

Domestic Determinants of External Credibility: Sovereign Borrowing
in Imperial Brazil, 1822-1889¹

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1. Introduction

Between 1826 to 1898 every borrowing state in Spanish America defaulted completely on external creditors at least once.³ Domestic creditors also fared poorly in these countries. Imperial Brazil, by way of contrast, always arranged funds for dividends for the holders of its bonds. As a result the Brazilian government became one of the more consistent sovereign borrowers in London in the nineteenth century, taking out new loans at least once each decade. Its domestic funded debt (denominated mainly in inconvertible local currency) grew with time, and after mid century became larger than the external debt.⁴ The fact that Brazil did not follow Spanish America's road to default during the

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³ Latin America nations have long histories of default, dating in most cases from the immediate post-independence period; Frank G. Dawson, *The First Latin American Debt Crisis: The City of London and the 1822-25 Loan Bubble* (New Haven: 1990).; Carlos Marichal, *A Century of Debt Crises in Latin America: From Independence to the Great Depression, 1820-1930* (Princeton: 1989).

⁴ This feature of Brazilian public borrowing has implications for strong forms of the "original sin" argument. These are taken up in a separate paper. On the problem of original sin in sovereign finance see Barry Eichengreen and Ricardo Hausmann, *Other*

nineteenth century is oft noted among financial historians of the region.⁵ To date, however, there have been no attempts to explain Imperial Brazil's credible commitment to repay its debts.

The question of how Brazil accessed capital markets in both London and Rio de Janeiro without major default occupies this paper.⁶ The central argument can be summarized in the following terms. Brazil could repeatedly borrow abroad and at home because default penalties made repayment relatively attractive. The political costs of default were high under the constitutional monarchy (1822-1889) for three reasons. First, penalties for default were embedded in Brazilian political institutions in a manner consistent with the classic formulation by North and Weingast.⁷ The constitution of 1824 both established a parliament, and specified that parliamentary consent was required to make any changes to taxes, expenditures, or borrowing. The constitutional provision

People's Money: Debt Denomination and Financial Instability in Emerging Market Economies (Chicago: 2005).

⁵ See for example Marichal, *A Century of Debt Crises in Latin America.*, and most recently Marcelo de Paiva Abreu, "Brazil as a Debtor, 1824-1931," *Economic History Review* LIX, no. 4 (2006). Contemporaries (on both sides of the Atlantic) were also well aware of Brazil's success at avoiding default.

⁶ Strictly speaking default is any action by the debtor that is not in accordance with the terms of the loan agreement. Default can range from the failure to pay the entire interest and principal due creditors, to milder cases involving the suspension of payments into sinking funds, or unilateral extensions of the maturity of the debt. Selective default targets specific creditors or groups of creditors for either a complete or partial default. Closer scrutiny of the Brazilian case than has been previously provided shows that it did have several partial defaults before 1860, and one complete default, discussed below.

⁷ Douglass C. North and Barry R. Weingast, "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England," *Journal of Economic History* 49, no. 4 (1989). Their argument has been contested, usually on the basis of interest rate data. See, for example, S.R. Epstein, *Freedom and Growth: The Rise of States and Markets in Europe, 1300-1750* (London and New York: 2000).; Gregory Clark, "The Political Foundations of Modern Economic Growth: Britain, 1540-1800," *Journal of Interdisciplinary History* 26, no. 4 (1996).; Nathan Sussman and Yishay Yafeh, "Institutional Reforms, Financial Development, and Sovereign Debt: Britain, 1690-1780," *Journal of Economic History* 66, no. 4 (2006). The North-Weingast view has also found new support in some corners, and valuable modification in others: James A. Robinson, "Debt Repudiation and Risk Premia: The North-Weingast Thesis Revisited," (Paper presented at the conference on "States and Capital Markets in Comparative Historical Perspective," UCLA Center for Economic History: 2006).; David Stasavage, "Credible Commitment in Early Modern Europe: North and Weingast Revisited," *Journal of Law, Economics, and Organization* 18, no. 1 (2002).

allotting parliament a role in financial policymaking increased the number of entities with veto authority over the question of default.⁸ Though originally crafted by an extraordinarily narrow group of political advisors close to the first emperor, the constitution nonetheless embodied a self-enforcing arrangement, persisting long after Pedro I abdicated. Second, the state's domestic creditors secured the debt politically, by virtue of their representation in the lower house of parliament. Creditor influence on questions of the debt was essential, since the expansion of the number of veto points in financial policymaking is, by itself, not a sufficient condition to guarantee the credibility of the promise to repay.⁹ Creditor influence in the parliament was clearly evident in policymaking. The 1827 law recognizing the national debt actually formally embedded leading individual creditors within the Finance Ministry, where they monitored the performance of the Treasury with respect to debt service. Third, and perhaps most surprisingly, external creditors found themselves protected as well. Brazilian creditors enjoyed direct and formalized political standing, which made the commitment to honor the domestic debt strong. This mechanism did not extend to foreign bondholders whose political standing within Brazil was much weaker. Moreover, the market for government securities was segmented by the location of issue, redemption, and dividend payments, along with the currency in which the loans were denominated. Overseas holders of Brazilian bonds would, by all accounts, appear to be at special risk of selective default, just as in Spanish America. Indeed, in 1831 the Brazilian cabinet proposed to suspend all service on the London debt. The majority of legislators, however, viewed the measure as a prelude to wider default, one that their domestic creditor-constituents sought to avoid. The quick and decisive defeat of the proposal revealed that the political standing of domestic creditors, their control of a veto point, and their uncertainty over the true intentions of the cabinet, extended political protection from default to foreign creditors.

⁸ This constitution proved self-enforcing, and did not depend on the willingness of the emperor (or the executive) to support its provisions. Indeed, the first emperor abdicated under duress, but the constitution remained intact.

⁹ This point is made most directly in David Stasavage, *Public Debt and the Birth of the Democratic State: France and Great Britain, 1688-1789* (Cambridge, UK: 2003), and David Stasavage, "Partisan Politics and Public Debt: The Importance of the 'Whig Supremacy' for Britain's Financial Revolution," *European Review of Economic History* 11 (2007).

The remainder of this paper proceeds in five sections. Section two summarizes Imperial Brazil's experience with borrowing, by reference to measures of the quantity of borrowing and , the government's cost of capital. Section three explores the government's resources for debt repayment, and the impact of the ability to pay on the market's perception of creditworthiness. The fourth section briefly addresses the question of default penalties unrelated to domestic political considerations. Section five presents detail on the configuration of political penalties for default. It also summarized evidence that the external debt was politically linked to the security of the domestic debt. The section wraps up with an interpretation of the patterns established in section two. The final section concludes with mention of some broader implications of Brazil's revolution in public finance in the nineteenth century

2. The Brazilian experience with long-term borrowing

Newly-independent Brazil had established a long-term funded debt both overseas and at home before the end of the 1820s. Overseas, Brazil borrowed principally in London, issuing bonds through the City's merchant-bankers. At home it borrowed mainly in Rio de Janeiro, the country's capital and principal port. There a community of Brazilian and foreign merchants provided a primary market for debt issues. Domestic borrowing in a few instances involved fixed-maturity loans. More commonly it involved the issue of perpetual interest bearing securities known as apólices.

Each instance of overseas borrowing is summarized in Table 1. Within Brazil, new domestic borrowing with apólices was nearly continuous. Brazil also borrowed domestically in 1868 and 1879 with fixed-maturity loans bearing exchange clauses. The stock of Brazil's total funded public debt (both domestic and external) from 1824 through 1889 is portrayed in Figure 1, expressed in both nominal and deflated pound sterling. From the 1820s through the 1850s the real level of debt grew only slightly. With the war against Paraguay the debt expanded rapidly in the late 1860s. Increasingly frequent borrowing resulted in an up tick in the debt during in the 1880s. Figure 2 presents the course of borrowing costs, both at home and abroad, over the same period. Rather than resort to current yields in the secondary market that use a frequently changing base-line

bond, the figures present estimates of the cost of new borrowing. These are calculated as the rate of return that equates the amount of money raised on each loan with net present value of the the stream of payments. The details vary by loan, and are contained in provisions of each loan contract, including payments of fees to financial intermediaries.¹⁰ The costs of new borrowing at home are estimated for the fixed-maturity loans in 1868 and 1879, and at selected intervals for apólices. The return on the risk free alternative, derived from current consol yields, varied only little over the period under consideration, so that changes in Brazil's borrowing costs correspond to changes in the risk premium. The cost of new borrowing clearly varied with changes in Brazil's circumstances, but tended to converge toward consol yields over the course of the century.

While Brazil avoided the fate of defaulting Spanish American republics, it did encounter financial difficulties early on. The Finance Ministry suspended the contracted annual amortization of its loans during the 1830s and 1840s (which was not that uncommon; both Britain and the U.S. did the same for even longer stretches of time). Brazil also leaned on its London bankers to help cover shortfalls for dividends in the 1820s and 1830s. Because of the succession crisis in Portugal, Brazil suspended service in 1828 on a loan it inherited from the Portuguese government. From the perspective of the researcher, all of these constitute some form of default strictly speaking. Holders of Brazil's own bonds nonetheless always received their dividends on time. The main inference that can be drawn from the evidence on the quantity and cost of borrowing in Figures 1 and 2 is that the state enjoyed creditworthiness from the outset that only increased with time. Borrowing costs did bump up at predictable intervals—whenever there was major political upheaval or war. As new borrowing raised the overall level of debt, the premium Brazil paid to borrow tended to decline.

¹⁰ Between the materials at the Rothschild Archive in London, and the Acervo do Museu da Fazenda Federal in Rio de Janeiro, most of the original loan contracts could be located.

3. The Ability to Pay and Default Risk

Much of the literature on sovereign debt emphasizes the role of default penalties in eliciting compliance with loan agreements.¹¹ Discussions of the Latin American experience in the nineteenth century, however, often revert instead to the issue of the state's *ability* to repay debt, taking the ability to be a fundamental property of the country in question.¹² Anecdotal examples abound, based on the purported capacity (or inadequacy) of this country or that country to service its debt. For example, Mexican silver mining was disrupted by political violence that kicked off the war for independence and persisted into the 1860s. As the story goes, this left Mexico without the resources required to service its debts, and default was inevitable. Peru similarly lost its silver mines and defaulted. But by mid-century Peru experienced a windfall from guano, so it was able to start borrowing again. In Brazil independence was followed not long after by the coffee boom, which provided the Imperial government with the means to service its debt. And so on, country by country, from the Rio Grande to Tierra del Fuego.

Several measures indicate that Brazil indeed possessed the ability to repay its loans. On the surface this might even seem to explain why it could borrow without default. The most common starting point for gauging a country's ability to pay its debt is the ratio of debt to GDP. Unfortunately, direct estimates of Brazilian GDP are not available for the nineteenth century, and the indirect estimates that exist are especially unreliable the further one moves back in time before 1907. Moreover, while better measures of the level of GDP would make it possible to tell whether Brazil's debt-to-GDP ratio was high or low relative to that of other nations, they would not reveal the implications of this ratio for Brazil's underlying ability to service the debt. This is

¹¹ This literature is vast. See Jonathan Eaton, Mark Gersovitz, and Joseph Stiglitz, "A Pure Theory of Country Risk," *European Economic Review* 30 (1986). I subsume reputational explanations under the heading of penalties as well, in distinguishing explanations based on a state's induced willingness to pay from explanations based on its intrinsic ability to pay.

¹² Often these discussions focus on debt crises, in which defaults are precipitated by shocks that reveal the underpinning inability to pay the debt. The question of the state's willingness to pay (and its determinants) is typically assigned much less importance.

because governments default at widely varying debt-to-GDP ratios.¹³ Additionally, downturns in GDP have a much weaker relationship to the incidence of default than expected, which at the very least calls into question the use of GDP as a measure of the state's ability to repay loans (and perhaps the question of ability to pay altogether).¹⁴ And most importantly, governments striving to service debt can have similar ratios of debt to GDP, while differing greatly in their capacity to command the requisite share of output.

The focus here is instead on measures of the debt-service ratio, the primary surplus, and the fiscal sustainability of the debt, as indicators of Brazil's ability to pay. The ratio of debt service to ordinary revenues is straightforward. Data for the 1830s through the 1880s are graphed in Figure 3. Though debt service consumed an appreciable share of the government's resources, Brazil's ratio was not especially onerous when compared with other countries.¹⁵ Servicing the debt each year required either new borrowing, or primary budget surpluses. In the long run, primary budget surpluses at some point become indispensable to avoid default. Imperial Brazil's primary surplus (deficit) is presented in Figure 4. It is likely that there were primary deficits through the 1820s—Brazilian independence preceded fiscal centralization—but accounts are available only for the province of Rio de Janeiro before the 1830s, and then still only with gaps. From the 1830s, in most years the government was actually in surplus. Small deficits appeared during the war against the secession of the southernmost province in the late 1830s and early 1840s. Large deficits accompanied the war against Paraguay in the late 1860s. Heavy public expenditures in the late 1870s (much of it for drought relief) again generated primary deficits. Though a primary surplus is a necessary long-term condition to service the debt, alone it does not guarantee fiscal sustainability. To satisfy the state's intertemporal budget constraint, increases in the level of debt must elicit

¹³ Carmen M. Reinhart, Kenneth S. Rogoff, and Miguel A. Savastano, "Debt Intolerance," *Brookings Papers on Economic Activity* 2003, no. 1 (2003).

¹⁴ Michael Tomz and Mark L.J. Wright, "Do Countries Default in "Bad Times"?", *Journal of the European Economic Association* 5, no. 2-3 (2007).

¹⁵ The ratios of debt service to total taxes in eighteenth century Britain and France were higher, around 40 to 50 percent (though at one point the French ratio went as high as 80 percent) Thomas J. Sargent and Francois R. Velde, "Macroeconomic Features of the French Revolution," *Journal of Political Economy* 103, no. 3 (1995), pp. 477-9.

accompanying increases in the primary budget surplus.¹⁶ A positive coefficient on the level of debt when regressed against the primary surplus is sufficient to show that the debt is fiscally sustainable. Only a rough test is possible. Using data on the primary surplus, and the level of total funded debt from 1833 to 1889, OLS yields the following equation (with t-statistics in parentheses):

$$ps = -4785188 + 0.0917 * D$$

-1.04
3.07

The R-squared of the regression is only 0.15, so relatively little of the overall variation in the primary surplus (deficit) is explained. The parameter estimate nonetheless suggests that the primary surplus responded to increases in the level of debt in the required way. A one-hundred milréis increase in the debt was associated with a nine milréis increase in the primary surplus. The increase actually exceeded Brazil's implied additional cost arising from new borrowing in most instances.

The hypothesis that Imperial Brazil never defaulted because of an underpinning ability to repay its debt yields an observable implication: default risk should be related to the government's debt-service capacity. This can be tested, but it requires evidence on the subjective probability of default at issue, by loan. The market's expectation of default is embedded in the relationship between the price of the bond at issue, the coupon rate, the duration of the loan, and the alternative rates of return that are available to the bond investor.¹⁷ However, simple measures of the ex ante probability of default require that a default scenario be specified (either permanent repudiation, total default for a limited period of time, or some form of partial default).¹⁸ This creates a problem, since the

¹⁶ Henning Bohn, "The Behavior of U.S. Public Debt and Deficits," *Quarterly Journal of Economics* 113, no. 3 (1998).

¹⁷ Note that if each loan had the same coupon rate, the same maturity, and confronted the same risk free cost of funds (ρ), one could compare the issue prices of the different loans and infer changes in the risk of default.

¹⁸ For Brazil, see William R. Summerhill, *Inglorious Revolution: Political Institutions, Sovereign Debt, and Financial Underdevelopment in Imperial Brazil* (New Haven: forthcoming), Ch. 3, which simply applies the method elaborated in Robert William Fogel, *The Union Pacific Railroad: a Case in Premature Enterprise* (Baltimore: 1960). Kris James Mitchener and Marc Weidenmier, "Supersanctions and Sovereign Debt

magnitude of the ex ante default probability varies greatly depending on the default scenario. Feder and Just provide a general formulation that does not require assumptions about the specific nature of the default:¹⁹

$$p = a \left\{ (1-s) \frac{[(1+r)^{-G} - (1+r)^{-T}]}{r} + \frac{s(t-q)}{r+q} \left[\left(\frac{1-q}{1+r} \right)^G - \left(\frac{1-q}{1+r} \right)^T \right] \right\} \quad (1)$$

where p is the price of the bond at issue, alpha is the (constant) annual stream of payments (dividends and amortization) to a “unitary” bondholder, rho is the return on the risk-free alternative investment, T is the duration of the bond, G permits the incorporation of an initial grace period during which there are no initial interest payments, q is the probability of default, s is the conditional expected loss rate from a default.²⁰ If the ability to repay is a major determinant of the default risk, then q depends on the state’s repayment capacity at the time of issue of a new bond. Repayment capacity is conventionally indicated by the debt-service ratio (x), the ratio of interest and amortization payments to the government’s ordinary revenues.

While the default probability, q, cannot be directly observed, it can be estimated in two steps. First, a logit specification relates the probability of default to the capacity to repay:

$$q_t = \frac{e^{B_0 + B_1 x_t}}{1 + e^{B_0 + B_1 x_t}} \quad (2)$$

Since q is unknown, the right-hand side of (2) substitutes for q in (1). The issue price of the bond (p) for each loan, the loan’s maturity (T), and the annual payment to bondholders (alpha) come from the original loan agreements between the Brazilian

Repayment," in *NBER Working Papers* (2005). take an identical approach to estimating default probabilities.

¹⁹ Gershon Feder and Richard E. Just, "Debt Crisis in an Increasingly Pessimistic International Market: The Case of Egyptian Credit, 1862-1876," *The Economic Journal* 94, no. 374 (1984).

²⁰ If q =0, or s=1, then the expression reduces to the no-default scenario.

government and its loan contractors in London. On a couple of loans the contracted amortization schedule did not provide for the full retirement of the loan via the sinking fund, implying a “balloon” payment at maturity. Because of the difficulty in accommodating this feature, a constant annual payment based on a full-retirement amortization schedule was calculated and substituted on these loans. The risk-free opportunity cost of capital was taken as the British consol yield on the date each loan was contracted.²¹ Observations of the debt-service ratio are drawn from those presented in Figure 4, but for the year immediately following each loan. Lagging the DSR incorporates the increase in the debt-service burden created by the new loan in each case.²² The use of total outlays on debt service, rather than just outlays on external debt service, is justified by the fact that London investors not only understood there was a substantial domestic debt, but they also traded in it locally in Brazil. Nathan M. Rothschild, for example, purchased Brazilian domestic apólices through his correspondents in Rio de Janeiro soon after they were first issued in the late 1820s.²³ British merchant bankers in Rio reported as early as the 1830s on the impact that investor demand in London had on the price of local bonds.²⁴ British merchants in Rio participated as well in ongoing subscriptions of the local equivalent of Exchequer Bills (*bilhetes do tesouro*). The growing share of debt that was domestic in origin, and the awareness of it in London, means the total debt service burden is the appropriate numerator.

Table 2 reports the results for Brazil. For comparative purposes it also presents the Feder and Just results for Egypt.²⁵ The parameter estimates for Egypt are significant

²¹ These yields are derived from the price quotes for consols in the *Course of the Exchange*.

²² For selected years in 1820s these figures are estimates derived by a careful reading of the reports of the Finance Minister to the parliament. A single measure of the DSR is used for 1824 and 1825. After 1829 the figures come from the annual volumes reporting the government’s revenues and expenditures; Brazil, *Balanço da Receita e Despesa do Império* (Rio de Janeiro: 1830-1889).

²³ See Summerhill, *Inglorious Revolution: Political Institutions, Sovereign Debt, and Financial Underdevelopment in Imperial Brazil.*, Chapter 4.

²⁴ See *Ibid.*, Chapter 3.

²⁵ Both countries took out numerous fixed maturity sterling loans in London in the nineteenth century.

at the 5% level. The estimate on B1 is positive; bond purchasers in London viewed the risk of default on each new loan as increasing with the debt-service ratio. The conditional probability of loss, s , was in effect unity; bond investors did not expect to recover even a shilling in case of Egyptian default.²⁶ Overall, Egypt's ability to pay—as indicated by the debt service ratio—goes far in explaining the market's perception of Egyptian default risk each time it borrowed.

The results for Brazil contrast sharply with those for Egypt. Even though the sample size is more than twice as large as that for Egypt, and the quality of the data likely better, none of the parameters for Brazil are significant at the 5% level. The conditional probability of loss, s , was in the range of 53 percent in case of default, but the statistical insignificance of the parameter makes it difficult to assign any meaning to it. Moreover, the estimate of relationship between the probability of default and the debt service ratio (B1) has the proper sign but is swamped by its standard error. The ability to repay had no simple or direct bearing on investors' assessments of Brazil's sovereign default risk.

Despite the emphasis on the ability to repay in discussions of nineteenth-century defaults in Latin America, the state's resources for debt service were not fixed exogenously. Indicators of the ability to pay may even be less important than other factors in assessments of the likelihood of default. The finding that Brazil's debt was sustainable "explains" the absence of default only to the degree that higher primary surpluses are seen as a mechanical response to higher debt. In practice, fiscal measures of the ability to repay are nothing less than the willingness of politicians to extract resources through taxation. Once the ability to pay is treated as a function of the state's political "capacity" to tax, the question of fiscal sustainability is subordinated to the question of the *political* sustainability of the debt. Indeed, fiscal sustainability is itself an outcome that warrants explanation. Sovereign states rarely default because they are truly insolvent; rather they default because the political ability to pay—by raising taxes, imposing a capital levy, or impressing assets—is too high. In times of fiscal duress the decision about who to stiff is always politically rooted.

²⁶ Feder and Just, "Debt Crisis in an Increasingly Pessimistic International Market: The Case of Egyptian Credit, 1862-1876.", p. 349.

4. Default Penalties and the Commitment to Repay

States repay debt not merely because they can afford to, but because it is also in the interest of a sufficiently influential group to do so. Sovereign states in the nineteenth century could not be compelled by courts to repay their debts. Potential lenders understood that promises to repay were not credible if the state could default at will. Attracting lenders meant that a state had to persuade them that repayment was, in effect, incentive compatible. A number of explanations for successful sovereign borrowing depend on a penalty that the government must suffer if it defaults. Penalties for default might include trade sanctions; “supersanctions” in the form of diplomatic pressure or military intervention; the loss of a reputation for repayment that raised the costs of future borrowing; exclusion from new borrowing via a general credit boycott; prevention from listing new bonds on exchanges; the loss of a credibility-conferring relationship with loan contractors; and institutionalized political repercussions by creditors, among other mechanisms.²⁷ The Brazilian case is briefly considered here in light of these.

Exclusion from credit markets in case of default comprises a penalty, but the frequency of default, as well as theory, suggest that it regularly fails to deter defaults. The Spanish American defaulters were often excluded from new borrowing for decades after default. In most cases, once access to the market resumed, the countries defaulted again. Moreover, exclusion was not even necessarily applied in all cases. In 1828 Brazil suspended payments of interest and principal on the loan it inherited from Portugal, until the succession war in Portugal could be resolved. Brazil nonetheless borrowed in London the following year. While the bonds of the new loan were blocked from listing on the exchange, price quotes appeared almost immediately in the press, revealing that traders in a curb market took up shares of the unlisted issue. Beyond credit sanctions and boycotts, the threat of trade sanctions by governments representing external creditors has been invoked as a potential penalty for default in the nineteenth century. Brazil might well have been vulnerable to such sanctions, but only slightly. While its imports came

²⁷ Reputation is sometimes treated separately from penalties. Since the loss of a reputation as a creditworthy state that accompanies default is costly to the debtor, I include it as a penalty mechanism, even though it is decentralized in its implementation.

mainly from Britain, where most of the bondholder were located, its foreign-exchange generating exports went predominantly to the U.S. There is little evidence, overall, that states in default suffered trade penalties.²⁸ More attention-grabbing sanctions, in the form of military force, could similarly serve as a default penalty. Gunboat diplomacy in general was reasonably common, and several major interventions began under the pretense of addressing sovereign default. The French intervention in Mexico in the 1860s was one example; another was the British and French intervention in Egypt in the 1870s. Brazil was not immune to external threats. The presence of a French naval squadron off Rio de Janeiro in the late 1820s convinced the emperor to hasten the settlement of French claims over ships lost to the Brazilian blockade of Buenos Aires. The threat of British naval force at mid-century similarly hastened the end of the Brazilian trade in slaves from Africa. Overall, however, intervention specifically in response to default was relatively rare. Brazilian leaders could not help but be aware of the fact Spanish American states had defaulted repeatedly with near impunity. British governments were famously reluctant to intervene in Latin America, even diplomatically, on the part of British bondholders.²⁹ The few instances of major intervention in response to default during the nineteenth century stemmed more from imperial designs on the part of European powers than they did seeking redress for bondholders.

Reputational considerations potentially play a role in credible sovereign borrowing at two levels. First, there is empirical support for the argument that debtor reputation mattered in the nineteenth century.³⁰ States that repeatedly defaulted suffered

²⁸ Mitchener and Weidenmier, "Supersanctions and Sovereign Debt Repayment."; Michael Tomz, *Reputation and International Cooperation: Sovereign Debt across Three Centuries* (Princeton: 2007).

²⁹ D.C.M. Platt, *Finance, Trade, and Politics in British Foreign Policy* (Oxford, UK: 1968), pp. 33-54; Tomz, *Reputation and International Cooperation*.

³⁰ This finding is consistent with some of the original models of sovereign borrowing, and somewhat at odds with the principal theoretical objection to reputational models, namely that concerns over future access to capital markets do not comprise a sufficiently strong penalty to deter default; see Jonathan Eaton and Mark Gersovitz, "Debt with Potential Repudiation: Theoretical and Empirical Analysis," *The Review of Economic Studies* 48, no. 2 (1981).; Jeremy Bulow and Kenneth Rogoff, "A Constant Recontracting Model of Sovereign Debt," *The Journal of Political Economy* 97, no. 1 (1989).

a penalty: they paid higher risk premia when they borrowed again.³¹ States that established a reputation for punctual repayment paid, on average, exhibited lower risk premia in secondary bond markets.³² Brazil has even been singled out as an illustrative case, where faithful payment of dividends to bondholders in London resulted in declining risk premia. The two facts cannot be disputed: consistent payment of dividends could not help but impress, and the risk premium on Brazil's bonds in London declined (unevenly) over time. Declining risk cannot however be attributed to Brazil's reputation for repayment. Econometric assessments that specifically account the factors that directly impacted the perceived risk of default--the timing of revolts, international conflict, the suspension and ultimate resumption of service on the Portuguese loan of 1823, the suspension and resumption of amortization on Brazil's own loans, and the delegation of monetary authority to a quasi-independent bank--leave little room for reputation in independently explaining changes in Brazil's risk premia, in both London and Rio de Janeiro.³³

Reputation can figure in at a second level. The reputation of loan contractors can confer credibility on the sovereign borrower that the borrower alone did not possess. In a richly detailed paper on early nineteenth-century sovereign bond issues, Flandreau and Flores present compelling new evidence that some contractors acquired a reputation for specializing in the bonds of high-quality borrowers.³⁴ Borrowing states in turn may be willing to pay a premium to issue through such contractors, since they can raise a larger loan at lower cost. Establishing a stable relationship with a financial agent possessing a reputation for specializing in the issues of states that did not default signaled bond investors that the state would repay.

While not having such a relationship undoubtedly made borrowing more difficult and costly, it was not necessary to consistently work through the same, high-quality intermediary in order to borrow. Brazil swapped financial agents several times before

³¹ Reinhart, Rogoff, and Savastano, "Debt Intolerance."

³² Tomz, *Reputation and International Cooperation*, pp. 39-69.

³³ William R. Summerhill, "Credible Commitment and Sovereign Default Risk: Two Bond Markets and Imperial Brazil," in *Political Institutions and Financial Development*, ed. Stephen H. Haber, Douglass C. North, and Barry R. Weingast (Stanford: 2007).

³⁴ Marc Flandreau and Juan Flores, "Bonds and Brands: Intermediaries and Sovereign Debt Markets, 1820-1830," (2007).

mid-century, usually under unfavorable conditions. When Brazil did not remit funds on time in the 1820s its loan contractors neither cut it off, nor did they force it into default. Instead, they structured a new bond issue to cover interest on the old bonds; even though the new issue could not even be formally listed on the exchange. When Brazil delayed remittances again in the 1830s the loan contractors and financial agent advanced funds rather than force default. Whenever a particular loan contractor or merchant-bank serving as financial agent would no longer cover Brazil's shortfalls, the Brazilian government simply arranged a new financial agent in London. The fact that loan contractors wanted to protect a reputation for handling bonds of non-defaulting states meant, in practice, that Brazil could actually exploit the contractor's reputational investment for its own short-term benefit. While this no doubt raised borrowing costs, it did not prevent Brazil from new borrowing. In short, the reputation of the financial intermediary, though no doubt important, seems unlikely to have been the principal source of sovereign credibility.

The search for systematic determinants of sovereign credibility and default risk. has expanded greatly in the last two decades. The purpose of the cursory discussion in this section is not to dismiss the importance of default penalties in those explanations. Instead, it is to suggest that some of the penalty mechanisms that have been put forth as general in nature do not really fit with the case of Imperial Brazil. If the history of sovereign borrowing tells us anything, it is that penalties strong enough to deter default are both relatively rare, and highly particular.

5. The Political Foundations of Credible Commitment

The role of institutionalized political penalties for default in making a state's promise to repay more credible have been prominently highlighted as a result of North and Weingast' influential paper on the Glorious Revolution. In the aftermath of independence, Brazilians established political institutions not unlike those of Britain and other nations that could borrow relatively freely. The Constitution of 1824 defined several provisions that supported long-term borrowing. In addition to creating the institutions of representative government, it specified the inviolability of property, and

specifically the public debt, as part of the civil and political rights of Brazilian citizens.³⁵ The constitution further assigned the responsibility for the budget, taxation, borrowing, and debt service to the parliament.³⁶ The institutional arrangements codified in the constitution partly internalized the costs of sovereign default. This raised the penalty for default to which policy makers could be subjected, in two ways. The first was by better aligning the interests of office-holders who wielded authority over debt with the interests of the debt-holders. Since policymakers in the parliament's lower house, the Chamber of Deputies, had to stand for election at least every four years, they had to be concerned in part with the preferences of their constituents. If deputies whose positions made them decisive on the question of debt in the lower chamber were responsive to domestic debt holders, their support of a proposal to default would elicit an electoral penalty from debt-holding constituents. Importantly, debt holders need not be in a majority among a deputy's constituents. Even if a large number of deputies were not directly responsive to debt holders, cross-issue coalitions within the chamber could prove sufficient to support honoring the debt.³⁷ The second way the constitution raised the penalty for default depended less on formal mechanisms. The constitutionally-enshrined promise to honor the debt was part of a broader set of expectations held by the citizenry that, if violated, could result in the withdrawal of support for the emperor, or the government as a whole. The fact that Pedro I was forced to abdicate for failing to prove responsive to Brazilian elites made it clear that even though the political institutions could persist, the "monarch" could be rejected.

Complementing the constitutional provisions was early legislation recognizing the national debt, and creating the mechanisms for its service. Prominent among these mechanisms was the creation of a five-seat council of creditors with oversight authority

³⁵ Article 179, Section 23; see José Carlos Rodrigues, *Constituição Política do Império do Brasil Seguida do Acto Adicional, da Lei da Sua Interpretação e de Outras* (Rio de Janeiro: 1863), pp. 141-155. Clearly, the specification of such a provision alone does not guarantee that it will be honored; the underpinning political equilibrium must be sustained in order for the state's commitment to honor the debt to endure.

³⁶ Article 15, Sections 13 and 14; Rodrigues, *Constituição Política do Império do Brasil.*, p. 19.

³⁷ Stasavage, *Public Debt and the Birth of the Democratic State.*, pp. 31-39, establishes this as a possibility result.

over debt management. The Law of 1827 regulating the public debt created the Caixa de Amortização, housed within the Finance Ministry but independent from the Treasury. Funds for debt service were handed over by the Treasury to the Caixa in order to meet scheduled payments of dividends. The Caixa's governing board—the Junta Administrativa—embodied a formal mechanism by which bondholders could directly keep tabs on the state's actions with respect to debt service. The Junta consisted of the Finance Minister, the Inspector General of the Caixa, and five unsalaried national capitalists, selected by the government from among those who were “most qualified for the duty and who held the largest amounts of apólices.”³⁸ Some 20 men occupied the five seats on the Junta from its creation in 1828 through the end of the empire in 1889.³⁹ Though a few were officeholders at some point, none were professional politicians, and nearly all of them are readily identifiable as highly prominent merchants and financiers in Rio de Janeiro. The Junta met twice a month, and whenever else necessary to take deliberative votes on matters pertaining specifically to the payment of interest and principal on the funded debt.⁴⁰ These meetings placed the Minister of Finance, who chaired the Junta, face to face with five of the state's leading individual domestic creditors. Any failure on the part of the Treasury to make available funds for debt service would be immediately apparent to the bondholders who made up the Junta. Moreover,

³⁸ Lei de 15 de novembro 1827, Artigos 41, 42, and 44. Minor reforms to the Junta were made by Decreto 5454 of 5 November 1873, and Decreto 9370 of 14 February 1885.

³⁹ The reports of the Finance Minister to the parliament at the start of each year's legislative session detailed the activities of the Caixa de Amortização, but never reported information on the members of the Junta Administrativa. Identifying the composition of the Junta relies on city almanacs for Rio de Janeiro; Pedro Plancher-Seignot, *Almanak Imperial do Comércio e das Corporações Cívicas e Militares do Império do Brasil* (Rio de Janeiro: 1829), p. 157; Emilio Seignot-Plancher, *Almanak Nacional do Comércio do Império do Brasil* (Rio de Janeiro: 1832), p. 154; Sebastião Fabregas Surigue, *Almanak Geral do Império do Brasil* (Rio de Janeiro: 1838), p. 128; Surigue, *Almanak Geral...1838*, p. 128; Viuva Ogier e Filho, *Folhinha Commercial, ou Pequeno Almanak do Rio de Janeiro* (Rio de Janeiro: 1843), p. 125; Filho, *Folhinha Commercial...1843*, p. 84; and from 1850 through 1889 *Almanak Administrativo, Mercantil e Industrial da Corte e da Capital da Província do Rio de Janeiro [Almanak Laemmert]* (Rio de Janeiro: 1843-1889).

⁴⁰ Francisco Cordeiro da [Visconde de Merumerin] Silva Torres [de Alvim], *Memória sobre o Crédito em Geral* (Rio de Janeiro: 1832), pp. 42-3; Lei de 15 de novembro de 1827, Artigo 43.

because the Junta's members were not just the largest creditors, but also prominent merchants and private bankers, they were well positioned to try and organize a credit boycott in case of default.

The political foundations of the commitment to honor the domestic debt are clear. What is less clear is how the array of domestic debt holder interests might also work to support the credibility of the external debt. Bondholders in London did not have direct representation in the Brazilian parliament. Brazilians did not own London-issued bonds in large amounts. The commitment to honor external debt necessarily required a different political basis than the commitment to honor the domestic debt. A unique legislative episode in 1831 permits a detailed analysis of how domestic political interests translated into external credibility. The cabinet proposed to the Chamber of Deputies a suspension of external debt service for five years.⁴¹ The deliberation and defeat of the proposal illustrates precisely how the institutions of representative government, especially the elected lower house, interacted with domestic political interests to render the commitment to honor the external debt a credible one. More than any provision made on paper, in either a constitution or a loan contract, it was this interplay of politicized interests and institutional structures that made it possible for Brazil to sustain its sovereign borrowing.

The proposed default arose as a result of political and fiscal challenges of the 1820s. The costs of basic state building, and Pedro's military campaign against Buenos Aires, were high.⁴² Shortfalls in revenues contributed to repeated delays in remittances of funds to pay dividends on London loans. Legislative budgeting in Rio de Janeiro was new and contentious, which delayed the passage of a truly national budget until 1828. One of the state's principal expedients—borrowing from the Banco do Brasil—was

⁴¹ Brief mentions of the episode are found in Jorge João [Barão de Javari] Dodsworth, *Organizações e Programas Ministeriais: Regime Parlamentar no Império*, 2. ed. (Rio de Janeiro: 1962)., p. 35; Valentim F. Bouças, *História da Dívida Externa* (Rio de Janeiro: 1950)., pp. 48-9; Afonso Arinos de Melo Franco, *História do Banco do Brasil (Primeira Fase -- 1808-1835)*, vol. 1 (Rio de Janeiro: 1973). , p. 240; and Francisco Tito de Souza Reis, *Dívida do Brasil, Estudo Retrospectivo* (São Paulo: 1917)., pp. 60-1. For a detailed treatment in the form of an analytic narrative see Summerhill, *Inglorious Revolution: Political Institutions, Sovereign Debt, and Financial Underdevelopment in Imperial Brazil.*, Chapter 3.

⁴² Neill Macaulay, *Dom Pedro: The Struggle for Liberty in Brazil and Portugal, 1798-1834* (Durham, N.C.: 1986). p. 211.

eliminated with expiration of the bank's charter in 1829.⁴³ By 1831 political problems were particularly acute. The emperor was enveloped in a vortex of political and ethnic nativism, and radical desires to reformulate the state (radicals sought an end to the monarchy altogether; nativists were opposed to the influence of Portuguese born advisors to the emperor, and expressed their stance against institutional centralization in terms of favoring political federation. The positions of the two groups overlapped, though not perfectly).⁴⁴ As political conflict evolved into crisis in 1831, Pedro abdicated under pressure. This initiated an era of transition and deep political uncertainty. For the parliament that entered session less than a month after Pedro's abdication, neither an emperor, nor the newly named regents, served as a veto player. Soon after the start of the annual legislative session, the Finance Minister proposed to suspend service on the foreign debt. In the debate over the proposal, opponents cast the possibility of even a selective default targeted at bondholders in London as putting the credibility of all government obligations at risk. Within a week proposal was defeated in the chamber by two to one margin. The failure of the proposed moratorium on the foreign debt sent a clear message to the capital markets: even without a sitting emperor, and in the midst of financial difficulties, Brazil's elected lower house representatives would honor the external debt.

In summary, political institutions supported credible sovereign borrowing in Brazil in four ways. First, by constitutionally establishing parliament as a veto entity on financial policies, the crown lost its ability to unilaterally default. Second, if the crown (or the cabinet) tried to default extra-constitutionally, the parliament and the state's creditors could punish the sovereign in a number of ways, ranging from the refusal to raise new taxes, to deposing the sovereign outright. Third, parliament provided one standing mechanism for creditors to coordinate their interests with respect to financial policy, while the Junta Administrativa provided another. To the extent that creditors could exercise influence over elected members of the lower house, they enjoyed a standing vehicle to organize against any attempts to default. Finally, the protections

⁴³ Franco, *História do Banco do Brasil (Primeira Fase -- 1808-1835)*., pp. 187-219.

⁴⁴ Post-independence politics are expertly treated in Macaulay, *Dom Pedro.*, and Roderick J. Barman, *Brazil: The Forging of a Nation, 1798-1852* (Stanford: 1988).

afforded domestic creditors extended to external creditors, since external default was viewed unfavorably by domestic bond holders.

This political-institutional basis for Brazilian borrowing did not register as a simple, one-time change in credit indicators, though its implementation had a detectable impact. Portuguese borrowing in Brazil in 1796 involved a forced loan; the first loan taken by the Brazilian government, in 1822, was also forced on the local merchants. By the time Brazil borrowed by issuing 30-year bonds in London in 1824, it was known that the new constitution limited the power of the emperor on financial matters. The existence of constitutional default penalties, however, were only one part of the solution to the commitment problem. The subjective probability that those penalties would actually be implemented was the rest of the equation. Institutions could be changed, even though such change was costly. Institutional arrangements acquired a reputation of their own, not merely through the regular payment of interest to bondholders, but through their durability in the face of opposition. The uncertainty surrounding the viability of the institutions defining default penalties translated into a lower debt ceiling, and higher credit risk. The pattern of borrowing and costs presented in Figures 1 and 2 can be interpreted in light of this consideration. Figure 1 suggests that Brazil's debt ceiling was fixed so long as it could not fully amortize its loans, and suffered from domestic political instability that raised the political costs of taxation. These problems were resolved by the early 1850s, and the debt ceiling was clearly raised by the 1860s. When Brazil went to war against Paraguay, capital markets responded (at a price) by providing it with large amounts of new borrowing. The credit ceiling was raised again in the 1870s and 1880s, most likely because it had become clear that Brazil would resolve the question of slavery without a civil war or major economic disruption. Figure 2 is nothing less than a barometer of the state. When political instability was high, so were Brazil's borrowing costs. Costs were at their peak during the political problems of the late 1820s and 1830s. Strikingly, by the 1860s the massive increase in borrowing associated with the Paraguay war implied only a modest increase in borrowing costs. Thereafter borrowing costs fell steadily, despite rising levels of debt.

6. Conclusions and Implications

The Brazilian constitution specified mechanisms that protected the state's creditors from expropriation. The effectiveness of these mechanisms was not limited to domestic creditors; it extended to foreigners as well. In 1831 a majority in the Chamber of Deputies was unwilling to exploit sovereign status to opportunistically evade financial obligations in London, and thereby upheld constitutional provisions guaranteeing the public debt. This revealed to actual and potential bond investors that Brazilian political institutions indeed played a central role in making credible the commitment to honor not just the state's its domestic debts, but its foreign debt as well. Without the authority that the chamber was assigned by the constitution there was no guarantee that opposition to default could translate into veto power.

As a consequence of these provisions, Brazil enjoyed success in sovereign borrowing that was unrivalled in Latin America until the 1880s. This strong record of public borrowing unraveled, however, in the 1890s. After the constitutional monarchy was overthrown by the army in 1889, the provisional government of the republic unilaterally pursued highly inflationary policies that undermined the value of the domestic debt. The influence of the legislative branch in public finance, which was so critical under the empire, was ironically reduced under the republic. Whereas in 1889 Brazil had taken out its largest loan ever, a debt conversion bond with a 56-year maturity, by 1892 it could only borrow a modest amount from the Rothschild house in London, using Treasury bills with short maturities. In 1898 Brazil for the first time truly defaulted, requiring a "funding loan" that paid interest on old bonds with new bonds, instead of cash. Though Brazil would return to the London capital market, under the gold standard, its performance on debt service would be rocky until the Vargas regime, when default became total.

Most strikingly, Brazil's success with public borrowing under the Empire did not translate into financial development on a broad scale. Financial development matters, because finance is a critical input—rather than an accompaniment-- for the expansion of

the real sector.⁴⁵ Historical work of increasing sophistication now buttresses this finding with a long-term perspective.⁴⁶ North and Weingast have argued that credible state borrowing was, in effect, a sufficient condition for the development of modern financial markets. While the British and U.S. cases suggest this was true, Brazil suggests that financial development was not so simple. There, the political arrangements that created creditworthiness for the state also undermined private financial development. Excessive centralization of policymaking authority at the national level created political barriers to entry in the financial sector. While the government's credit costs fell, private mortgage interest rates remained consistently high.⁴⁷ Before 1850 there was no obvious way to create a joint-stock company, except through government favoritism. From 1850 through 1882 this favoritism was formalized under the commercial code, which required the permission of one or more entities of the government to create a company. Commercial banking remained highly concentrated during the imperial era. Boards of directors at these banks often included a sitting office holder in the parliament, who could further help limit entry by competitors. Private finance developed in Brazil to much lesser degree than one would expect given the extent of the revolution in public finance.

The surprising divergence between the conditions of public borrowing in Brazil, and broader financial development persisted after the fall of the Empire, but in an inverted fashion. While public sector financial problems accumulated steadily in the

⁴⁵ Robert G. King and Ross Levine, "Finance and Growth: Schumpeter Might Be Right," *The Quarterly Journal of Economics* 108, no. 3 (1993).; Jeremy Greenwood and Boyan Jovanovic, "Financial Development, Growth, and the Distribution of Income," *Journal of Political Economy* 98, no. 5, Part 1 (1990).; Valerie R. Bencivenga and Bruce D. Smith, "Financial Intermediation and Endogenous Growth," *The Review of Economic Studies* 58, no. 2 (1991).; Ross Levine and Sara Zervos, "Stock Markets, Banks, and Economic Growth," *American Economic Review* 88, no. 3 (1998).

⁴⁶ Peter L. Rousseau and Richard Sylla, "Financial Systems, Economic Growth, and Globalization," in *Globalization in Historical Perspective*, ed. Michael D. Bordo, Alan M. Taylor, and Jeffrey G. Williamson (Chicago: 2003). pp. 388-403; Peter L. Rousseau and Paul Wachtel, "Financial Intermediation and Economic Performance: Historical Evidence from Five Industrialized Countries," *Journal of Money, Credit and Banking* 30, no. 4 (1998)..

⁴⁷ Joseph Ryan, "Credit Where Credit Is Due: The Evolution of the Rio de Janeiro Credit Market, 1820-1900" (PhD, University of California, Los Angeles, 2007).

1890s, banking and securities exchanges both expanded rapidly.⁴⁸ Though the stock market boom became an unsustainable bubble, and many new banks did not survive long into the twentieth century, private financial development accelerated rapidly and had durable consequences. The Brazilian case reveals that there is no necessary linkage between the state of public finances, and private financial development.⁴⁹ The details of the political institutions that mediate this linkage matter a good deal, and vary considerably.

⁴⁸ Anne G. Hanley, *Native Capital: Financial Institutions and Economic Development in São Paulo, Brazil, 1850-1920* (Stanford, 2005).; Stephen H. Haber, "The Efficiency Consequences of Institutional Change: Financial Market Regulation and Industrial Productivity Growth in Brazil, 1866-1934," in *Latin America and the World Economy since 1800*, ed. John H. Coatsworth and Alan M. Taylor (Cambridge, Mass.: 1998).; Gail D. Triner, *Banking and Economic Development : Brazil, 1889-1930* (New York: 2000).

⁴⁹ This finding parallels that for France, where there was considerable private financial development despite problems with public finance; Philip T. Hoffman, Gilles Postel-Vinay, and Jean-Laurent Rosenthal, *Priceless Markets: The Political Economy of Credit in Paris, 1660-1870* (Chicago: 2000).

Table 1. Summary of Brazilian External Borrowing, 1824-1889

Loan	Place of Issue	Principal Purpose of Loan	Bank	Issue Price	Coupon Rate	Amount Raised	Amount Issued	Maturity (Years)
1824	London	Deficit	Bazett et al.	75	5	1,000,000	1,333,300	30
1825	London	Deficit	Rothschild	85	5	2,000,000	2,352,000	30
1829	London	Loan Interest	Rothschild	52	4	200,000	384,600	30
1829	London	Loan Interest	Wilson & Co.	52	4	199,940	384,500	30
1839	London	Deficit	Samuel & Phillips	76	5	312,500	411,200	30
1843	London	Portugal (Convention of 1842)	Goldsmid, et al.	85	5	622,702	732,000	20
1852	London	Retire 1823 Portuguese Loan	Rothschild	95	4.5	954,250	1,010,000	30
1858	London	Buyout of Dom Pedro II Railroad	Rothschild	95.5	4.5	1,425,000	1,523,500	20
1859	London	Retire 1829 Loans	Rothschild	100	5	508,000	508,000	30
1860	London	Infrastructure	Rothschild	90	4.5	1,210,000	1,373,000	30
1863	London	Retire 1824 Loan/1843 Loan/Cover Floating Debt	Rothschild	88	4.5	3,300,000	3,855,300	30
1865	London & Amsterdam	War Finance	Rothschild	74	5	5,000,000	6,963,600	37
1871	London	Floating Debt/Railroad Extension	Rothschild	89	5	3,000,000	3,459,000	37
1875	London	Railroad Construction and Railroad Dividend Guarantees	Rothschild	96.5	5	5,000,000	5,301,200	30
1883	London	Railroads/Public Works/Engenhos Centrais	Rothschild	89	4.5	4,000,000	4,599,600	38
1886	London	Floating Debt/Deficit	Rothschild	95	5	6,000,000	6,431,000	38
1888	London	"Abolition"	Rothschild	97	4.5	6,000,000	6,297,300	38
1889	London	Conversion	Rothschild	90	4	17,440,300	19,837,000	56

NOTES: Table excludes Portuguese Loan of 1823, the service of which Brazil assumed in 1825 in return for Portugal's recognition of Brazilian independence. Brazil did not issue the loan, and raised no funds from it.

Table 2

Risk of default at initial issues as a function of the ability to pay, Brazil and Egypt, 1800s

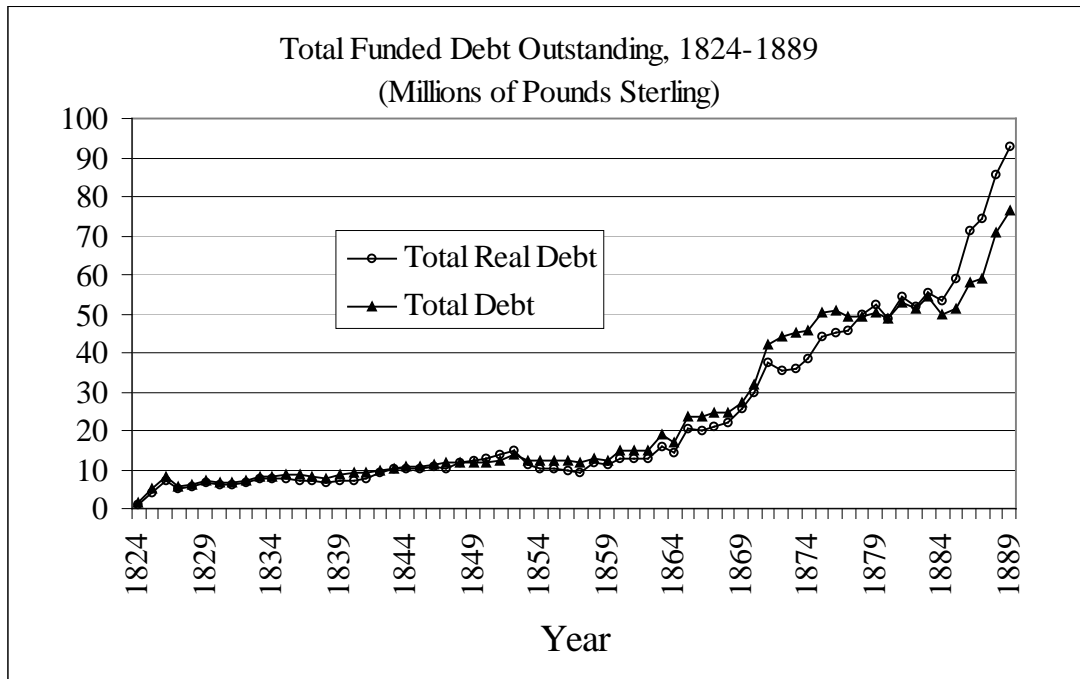
	Egypt (1862- 1874)		Brazil (1824- 1889)	
Parameter	Value	S.E.	Value	S.E
s	0.94*	0.28	0.53	0.35
B0	-3.1*	0.4	-2.69	1.38
B1	0.83*	0.32	0.63	2.4
Adj R-sq	0.79		0.98	
N	9		19	

* Significant at 5% level

Note: Non-linear estimation of equation (1). s is the conditional recovery rate

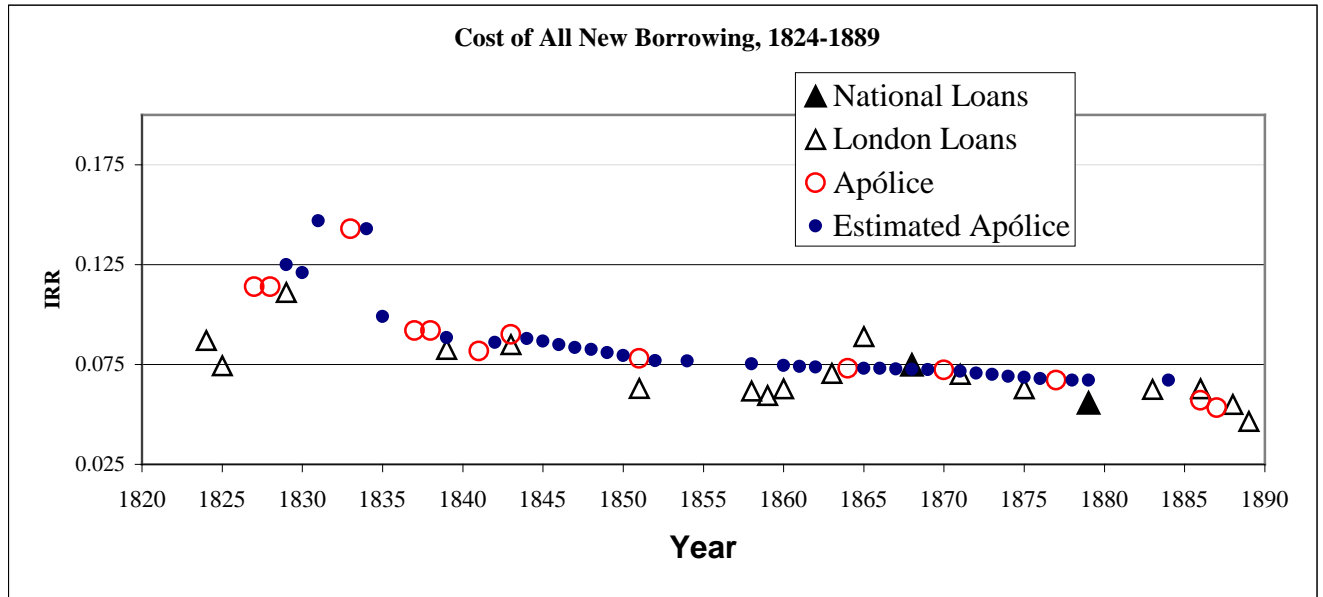
Sources: For Egypt, Feder and Just (1984); for Brazil, see text.

Figure 1



SOURCE: *RMF*, 1827-1890. Internal debt denominated in Brazilian currency converted to sterling at the average remittance rate of exchange for each period. Current values converted to constant prices using the Rousseaux price index for Britain.

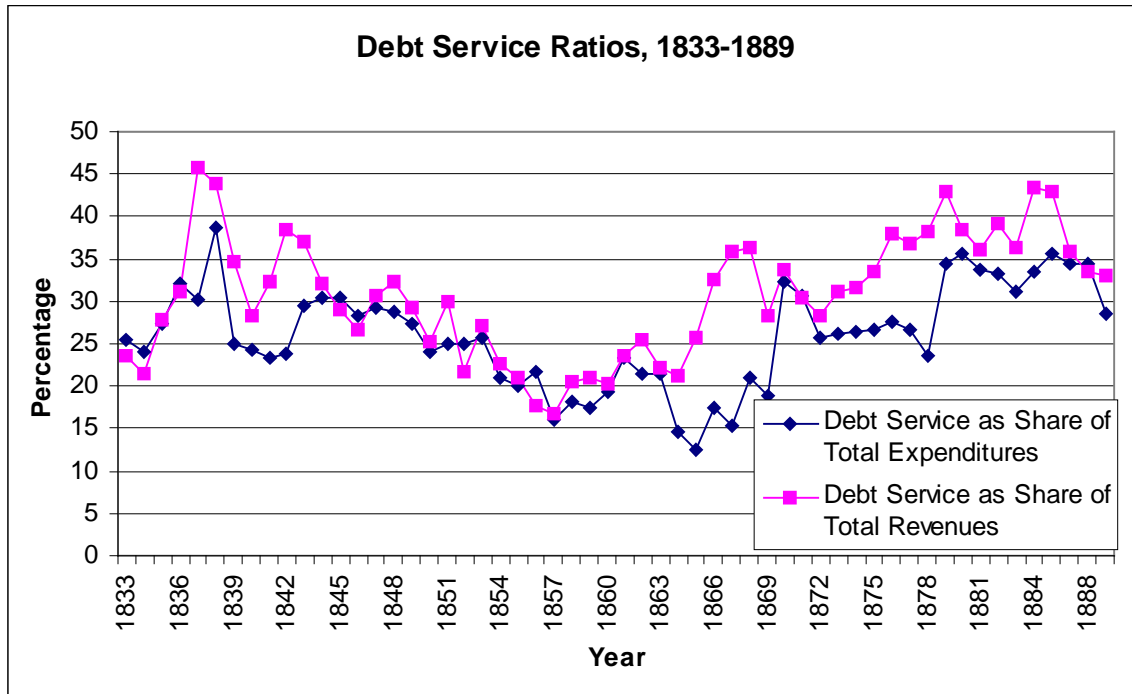
Figure 2. Initial Issue Cost of Borrowing, 1824-1889



SOURCES: See text.

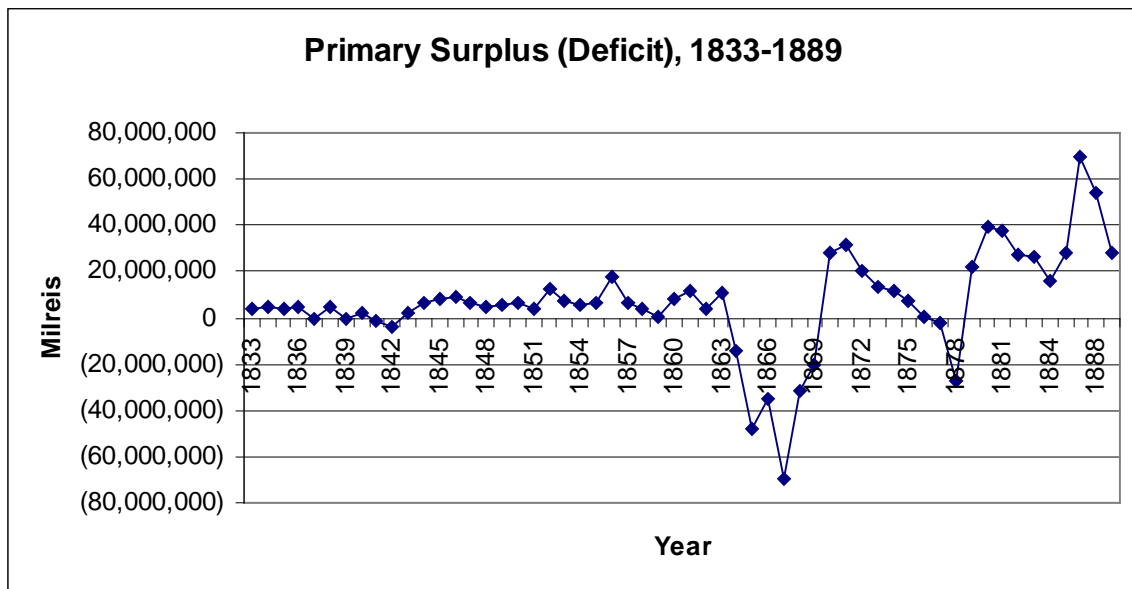
NOTE: Internal rates of return on *apólices* estimated from *apólice* coupon rate, issue price, and a one-percent annual amortization rate; internal rates of return on the National Loans of 1822, 1868 and 1879 based on conditions in government decrees that established the issues; internal rates of return on London issues based on terms and conditions detailed in each actual loan contract between the government of Brazil and merchant bankers.

Figure 3



Source: *Balanço da Receita e Despesa do Império*, various years.

Figure 4



Source: *Balanço da Receita e Despesa do Império*, various years.

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