wright (2000) in assuming that bondholders impose a limited moratorium to new applications for credit by the defaulting sovereign. This so-called regime-switching formulation has the advantage of allowing to derive the punishment duration that is optimal in some sense, and to isolate the basic parameters, which determine it.

### 3.2.2 Equilibrium

Given this setting, it is possible to show that there is a strategy profile which constitutes a sub-game perfect Nash equilibrium of this game. In these strategies, players alternate between “cooperation” and “punishment” phases. In the former they abide by their contractual obligations (i.e. bondholders buy an amount \( I \) of the sovereign’s debt per period, while the sovereign pays a total sum of \( R \) as debt service in interest and repayment of principal). These strategies are:

- for the bondholders
  - start in a punishment phase with payoffs \( f(0, \theta_t) \) for the sovereign, and \( rI \) for the bondholders; where \( r \) is the riskless rate of return on bonds of the bondholders’ country government.\(^{34}\)
  - after \( t \) periods of punishment return to a cooperation phase with payoffs \( f(I, \theta) - R \) and \( R - I \)
  - if the sovereign defaults start a new punishment phase;

- for the sovereign

\(^{32}\)In terms of the timing of the game this implies that the bondholders commit an amount \( I \) at the beginning of each period, in the expectation of receiving \( R \) at the end of the same period.

\(^{33}\)I assume \( f_I > 0, f_\theta > 0 \).

\(^{34}\)I will assume \( R > (1 + r)I \), which is equivalent to say there is a yield premium for foreign sovereign debt.
• repay the interest and principal at the end of each period if \( \theta_t = \theta \)

• default if \( \theta_t = 0 \).

Let \( V^+_s, V^-_s \) be the present discounted value to the sovereign of paying, respectively, defaulting, starting from any time period. Likewise, define \( V^+_b, V^-_b \) as the present discounted value for the bondholders from cooperating, and boycotting the sovereign, respectively. And let \( \beta \) stand for the discount factor.\(^{35}\) By replacing the payoffs under the cooperative and punishment phases I get:

\[
\begin{align*}
V^+_s &= (1 - \gamma) [ f(I, \theta) - R + \beta V^+_s ] + \gamma [ f(I, 0) + \beta V^-_s ] \\
V^-_s &= P (\ell + \beta V^+_s) + (1 - P) \left\{ \frac{\beta - \beta^{t+1}}{1 - \beta} [ (1 - \gamma) f(0, \theta) + \gamma f(0, 0)] + \beta^t V^+_s \right\} \\
V^+_b &= (1 - \gamma) (R - I + \beta V^+_b) + \gamma (-I + \beta V^-_b) \\
V^-_b &= P (A + \beta V^+_b) + (1 - P) \left\{ \frac{\beta - \beta^{t+1}}{1 - \beta} r I + \beta^t V^+_b \right\}
\end{align*}
\]

Because default may also happen in future periods, the expressions for \( V^-_s \) and \( V^-_b \) depend on the probability \( P \) that a settlement will be reached without the need for a punishment phase. In this context, \( A \) is the amount of the settlement proposed by the sovereign, which is defined by \( f(I, 0) - A = \ell \), where \( \ell \) is the minimum consumption level tolerated by the sovereign. By definition, \( R > A \), but \( A > r I \), which implies that a settlement is mutually beneficial for both parties, at least from a one period only perspective.

For the sovereign’s strategies to form an equilibrium, I still need an incentive constraint for the sovereign:

\[
V^+_s \geq (1 - \gamma) [ f(I, \theta) + \beta V^-_s ] + \gamma [ f(I, 0) + \beta V^-_s ]
\]

This basically guarantees that the sovereign will not want to deviate once in a cooperation phase. After replacing (2) into (1) I get:

\[
V^+_s = \mu_I - \frac{(1 - \gamma) R + \gamma \left[ P \ell \beta + (1 - P) \frac{\beta^t - \beta^{t+2}}{1 - \beta} \mu_0 \right]}{1 - \beta (1 - \gamma) - P \gamma \beta^2 - (1 - P) \gamma \beta^{t+2}}
\]

in which \( \mu_I (\mu_0) \) is the expectation of output under cooperation (punishment): \( \mu_I = (1 - \gamma) f(I, \theta) + \gamma f(I, 0) \), and \( \mu_0 = (1 - \gamma) f(0, \theta) + \gamma f(0, 0) \).\(^{36}\) Relative to these two values I will make the reasonable assumption that \( \mu_I - (1 - \gamma) R > 0 \), i.e. that the per-period expected surplus under cooperation is positive - otherwise foreign debt would have no value to the sovereign. Under this condition it is easy to check that \( \frac{\partial V^+_s}{\partial t} < 0 \).

Because the bondholders have an obvious interest in minimizing their costs of punishing the sovereign, the optimal punishment duration \( t^* \) is the smallest value of \( t \) consistent with (5). After replacing (6) into (5), I come to an expression which cannot directly be solved for the value of \( t \).

\(^{35}\)In alternative, if \( \delta \) is the discount rate, \( \beta = \frac{1}{1+\delta} \).

\(^{36}\)This implies \( \mu_I - (1 - \gamma) R \) is the expected per-period surplus of the sovereign under cooperation.
\[
\frac{\mu_I - (1 - \gamma) R + \gamma \left[ P \ell \beta + (1 - P) \frac{\beta^2 - \beta^{t+2}}{1 - \beta^2} \mu_0 \right]}{1 - \beta (1 - \gamma) - P \gamma \beta^2 - (1 - P) \gamma \beta^{t+2}} - \frac{\mu_I + P \beta \ell + (1 - P) \frac{\beta^2 - \beta^{t+2}}{1 - \beta^2} \mu_0}{1 - P \beta^2 - (1 - P) \beta^{t+2}} \geq 0 \quad (7)
\]

However, because the left-hand side is monotonically increasing in \( t \), \( t^* \) is the value for which (7) holds with equality.\(^{37}\) Given that, I can study the sensitivity of this optimal duration of punishment to the several parameters of the model, by implicit differentiation. Table 4 summarizes the signs of the derivatives. The signs of the first four derivatives are intuitive, inasmuch as an increase in the expected per-period surplus in cooperation (i.e. an increase in \( \mu_I \) and/or a decrease in \( R \)) increases the relative cost of the punishment phase to the sovereign, who can then be dissuaded with a smaller duration of punishment. Likewise, an increase in the per-period expected output under punishment (i.e. an increase in \( \mu_0 \) and/or \( \ell \)) requires a longer punishment.

The impact on \( t^* \) of an increase in \( P \) is also positive because a higher probability of settlement increases the expected per period payoff to the sovereign under punishment, what then has to be compensated with a longer duration of punishment. An increase of the probability \( \gamma \) of default in equilibrium has an uncertain impact because of two countervailing effects. On the one hand, it decreases \( \mu_I \), which requires a lower \( t^* \), on the other, it also reduces \( \mu_0 \) implying a higher \( t^* \). The net effect will then depend on how much larger \( \mu_I \) is in relation to \( \mu_0 \). Finally, the undecided sign of the derivative with respect to \( \beta \) has the same interpretation, because a higher \( \beta \) (meaning a lower discount rate \( \delta \)) increases simultaneously the present discounted value of future cooperative payoffs and of present punishment values. This time, the larger \( \mu_I/\mu_0 \), the higher the likelihood of \( t^* \) increasing with \( \beta \).

3.3 First stage: majority formation

I now move up one stage in the game tree to study the conditions for the formation of blocking minorities that, in the absence of pre-established majority and aggregation clauses, may provoke a breakdown in the negotiations between bondholders and the sovereign for a settlement after a default. In this section I will use the following notation: \( x_i \) is the share of the total debt in default owned by bondholder \( i \), \( R \) is the normal debt service (as above), and \( A \) is the amount the sovereign offers as a settlement after default.

As is well described in Kletzer (2003), the formation of a minority of bondholders that can successfully refuse to agree to the settlement proposed by the sovereign, and still receive full repayment can be modelled as a war of attrition. As the payoff of an individual bondholder to join the blocking minority is always greater than accepting the settlement offered by the sovereign, bondholders engage in a competitive process to hold out from this settlement. Bondholders are selected into the two pools depending on their willingness to pay the costs of delaying the settlement (if any).

\(^{37}\) In fact, depending on the parameter values, the root for \( t^* \) may not be positive - apparently a case in which the cost of punishments would be so great for both parties that cooperation would be sustained without ever entering into a punishment phase. I will assume throughout \( t^* > 0 \).
A problem with this class of games is the multiplicity of potential equilibria. Nevertheless, I will follow Kletzer (2003) in concentrating in the (unique) symmetric equilibrium, which involves mixed strategies.

To illustrate the structure of these games start with the simplest case, i.e., only 2 bondholders, who hold shares $x$, and $1 - x$ of the total debt in default. For each bondholder, the cost of delay is $x_i (A - x_j R)$ per period, whereas the gain from outliving his opponent is $x_i R$. Let $p_i$ be the probability bondholder $i$ accepts the settlement. In equilibrium he should be indifferent between holding out a further period and settling, that is:

$$p_j x_i R - (1 - p_j) x_i (A - x_j R) = 0$$

In a symmetric equilibrium, $p_i = p_j = p$, and replacing in (8) I can solve for the equilibrium probability of accepting the settlement: $p^* = \frac{A - x_j R}{A + R (1 - x_j)}$.

Not surprisingly, $p^*$ is increasing with $A$ and is decreasing with $R$ and the share owned by the other bondholder $x_j$.

Suppose now there are $n$ bondholders, $n \geq 2$, and that the maximum size of a successful hold out minority is $x$.

Again concentrating only on the symmetric equilibrium, an individual bondholder will be a member of the minority with probability

$$\Pr \{ \text{at least } (1 - x) n \text{ other bondholders concede} \}$$

Under a symmetric equilibrium, the value of $p$ is common to all $n$ bondholders. Hence, the random variable “number of bondholders who concede” has a binomial distribution. This implies the probability of inclusion in a successful minority is:

$$1 - \sum_{i=0}^{(1-x)n-1} \binom{n}{i} p^i (1-p)^{n-i}$$

Noting that for a sufficiently large $n$, the binomial distribution can be approximated with the normal distribution, (10) can be replaced with $1 - \Phi \left( \frac{(1-x)n - np}{\sqrt{np(1-p)}} \right)$. By similar reasoning, the bondholder will be excluded from the successful minority with probability $\Phi \left( \frac{(1-x)n - np}{\sqrt{np(1-p)}} \right)$. Now, his equilibrium condition is:

$$\left[ 1 - \Phi \left( \frac{(1-x)n - np}{\sqrt{np(1-p)}} \right) \right] R - \Phi \left( \frac{(1-x)n - np}{\sqrt{np(1-p)}} \right) (A - x R) = 0$$

Although (11) can no longer be solved directly for $p$, I can still implicitly establish its relation with the relevant parameters, namely, $R$, $A$, $x$ and $n$. Table 5 summarizes the comparative statics results.

[Table 5 about here.]

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38 By “successful” I mean a minority that can hold out an agreement and be compensated in full by the majority interested in accepting the settlement proposed by the sovereign.

39 A conservative rule for this approximation is that $\min \{ np, n (1 - p) \} \geq 5$. 

17
It is easy to verify that the equilibrium level of \( p^* \) is an increasing function of \( A \), the settlement offered by the sovereign. On the other hand, \( p^* \) varies inversely with \( R \) and \( x \) (the greatest size of the successful minority). The sign of the derivative with respect to \( n \), the number of bondholders, depends on the minimum size of the majority, \( 1 - x \). If \( p^* > 1 - x \) there is a “crowding out” effect of bondholders out of the conceding majority, because the individual probability of accepting the terms of settlement exceeds the required proportion \( 1 - x \). Because of that, a rise in the number of bondholders only aggravates this effect and therefore reduces the equilibrium probability of conceding. If, on the contrary, \( p^* < 1 - x \) to start with, the adding of new bondholders has the converse “crowding in” effect and raises \( p^* \).

In principle, these results should be generalizable to a setting with heterogeneous bondholders. In particular, a negative relation between \( p^* \) and \( n \) should translate into an equivalent relationship between the probability of reaching a settlement and the concentration of bond holdings. *Ceteris paribus*, the higher the concentration of holdings of defaulted bonds the easier it should be to reach a settlement (the higher \( p^* \)).

Finally, I can now precise the value of probability \( P \), used in the previous section. \( P \), which is the probability that at least \((1 - x)n\) bondholders concede is given by:

\[
P = 1 - \sum_{i=0}^{(1-x)n-1} \binom{n}{i} (p^*)^i (1-p^*)^{n-i}
\] (12)

Or, using the normal approximation:

\[
P = 1 - \Phi \left( \frac{(1 - x) n - np^*}{\sqrt{np^* (1 - p^*)}} \right) = \frac{A - xR}{A + R (1 - x)}
\] (13)

where the last identity comes from the equilibrium condition (11).

### 3.4 First stage: bondholders’ organizations

I now turn to the last element in this game - the definition of the maximum size of a hold out minority without impairing the immediate acceptance of the settlement proposed by the sovereign. The organizational structure of the bondholders is now relevant for the result. For sake of simplicity, I will reduce the institutional variation observed in bondholders’ organizations to three ideal types identified in 2.2.2: *ad hoc* representation, indirect representation, and corporations of bondholders.

Moreover, I will also distinguish these three types of organizations in a very stylized fashion. The first two do not provide for any aggregation or collective action clauses, so that the maximum size of a successful minority \( x \) will depend entirely on the opportunity costs from delay, which depend on the optimal \( t^* \) derived in the second section. These costs, however, vary with the relevant discount rate of the bondholders. Because issue banks faced a conflict of interests in the representation of bondholders I will posit that they had a higher discount rate (equivalently: a lower discount factor: \( \beta_b < \beta \)) than

\[40\text{However, above a certain level of concentration, a settlement may be invalidated because of a small numbers problem, as follows. If the smaller bondholder owns a share larger than } x \text{ there is no incentive for any of the other bondholders to compensate him - in other words there cannot be a “successful minority”.}

\[41\text{In the formula I am assuming that } xn \text{ is an integer.} \]
bondholders who form *ad hoc* committees. Bondholders’ corporations are distinguished by the fact that they specify the minimum majority of bondholders required to make any settlement binding to all holders of the defaulted securities under negotiation.\(^{42}\)

In what follows I will abbreviate the three types by: AR (*ad hoc* representation), IR (indirect representation), and CFB (corporation of bondholders). I will also consider three cases:

- AR or IR with all bondholders sharing the same rate of time preference;
- aggregation of bondholders with different types of organization (AR and IR);
- aggregation of bondholders with and without CFB.

### 3.4.1 Case I: AR or IR, with same time preference

In the absence of collective action clauses, the possibility of reaching an immediate settlement is dependent on the trade-off between the costs to the bondholders of delaying the solution to the default and of paying-off in full to a minority of owners of bonds who refuse the renegotiation terms. The settlement will then be reached with no delay when two conditions are met:\(^{43}\)

\[
A - x R > \beta^* (1 - x) R \\
\beta^* x R > A - (1 - x) R
\]

where (14) states that the majority \((1 - x)\) of bondholders prefers to compensate the minority to having to wait, whereas (15) guarantees the interest of the minority in holding out. These two inequalities have solutions \(x < \tilde{x}\), and \(x < 1 - \tilde{x}\), respectively. Whenever \(\tilde{x} = \frac{A/R - \beta^*}{1 - \beta^*} < \frac{1}{2}\), the second condition is redundant, if all bondholders share the same discount rate.\(^{44}\) And the converse applies if \(\tilde{x} > 1/2\).

The only difference between the AR and IR regimes is in the discount rate, which being larger in the latter case implies \(\beta_b < \beta\). Although the partial derivative of \(x\) with respect to \(\beta\) is negative, \(t^*\) is also dependent on \(\beta\), and with an undefined sign. As seen in subsection 3.2.2, if the opportunity cost of punishment in terms of output loss \((\mu_I - \mu_0)\) is sufficiently large, then \(\partial t^*/\partial \beta > 0\). In that case \(\partial x/\partial \beta > 0\), so that an indirect representation system would actually decrease the size of the largest successful minority \(\tilde{x}\).\(^{45}\)

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\(^{42}\)There is a parallel here with the contemporary problem of aggregation of bondholders. Although institutions as the British *Corporation* facilitated that aggregation within each country, membership was not mandatory, and there were certainly British bondholders who were not obliged by the qualified majority rules of the Corporation of Foreign Bondholders. For a similar comment on the French case see Lesueur (2002).

\(^{43}\)These expressions differ from the equivalent conditions in Kletzer (2003) and Eichengreen, Kletzer and Mody (2003), because I posit that, without settlement, bondholders will receive full albeit delayed repayment \((R)\), instead of their share of the proposed settlement \((A)\). This is a consequence of the regime-switching model I used to endogeneize \(t^*\).

\(^{44}\)I will be assuming that \(A/R > \beta^*\).

\(^{45}\)More precisely, the result carries through for a sufficiently small elasticity of \(t^*\) with respect to \(\beta\): \(\frac{\partial t^*}{\partial \beta} < -\frac{1}{\ln \beta}\). Still, this is a reasonable condition for normal discount rates. For instance, if \(\delta = 0.05\), the right hand side of the last expression has a value of 20.5. If the output cost of punishment is not large enough to make \(\partial t^*/\partial \beta > 0\), the contrary result, \(\partial t^*/\partial \beta < 0\) holds.
Now, the results from the previous section imply that, in equilibrium, the aggregate probability of accepting a settlement $P$ depends negatively on $x$. So, the two regimes differ in the probability of settlement (higher under IR than AR), and in the distribution of the value appropriated by the bondholders under a settlement, which is more concentrated in the AR case.

### 3.4.2 Case II: AR vs. IR

I consider the case where the defaulted bonds are held by bondholders with different types of organization. For sake of simplicity, I will start with two classes of bondholders, one with AR, and the other with IR regimes. I also make the crucial assumption that the bondholders play a war of attrition within their class.\(^{46}\)

The usual condition for the formation of a majority applies to both classes:

$$x < \hat{x} = \frac{A/R - \beta^*}{1 - \beta^*}$$  \hspace{1cm} (16)

$$x < \bar{x}_b = \frac{A/R - \beta^*_b}{1 - \beta^*_b}$$  \hspace{1cm} (17)

In the previous subsection I argued that there was a reasonable expectation that $\bar{x}_b < \hat{x}$. The consequences of the aggregation of these two classes of bondholders can be readily understood from Figure 1.

[Figure 1 about here.]

Only if the share of bondholders under an AR regime exceeds $1 - \hat{x}$ will these bondholders be willing to form a majority to accept the settlement and pay out the remaining minority share of $\hat{x}$. Similarly, only if the bondholders with AR do not exceed a fraction of $\bar{x}_b$ will the IR bondholders agree to compensate them and form their own majority. For any distribution of bondholders in which the share of AR lies between $\bar{x}_b$ and $1 - \hat{x}$ no class of bondholders will have interest in leading the renegotiation towards a settlement.\(^{47}\)

This result can be interpreted in the sense that a settlement is harder to reach when bondholders are split into different types of organizations. Now, the probability of reaching a settlement, $P$, depends on the actual distribution of bondholders among classes:

$$P = \frac{A - \bar{x}_b R}{A + R - \bar{x}_b R} \left[1 - F(1 - \bar{x}_b)\right] + \frac{A - \bar{x}_b R}{A + R - \bar{x}_b R} F(\bar{x}_b)$$ \hspace{1cm} (18)

where $F(\cdot)$ is the c.d.f. of some distribution of the share of bondholders with AR. This share cannot, however, be considered purely random, because it was partly determined by the choice of the issue markets by the sovereign.\(^{48}\) In other words, the sovereign would have interest in either placing all of its

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\(^{46}\)Otherwise the game would fall into a war of attrition between players with different time preferences, which has the trivial equilibrium where players with higher discount rate always concede.

\(^{47}\)The Figure was drawn under the assumption that both $\hat{x}$ and $\bar{x}_b$ were lower than $1/2$, which is reasonable, since they represent the maximum size of minorities. If only $\hat{x} > 1/2$ then the share with no settlement is reduced. If $\bar{x}_b > 1/2$ there will be no such share.

\(^{48}\)Naturally, bondholders could use the secondary market to redistribute the bonds issued according to their preferences, not the sovereign’s. Indeed, contemporary literature frequently mentions these operations of “international arbitrage”. See, among many, Clarke (1878), ANPFVE (1900), and Marx (1913).
debt with the same class of bondholders, or then, to distribute it in such a way that the share owned by AR bondholders would either be below $\hat{x}_b$ or above $1 - \hat{x}$. Equalitarian distributions across classes would therefore be perceived as disadvantageous \textit{ex ante}.\footnote{Notice that this probability $P$ is smaller than the probability of reaching a settlement under IR, although it may be greater than the corresponding probability under AR.}

### 3.4.3 Case III: corporations of bondholders

The main departure from the two previous cases comes from the bondholders’ corporation ability to define a qualified majority ($q$) necessary to make any negotiations with the sovereign binding for all bondholders.

The outcome will then only materially differ if $q < 1 - \hat{x}$, i.e., if the prescribed majority is lower than the minimum share of bondholders necessary to carry out a settlement without binding majorities.

Relative to case II, this would more likely be relevant if bondholders under a CFB were paired with IR, than if they had to deal with AR representatives - given that the minimum size of the voluntary majority is expected to be larger in the former than in the latter regime.

Eichengreen, Kletzer, and Mody (2003) correctly identify a moral hazard problem, coming from the impact on \textit{ex ante} incentives of a relatively greater ease at reaching a settlement after default. The regime-switching model under moral hazard I outlined in the second section is formally similar to the authors’ discussion, except for endogeneizing the time of delay. However, at this stage, I derive no implications for bond spreads. At best, I can make two remarks.

The undefined sign of the derivative of $t^*$ with respect to the probability of default $\gamma$ seems to echo the authors’ result that “deteriorating fundamentals can either increase or decrease the return difference between bonds issued with or without CACs, depending on the distribution of private information and expected costs of delay under UACs” (p. 42). In the model this relation comes in two steps. First, deteriorating fundamentals (a rise in $\gamma$) have an uncertain effect upon costs of delay ($t^*$). Second, CFB only increases the probability of settlement if, when paired with another form of organization, it requires a majority $q < 1 - \hat{x}$. Hence, individual bondholders, by joining a CFB may be increasing the probability to settle a default driven by a rise in $\gamma$, which actually reduced $t^*$. If that were to be the case, bondholders under AR or IR could fare better since the costs of delay were lower.

The evidence reported by Mauro, Sussman and Yafeh (2002) points to a substantial convergence in yield spreads just before 1914. In that sense, it may make more sense to tell a story about credit rationing than yield spreads. Still, the evidence of these authors should be taken with care, because all bonds in their sample were issued in London, and hence, all under a CFB regime. A more promising way of settling this question may be to compare yield spreads between bonds issued, say, in London (under CFB) and Berlin (IR). And, if it is the case that a convergence of yields was also observed between these two classes of bonds, to inquire into the changes in the composition of the portfolio at the markets with different bondholders regimes. For instance, it would be interesting to relate the stylized fact about British divestment from European applications, since the 1880s (taken over by France and Germany), to the structure of its financial institutions, in general, and bondholders’
organizations, in particular. If I am to assume that European applications were subject to worse fundamentals (higher $\gamma$), this portfolio restructuring would be materially identical to the higher yields of bonds issued with CACs, as predicted by Eichengreen, Kletzer, and Mody (2003). That is to say, in a market that provided easier conditions for renegotiation of defaulted debt, bad debtors tended to be rationed out - because of problems of moral hazard -, either by higher yields (and, hence, lower effective capital calls), or simple quantity rationing, as since the 1880s.

3.5 Empirical implications

Before moving to the empirical part of the paper, I would like to recapitulate the main predictions, which are borne out by the model, and that can be tested with the data I gathered. There are four groups of such predictions.

1. Bondholders’ organizations should make a difference for the duration of renegotiation, with shorter delays allowed by CFB and IR than AR. And the more so the lower the qualified majorities $q$ required by CFB, or the larger financial interests in the defaulting sovereign from the banks representing bondholders under IR.

2. Settlements agreed simultaneously with different types of bondholders’ organizations should be less frequent or involve longer delays, then when dealt with bondholders under the same regime.

3. When settlements were achieved without the intervention of a CFB, the share of bondholders holding out should be larger under AR than IR.

4. The delay that ensues after the break off of preliminary negotiations for a settlement ($t^*$, in the model) should vary positively with the amount in arrears ($R$), and also with the losses to the sovereign from staying out of the international capital market ($\mu_I - \mu_0$). Naturally, it is not clear how to measure these counterfactual losses. Nevertheless, the model also predicts that the reaction of $t^*$ to fundamentals ($\gamma$) and bargainers’ impatience ($\beta$) will depend on the degree of these losses.

4 Empirical results

4.1 Outline

In order to explore some of the empirical implications of the simple theoretical framework I derived previously, I propose to estimate a random effects panel data model for the renegotiation of sovereign defaults. I will concentrate on the study of the determinants of the duration of defaults ($t^*$), because that is the dimension of the renegotiation outcomes which is more clearly identified from the framework. In the above formulation, the actual terms of settlement ($A/R$) are exogenous, which is a convenient modelling simplification at this stage, but clearly does not conform to the historical evidence. Nevertheless, I will adjust the panel data model taking both the duration of defaults and a measure of the terms of settlement as dependent variables.
As a complementary step, I also estimate an unobserved effects probit model for the probability of default of each country in each year in the sample. This estimation has the further advantage of extending the previous results by Suter (1990) to an earlier time period, and the estimates of Flandreau and Zumer (2004) to a larger sample of countries.

Finally, in order to explore the possible implications of different institutional settings in the supply markets for the distribution of foreign investment, I also compare the determinants of British and German capital exports in the 1883-1913 period. The comparison of these two markets is relevant in that they had the most different set of institutions for the protection of bondholders, based on CFB and IR institutions, respectively. Naturally, the British and German capital markets differed in many other respects, which implies an obvious problem of identification. Indeed, the hypothesis that German and British capital flows differed in some way related to their financial institutions is hard to test directly with essentially only two data points. Nevertheless, the evidence presented in subsection 4.4 is interesting in of itself, because it speaks to the classical dichotomy between “developmental” and “revenue” finance of Fishlow (1985).

4.2 Definition of the sample

According to Appendix A of Suter (1990) 27 countries defaulted between 1820 and 1913, adding up to a total of 72 episodes. I will follow this author’s broad definition of a default episode, which includes partial or total default on amortization quotas or interest (or both), and outright repudiation. This means that voluntary operations of conversion of old securities into lower coupon bonds are not included in this definition, even though they had a negative impact on the bondholders’ returns. Moreover, this definition only includes debentures issued by governments or state corporations (e.g. regional or municipal governments), despite the fact that formally private stock or debt was often floated under government guaranty, or taken over by the government in case of insolvency.

Table 6 summarizes a number of descriptive characteristics of these countries, namely, geographic region, number of defaults, whether these countries suffered an international intervention after a default, and the types of bondholders’ organizations with which they had to negotiate settlements.

[Table 6 about here.]

This simple enumeration suggests some patterns: the concentration of defaults from Latin American countries (17 countries and 53 episodes), the relative infrequency of default episodes (the median is 2) and of foreign interventions (occurring in slightly more than a third of counties, but only in 1/9 of default episodes), and the ubiquity of CFB organizations in the negotiation of settlements. In fact, the last pattern may partly be a proxy for the omnipresence of British investment interests throughout the period, at least until the late 1890s, when other similar bondholders’ protection organizations were created in France and Belgium.\footnote{To be more precise, the British Corporation of Foreign Bondholders was founded in 1868, while there were only 28 default episodes before this date. Likewise, between this date and 1898 (when the French and Belgium organizations were created) only the Dutch bondholders had followed the British example in creating a permanent bondholders’ organization.}
In constructing a sample I was limited by the availability of data regarding the covariates used in the empirical models. Moreover, because the relevant data is only available for a very small number of countries prior to 1870, I reduced the sampling period to the interval 1870-1913. Conditional upon these limitations, I then included all countries for which data was available and that enjoyed sovereign status for at least a fraction of the sample period. The outcome was a sample of 37 countries, 18 of which defaulted on their foreign liabilities during the period under research. The overall significance of this sample can be approximated by its share in the stock of world sovereign debt. According to Nash (1899) and United Nations (1946), the share of these countries was stable at 95% in 1888, and in 1913-14.

I should add that, despite the loss of almost 40% of the default episodes implied by this time constraint, the choice of 1870 as a breakpoint does make sense in terms of the object at hand, namely, the study of institutional variation in bondholders’ protection. Indeed, the first CFB-type organizations emerged in the 1870s, while German foreign investments only acquired an international standing since the 1880s, thereby increasing the frequency of IR representation in the renegotiation of default settlements.

Table 7 compares the characteristics of the sub-sample of defaulting countries with the population of defaulters.

Although I will take it as representative, I am aware that some of the sub-sample’s characteristics imply that the selection process was not purely random. In looking for those countries with data, I implicitly selected against small countries, with no organized statistical apparatus, as can be inferred from the very low share of the debt in default accounted by the 9 countries out of the sample. Likewise, the high percentage of creditors’ interventions within the sample may also indicate a systematic bias into selecting countries for which data was collected under the requirement of the creditors themselves.

As for the non-defaulters, they form a relatively broad sample, both in terms of their position in the international capital market, and their geographical location (with the exception of Africa). The 19 countries include the core lenders Britain, France, and Germany, smaller lenders, as Belgium and the British Corporation, after its inception was only absent from the negotiation of one settlement involving British interests—the Brazilian default of 1898.

This period is also the one with the largest concentration of defaults: 33 overall. Finally, as far as I could ascertain, the British Corporation, after its inception was only absent from the negotiation of one settlement involving British interests—the Brazilian default of 1898.

The latter provision excluded countries like India, Indonesia, or the Philippines.

To be more precise, Austria-Hungary, Ecuador, and Greece were already in default in 1870. I included the first two episodes in the sample reporting all the relevant variables to 1870. I left out Greece because I could not find information for all the covariates with respect to the full default period 1826-79. Moreover, this default episode had a strong political character, since it referred to debt guaranteed by the European powers. Moreover, during the official default period Greece was able to float new loans.

The breakdown was 21.6% for defaulters and 73.4% for non-defaulters, in 1888, and 25.2% and 69.7% in 1913-14. I am thinking of such cases as the foreign debt administrations in Egypt, Greece, Tunisia, and the Ottoman Empire. Still, this is probably a more muted point, namely because, according to Suter (1990), the late decades of the 19th century and the early 20th are a period of increased “core rivalry”, by opposition to the undisputed British dominance until then. In such circumstances it would naturally follow a more heavy-handed treatment of defaults by major lending nations.
Netherlands, and the main non-defaulting borrowing countries.\textsuperscript{55} Table 8 provides the breakdown of the sample by geographical regions.

[Table 8 about here.]

4.3 Empirical specifications

4.3.1 Random effects probit

I begin by estimating the following panel data random effects probit:

\[ P(y_{it} = 1| x_{it}, c_i) = \Phi(x_{it} + c_i) \] (19)

or, in the latent variable form:

\[ y_{it}^* = x_{it}\beta + v_i, \quad y_{it} = 1 \{ y_{it}^* > 0 \} \] (20)

where \( y_{it} = 1 \) if country \( i \) is in default in year \( t \), and the composite error \( v_{it} = c_i + u_{it} \) is such that both the unobserved effect \( c_i \) and the idiosyncratic error \( u_{it} \) are orthogonal to \( x_{it} \). Although this method imposes some more stringent assumptions on the structure of the errors, I chose it here because I include some time-unchanging covariates in \( x_{it} \).

The vectors \( x_{it} \) include four types of covariates. The first are location fixed effects, i.e., country and region dummies, where the region variable is coded as in Table 8. The inclusion of such variables is common, and serves the purpose of controlling for specific unobservables related to each country or its region. With respect to the variable region, I tried to code it from simple geographic units, i.e., without imposing information on what we know of the regional pattern of defaults.\textsuperscript{56}

The second group of variables represents domestic political conditions that might affect the likelihood of a default. One variable, coded as a dummy, takes the value of one in case of the occurrence of wars or other major domestic political disturbances. This variable was coded based on the compilation of Kohn (1986).\textsuperscript{57} Another dummy represents political dependency. It takes the value of one if the country is submitted to any form of political dependency (colony, or protectorate) at each date in the period covered.\textsuperscript{58}

A third group of variables represents the country’s “fundamentals” in each year. Following Suter (1990), Flandreau (1998) and Flandreau and Zumer (2004), I used alternatively the ratios exports/...
population and interest service of debt/total government revenue. Contrary to the authors cited, I homogenized the first ratio across countries by converting the value of exports into pounds sterling. This implies that any exchange rate shocks are already absorbed by this variable, which then measures more accurately the access of the country to foreign exchange.\textsuperscript{59} Because of an obvious endogeneity problem, I measure the second ratio as its value lagged by one year, i.e. just before the default.

In the estimation, I chose not to include the two ratios simultaneously because they tend to be highly collinear for the majority of countries.\textsuperscript{60} Moreover, up to now, I have information for the second ratio before 1880 only for seven countries, so that the model with the second ratio is actually estimated for the period 1880-1913 only. In future developments of this project I intend to extend the data coverage for this type of variables in terms of time length, and also to include other indicators. Among such indicators would be measures of central bank liquidity (reserves/banknotes), economic growth, external shocks (as in Blattman, Hwang and Williamson 2004), or polity measures.

Finally, I add year effects as an attempt to control for Suter’s (1990) “global debt cycles”.

The results are summarized in Table 9 for several alternative specifications. Overall, the results are consistent with intuition, and the similar exercise by Flandreau and Zumer (2004). Domestic political instability tend to have a positive and significant impact on the probability of default in a given year, whereas a better level of fundamentals dampens that probability. However, the results with respect to fundamentals are weaker when measured by the ratio service/revenue, only significant in the first regression (without fixed effects).

\[\text{Table 9 about here.}\]

Notice also that the coefficient on the variable dependency cannot be estimated with sufficient precision.

### 4.3.2 Random effects panel

In order to study the determinants of default renegotiations, I adjusted the following linear random effects panel regression:

\[s_{it} = z_{it} \alpha + w_{it}\]  \hspace{1cm} (21)

where again \(w_{it}\) is a composite error term orthogonal to the covariates in each vector \(z_{i}\). To spare on degrees of freedom, I only retain the region fixed effects. Other than that \(z_{i}\) also includes groups of political and economic variables, together with a new group of institutional variables. The first of these is formed by the same indicator function for wars and other political disturbances, and by another indicator for foreign intervention after a default. Events as the English de facto occupation of Egypt after 1882, or the introduction of an autonomous administration of the fiscal monopolies in 1895, in Serbia, are coded as 1 in this variable.

\textsuperscript{59}The authors quoted measure the ratio in national units of account, but add a covariate for exchange rate volatility.
\textsuperscript{60}Especially among the countries with better growth performance, which is not surprising. Economic growth, if accompanied by export growth will increase the first ratio, while reducing the second through increase in revenue. Hence the two ratios should be negatively correlated, as is indeed the case.
Economic fundamentals are now represented by the average rate of recovery of the export/population ratio during the default period, and also by the amount in arrears before the settlement. The latter is added to test explicitly for one of the predictions of the model in section 3: that the higher the amount in arrears the longer the period in default.

Also directly related to the predictions of the theoretical analysis are a group of variables that represent the institutional environment of the debt renegotiations. There are three such variables: the shares of the total debt defaulted owned by bondholders represented through their banks (IR) or a permanent organization (CFB), as well a dummy variable for the interaction of different bondholders’ organizations in the negotiation of the same default case. The values for these variables were collected from a variety of sources that includes the reports of bondholders’ organizations (especially the British Corporation), contemporary literature, and a number of recent studies.

Finally, I also include a reputation variable, to capture the effects of market’s memory on the terms of settlement. Flandreau and Zumer (2004) and Tomz (2001) alike emphasize the relevance of reputation formation in the sovereign debt market during this period. This variable is measured as the number of years (if any) since the last default by the country.

As mentioned in 4.1, this model is estimated with the dependent variable $s_{ikt}$ representing alternatively the length of default (in years), and the actual terms of settlement. To capture the latter I opted for a synthetic measure that departs from the practice of the literature of considering separately the partial dimensions of the same financial deal. That is, instead of measuring separately the capitalization rate of arrears, the change in interest and/or amortization rates, and the reduction in the principal outstanding, I combine all of these by calculating the internal rates of return (IRR) earned by the bondholders before the default and after the settlement. In the regressions, this variable is actually measured by the ratio IRR after/ IRR before. There are several advantages to this choice. First, it provides a more accurate and comprehensive measure of debt relief for the sovereign than each of the four separate partial measures mentioned above. And I guess there is no doubt that these were the actual calculations done by the bondholders and their representatives at the time. Secondly, these internal rates of return vary across different bonds, which allow me to expand the sample size from the number of default episodes to the number of defaulted bonds. In other words, the relevant observation in this version of the model $s_{ikt}$ is not the default episode of country $i$ in year $t$, but the combination default country $i$ - bond $k$ -year $t$. A final advantage has to do with the simplistic way in which the partial information is sometimes interpreted. Oftentimes, inferences are directly made from the reductions in interest and/or principal, without taking into consideration the new and old amortization conditions, or any special clauses about increasing interest schedules, new capital issued without interest, or delayed amortization plans. The implicit assumption in such practice seems to be

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61 Again for obvious endogeneity problems, I cannot define the first variable in terms of the ratio debt service/revenue.
62 Notice that, to avoid redundancy, the share of the debt owned by bondholders represented by ad hoc committees (AR) is dropped.
63 That is, if $c$ is the nominal coupon rate, $a$ the sinking fund quota, $K_0$ the initial (effective) capital, and $n$ the maturity of the loan (in semesters), the IRR $\tau$ solves the equation: $K_0 = \sum_{t=0}^{n} (c + a)(1 + \tau)^{-t}$.
64 As an example, the 1893 Arreglo Romero of the Argentinean default included provisions for the settlement of 14 defaulted bonds.
that all debt would be perpetual, in which case the yield would only depend on the coupon and the emission price. However, from the information I have so far gathered, this was more the exception than the rule, in particular for recurrent defaulters, which could only get money through amortizable loans, often with fast sinking funds.65

Unfortunately, this last advantage is also a catch because the reconstruction of the amortization and service plans of each loan under the pre-default and post-settlement conditions involves a considerable amount of research. The relevant data is to be found in the reports of bondholders’ organizations (above all in the comprehensive reports of the British Council of Foreign Bondholders), and in numerous contemporary or recent monographies on each national case. Because I am still in the process of collecting the data, the results of the estimation are conditional on the compilation of further data. As of today, they refer to the settlement of 50 bonds defaulted on by 10 countries: Argentina, Colombia, Ecuador, Egypt, Guatemala, Mexico, Peru, Portugal, Turkey, and Uruguay.

Table 10 contains the results for both variants of the model. The first two specifications were adjusted for the duration of default as the independent variable, the last two for the ratio of IRR after/IRR before.

[Table 10 about here.]

Starting with the former, as expected, the coefficients associated to the variables intervention, recovery (of fundamentals), CFB and IR organizations have a negative and statistically significant impact on the duration of the defaults. In particular, the marginal effect of increasing the share of debt represented by a CFB by 1 percentage point would be a reduction of something between 5 and 6 months to the duration of default, relative to the case where that share would be represented by an AR organization (the omitted category). The quantitative impact of IR organizations is similar. This is coherent with the predictions of the model in section 3. The presence of different types of bondholders organizations also seems to have increased the duration of defaults, although the coefficient was not estimated with enough precision. Contrary to expected, the coefficient on arrears is negative, although not significant. Also counterintuitive is the negative impact of contemporaneous political unrest on the duration of default, but the result is again not significant. Finally, the effect of memory seems to have been also negative, albeit only marginally significant in the estimation without fixed regional effects. This is consistent with the casual intuition that the further away the memory of a previous default, the less adamant would be the bondholders in prolonging the negotiations or the punishment of the defaulter in the expectation of imposing a harsher deal.

The first observation on the second set of regressions is the inclusion of an extra covariate, the old rate of return on each bond defaulted on. I included this variable to control for the fact that whenever the pre-default IRR was already very low (e.g. if the result of a previous settlement) the new settlement typically fixed a “high” ratio for the new IRR. In these cases, the relatively small sacrifice for the bondholders was not a consequence of a significant improvement in the debtor’s ability to pay, but an

65To be sure, not all literature follows this practice. Lindert and Morton (1989), as well as Eichengreen and Portes (1989) also calculate effective yields.
extra deduction from an already meagre rate of return. Moreover, because when adjusted by a random effects panel the share of variance due to unobservables was not significantly different from zero, and hence, the results didn’t differ materially from pooled OLS, I am only reporting the latter estimates. The results are again only partially coherent with what one would expect. Almost all estimates have the expected sign - the exceptions are the indicator for political disturbances, and the rate of recovery of fundamentals during the default period. Nevertheless, the former result might be due to the association between local political disturbances and foreign intervention, so that this coefficient might be capturing the mixed effect of both types of political events. CFB and AR organizations have a positive effect on the settlements the bondholders could extract from the defaulting sovereigns, but only marginally significant in the latter case. Likewise, the interaction of different types of bondholders organizations might have induced worse terms. Memory, finally, seems to have been a significant consideration in the bondholders’ resolve to defend their contractual rights. All things considered, these results are still subject to improvement with the increase in the sample size. This will involve an obvious gain in terms of the decrease in the standard errors of the estimators, although it is not clear whether the size, and especially, the magnitude of the coefficients will remain unchanged. As such, they are better left without too much interpretation at this stage.

4.4 *Ex ante* implications - British vs. German capital

On a broader perspective, the comparative study of the organization of the national bondholders committees should help to provide a better understanding of the stylized facts about the history of European capital flows and security markets mentioned in the Introduction. The different ways by which the same information asymmetry was translated into distinct agency relations may shed light on the patterns of capital flows, and also on the timing of the rise of the two international securities markets (Paris and Berlin) that operated under a substantially different mechanism than the British.

For instance, a greater concentration of market power in the continental banking systems, in the context of “relationship banking”, might help explain the larger commitment to sovereign debt instruments, compared to the British capital market. French or German issue banks, which, contrary to the specialized London institutions, used a widespread branching to tap from a vast savings pool, would arguably be in better position to mount great underwriting operations for foreign governments. Another point would be to investigate whether the variation between the three solutions for bondholders’ protection, in terms of their renegotiation- or borrower-friendliness, could have affected the *ex ante* choice of placement markets by the sovereigns.

At the present stage of this project, I am not yet prepared to integrate the two sides (*ex ante* and *ex post*) of the story, namely for want of data. Indeed, a problem with testing the impact of

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66 The standard errors reported are robust, and clustered for each country.
67 The intervention variable was dropped from the fourth regression because of collinearity.
68 I’m thinking of cases where a successful foreign intervention led to a political backlash. Egypt may be a case in point.
69 I now took IR as the omitted category, given the expectation that settlements negotiated by the issue banks would be less advantageous to their clients, although faster to reach.
institutional diversity on market outcomes is that it requires an institutional diverse database. Up to recently, the only fully disaggregated database of European capital exports before 1914 available was that published by Stone (1999), based on the effective capital calls of foreign securities traded in the London stock exchange. This information has been used in the literature to characterize the pattern of “British” capital exports. Clemens and Williamson (2002), in particular, use this data to argue that the pattern of British foreign investment exhibits a “wealth bias” , because it is mainly explained by such fundamentals as the levels of schooling, natural resources, and the demographic structure of the recipient countries. This result fits with Fishlow’s (1985) characterization of British investment as mainly “developmental”.

This might be so, but I find the statistical evidence insufficient to sustain such a claim. First, Clemens and Williamson (2002) fail to acknowledge that a substantial part of officially “British” capital calls were actually applications of Continental money that sought the London market, especially before the rise, between the late 1870s and the 1880s, of Paris and Berlin as major competing centers for the international distribution of European capital. In this sense, it is dubious whether the results actually characterize a “British” pattern of investment, by contrast to a “Continental” pattern. A suggestive, albeit crude, way of quantifying this problem would be to compare Table 2’s estimates of the stock of foreign investments of each country with the cumulated balances of their current accounts. The estimates of Table 2 are typically based on the information about foreign securities listed in the main stock exchanges, complemented with data on direct investment in foreign business enterprises. I would therefore expect to find a ratio between cumulated current accounts and stock of foreign investment above 1, for countries such as Belgium and the Netherlands. Even considering the omissions in the estimates of the stock of investment, and the imprecision of current accounts numbers, such a result would be consistent with the flow of capital from these countries through financial centers as London, Berlin, and Paris. Unfortunately, I have not yet found the relevant statistics for Belgium and the Netherlands, so that this part of the argument will be pending on further research.70

Second, as the authors acknowledge themselves, they could not replicate their results for German or French investment abroad, for lack of a comparable disaggregation to Stone’s (1999). Short of dismissing Continental European investment as “revenue”, I would like to replicate Clemens and Williamson’s (2002) methodology to a disaggregation of French and German foreign capital applications. But for the time being, I will present here a preliminary exploration of the data on German capital exports, which I compiled for the period 1883-1913. As an organizing principle, I will follow a close methodology, and use a similar sample of countries as Clemens and Williamson (2002). From this exercise I will try to draw inferences on the similarities or differences between the “British” and the “German” patterns of capital export. But first, a brief description of the construction of the German data.

70From the data I do have, for Germany, France, and the UK, I found two interesting results: a ratio significantly lower than 1 for France, but only until 1885; and a dramatic reduction in the ratio for Germany, from well above 1 to less than 1, also around the mid 1880s, and lasting until 1913. I used the current account data from Jones & Obstfeld (2001).
4.4.1 Sources on German capital exports

There are three main sources from which to reconstruct the flows of German capital to foreign applications. The first one is the returns of the German stamp and securities tax (Effektenstempelsteuer), which was levied on every foreign security sold or held in Germany. Although contemporaries considered this to be the nearest measure of “the exact amount and the precise time of capital investment” (Marx 1913: 60), as any tax data, we have to take into account the possibility of tax evasion. Moreover, this information is only available for a fraction of my research period, which led me to combine it with the two other pieces of information.\(^{71}\)

Because of renewed worries about the “drain” of German capital to foreign applications, government authorities also became interested in the estimation of capital exports, providing some very useful compilations of securities floated, along with extensive discussions about the reliability of the alternative statistical compilations available.\(^{72}\). One of the outcomes of the Börse-Enquête was the creation, for each German exchange, of a government representative (the Reichskommissar), and of a committee of experts responsible for approving the listing of new securities on the “official market” of each exchange (Zulassungsstelle). These two public instances shared some of the responsibilities of the present-day SEC, and were responsible for keeping and publishing a full list of all new securities listed in each year in all German exchanges. Contrary to Britain and France, the German foreign capital market cannot be reduced to Berlin. Based on the stamp tax data, in the period 1882-1892, I could calculate that Frankfurt and Hamburg absorbed 11.6% and 6%, respectively, of the total market for foreign securities. Moreover, there is a distinct pattern of geographic specialization. More than half of total German investment in Scandinavia was arranged via Hamburg, whereas Frankfurt dedicated almost half of its investments to Southern European applications. Finally, almost all of overseas investment was negotiated in Berlin. For this reason, I used the information on the foreign securities listed in the markets of Berlin, Frankfurt, and Hamburg. Despite its comprehensiveness, this Zulassungsstatistik is only partially helpful. One of its problems is that it only includes the official segment of the market, and not the curb (what Germans symptomatically called the “free market”). Nevertheless, this is also a problem with Stone’s (1999) data for London. Secondly, new emissions were usually listed for their full amount, without distinguishing the share (if any) actually sold in Germany.

In order to recover the German share of the effective capital calls, I draw extensively, as Stone (1999) and his predecessors Leland Jenks and Matthew Simon, on the financial press of the time, which published at regular intervals the return of foreign securities floated at German stock exchanges, as well as estimates of the effective capital calls. The prominent sources of this type are the weekly Deutsche Ökonomist, and the daily Frankfurter Zeitung. There is a fair amount of disagreement

\(^{71}\)Contemporaries also complained often about the reluctance of the Imperial tax administration to publish the data on this tax. See Eberstadt (1901), or the regular protests on the pages of the Deutschen Ökonomist. The statistical administration eventually gave way, but only since 1911. Before that, the only information on stamp tax returns I could find was compiled for the Börse-Enquête of 1893. It covers the period 1882-92, but unfortunately aggregating all the data, thereby forfeiting the time dimension.

\(^{72}\)The two main official sources of information are the Börse-Enquête (1893), and the Bankenquête (1910)
between this two publications. But, I chose to follow, whenever possible, the first over the second source for a couple of reasons. First, it is the most consistent of the two, and was published every semester since 1883, which may imply that the sources of measurement error remain relatively constant throughout. Second, Wilhelm Christians, the editor of the Deutsche Ökonomin aimed at including all foreign securities sold in Germany, whereas the Frankfurter Zeitung only published estimates on foreign government and mortgage bonds (Pfandbriefe).

Because the financial press usually only gathered the value of securities floated in the official stock exchange market, I also tried to complete the time series of German capital export with other sources of information on foreign direct investment. It was often the case that a direct investment abroad by a German corporation did not give rise to the listing of a security in a German exchange, or then the security only started to be started some time after the original flow of funds. Likewise, many colonial enterprises did not issue securities in German exchanges, or only went public after some time. The main sources I used to try and breach this gap were the 1914-15 edition of the Saling’s Börsen-Papiere, a very detailed investment handbook, the book by Otto (1911) on the foreign investments of big German banks, and the colonial investment handbook of Hellmann (1914).

The current status of my disaggregation of German capital exports can be summarized in a few figures. Between 1883 and 1913, 994 securities were sold in Germany, which represented 15.21 billion Marks (£760 million) net invested in 55 foreign countries. Of these, at least 115 were not originally sold in Germany, and from the remaining I could not identify the German share of the placement for 88. The sample, which I will take as reference for the “German” pattern of capital exports, is therefore composed of 791 securities, worth 13.69 billion Marks in effective capital calls. The second and third columns of Table 11 compare the distribution of these flows by region and sector, with the equivalent data for Britain. Broadly speaking, these figures confirm the well-known differences between the composition of the stock of “British” and “Continental” foreign investment in 1913. German capital had a disproportionate concentration in European applications, compared to the British preference for the recent settlement regions. Government debentures attracted more German than British investors, while the latter bought a higher share of industrial securities. Nonetheless, the share of railroad and financial investments (a part of the “developmental” concept in Fishlow) is very similar in the two cases. Finally, a much smaller share of German foreign investment was directed to the colonies than

73 The official opinion inclusively changed mind on the worth of the two. The report of the Börsen-Enquête, wrote by Gustav v. Schmoller in 1893, praised the data of the Deutsche Ökonomin. The members of the 1908 Bankenquete, on the other hand, although understanding that both sources were incomplete, considered the figures of the Frankfurter Zeitung to be closer to the truth (US National Monetary Commission 1910: 478-79).

74 To have an idea of the significance of this addition, the off-the-market investment compiled from these three sources represents 12% of the total nominal capital value of our sample.

75 Admittedly, these figures are not a stock estimate, but only a sum of flows on the primary market. Because the original distribution of investments could easily be reversed after the IPO, these data should not be taken as directly comparable to Table 3.

76 I am using here a very broad definition of “industrial” applications, which includes the following categories in Stone’s classification: public utilities, raw materials, industrial and miscellaneous, and shipping. I do so because I will not be interested in explaining the sectoral composition of European foreign investment.
was the case in Britain.77

Even so, this is a static perspective on a very irregular flow of capital, which means that a lot of information is lost in the aggregation of Table 11. In the next subsection I reintroduce the time dimension, in the context of cross-country foreign investment regressions.

[Table 11 about here.]

4.4.2 Regression estimates

As mentioned, I use Clemens and Williamson’s (2002) framework to try to infer the determinants of European capital exports before 1914.78 More than explaining the measured “wealth bias” of European investment abroad, I am here interested in comparing the statistical relation between the two series of capital flows and the same set of covariates. If we assume that British investment was indeed “developmental”, we can consider this part of the paper as an informal test of the null that “German” investment shared the same characteristic. In other words, if the pattern of estimates is similar for both cases, it is harder to conserve the alternative hypothesis that Continental investment followed more the prospects of government-protected high revenues. I also further specify this hypothesis, by comparing German investment in government and private applications.79

Data limitations force me to work with yet another sample, which is partly coincident with the ex post sample of Table 8. I now take 27 of the 34 countries included in Clemens and Williamson’s (2002) study.80 This is the number of countries, within the sample of these authors, which received German capital between 1883 and 1913, through a total of 573 securities. Table 12 lists the countries included in this “restricted sample”. The last two columns of Table 11 break this sample by region (British and German flows), and by sector (only German).

[Table 12 about here.]

I deviate from Clemens and Williamson’s (2002) study in estimating random effects panel regressions with annual data. The authors prefer to aggregate the time dimension into 6 multi-year periods, in order to “defuse the effects of outlier years” (2002: 16). These periods are separated by local minima in the British capital export series, and broadly include full swings of the cyclical pattern of British foreign investment. I appreciate their point, but prefer to work with annual data, both to avoid losing a considerable amount of information on a very volatile flow, and also because there is not much coherence between the German and British capital exports.81 This implies that I could define the same cutoffs for German capital exports.

77In fact, the “Colonial” category in Table 11 only includes capital invested in typical colonial plantations or in the extraction of raw materials. German investment in the colonies under the five categories represented 1.8% of the total, still dwarfed by 41.8% of British foreign investment absorbed by the British Empire in the same period.

78For a complementary approach, which studies British foreign investment from the perspective of the optimal portfolio composition (in terms of the trade-off return-risk) see Goetzman and Ukhov (2005).

79I cannot do the same for the British capital flows, because I only have the total flows by country of destination.

80Of these, 21 were present in the sample of 37 countries from section 4.

81The correlation coefficient between Stone’s (1990) and my “Full sample” (791 securities) of German capital exports is only 0.156, which is not significant at any of the common levels.
The list of covariates is organized into three groups of variables, which essentially correspond to Clemens and Williamson’s (2002) regressions:\(^82\)

- variables relating to international capital market failures: political disturbances, the countries’ record of adherence to the gold standard, their level of import tariffs, their colonial status, and their effective distance from London (rescaled to Hamburg, in the case of the German regressions);
- measures of economic fundamentals in recipient countries: lagged terms of trade, population growth, net migration rate, share of primary products in exports, level of primary schooling, and urbanization rates, and
- lagged GDP.

However, I employ a different panel data estimation method. Because of the results of Hausman tests, I run fixed-effect panels, instead of the random effects models of Clemens and Williamson (2002).\(^83\)

Results are available in Table 13 for 3 alternative specifications: British capital, total German capital, and German capital invested in government-related applications, which benefited from sovereign immunity. The dependent variable is coded as the share of each country in total annual real capital exports.\(^84\)

[Table 13 about here.]

These results are in broad agreement with Clemens and Williamson’s (2002) findings, namely in terms of the greater role of the countries’ fundamentals in attracting foreign investment, compared to the negative impact of market failures in the global capital market. In these set of statistics, the only consistently significant variable of the first group is the presence in the gold standard, which had a significant positive impact on British and German capital exports. With regard to the economic fundamentals, there are some differences between the two capital exports of these two European countries. German capital seemed to react especially to the trade possibilities of the recipient countries (TOT and share of primary products in exports), whereas British investment took a longer perspective, and was sensitive to the size, composition, and qualification of the population.

Even so, based on these results, I find the “German” foreign investment pattern as “developmental” as the British one. This conclusion is also confirmed by the results exclusively for German applications in sovereign debt (last column of Table 13, which significantly do not differ from the overall pattern of German capital exports. A possible objection that could be raised to this interpretation is that I am not controlling for the influence of government persuasion over private investors, banks, and corporations, in order to gain diplomatic advantages through a closer financial support of foreign governments. This is a complex hypothesis to test, but it should be noticed that it applies to both countries, Britain and Germany, even if the “pound diplomacy” was led with greater subtlety than the sometimes truculent

\(^82\) The sources for the first set of variables can be found in the data appendix to Clemens and Williamson (2002). To rescale the measure of effective distance, I followed the same methodology of the authors in calculating the effective distance between London and Hamburg, which I then added to the measure of the effective distance to London.

\(^83\) Among other things, this implied dropping the LDC dummy included in these authors regressions.

\(^84\) To deflate German capital flows I used Hoffman’s (1965) consumer price index.
pronouncements from the Wilhelmsstraße. As an imperfect attempt to control for this possibility, I ran again the regressions excluding the two most obvious cases of official support to closer economic ties, the Austro-Hungarian Empire, and the Ottoman Empire. The results, which I do not report here, do not alter significantly the picture above, which reinforces my line of interpretation.

5 Conclusion

This paper is part of a larger research project, which is still largely incomplete. The theoretical analysis is to be extended to a broader setting, while the empirical results are preliminary in nature, pending upon the ongoing collection of the relevant data. The nature of these data includes both the quantitative variables used in the regressions of section 4, and qualitative information gathered from the archival sources. From my experience, much can be learned from the material kept in the historical archive of the Deutschen Bank, the German Federal Archives in Berlin, the archives of the Association Nationale des Porteurs de Valeurs Mobilières, or the French Foreign Ministry, in Paris. Many of the theoretical questions (especially the nature of the strategic interaction between committees) probably can only be addressed empirically through the study of these archival collections.

Nevertheless, I think to have established the interest in pursuing the research of these questions, for a correct understanding of the contribution of bondholders’ organizations to the ordered governance of the first globalized sovereign debt market. To reiterate, it is important to understand how the significant variations in the design of these organizations affected the functions they were created to serve, i.e. the monitoring of sovereign debtors, and the centralization of the renegotiation of defaulted debt. And it is also necessary to inquire about the broader significance of these variations in institutional design for the observed patterns of European foreign investment at the time. Both questions are certainly important if we want to draw “lessons from the past”.

Still, as shown by Barth (1995) the degree of government intervention in German foreign investment, and the degree to which it actually had an impact on private decisions has been greatly exaggerated in conventional literature.

I chose not to include Russia in this group for, although a close partner of German foreign policy during Bismarck, it quickly evolved into a foe, especially after the Franco-Russian Entente. The German government accordingly tried to create obstacles to the investment of German funds in Russia.

The only remarkable difference is that the gold standard variable becomes insignificant.
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Winkler, Max (1933), Foreign Bonds. An Autopsy, Philadelphia: Roland Swain.


### Table 1: Current Accounts Relative to GDP

<table>
<thead>
<tr>
<th>Country</th>
<th>1870-1889</th>
<th>1890-1913</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>18.7</td>
<td>6.2</td>
</tr>
<tr>
<td>Australia</td>
<td>9.7</td>
<td>6.3</td>
</tr>
<tr>
<td>Canada</td>
<td>7.2</td>
<td>7.6</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Finland</td>
<td>6.2</td>
<td>5.9</td>
</tr>
<tr>
<td>France</td>
<td>2.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Germany</td>
<td>1.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Italy</td>
<td>1.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Japan</td>
<td>0.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Netherlands</td>
<td>6.0</td>
<td>5.3</td>
</tr>
<tr>
<td>Norway</td>
<td>1.6</td>
<td>4.1</td>
</tr>
<tr>
<td>Spain</td>
<td>10.0</td>
<td>1.4</td>
</tr>
<tr>
<td>Sweden</td>
<td>3.1</td>
<td>2.3</td>
</tr>
<tr>
<td>UK</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>USA</td>
<td>1.5</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Mean absolute values  

### Table 2: Shares of Leading European Countries in Total Foreign Investment

<table>
<thead>
<tr>
<th>Year</th>
<th>UK</th>
<th>France</th>
<th>Germany</th>
<th>Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>1825</td>
<td>33.3</td>
<td>11.1</td>
<td>N.a.</td>
<td>33.3</td>
</tr>
<tr>
<td>1840</td>
<td>45.0</td>
<td>18.8</td>
<td>N.a.</td>
<td>12.5</td>
</tr>
<tr>
<td>1855</td>
<td>37.9</td>
<td>30.3</td>
<td>N.a.</td>
<td>9.1</td>
</tr>
<tr>
<td>1870</td>
<td>42.8</td>
<td>27.8</td>
<td>N.a.</td>
<td>5.6</td>
</tr>
<tr>
<td>1885</td>
<td>46.2</td>
<td>19.4</td>
<td>11.8</td>
<td>5.9</td>
</tr>
<tr>
<td>1900</td>
<td>44.6</td>
<td>18.6</td>
<td>12.9</td>
<td>3.9</td>
</tr>
<tr>
<td>1914</td>
<td>41.8</td>
<td>19.8</td>
<td>12.8</td>
<td>N.a.</td>
</tr>
</tbody>
</table>

Values in percentage  
Sources: Bairoch (1976) and Maddison (2001)

### Table 3: Geography of European Capital Exports

<table>
<thead>
<tr>
<th>Region</th>
<th>UK 1900</th>
<th>1913</th>
<th>France 1900</th>
<th>1913</th>
<th>Germany 1913</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>10.4</td>
<td>5.3</td>
<td>70.6</td>
<td>51.9</td>
<td>44.0</td>
</tr>
<tr>
<td>North America</td>
<td>18.8</td>
<td>35.3</td>
<td>2.6</td>
<td>5.5</td>
<td>19.8</td>
</tr>
<tr>
<td>Latin America</td>
<td>10.4</td>
<td>18.5</td>
<td>11.2</td>
<td>17.7</td>
<td>15.5</td>
</tr>
<tr>
<td>Oceania</td>
<td>13.3</td>
<td>11.0</td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>14.2</td>
<td>17.8</td>
<td>3.4</td>
<td>13.8</td>
<td>12.1</td>
</tr>
<tr>
<td>Africa</td>
<td>15.8</td>
<td>12.3</td>
<td>12.1</td>
<td>9.9</td>
<td>8.6</td>
</tr>
<tr>
<td>Other</td>
<td>17.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Values in percentage  
Source: Woodruff (1966)
Table 4: Comparative Statics of $t^*$

<table>
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<tr>
<th>Increase in...</th>
<th>impact on $t^*$</th>
</tr>
</thead>
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<tr>
<td>$R$</td>
<td>increase</td>
</tr>
<tr>
<td>$\mu_I$</td>
<td>decrease</td>
</tr>
<tr>
<td>$\mu_0$</td>
<td>increase</td>
</tr>
<tr>
<td>$\ell$</td>
<td>increase</td>
</tr>
<tr>
<td>$P$</td>
<td>increase</td>
</tr>
<tr>
<td>$\gamma$</td>
<td>uncertain</td>
</tr>
<tr>
<td>$\beta$</td>
<td>uncertain</td>
</tr>
</tbody>
</table>

Table 5: Comparative Statics of $p^*$

<table>
<thead>
<tr>
<th>Increase in...</th>
<th>impact on $p^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$A$</td>
<td>increase</td>
</tr>
<tr>
<td>$R$</td>
<td>decrease</td>
</tr>
<tr>
<td>$x$</td>
<td>decrease</td>
</tr>
<tr>
<td>$n$</td>
<td>uncertain</td>
</tr>
</tbody>
</table>

Table 6: Defaulting Countries, 1820-1913

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Defaults</th>
<th>Intervention</th>
<th>Bondholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>Afr</td>
<td>1</td>
<td>yes</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Liberia</td>
<td>Afr</td>
<td>2</td>
<td>yes</td>
<td>CFB+IR</td>
</tr>
<tr>
<td>Morocco</td>
<td>Afr</td>
<td>1</td>
<td>yes</td>
<td>IR</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Afr</td>
<td>1</td>
<td>yes</td>
<td>AR</td>
</tr>
<tr>
<td>Turkey</td>
<td>Asi</td>
<td>1</td>
<td>yes</td>
<td>CFB+IR+AR</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>C-Am</td>
<td>4</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>El Salvador</td>
<td>C-Am</td>
<td>2</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Guatemala</td>
<td>C-Am</td>
<td>4</td>
<td>no</td>
<td>CFB+IR</td>
</tr>
<tr>
<td>Honduras</td>
<td>C-Am</td>
<td>2</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Mexico</td>
<td>C-Am</td>
<td>5</td>
<td>no</td>
<td>CFB+IR</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>C-Am</td>
<td>3</td>
<td>yes</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Santo Domingo</td>
<td>C-Am</td>
<td>4</td>
<td>yes</td>
<td>CFB+IR+AR</td>
</tr>
<tr>
<td>Greece</td>
<td>Eur</td>
<td>2</td>
<td>yes</td>
<td>CFB+IR+AR</td>
</tr>
<tr>
<td>Portugal</td>
<td>Eur</td>
<td>4</td>
<td>no</td>
<td>CFB+IR+AR</td>
</tr>
<tr>
<td>Serbia</td>
<td>Eur</td>
<td>1</td>
<td>yes</td>
<td>IR</td>
</tr>
<tr>
<td>Spain</td>
<td>Eur</td>
<td>3</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>US states</td>
<td>N-Am</td>
<td>2</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Argentina</td>
<td>S-Am</td>
<td>2</td>
<td>no</td>
<td>CFB+IR+AR</td>
</tr>
<tr>
<td>Bolivia</td>
<td>S-Am</td>
<td>1</td>
<td>no</td>
<td>CFB</td>
</tr>
<tr>
<td>Brazil</td>
<td>S-Am</td>
<td>2</td>
<td>no</td>
<td>IR+AR</td>
</tr>
<tr>
<td>Chile</td>
<td>S-Am</td>
<td>2</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Colombia</td>
<td>S-Am</td>
<td>5</td>
<td>no</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Ecuador</td>
<td>S-Am</td>
<td>5</td>
<td>no</td>
<td>CFB+IR+AR</td>
</tr>
<tr>
<td>Paraguay</td>
<td>S-Am</td>
<td>2</td>
<td>no</td>
<td>CFB</td>
</tr>
<tr>
<td>Peru</td>
<td>S-Am</td>
<td>2</td>
<td>yes</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Uruguay</td>
<td>S-Am</td>
<td>2</td>
<td>no</td>
<td>CFB</td>
</tr>
<tr>
<td>Venezuela</td>
<td>S-Am</td>
<td>6</td>
<td>yes</td>
<td>CFB+IR+AR</td>
</tr>
</tbody>
</table>

Table 7: Characterization of Population and Sample of Defaulting Countries

<table>
<thead>
<tr>
<th></th>
<th>Population (1820-1913)</th>
<th>Sample (1870-1913)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of countries</td>
<td>27</td>
<td>18</td>
</tr>
<tr>
<td>Share of Latin America</td>
<td>68.0%</td>
<td>61.1%</td>
</tr>
<tr>
<td>Median number of defaults</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fraction of Interventions</td>
<td>11.1%</td>
<td>27.8%</td>
</tr>
<tr>
<td>Most frequent bondholders’ mix</td>
<td>CFB+AR</td>
<td>CFB+AR</td>
</tr>
<tr>
<td>Share in total debt defaulted</td>
<td>100%</td>
<td>91.2%</td>
</tr>
</tbody>
</table>

Sources: Table 6 and Suter (1990) for debt shares. The sample’s share of total debt was calculated with respect to the total debt in default in the sample period 1870-1913.

Table 8: Countries Included in Sample

<table>
<thead>
<tr>
<th>Region</th>
<th>Defaulting</th>
<th>Non-defaulting</th>
</tr>
</thead>
<tbody>
<tr>
<td>South America</td>
<td>Argentina*, Brazil, Chile,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Colombia*, Ecuador*, Paraguay,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peru*, Uruguay*</td>
<td></td>
</tr>
<tr>
<td>North and Central America</td>
<td>Guatemala*, Mexico*, El Salvador</td>
<td>Canada, US</td>
</tr>
<tr>
<td>Africa</td>
<td>Egypt*</td>
<td></td>
</tr>
<tr>
<td>Asia and Oceania</td>
<td>Turkey*</td>
<td>Australia, China, Japan, New Zealand</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>Greece, Portugal*, Serbia, Spain</td>
<td>Italy</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>Austria-Hungary</td>
<td>Bulgaria, Romania, Russia,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Belgium, Denmark, France,</td>
</tr>
<tr>
<td>North and Central Europe</td>
<td></td>
<td>Germany, Netherlands, Norway,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sweden, Switzerland, UK</td>
</tr>
</tbody>
</table>

* Countries also included in regressions with ratios.

Table 9: Results from Probit Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.45071</td>
<td>-2.59848</td>
<td>-0.23502</td>
<td>-5.40391</td>
<td>-0.60220</td>
<td>7.25613</td>
</tr>
<tr>
<td>Pol. Disturbances</td>
<td>0.57440</td>
<td>0.95808</td>
<td>0.53602</td>
<td>0.94491</td>
<td>0.45129</td>
<td>1.12307</td>
</tr>
<tr>
<td>Dependency</td>
<td>-8.38827</td>
<td>-9.83852</td>
<td>-8.90865</td>
<td>7.31959</td>
<td>-8.20529</td>
<td>-0.01231</td>
</tr>
<tr>
<td>Exports/Pop.</td>
<td>-0.48691</td>
<td>-0.52400</td>
<td>-0.56217</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service/Revenue</td>
<td>0.02169</td>
<td>0.00173</td>
<td></td>
<td>-0.01511</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1559</td>
<td>775</td>
<td>1559</td>
<td>775</td>
<td>1559</td>
<td>775</td>
</tr>
<tr>
<td>(\rho)</td>
<td>0.58850</td>
<td>0.59790</td>
<td>0.50619</td>
<td>0.98563</td>
<td>8.315e-7</td>
<td>8.315e-7</td>
</tr>
<tr>
<td>(\chi^2)</td>
<td>205.33847</td>
<td>48.18150</td>
<td>115.80669</td>
<td>29.96919</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

t-statistics in parenthesis. ***(**[*]) Statistics significant at less than 1%(5%[10%]).
### Table 10: Results from the Model of Debt Renegotiation

<table>
<thead>
<tr>
<th>Variables</th>
<th>Durations</th>
<th>Durations</th>
<th>Ratios</th>
<th>Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>47.99009</td>
<td>61.14843</td>
<td>0.37810</td>
<td>0.08067</td>
</tr>
<tr>
<td>Old return</td>
<td>-8.29304</td>
<td>-13.61600</td>
<td>0.79204</td>
<td></td>
</tr>
<tr>
<td>Pol. Disturbances</td>
<td>0.24818</td>
<td>2.25431</td>
<td>0.28499</td>
<td>0.08067</td>
</tr>
<tr>
<td>Interventions</td>
<td>-10.51213</td>
<td>-6.26607</td>
<td>0.81870</td>
<td></td>
</tr>
<tr>
<td>Recovery</td>
<td>-6.97439</td>
<td>-5.81261</td>
<td>-0.03722</td>
<td>-0.40100</td>
</tr>
<tr>
<td>Arrears</td>
<td>-0.18149</td>
<td>0.16351</td>
<td>-0.00138</td>
<td>-0.00072</td>
</tr>
<tr>
<td>CFB</td>
<td>-0.40160</td>
<td>-0.52993</td>
<td>0.14173</td>
<td>0.02823</td>
</tr>
<tr>
<td>IR</td>
<td>-0.43226</td>
<td>-0.50460</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR</td>
<td>0.55104</td>
<td>0.38047</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mix</td>
<td>0.19229</td>
<td>3.14545</td>
<td>-0.09832</td>
<td>0.09319</td>
</tr>
<tr>
<td>Memory</td>
<td>0.04608</td>
<td>-0.02385</td>
<td>0.01270</td>
<td>0.02095</td>
</tr>
<tr>
<td>Region FE</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>23</td>
<td>23</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>R²</td>
<td>0.66292</td>
<td>0.74882</td>
<td>0.26885</td>
<td>0.47506</td>
</tr>
</tbody>
</table>

**(*[**]) Statistics significant at less than 1%(5%(10%)).

### Table 11: British and German Capital Exports, 1883-1913

<table>
<thead>
<tr>
<th></th>
<th>Total sample</th>
<th>Restricted sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Germany</td>
<td>Britain</td>
</tr>
<tr>
<td></td>
<td>(N=791)</td>
<td></td>
</tr>
<tr>
<td>By region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South America</td>
<td>9.3</td>
<td>17.8</td>
</tr>
<tr>
<td>North &amp; Central America</td>
<td>11.6</td>
<td>35.5</td>
</tr>
<tr>
<td>Africa</td>
<td>7.9</td>
<td>11.7</td>
</tr>
<tr>
<td>Asia &amp; Pacific</td>
<td>9.1</td>
<td>25.5</td>
</tr>
<tr>
<td>Europe</td>
<td>62.0</td>
<td>9.5</td>
</tr>
<tr>
<td>By major sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>51.2</td>
<td>33.1</td>
</tr>
<tr>
<td>Railroads</td>
<td>30.2</td>
<td>32.3</td>
</tr>
<tr>
<td>Financial</td>
<td>10.6</td>
<td>7.5</td>
</tr>
<tr>
<td>Industrial</td>
<td>7.4</td>
<td>19.8</td>
</tr>
<tr>
<td>Colonial</td>
<td>0.6</td>
<td>7.3</td>
</tr>
<tr>
<td>Totals (£m)</td>
<td>686.0</td>
<td>3256.9</td>
</tr>
</tbody>
</table>

Values in percentage. Sources: Stone (1999) for British data, and the database compiled by the author for German data.
<table>
<thead>
<tr>
<th>Region</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>South America</td>
<td>Argentina*, Brazil*, Chile*, Colombia, Peru*, Uruguay*</td>
</tr>
<tr>
<td>North &amp; Central America</td>
<td>Canada*, Cuba, Mexico*, US*</td>
</tr>
<tr>
<td>Africa</td>
<td>Egypt*</td>
</tr>
<tr>
<td>Asia &amp; Pacific</td>
<td>China*, Indonesia, Japan*, Thailand, Turkey*</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>Greece*, Italy*, Portugal*, Serbia*, Spain*</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>Austria-Hungary, Russia</td>
</tr>
<tr>
<td>North &amp; Central Europe</td>
<td>Denmark*, France*, Norway*, Sweden*</td>
</tr>
</tbody>
</table>

* Countries also included in *ex post* sample.
Table 13: **Determinants of British and German Capital Exports, 1883-1913**

<table>
<thead>
<tr>
<th></th>
<th>British</th>
<th>German</th>
<th>German (gov’t)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constant</strong></td>
<td>-0.09576</td>
<td>-0.42040</td>
<td>-0.42046</td>
</tr>
<tr>
<td></td>
<td>(0.10467)</td>
<td>(0.20490)**</td>
<td>(0.20528)**</td>
</tr>
<tr>
<td><strong>Log GDP</strong></td>
<td>0.02100</td>
<td>-0.01646</td>
<td>-0.01658</td>
</tr>
<tr>
<td></td>
<td>(0.01114)*</td>
<td>(0.02205)</td>
<td>(0.02209)</td>
</tr>
<tr>
<td><strong>Pol. Disturbances</strong></td>
<td>-0.00466</td>
<td>0.00375</td>
<td>0.00364</td>
</tr>
<tr>
<td></td>
<td>(0.00529)</td>
<td>(0.01028)</td>
<td>(0.01030)</td>
</tr>
<tr>
<td><strong>Colony</strong></td>
<td>0.00652</td>
<td>-0.05482</td>
<td>-0.05469</td>
</tr>
<tr>
<td></td>
<td>(0.01492)</td>
<td>(0.02908)*</td>
<td>(0.02913)*</td>
</tr>
<tr>
<td><strong>Gold standard</strong></td>
<td>0.01158</td>
<td>0.01857</td>
<td>0.01868</td>
</tr>
<tr>
<td></td>
<td>(0.00419)***</td>
<td>(0.00820)**</td>
<td>(0.00821)**</td>
</tr>
<tr>
<td><strong>Tariffs</strong></td>
<td>0.00021</td>
<td>0.00036</td>
<td>0.00035</td>
</tr>
<tr>
<td></td>
<td>(0.00032)</td>
<td>(0.00062)</td>
<td>(0.00062)</td>
</tr>
<tr>
<td><strong>Distance (London)</strong></td>
<td>-3.790e-6</td>
<td>-3.924e-6</td>
<td>-3.931e-6</td>
</tr>
<tr>
<td></td>
<td>(1.694e-6)**</td>
<td>(3.365e-6)</td>
<td>(3.372e-6)</td>
</tr>
<tr>
<td><strong>Distance (Hamburg)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lag TOT</strong></td>
<td>0.00009</td>
<td>0.00033</td>
<td>0.00033</td>
</tr>
<tr>
<td></td>
<td>(0.00007)</td>
<td>(0.00014)**</td>
<td>(0.00014)**</td>
</tr>
<tr>
<td><strong>Lag Net Immigration</strong></td>
<td>0.00337</td>
<td>-0.00289</td>
<td>-0.00265</td>
</tr>
<tr>
<td></td>
<td>(0.00315)</td>
<td>(0.00613)</td>
<td>(0.00614)</td>
</tr>
<tr>
<td><strong>Pop. growth</strong></td>
<td>0.00773</td>
<td>0.00946</td>
<td>0.00950</td>
</tr>
<tr>
<td></td>
<td>(0.00250)***</td>
<td>(0.00097)*</td>
<td>(0.00097)*</td>
</tr>
<tr>
<td><strong>Prim. products/ Exp.</strong></td>
<td>-0.00028</td>
<td>0.00300</td>
<td>-0.00300</td>
</tr>
<tr>
<td></td>
<td>(0.00050)</td>
<td>(0.00097)***</td>
<td>(0.00097)***</td>
</tr>
<tr>
<td><strong>Schooling</strong></td>
<td>-0.00004</td>
<td>-0.00002</td>
<td>-0.00002</td>
</tr>
<tr>
<td></td>
<td>(0.00002)***</td>
<td>(0.00003)</td>
<td>(0.00003)</td>
</tr>
<tr>
<td><strong>Urbanization</strong></td>
<td>0.08331</td>
<td>-0.11084</td>
<td>-0.11060</td>
</tr>
<tr>
<td></td>
<td>(0.04386)*</td>
<td>(0.08540)</td>
<td>(0.08556)</td>
</tr>
</tbody>
</table>

**N** 764 764 764

**R²** 0.06622 0.05206 0.05179

**ρ** 0.73720 0.65484 0.65216

**F-stat** 4.29632 3.32707 3.30881

***(*[*])** Statistics significant at less than 1%(5%[10%]).
Figure 1: Percentage of bondholders under AR