Sovereign Commitment and Financial Underdevelopment in Imperial Brazil[*]

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ABSTRACT: In 1824 the creation of political institutions that constrained the monarch's ability to unilaterally tax, spend, and debase the currency allowed Brazil to borrow repeatedly in London and in Rio de Janeiro to an extent that (at least through the 1880s) was unrivalled among the new nations of Latin America. The share of total public debt accounted for by long-term funded issues grew, and domestic debt came to dominate foreign debt by mid century. Sovereign debt yields fell over time in London and Rio de Janeiro, and the cost of new borrowing declined on average. The market's assessment of the probability of Brazilian government default tended to decrease. The development of vibrant private financial markets did not, however, follow from the enhanced credibility of government debt. Business finance in Imperial Brazil suffered from politicized market interventions that undermined the development of domestic capital markets until the early 1880s. Private interest rates remained high, entry into commercial banking was heavily restricted, and limited-liability joint-stock companies were tightly controlled. The Brazilian case provides an important counterexample to the general proposition of North and Weingast that institutional changes that credibly commit the government to honor its obligations necessarily promote financial development more broadly. In Imperial Brazil the very institutions that enhanced the credibility of sovereign borrowing permitted the systematic repression of private financial development.

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Introduction

At independence in 1822 Brazilians confronted a two-pronged challenge: the fundamental problem of state building, and a public debt inherited from the colonial era, originally taken on by the Portuguese Crown. Brazil's solution to both of these problems echoed that adopted in late seventeenth-century England. In 1824 Emperor Dom Pedro I established a liberal constitution that created a parliament with authority over the budget and borrowing. That same year the Imperial government obtained its first foreign loan in London, raising three million pounds sterling for the purpose of covering current budget deficits and funding the pre-independence debt. By the end of the Empire in 1889 the central government had succeeded in obtaining sixteen funded loans abroad, mainly through the London Rothschilds, issuing nearly 67 million pounds sterling in bonds and raising 60 million pounds. It also took out two large loans at home as well as issuing a large of amount of perpetual interest-paying debt domestically, the value of which eventually exceeded that of Brazil's foreign borrowing. Through the First Reign, the Regency, and nearly fifty years of the Second Reign, Imperial Brazil never missed an interest payment.

This paper not only establishes a new perspective on Brazil's financial history under the constitutional monarchy from 1822 through 1889, by reference to a body of original quantitative evidence drawn from primary sources. It also shows how this particular historical experience sheds new light on central issues in the study of economic development: the credibility of sovereign borrowing, the role of limited government in the characterization of states as either weak or strong, the relative importance of property rights institutions and contracting institutions in financial development, and the economic consequences of extreme political centralization.

The creation of the Constitution of 1824 established the basis for transforming public finance in Brazil in ways that are analogous to the public-sector outcome of the Glorious Revolution in England more than a century before.[1] By stripping the sovereign of discretion over questions of public finance, the constitution provided a form of limited government, where parliamentary approval was required to borrow, spend, and tax. This left the state "weak" in a salutary way. In forging institutional arrangements that helped it credibly commit to honor its debts Brazil avoided the "no lending" equilibrium that figures as a prominent result in the theory of sovereign debt.[2] A revolution in private finance, however, proved far more elusive. The Brazilian state, even with the institutions of limited government, proved to be "strong" in a distortionary way. The nation's political elite used the strength of the state to, among other things, channel rents from

[1] North and Weingast (1989). A growing literature re-examining financial aspects of the Glorious Revolution reveals that England, post-revolution, was still subject to high borrowing costs, showing that factors related to war and partisan control of the government continued to effect the cost of borrowing, and that the revolution in public finance did not immediately translate into lower private interest rates; see Stasavage (2003); Sussman and Yafeh (2005); Quinn (2001). For an analysis in which high interest rates are consistent with improved sovereign credibility see Robinson (2006).

[2] On the theory of sovereign borrowing see Bulow and Rogoff (1989); Eaton, et al (1986); Cole and Kehoe (1995); Eaton and Gersovitz (1981).

financial activities to themselves. Property rights institutions shaped Brazil's contracting institutions in a way that weakened financial development, irrespective of the state's credibility in debt markets.[3]

This de-linking, in practice, of a revolution in public finance and the development of private capital markets is unexpected. Indeed, sound public finance has been singled out by investigators as a prerequisite for the private financial development required for modern economic growth.[4] Historically, the key to sound public finance was the credible commitment by the state to abide by agreements, not expropriate wealth, and in particular, not repudiate debt. In relatively high-income economies, credibly committing to repay sovereign debt created, in sequence, broad advances in public and private finance. Governments succeeded in borrowing more, funded debt increased as a share of total debt, borrowing costs fell, and risk of default diminished. Guarantees of financial property impelled the expansion of private capital markets. At the other extreme, in poor economies like those of newly independent Latin America, default and repudiation in the 1820s cut off countries from foreign lending, led to a succession of forced domestic loans, contributed to the spiral of violent political instability, and undermined the development of private finance. Indeed, North and Weingast's pathbreaking examination of the financial consequences of the Glorious Revolution suggested that states may be sorted into two groups: those that succeed in establishing the credibility (via the institutions of limited government) that is needed in order to borrow in the capital market, and those that do not. Until relatively recently this categorization was seen to apply broadly, across both time and space. Figure 0 portrays this partition along the NW-SE diagonal, using the label "Spanish America" as a short hand for cases that fail to meet the North-Weingast criteria.

The idea that there is a strict necessity of a revolution in public finance for the development of private capital markets has already been called into question by Hoffman, et al. (2000), focusing on the case of France. France falls into the quadrant of Figure 0 where there was no limited government, but already an appreciable degree of financial development through the eighteenth century. Imperial Brazil provides an additional noteworthy intermediate case, occupying the first quadrant. There, thanks in large part to the institutions of limited government, the state's ability to borrow was far more similar to the successful cases among the North Atlantic nations that it was to Brazil's less fortunate Spanish American neighbors. Yet private financial development was poor. This paper uses the Brazilian case to show that not only is a revolution in public finance not necessary, it is also, unfortunately, not a sufficient condition for the development of robust domestic capital markets. In light of Imperial Brazil's experience history, a variation on Weingast's "fundamental dilemma" of the state is in order: any state that is

[3] On the distinction between property rights institutions and contracting institutions, see Acemoglu and Johnson (2005)

[4] North and Weingast (1989); Rousseau and Sylla (2001), especially pp. 2-3.

capable of enhancing the credibility of sovereign debt may also be able to stifle private financial development.[5]

It proceeds in four sections. It first turns briefly to the sources of credible commitment to honor public debt. The creation of a Parliament with genuine authority over taxation, spending, and borrowing was the font of credible commitment. In the language of modern political economy, the establishment of a bi-cameral legislature expanded the number of veto-players involved in the strategic interactions over financial policy making, constraining the Crown's ability to unilaterally increase expenditures or default on debt obligations. Brazil's political arrangements were clearly similar to those of England, where the Glorious Revolution vested new authorities in Parliament, reducing the Crown's capacity for repudiation and autonomous revenue raising.[6]

The paper then examines the main features of Brazil's revolution in public finance. To make the argument that the Brazilian state attained credibility required to convince the markets that it would abide by its contractual obligation to repay sovereign debt, and hence respect the property rights of creditors, the second section specifies and operationalizes five indicators of the improvement in public finance. The first, discussed in the context of a brief history of the Brazilian debt, was a rising share of funded debt relative to the unfunded obligations of the state. The second indicator was the ability to issue an increasing volume of debt. That an important component of Brazil's financial revolution was domestic is suggested by a third indicator, the share of funded debt subscribed at home. Fourth, the ability to issue debt more cheaply, on average, over time, is established using calculations of the ex-ante internal rate of return on new loans. The final indicator is a measure of the market's perception of the probability of default on new issues. It too declined over the course of the Imperial era.

The much-less promising evolution of private finance occupies the third section. It draws on financial indicators and the legislative history of Brazil to argue that regulatory actions by the state actively stifled private financial development through the early 1880s by heavily restricting the formation of joint-stock firms, and limiting the formation of commercial banks. At least two actors benefited from these policies, and these provide some clues about the politics that lurked behind these regulations. First, the

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[5] Weingast (1997). The phenomenon addressed in this paper ultimately requires an analysis of institutional features of the polity, and their economic consequences, that moves beyond the problem of credible commitment.

[6]Brazil diverges from the English example, however, in that it did not delegate authority over matters such as receipt of revenues, or the disbursement of interest payments. No government-privileged bank charged with maintaining currency convertibility or monitoring debt payments emerged in Brazil in the immediate aftermath of independence. On the contrary, an appreciable portion of early public debt was due to the pre-independence establishment of the official Bank of Brazil. A later incarnation of the Bank of Brazil effectively enjoyed a monopoly of currency issue starting in 1853, in exchange for helping retire currency from the first Bank of Brazil, but lost the monopoly of issue in 1866. It only occasionally served as the state's financial agent, and was one of several commercial banks that eventually facilitated the issue of domestic debt.

central government itself maintained a virtual monopoly on the issue of currency for most of the Imperial era, limiting the issue of bank notes. Seignorage profits were thus reserved for the state. Second, those few firms that did obtain limited-liability joint stock status became incumbents in what was a fundamentally closed system through 1882. This allowed them a chance to garner rents, and also gave them an incentive to oppose free entry by new firms. The final section concludes.

Between Citizen and Crown: Institutions and Credible Commitment

In terms of the political changes of Europe from the late seventeenth through the early nineteenth century independent Brazil was born liberal. Emperor Pedro I imposed a constitution that broke sharply with the prevailing model of government, dividing his authority over policymaking with a bi-cameral Parliament. The constitution served as the coordinating device for national governance that endured with only modest modifications for more than six decades. It specified the inviolability of property, including the public debt.[7] It further assigned the responsibility for the budget and taxation, along with the debt, to the Parliament.[8] The franchise was restricted (limited to adult free males with an income), but no more so than in most western European parliamentary systems at the time, and was sufficient to provide a basis of representative government. Importantly, the franchise was restricted by wealth, and wealthy Brazilians were those who held government bonds. As such, debt holders no doubt enjoyed appreciable representation in Parliament, which helped reduce the temptation for government to default.

By establishing a parliament with budgetary powers Pedro I eliminated a problem that had long bedeviled absolutist monarchs. Public finance characterized by arbitrary taxes, selective rewards, forced loans, and repeated repudiations had undermined early modern European budget making, leave states short of funds, and leaving asset holders and creditors bereft of monies owed them. In such circumstances finance was costly for both sides of any loan agreement. After independence Brazil escaped this problem; Pedro I had no independent sources of significant income, and no ready way to pursue expenditures that did not enjoy the support of the elected representatives of the enfranchised citizenry. The Emperor was left with little or no discretion over spending. Parliament became a veto player in financial policymaking, constraining decisions by the Crown. Parliament too was divided, into an upper chamber of Senators appointed for life, and a lower chamber of Deputies elected for a four-year term. The division of authority between crown and Parliament, and further between the lower and upper houses, required compromise on taxes and budgeting, and left no single player with full authority over spending.

The experience of the rest of Latin America suggests the costs of failing to establish institutions that provided for credible commitment to debt payment. Initial loans to the newly independent nations in Spanish America quickly translated into

[7] Constituição Política do Império do Brasil, Article 179.

[8] Ibid., Article 15.

default, which proved to be nearly total in some cases.[9] Rescheduling, the resumption of payments, and obtaining interest on arrears frustrated bondholders in London for decades. For many of the Spanish American republics, the period from the 1820s to the 1880s was one in which new loans were nearly impossible to raise abroad. When loans could be raised, they were costly in the extreme.

Public Finance

Funding the Debt: A Brief History of Brazilian Borrowing

The early history of Brazilian debt is inextricably bound up with the debt of the mother country. Brazil's pre-independence debt arose in two phases. In the late colonial era the colonial administration accumulated a backlog of unpaid bills. Several measures were taken to try and fund this debt. In 1796 a small share of a royal loan raised in Portugal went to pay expenses in Brazil. Tellingly, the loan was a forced one.[10] In 1799, during which the Prince Regent (and later King) John VI ruled, perpetual bonds were issued as payment for debts. Measures to funding the debt were rare and usually insufficient. The second phase began with Napoleon's campaign in Iberia, which sent the same king fleeing to Brazil, where in 1810 the royal government undertook a registration of all outstanding debts. Revenues from the colony that had previously gone to Portugal now found new uses. In addition to bearing the full costs of the royal household, Brazilians also subsidized the Portuguese army fighting in Europe, and military operations in the Rio de la Plata. Tax collections proved insufficient, and the Crown resorted to several predictable methods of generating revenues. Brazil's currency at the time of the arrival of the royal court was largely metallic, with gold and silver both in circulation. John VI debased the silver currency, generating about twenty percent seignorage revenues on each silver coin. He then issued highly debased copper coins, each of which provided seignorage returns in the range of 320 percent, and also gave rise to massive counterfeiting. Ultimately, to combat counterfeiting, most copper was withdrawn, and replaced with royal treasury notes. To create a new source of lending the King authorized the creation of the first Bank of Brazil in 1808, with a monopoly of banknote issue. To finance military expenditures, the cap on banknotes was repeatedly raised, which allowed the Bank to issue notes effectively without limit. By 1821 the paper in circulation was seven times the value of the metals that were assigned to back it. Convertibility was suspended that year when John VI returned to Portugal, taking the royal treasury with him, but leaving Brazilians with the debt of the bank. Between his arrival in 1808 and his departure in 1821, John VI elevated Brazil to the status of a Kingdom, but in a double application of Gresham's law successively drove gold from circulation, and then silver, leaving Brazil with considerable bills to pay.

In 1822 Brazilians perceived the Portuguese liberal movement as seeking to reduce Brazil once again to the condition of colony, and opted for independence. The

[9] See, for example, Marichal (1989); Tenenbaum (1986); Dawson (1990); Costeloe (2002); and the essays in Liehr (1995).

[10] Background on late colonial debt draws principally on Bouças (1946), pp. 5-12.

new Brazilian state inherited an array of unfunded domestic debts, and also encountered an immediate current budget deficit. Difficulties in balancing the budget proved durable. In only 11 of 68 years was Imperial Brazil able to attain a budget surplus. Figure 1 presents expenditures and revenues from 1823 through 1889. Throughout the Imperial era revenues drew heavily on taxes on foreign trade. Through 1870 the largest single category of expenditures was military; thereafter outlays shifted increasingly toward subsidies to infrastructure investments.

The government took out its first foreign loan in order to cover the large budget shortfall in 1824. The merchant bank in London that handled the loan delivered the first tranche and made the initial issue of bonds, but did not complete the contract.[11] Brazil quickly turned to the Rothschilds, who underwrote the remainder of the loan in 1825. A second "loan" generated no revenue for Brazil at all. Under the Additional Convention of 1825 that arranged for Portugal's recognition of Brazilian independence, Brazil secretly agreed to take on the remainder of Portugal's 1823 loan in London in compensation for seized property of private parties and of the Crown. The financial bubble in London that rested heavily on Latin American investments burst in 1825. When the smoke cleared, only Brazil issues remained intact.[12] In 1827 Brazil's Parliament formally established the national debt, to fund outstanding obligations from the pre-independence era, and to make provisions for future borrowing.[13] The government immediately tapped domestic capital markets, at the time limited almost exclusively to Rio de Janeiro, and issued perpetual bearer bonds known as *apólices*. These ultimately became the mainstay of the public funded debt.

New loans were contracted in London in 1829 in a nearly desperate measure to cover interest obligations. The political conflict and crisis culminating in the abdication of Emperor Pedro I in 1831 registered in both domestic and overseas capital markets, with current yields approaching 17 percent in Rio de Janeiro. Soon after the abdication the Minister of Finance approached the Chamber of Deputies with a proposal to suspend service on external loans, and use the money to redeem copper coinage. Within a week an overwhelming majority of the Deputies voted down the measure. Had they not done so Brazil could have easily gone down the path of suspension and default pursued by Spanish American republics. Brazil did not obtain a new foreign loan until 1839, but never again during the Imperial era was its commitment to repayment seriously in doubt. Thereafter at regular intervals Brazil raised funds in London and at home. Excluding the

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[11] Carreira (1889; reprint 1980), pp. 120-138. Here and below the terms and conditions of Brazil's London borrowing from the 1820s through the 1880s are taken from manuscript loan contracts, loan memoranda, and General Agreements. These are found in the Rothschild Archive in London in the case of borrowing arranged the N.M. Rothschild or N.M. Rothschild and Sons, and the Arquivo do Museu da Fazenda Federal in Rio de Janeiro. In the few instances where no loan contract seems to have survived, the reports to the Brazilian parliament from the Minister of Finance were scrutinized to obtain details on the loans.

[12] Dawson (1990).

[13] Lei de 15 de novembro de 1827.

initial assumption of Portugal's 1823 loan (which Brazil would later refinance), the Brazilian central government took out 20 loans before the end of the Empire in 1889. Of the 20 loans, 18 were through merchant banks in London, and two were issued domestically. These loans came in addition to the ongoing emission of domestic apólices. New apólices entered circulation in every one but 14 years after their introduction in 1827.

A principal consequence of the creation of a funded debt, and the regular issue of new loans, was that funded obligations quickly outweighed unfunded debt. Figure 2 presents the relative position of central government obligations in four categories: funded domestic debt, funded foreign debt, interest-bearing short-term treasury notes, and currency. With the loans of 1824/1825, and the issue of apólices in 1828/1829, Brazil's funded debt attained 60 percent of its total obligations in 1829. That share rose steadily through 1862. Between 1862 and 1868 the share of debt that was funded was set back to its 1844 level, as a result of the rapid issue of treasury notes to help finance the war against Paraguay. The share of funded debt increased thereafter, though more slowly than before, and by 1885 had not quite yet attained the pre-war level. Overall, funded debt exceeded unfunded debt by a good margin

Brazil's reputation for repayment was remarkable among Latin American nations. Though the contracted amortization of foreign loans took place only intermittently through 1850, Brazil never missed interest payments, except in the case of the 1823 Portuguese Loan (which came to be a disputed obligation), and never attempted to pay interest in anything other than cash, even when new borrowing was required to do so.

Quantities and Sources of Borrowing: From Lombard Street to Rua Direita

Brazil enjoyed unrivalled success among Latin American nations in issuing long-term debt. Figure 3 presents the volume of government obligations outstanding in London and Brazil from 1824 through 1889, expressed both in current pounds sterling, and in pounds adjusted to 1880 prices.[14] It draws on time series on the debt in circulation constructed from the annual reports to the parliament from the Brazilian finance minister.[15] All overseas loans were issued in sterling, and most domestic debt was issued in Brazilian currency, which for much of the period was not convertible. Save for the "National" loans of 1868 and 1879, this domestic debt was in the form of apólices (literally "policies"), which were perpetual interest-earning bearer bonds. The vast bulk of these in circulation paid six percent interest per year on their face value. Foreign and domestic fixed-maturity loans had coupon rates varying between 4.5 and 6 percent.

The total funded debt increased appreciably over the course of the Empire. Four phases in the growth of the debt can be identified from Figure 3. Despite institutional arrangements that supported sovereign borrowing, debt increased slowly. Political instability stemming from an array of factors (political nativism, the abdication of Pedro

[14] Adjustments made using the Rousseaux price index in Mitchell (1988).

[15] The series on the volume of debt issued in London and Brazil generally concord with those previously published, though reconstructing them from the original source made it possible to correct some minor errors; Bouças (1946); Abreu (1985); Levy (1995).

I, violent uprisings, and regional separatist movements) put the durability of Brazil's core political institutions in doubt, especially through the mid 1840s. From 1824 to 1860 there was only a gradual rise in the amount of funded debt. This seemingly modest increase is actually remarkable in comparison with the rest of Latin America, where governments consistently failed to fund their debt at all, much less make payments on interest arrears and loans in default. By the 1860s Brazilian debt was increasing even before the Paraguayan war, thanks to new issues of both domestic and foreign bonds. Additional borrowing, both during the war, and afterwards to convert unfunded liabilities of the treasury into funded debt, made for a rapid increase in total debt in the 1860s and early 1870s. From 1870 through 1884 the increase was much less pronounced, but levels jumped again in the last five years of the Empire.

The aggregate periodization does not strictly hold when the debt is considered in per capita terms. Figure 4 normalizes the debt by the best available population estimates for nineteenth-century Brazil.[16] As in the case of the aggregate debt, deflating the values does not make for a major difference in either the level of debt nor the rate of growth before the 1870s. When considered in per capita terms the third phase is less one of growth, than it was one of leveling out. From 1824, when per capita funded debt was only a few shillings, through 1889 Brazilian debt levels increased to nearly seven pounds per person. While such levels were quite small in comparison with Britain, even in the eighteenth century, they were roughly commensurate with the gap in income and productivity between the two countries, and far beyond the levels of funded debt elsewhere in Latin America.

Issuing Debt on Lombard Street

Obligations taken up in London comprised the bulk of Brazil's funded debt for nearly three decades after independence. Figure 5 charts the relative share of total debt accounted for by foreign and domestic issues, respectively. For a few years in the 1850s the stock of domestic debt outstripped foreign, flip-flopping several times through the war with Paraguay and its immediate aftermath. Thereafter, issues in London contributed relatively less to new borrowing. By the 1870s Brazil was definitively more reliant on domestic finance than it was on overseas lending.

Loans in London were taken out through the city's leading merchant banks. Merchant bankers negotiated the terms of loans with the Brazilian ambassador to the court of St. James, who took his instructions from the Brazilian Minister of Finance in Rio de Janeiro.[17] Loan contracts specified the fees that would be paid for issuing the loan, the discount at which bonds would be subscribed by the merchant bank, and the coupon rate. Early loans further specified the source of funding for dividends and amortization, typically the country's customs' revenues. Later loans simply dedicated more vaguely the "resources of the Empire" to paying the loan. Merchant bankers took a

[16] All aggregate population figures for Brazil are necessarily conjectural up to 1872, when the first national census was taken.

[17] It was often the case, and an indication of the importance of financial matters, that the President of the Cabinet took for himself the portfolio of Finance.

speculative position in each loan, taking on risk, since if the market chose to value the bonds at less than the contracted price the burden of the difference fell on the bank. Table 1 provides the identities of the merchant banks that handled each loan, along with the amounts raised and issued. The table presents the terms for 18 separate issues, though technically there were 16 loans. The first loan, in 1824, was arranged through a consortium of private bankers. When the consortium that handled the 1824 loan did not proceed beyond the first one million pounds, the balance was issued by the London Rothschilds with terms somewhat more favorable to Brazil. The 1829 loans went through two bankers--the Rothschilds, and Wilson--under virtually identical terms. Of the 18 separate issues, 14 were handled through the Rothschilds, who by the 1850s became the official overseas financial agents of the Imperial Brazilian government. Though these shares were never quoted in Rio de Janeiro, they may well have been held there, since private bankers in Brazil corresponded with banking houses in the UK. The bonds likely circulated in Continental Europe, and dividends on at least the 1865 loan were payable either in London or Amsterdam.

The declared purpose of the London loans reported in Table 1 varied from simple deficit financing, to specific infrastructural uses. Of the 18 loans, 14 had little if any conceivable developmental purpose, conventionally defined. Several loans either indemnified the Portuguese for Brazilian independence, or re-financed indemnities. The 1858 buyout of the Dom Pedro II railroad was not, strictly speaking, an infrastructure investment, since it simply transferred the railroad's ownership from shareholders to the state, and did not in itself increase the level of social overhead capital beyond what was already in place. It did pave the way for the government to continue the line's expansion. The 1865 loan was the largest up to that point in time, and was taken out early in the war against Paraguay in anticipation of military expenses. The largest foreign loan, by far, was the one subscribed in the last year of the Empire to convert all shares with coupon rates of five percent to new bonds with a coupon rate of four percent. By the end of the Empire, the government had issued bonds in London with a face value of nearly 67 million pound sterling, and raised nearly 60 million pounds.

Borrowing on Rua Direita

By the second half of the Empire most funded debt was domestic in origin. Domestic borrowing by the central government drew heavily on the financial community in Rio de Janeiro, which was concentrated downtown around Rua Direita.[18] The issue of domestic funded debt involved two different types of debt instruments. The more important of the two, in terms of amounts issued and funds raised, were the perpetual-interest bearer bonds called apólices, first established by the debt law of 1827. Apólices were denominated in Brazilian currency, with no protection against increases in the general price level, and were amortized intermittently and irregularly. Interest on apólices was payable in both Rio de Janeiro and in the larger commercial centers where the central government had treasury offices.

[18] Later renamed Primeiro de Março, Rua Direita and its environs were the location of the Rio de Janeiro stock exchange, major commodities brokers, a host of private banks, and the third Bank of Brazil, among other prominent businesses.

The bulk of the apólices issued were six-percents. New issues required a government decree stating the amount to be issued and the purpose of the funds raised. Table 2 reports the purpose of each increment issued. As in the case of foreign borrowing, the funds raised from apólices were used for varied purposes, mainly to cover deficits, but also for the redemption of treasury notes, some infrastructure, and even dowries for the women of the royal family. The single largest issue came during the war with Paraguay and its immediate aftermath, accounting for more than forty percent of all of six-percents issued during the Empire. In the 1880s, Brazil switched to the issue of five-percents, in response to the improved status of government debt in the Rio market. As Table 3 shows, the bulk of these appeared with a single issue in 1886, to redeem treasury notes and currency. By the end of the Empire in 1889 more than 380 million milréis of apólices had been issued in Brazil, only 10 million of which had been amortized. This figure exceeded the amount of paid-in equity of all firms listed on Rio de Janeiro's stock exchange in 1888.

The second type of category of domestic long-term debt instruments was the "national loan." There were three of these. The first was hastily extracted in 1822 from the merchant community of Rio de Janeiro, which by all accounts was a forced loan. The second was also raised under urgency in 1868, during the war with Paraguay, but without coercion. The third was taken out 1879. Table 4 summarizes the terms of the 1868 and 1879 issues. Like apólices, both national loans were denominated in milréis, but unlike apólices these loans promised interest and redemption at a fixed rate of foreign exchange. The 1868 loan was denominated in gold. The 1879 loan was fixed in sterling, but it gave the option to the Brazilian government of paying dividends in either actual English money, or in Brazilian currency at the prevailing rate of exchange. Interest on the national loans was payable in both Brazil and in Europe, so that bonds of the national loans circulated and traded outside of Brazil. Given their pegged values to external currencies, they were far more similar in secondary markets to Brazil's foreign loans.[19]

Domestically-issued debt attained its highest level at the end of the Empire in 1889, when apólices and national loans combined represented obligations totaling nearly 435 million milréis (more than 46 million pounds sterling) in circulation. The level of domestic debt would have gone higher still, dramatically so, had indemnification bills in Brazil's Senate been approved and former slaveholders compensated in the wake of abolition. In 1888, barely a month after abolition, the Barão de Cotegipe, senator and former president of the Council of Ministers, proposed that the government issue that same year 200 million milréis in apólices to indemnify former slave owners for the loss of their property.[20] The proposal failed, and instead indirect subsidies were created through new banks of issue. The banks were intended to provide cheap credit to

[19]Though both loans were raised in Rio de Janeiro, the 1879 bond was formally listed on the London exchange, in addition to Brazil. Most of the 1879 loan, and a large portion of the shares of the 1868 loan, were held outside of the country by the early 1880s; Retrospecto Commercial do Jornal do Commércio, 1883, p. 34.

[20]Brazil, Anais do Senado, 19 June 1888.

plantations owners, but the measure came too late to shore up political support for the Emperor.

Yields and Borrowing Costs

Brazil did not have a funded debt in the colonial era, and the National Loan preceding independence in 1822 was a forced one, the terms of which did not reflect "market" conditions. As such it is impossible to assess the impact of institutional changes embodied in the constitution of 1824 on bond yields. What is clear is that not only was Brazil able to raise funds, but that the yields on Brazilian issues fell, on average, over time. Increases in yields were intermittent, non-permanent, and a predictable response to unpredictable events. Figure 6 presents the current yield on apólices in Rio de Janeiro, based on end-of-month spot observations.[21] The most dramatic change in yields came with the political instability of the First Reign (1822-1831). Nativist, anti-Portuguese sentiment was the defining feature of early national Brazilian politics. Emperor Pedro I, despite having declared independence, and establishing the liberal Constitution of 1824, came to be viewed as increasingly beholden to Portuguese influences and advisors. Under pressure from Portugal to return to resolve a succession crisis, he abdicated the Brazilian throne in April of 1831.[22] The big run up in yields came during this political crisis. Yields increased before and after abdication, but dropped precipitously soon thereafter, as the Regency was emplaced, and it became clear that the core institutions of the constitutional monarchy were not threatened, and that the public debt would not be repudiated. Yields again rose some 200 basis points from 1835 to 1844, as a well-known series of local uprisings and separatist revolts erupted in various parts of Brazil. The decline in yields in the mid 1840s appears closely related to the pacification of the longest-running separatist revolt in Brazil's far south. Declining yields were also be due in part to new tariffs in 1844, which raised rates on British goods to those paid by products from other nations, resulting in a near balancing of the budget.

Rio yields hovered below six percent for much of the 1850s, during the government of the "conciliation" cabinet. Yields rose gradually, and even at the height of the war with Paraguay in the 1860s did not attain the levels seen in the early 1840s. Hefty new issues of debt both at home and overseas did not prevent yields from falling again below six percent, where they stayed for most of the 1870s and 1880s. The conversion of Brazilian apólices from six percent to a five percent basis had been authorized by the Parliament in the early 1880s. It did not have much of visible impact on yields, nor in the financial press, when it was implemented in April of 1886.[23]

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[21] From 1829 through 1849 these are price quotations taken from the Jornal do Commércio. Beginning in 1850 the ledgers of the stock exchange are available at the Arquivo Nacional, so that most of the figures from 1850 onward are actual transaction prices.

[22] The best treatment of this episode by far is Macaulay (1986).

[23] Note however that tests for structural breaks in the domestic yield series, under the Bai-Perron procedure, find a break at the time of the conversion.

Brazilian apólices generally moved in concert with yields on the government's bonds in London. Figure 7 portrays the two yield series.[24] Visual inspection is sufficient to show that yields in the secondary markets of Rio de Janeiro and London moved in tandem, with a couple of notable exceptions. London yields at the time of Pedro I's abdication did not approach anything like the peak hit in Rio de Janeiro. Yields climbed more sharply in London, however, later in the war against Paraguay.

The cost of new borrowing also fell, on average, over time, suggesting declining risk premia. This finding emerges from calculating the interest rate that Brazil contracted to pay for each of the loans that it took out. Brazil's cost of capital, ex ante, was the internal rate of return at which the discounted present value of the future streams of dividends, amortization, and fees just equaled the amount of money Brazil raised with the loan. In the case of merchant-bank loans in London, this sum usually came in tranches over a period of one year or less, with a discount provided by the government for any early pay-ins. In return for this sum, the government agreed to pay dividends, amortization, and fees on an issue of bonds for a fixed interval of time. The nominal value of the bonds exceeded the sum raised, for two reasons. First, the bonds were issued at a discount under their face value, so that raising, for example, 1.21 million pounds might require the issuance of 1.373 million pounds worth of bonds. Second, the issuance fees were built into the loan, and covered by the cash raised from bonds, so that Brazil did not have to front money for the issue. Contractual terms varied from loan to loan, but in the typical Rothschild contract the government promised to make available to the Rothschilds the funds required six months in advance of each dividend payment, and that such payments were handled solely by the bank in return for a percentage fee each year. Amortization was handled solely by the merchant bank. In the case where shares were trading below par, the government paid a lower fee for amortization purchases. In the case where shares were trading above par, the government paid a higher fee for an amortization lottery conducted by the merchant bank. Amortized shares continued to receive dividends, which were used by the merchant bank to build up the sinking fund to support additional future amortization.

For Brazil's domestic borrowing no merchant banks were directly involved in underwriting the issue, though in later decades Rio de Janeiro commercial banks were used to help place bonds. Loan costs, in these cases, were limited to the initial discount, and any fees that the government paid to banks to assist with the issue. This information is available for both of the national loans, and also can be inferred for at least three issues of apólices for which the initial issue price is known.[25] Brazil's ex ante cost of capital at the time of the loan is the internal rate of return on each loan, calculated as:

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[24] Prices of all Brazilian bonds traded in London have been collected on an end-of-month basis from the Times, Course of the Exchange, and Investors Monthly Manual, from 1825 through 1889. The five-percent bonds used here provide the most continuous coverage. Yields to maturity were calculated using the remaining time to redemption of each issue comprising the series.

[25] One might expect that the initial issue price of an apólice to be that prevailing in the secondary market, though in 1840 at least that was not the case; RMF, 1841, Table A.

$$PV = \sum_{t=0}^{T}\left(\frac{(D_t + A_t + Fd_t + Fa_t)}{(1+r)^t}\right) + \frac{B_T}{(1+r)^T}$$

where PV is the sum Brazil received from the loan, D is the dividend payment on the total issue, at time t, A is the annual amortization, Fd is the fee on annual dividends (which in the first period also includes issue fees), Fa is the fee on annual amortization, B is the balance owed at maturity (akin to a balloon payment on a mortgage), T is the terminal period of the loan, and r is the Brazilian government's cost of capital.[26] The fee on amortization is assumed to be the lower of the fees specified, under the assumption that the were amortized at par. Figure 8 presents estimates of the ex ante cost of new debt issues in both London and Rio de Janeiro. Borrowing costs in Rio de Janeiro were usually consistent with borrowing costs in London, with the exception of 1851. The Ministry of Finance was likely a reasonably shrewd customer, and took into consideration conditions in both markets when deciding where to place an issue. Brazil's borrowing costs were at their highest, unsurprisingly, with the interest-covering loans of 1829. Costs fell thereafter, rose again through the early 1840s, declining in the 1850s, rising again with the war against Paraguay, and falling off thereafter.

The course of Brazil's primary-market borrowing costs over time is familiar. It generally mirrors the yield movements in the secondary market. In an era when consol yields ranged from 2.83 to 3.7 percent a year, Brazil's "country risk" was plainly apparent, though in comparison with recent history it was often at enviably low levels in the nineteenth century. Taking into account not only yields in the secondary market, but also the contracted borrowing costs, by every available measure Brazilian borrowing costs fell over time.

The Probability of Default

In the primary market for sovereign debt the sovereign's borrowing costs include a risk premium that reflects investor expectations about the probability of default. The market's expectation of the probability of default at the time the loan is made is thus embodied in the bonds' initial purchase price. Loan contracts detailed issue prices, loan maturity, and dividend rates, and with this information—along with some reasonable assumptions--the probability of default can be quantified with precision. Two different default scenarios are addressed. The first entails a partial default, in which the sovereign fails to pay interest on the loan, but when the loan matures the sovereign repays the

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The calculation of borrowing costs on apólices assumes that they would be amortized at rate of 1 percent per year for 100 years.

[26] The cost of capital in the expression must be computed using numeric techniques. Since there can be multiple rates of return that solve the expression, in practice the approach was to begin with an arbitrarily low r, at the lowest pre-1889 published coupon rate of 4.5 percent, and increase the value of r in increments of 0.1 until the expression attains the value of the money raised on the loan.

amount invested by the bondholder at the initial issue. The second scenario is more stark: upon receipt of the loan's initial proceeds, the sovereign repudiates the debt entirely, failing to pay interest, or repay the principal.[27] In both scenarios, the probability of default is estimated under two assumptions. First, lenders are taken as risk neutral. Second, there is a two-point probability distribution over outcomes, such that one of two states—full compliance, or the default scenario--strictly prevails.[28]

Taking the expected value of the bond investment as that of a "fair bet," the expected return to the investor from purchasing the bond must be at least as great as the actual return on consols. The difference between the two returns provides the basis for estimating the probability assigned by the market to Brazilian default. The expected return on the bond is a weighted average of the contractual return and the default return, where the weights are the probability of contractual compliance and default, respectively:[29]

$$R_1(1-p) + R_2 p \geq R_3$$

where R1 is the ex ante internal rate of return to the bond purchaser at issue if there is no default, p is the probability of default, R2 is the rate of return under the default scenario, and R3 is the current consol yield. In the partial-default scenario, where the government does not pay interest but does repay the investor's initial outlay, the default rate of return is zero. In the full-repudiation scenario, the default rate of return is –100, reflecting the total loss of principal by the investor.

Consider, for the purpose of illustration, the Brazilian loan of 1858. N.M. Rothschild & Sons agreed to issue bonds with a face value of 100 pounds, providing Brazil with 95.5 pounds in cash on each bond. In return Brazil contracted to pay 4.5 pounds a year in dividends for twenty years, and to then redeem the remaining shares outstanding at 100 pounds each at the end of the twentieth year. Additionally, there was a small chance each year that the bond would be redeemed as part of the stipulated

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[27] There is a continuum of such scenarios running between these two, and others still more mild than the first, in which the investor might receive both interest and some portion of their principal after years of negotiations, write-downs, and rescheduling. These possibilities are not simply conjectural; several of them correspond to the actual experience of British investors in Mexican bonds, for example, who ended up accepting in some cases only pennies on the pound, after decades of negotiation; Michael P. Costeloe, *Bonds and Bondholders: British Investors and Mexico's Foreign Debt, 1824-1888* (Westport, Conn.: 2003).; Salvucci, "La Deuda Eterna,"..

[28] The default probability would clearly vary with the scenario used. So long as the same default scenario is used for each loan, the direction and proportions of the changes in default probability over time are preserved.

[29] This is the approach taken by Fogel in assessing the probability of default on Union Pacific bonds; Robert William Fogel, *The Union Pacific Railroad: A Case in Premature Enterprise* (Baltimore: 1960).. For an econometric approach to the problem of estimating default risk at issue, see 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).

amortization. If Brazil followed through and honored the loan, the expected return to an investor who purchased an 1858 bond at issue and held it until maturity, taking into account the chance of early redemption, was 5.3 percent per year.[30] At the time of issue, the same investor had the option of purchasing instead a British consol, carrying a current yield in 1858 of 3.06 percent per year.[31] The expected return to investors in Brazil's new bonds in 1858 must have been at least as much as the 3.06 percent per year that the investor could earn on a consol. Assuming that default was partial and resulted in a zero return:

$$5.3(1-p)+0p \geq 3.06$$

which implies that the expected default probability at issue in 1858 was 42 percent. In the scenario of full repudiation by the government *ex post*, the *ex ante* expected return of the bond investor must still have been at least 3.06 percent per year:

$$5.3(1-p)-100p \geq 3.06$$

which implies that the expected repudiation probability at issue in 1858 was 2.14 percent.

This approach to measuring the default probability is necessarily biased by the assumptions required for its computation. That the Rothschilds contracted the loan in 1858 at 95.5 did not mean they were guaranteed of being able to issue shares at that price. If the price at which they could place the bonds proved to be less than 95.5, then the Rothschilds would have been too optimistic in their evaluation of default risk. Moreover, if default would have eventually lead to refinancing, and the resumption of reduced interest payments at some later date, the probability of default would be larger than in the case where the default payoff is taken to be nil or negative.[32]

Using information from the loan contracts on subscription prices, dividends, and maturity, along with the current consol yields, the ex ante internal rate of return for a bond purchaser is estimated for each loan, and along with it the probability of default. Figures 9 and 10, and Table 5 present the repudiation and default probabilities for each loan issued in London from 1824 through 1889. By either measure, the probability of default was at its highest in Brazil in 1829, when the government turned to two merchant banks to raise the loans required to cover interest on its previous loans. The risk of an interest-only default in 1829 was fully 65 percent, repudiation risk rose above 5 percent, and the government's cost of raising the loan ran into the double digits. Yet by the next time Brazilian government borrowed in London a decade later, its probability of default had declined, and only continued to fall into the third decade of Pedro II's rule. The loans subscribed during the war with Paraguay exhibited a newly elevated probability of default, hitting a level Brazil had not seen since 1843. The default probability fell again

[30] Computed as the internal rate of return that sets the issue price equal to the discounted stream of dividends and the redemption value at maturity.

[31] This calculation assumes that the investor then sold the consol at the end of the thirty years for the same price they paid for it.

[32] Since $R_1 > R_3$, it must be the case that $\frac{dp}{dR_2} > 0$.

after the war, and hit its lowest point at the end of the Empire with the Conversion Loan of 1889.

The credibility of Brazil's commitment to honor its financial obligations, which emerged with the Constitution of 1824, was only enhanced with the passage of time. The indicators traced here reveal that Imperial Brazil underwent a revolution in public finance, modest by British standards, but striking when considered in light of the experiences of the Spanish American republics. The share of funded obligations in total debt increased, hiccupping only during the hugely expensive war with Paraguay, and thereafter recovered. The amount of long-term debt grew, as Brazil repeatedly returned to the capital markets and raised funds, and also did so increasingly at home. Yields on debt instruments fell over time, moving downward on consol yields. The costs of new borrowing fell over time, as did the probability of default.

Private Finance

The pace and degree of the revolution in Imperial Brazilian public finance was not accompanied by similarly strong effects in private financial markets. Investigators increasingly accept that financial development is a requirement for, rather than a handmaiden of, modern economic growth.[33] Further, the form of financial development is not very important. Savings and investment that occurs through banking organizations is not necessarily better or worse than savings and investment channeled through impersonal stock and bond markets.[34] With respect to both types of private finance Imperial Brazil was critically deficient. Unlike in Britain, where the expansion of public borrowing and spending involved mainly the military component of the state bureaucracy and was not accompanied by heavy regulation of the economy, in Brazil the growth of the state came with rising control over private financial mechanisms. The model of the permissive business environment of England was, by 1850, firmly eschewed in Brazil. That the development of public finance was not accompanied by private financial florescence points to the need to focus attention on just what did transpire with respect to financial markets, and the institutions that governed them in Brazil between 1822 and 1889.

Brazilians taking loans from either banks or private parties bore high borrowing costs, and businesses were limited in the corporate form they could adopt. Single agents typically engaged in simple short-term private lending and borrowing. If groups of people had been able to pool resources, they could have established larger enterprises when warranted, and could have lowered the cost of their funds. In Imperial Brazil, entrepreneurs seeking more finance than could be mustered in a sole proprietorship or two-person partnership could draw on more capital by adding silent partners. They often wished to go further, and draw on considerable amounts of funds by creating a "sociedade anonima"--a limited liability joint stock company. Depending on the nature of the business, and the market it faced, the limited-liability joint stock form could provide considerable advantages.

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[33] Levine, et al. (2000).

[34] Levine (2001).

Yet for most of the Imperial era relatively few such companies existed. The problem with limited liability joint stock companies in Brazil had nothing to do with presumed weaknesses of Civil Law countries that occupy presentist assessments of corporate regulation and governance.[35] The problem, in short, was not one of creditor and shareholder rights. In Imperial Brazil these were reasonably well defined and fully transparent once the Commercial Code of 1850 was implemented. The fundamental difference between the laws in the England (the canonical common law case) and in Brazil regarding the formation of limited-liability joint stock companies was a simple one: in England, anyone could start one and register it after 1844, while in Brazil, nobody could start one, no matter what, without previous authorization of the government. The principal challenge to creating limited liability joint stock companies was thus government fiat. Whereas the English Companies Act of 1844 made limited liability a simple administrative procedure, limited liability did not exist at all in Brazilian law until the end of 1849.[36] Once limited liability did exist as an option in Brazil, it was only by arbitrary decision of the national government that a joint stock company could constitute itself. Short of receiving this recognition by the government, shareholders were fully responsible for debts incurred by the business. Property rights institutions in effect trumped contracting institutions. Once the former dictated the terms of doing business, there was little leeway for the latter to resolve fundamental problems of incorporation in Brazil.

This regulatory context was rooted in the history of commercial law in the country. The relevant legal background to corporate law in Imperial Brazil actually predated the Civil Law tradition that has come to be questioned by modern scholars. If civil law systems are poor substitute for common law in matters of business, a Commercial Code nonetheless offered at least some potential advantages over the hodge-podge of medieval and early modern law that Brazil inherited from Portugal. In the wake of independence all Portuguese legislation not explicitly overturned by Brazil's constituent assembly continued in effect. A bewildering array of laws thus governed commerce in the first decades after independence. Brazil's socio-legal "superstructure" had three core components: Portuguese law; regulations specifically governing colonial Brazil (including the years after the arrival of the King of Portugal in 1808); and the laws governing the United Kingdom of Portugal and Brazil from 1815 to 1822. The Portuguese law that was in effect at independence derived mainly from the Filipine Ordinances of 1603, themselves based on Manueline Ordinances of 1514, which were further based on Afonsine Ordinances of 1480. Specific colonial regulations were those of 1548, 1612, and 1763, all of which addressed issues of commerce in the colony. Included among these was the Law of Good Reason, which indicated that in addition to pre-1822 Portuguese legislation regarding commercial matters, parties in Brazil could draw on the commercial laws of all Christian nations in business affairs. In principle, Brazilian commercial law could be that of any one of a number of nations.

The property rights institutions of Imperial Brazil compounded this colonial heritage with strong limits on entry, which weighed heavily on the growth of the financial

[35] La Porta, et al. (1997; 1998).
[36] Harris (2000).

sector. It was left to the Imperial government to create specific statutes to replace the more archaic ones in effect, but the proposed commercial code presented to the lower house of Parliament in 1834 was not adopted. Joint-stock companies could organize, though with no basis for limited liability. The first general provisions governing the establishment of joint stock companies with limited liability were instituted by Cabinet decree only in 1849, anticipating the passage of the first Commercial Code by Parliament the following year.[37] Limited liability status required approval from either the Cabinet (in the case of firms in the city of Rio de Janeiro), or from Provincial Presidents (who were appointed by, and responsible to the Cabinet) elsewhere. Unless and until the designated authority granted limited liability, all shareholders had full responsibility for debts and no protection from creditors. Brazil then embarked on a process of corporate legislative development that can only be described as under whelming, for more than three decades. The 1850 Commercial Code made it possible to establish a joint stock company, with shareholder liability for debts limited to the value of the shares they held.[38] But the Code maintained the 1849 provision that such firms could exist only with Cabinet approval.[39] Moreover, were a company to seek any government concession or privilege, the approval of the executive depended further on the approval of the legislature.

The legislation had a loophole, however, which Brazil's leading private banker, the Barão (later Count) of Mauá sought to exploit, by attempting to establish a silent partnership (*sociedade em comandita*) with tradable equity shares. In reaction to his initiative, an additional decree in 1854 prevented partnerships from issuing equity shares, even with unlimited liability, eliminating the potential benefits of having a secondary market for the securities of these firms.[40] In 1860 things got worse. Parliament maintained its grip on limited liability, and imposed further restrictions on joint stock companies, especially banks, shifting part of the authority for the granting of limited liability for financial firms to the Emperor's Council of State (similar to a privy council, whose members enjoyed life tenure).[41] This measure applied equally to companies seeking to build a railroad or canal in more than one province.[42] Thus with the Council, and not just the Cabinet and Parliament, rested authority over limited liability until 1882. For more than two decades the Sections of Treasury and Empire of the Council busied themselves scrutinizing the statutes of every proposed banking company, many railroads, and countless other companies who sought some sort of government privilege or concession.[43] These measures were not used to prevent joint-stock companies from forming at all. Rather, for more than 30 years, they made it possible for the Cabinet to maintain considerable control over which enterprises could attain such status. They also guaranteed powerful limits on commercial banking. Next to railroads, probably no other

[37] Decreto 575, 1 October 1849.
[38] Article 298.
[39] Article 295.
[40] Caldeira (1994).
[41] Lei 1083, 22 August 1860, Article 2, Section 3.
[42] Decreto 2711, 19 December 1860, Capitulo 1, Artigo 9, Section 1.
[43] Garner (1988), especially pp. 381-420.

branch of business would have benefited so much from the opportunities of the joint stock form of incorporation.

The restrictiveness of the 1860 law was widely noted. Even Cabinet Ministers acknowledged, openly, the negative impact of the 1860 law on corporate formation. In his report to the Parliament, Minister of Agriculture Dantas noted that "s*ociedades anónimas* continue to be ruled by the law of 1860...in my view prejudicially for the spirit of association..."[44] In the 1870s these sentiments underpinned legislative proposals to loosen the law of 1860. After several years of considering and crafting new legislation, in 1882 the Parliament reversed itself, moving in the direction of the English Companies Act. Only in 1882 could companies finally establish themselves with limited liability through an administrative registry and without government authorization, subject to several qualifications. The three most important exceptions were foreign joint-stock companies, companies commercializing foodstuffs, and joint-stock financial firms that engaged in mortgage lending (*sociedades de crédito real*), all of which continued to require government approval.[45] The 1882 reform also permitted the creation of partnerships where the capital of silent partners could be made into tradable equity shares, and in which silent partners were responsible for debts only up to the amount of their contracted capital.[46]

Several indicators reveal the very limited degree of private financial development that was permitted by this regulatory regime before 1882. The first indicator draws on Ryan's research findings on private credit contracts in Rio de Janeiro.[47] Over the course of the nineteenth century interest rates for private loans remained high, and did not decline to anywhere near the degree that interest rates on public debt did. Figure 11 presents summary measures of the average rate of interest on all private lending contracts recorded in Rio de Janeiro. Private rates of borrowing from 1835 through 1845 generally followed the upward trend of bond yields (see Figure 7), and then similarly declined through 1855. They rose suddenly between 1855 and 1860, then fell somewhat, always remaining above ten percent. By 1885, when yields on government debt were well below six percent in both Rio de Janeiro and London, average private rates of interest in Rio de Janeiro were still at ten percent. Average private borrowing rates remained high despite the fact that credit contracts in the late 1870s and 1880s included an appreciable number of bank mortgage loans that were in effect subsidized by government guarantees. Excluding these subsidized loans would raise the averages rate of interest higher still.

The increased restrictions on joint-stock formation in 1860 can be seen in two measures. The first is presented in Figure 12, which reports the amount of paid-in capital of joint-stock companies newly authorized each year from 1851 through November of 1865 (at current prices). From 1851 through 1860 an additional 11.4 million milréis of domestic joint-stock capital, on average, was formed each year. From 1861 through

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[44] RMACOP, 1867.

[45] Lei 3150, 4 November 1882, Article 1; Decreto 8821, 30 December 1882, Article 130, Section 4, and Article 133.

[46] Lei 3150, 4 November, 1882, Article 34; Decreto 8821, 30 December 1882, Articles 145, 146, 147, and 148.

[47] Ryan (in progress).

1865, in the wake of the Law of 1860, that figure fell to 2.7 million milréis per year. This decline is actually understated by the figure. The pre-1860 formations exclude two massive firms that were created with government assistance. Had they been included, the pre-1860 figures would have been much larger. The second measure is the pace of formation of silent partnerships over this same interval. Entrepreneurs seeking to pool capital to start a firm who were deprived of the chance to organize a joint-stock company had but a single alternative: the *sociedade em comandita.* Managing partners remained fully liable for the firm's obligations, but silent partners were liable only for their share of the firm's capital. Figure 13 shows how the period following the Law of 1860 saw an acceleration in the formation of sociedades em comandita. Considering Figures 12 and 13 together, the inference is clear: restrictions on joint-stock companies meant that new firms increasingly had to take on the form of partnerships.

Just as the 1850 Commercial Code controlled the formation of joint-stock companies, and the 1860 legislation reduced the pace of joint-stock formation, the 1882 law was followed by an increase in the paid-in capital of joint-stock firms. Table 6 presents figures on paid-in capital for 1851, 1860, 1878, and 1888. Joint-stock capital increased, both in terms of the total and per capita, in the wake of the Commercial Code of 1850, as provisions for limited liability were first emplaced. This increase stalled after 1860, and actually fell in real per capita terms. From 1878 through 1888 (bracketing the 1882 reform of the commercial code), joint-stock capital formation increased appreciably. Overall, private financial development was modest to stagnant for much of the Imperial era. By all appearances, it was political connections that mattered for aspiring entrants to banking in particular. Most boards of directors of major commercial banks in Rio de Janeiro included prominent politicians, many of whom were sitting office holders while simultaneously overseeing the banks' affairs.[48] The political economy of bank entry in Brazil was a case of "lobbying on entry," where institutional obstacles made the resort to politics indispensable for organizing large-scale business enterprise.[49] Commercial laws and regulations controlled the development of business more than they promoted it.

Conclusions

Imperial Brazil's commitment to honor sovereign debt before 1889 emerged from the institutional arrangements of 1824. Both the domestic and foreign components of this commitment were badly damaged when the Emperor was overthrown in 1889 and the Constitution of 1824 dismantled. Until then, Brazil was one of only a few peripheral economies to list bonds denominated in domestic currency (albeit with exchange clauses) in Europe. It was also a rare exception in its capacity to successfully issue long-term obligations at home. This ability to increase its domestic debt persisted until the military-led coup in 1889. More than a mere change in the head of state, the coup undid the institutional arrangements that had allowed for the credibility of the public debt. By the mid 1890s inflationary finance had badly eroded the value of domestic bonds, and left the government without the regular recourse to domestic capital markets that it had

[48] Summerhill (2006), chapter 7.
[49] For the theory of such restrictions see Perotti and Volpin (2004).

previously enjoyed. In London the Brazilian government found it could issue only short-term treasury notes, where only a few years before it had borrowed with a 56-year maturity. By 1898 the problem had grown to where it impacted Brazil's ability to service its long-term debt at home and abroad, leading to rescheduling of its foreign obligations. Less than a decade after the end of the constitutional monarchy, Brazil's "fall from grace" in public finance was complete.

No single factor accounts for Imperial Brazil's failure to build vibrant private financial markets on the foundation of its sound public finances before 1889. Three factors do stand out. First, the Imperial government maintained a monopoly over currency issue for most of the period. The advantages it enjoyed from this control included seignorage rents, and the ability to issue currency at will under extraordinary circumstances (such as the war against Paraguay). This authority ruled out the issue of banknotes for much of the era. Instead, commercial banks would emit short-term notes (*vales*) that were not legal tender, and could only be redeemed at the bank. Banks of issue, which could have been valuable sources of credit creation, were so few in number and operated for such a brief interval that they had little impact on the economy. Second, commercial banks, even when restricted from issuing banknotes, enjoyed privileges from the very restrictions on entry that were imposed by the government, up until the banking reform of 1889. As such, these incumbents stood to gain much from the limits on competition, and may have coalesced in favor of continued restrictions.[50] Third, the political institutions that provided stability and credible commitment to honor debt were highly centralized. Imperial Brazil never had the decentralized, federal-like arrangements of Great Britain or the United States, nor their independent judiciaries. In the U.S. federalism made it possible to have (among other things) hundreds of local banks, creating credit on a large scale. In Brazil extreme centralism undermined all such local impulses, since authority over policymaking, command over the vast bulk of public revenues (to include those of the provinces and municipalities), and even the review of provincial legislation, was vested with parliament, the Cabinet, and the Council of State. The centralized pork-barreling of every conceivable policy was not counterbalanced by efficiency-enhancing competition among sub-national units of government. In such a setting, restrictive and costly controls over private finance prevailed, to the detriment of domestic capital markets.

[50] The more narrow implications of this question occupy another paper, in progress, on the profitability of commercial banking in Brazil from 1850 through 1889. The broader implications raise an entire research agenda on politics and financial policy in an open economy.

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

Loan	Average Annual Interest Cost	Place of Issue	Purpose	Coupon	Bank	Amount Raised	Amount Issued	Period (Years)
1824	8.22	London	Deficit	5	Bazeth et al.	1,000,000	1,333,300	30
1825	6.95	London	Deficit	5	Rothschild	2,000,000	2,352,000	30
1829	12.8	London	Loan Interest	4	Rothschild	200,000	384,600	30
1829	12.8	London	Loan Interest	4	Wilson & Co.	199,940	384,500	30
1839	8.1	London	Deficit	5	Samuel & Phillips	312,500	411,200	30
1843	7.9	London	Portugal (Convention of 1842)	5	Goldsmid	622,702	732,000	20
1852	5.6	London	Retire 1823 Portuguese Loan	4.5	Rothschild	954,250	1,010,000	30
1858	5.9	London	Buyout of Dom Pedro II Railroad	4.5	Rothschild	1,425,000	1,523,500	20
1859	5.53	London	Retire 1829 Loan	5	Rothschild	508,000	508,000	30
1860	6.27	London	Infrastructure	4.5	Rothschild	1,210,000	1,373,000	30
1863	6.5	London	Retire 1824 Loan/Paydown 1843 Loan/Cover Floating Debt	4.5	Rothschild	3,300,000	3,855,300	30
1865	8.6	London	War Finance	5	Rothschild	5,000,000	6,963,600	30
1871	6.69	London	Floating Debt/Railroad Extension	5	Rothschild	3,000,000	3,459,000	37
1875	5.38	London	Railroad Construction and Railroad Dividend Guarantees	5	Rothschild	5,000,000	5,301,200	30
1883	6.04	London	Railroads/Public Works/Engenhos Centrais	4.5	Rothschild	4,000,000	4,599,600	38
1886	6.09	London	Floating Debt/Deficit	5	Rothschild	6,000,000	6,431,000	38
1888	5.29	London	"Abolition"	4.5	Rothschild	6,000,000	6,297,300	38
1889	5.08	London	Conversion	4	Rothschild	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. Interest cost is the internal rate of return, ex ante, that equates the net present value of the loan (the amount received at issue) with the future stream of dividends, amortization, and fees.

Table 2. Issues of Brazilian Six-percent Perpetual-interest Bonds (*Apólices*), 1828-1886

Periods	Purpose	Amount Issued
1828-1832	Deficit	13,496,600
1832-1834	"Prezas"	5,974,600
1837	Revolts	1,723,000
1837-1838	Deficit	5,861,400
1839	Deficit	1,918,000
1840	Military expenditures	303,400
1841	Deficit	4,105,600
1842-1843	Deficit	5,346,600
1842-1845	Portuguese claims	2,124,200
1843-1844	Royal dowry and trousseau	1,720,000
1843-1846	Deficit	1,495,000
1844-1845	Deficit	2,344,000
1844-1848	Deficit	7,505,400
1846	Deficit	336,000
1851-1853	Deficit	5,213,800
1858	Portuguese claims	5,400
1860-1862	Swap for shares of Recife and San Francisco railroad	2,466,400
1860-1863	Swap for shares of Bahia and San Francisco railroad	186,600
1860-1872	Swap for shares of Dom Pedro II railroad	11,328,600
1861-1862	Withdraw paper money	2,150,000
1863	Withdraw paper money/Redeem notes and Rio de la Plata indemnities	5,890,400
1864	Takeover turnpike road	3,161,000
1865	Withdraw paper money/Royal weddings	1,228,000
1865-1872	Paraguayan war	143,894,700
1869	Land purchase	50,000
1870	Island purchase	1,705,800
1870	Redeem treasury notes	25,000,000
1871		600
1873-1876	Dock company	2,734,000
1876	Deficit	8,600,000
1877	"Diverse"	30,000,000
1877	Dowry	1,200,000
1879	Consolidation of floating debt	40,000,000
1880-1882	Swap for shares of Baturité railroad	606,000
Total Issued		339,675,100
Amortized		10,154,200
Circulation		329,520,900

NOTES: amounts issued in milréis.

Table 3. Issues of Brazilian Five-percent Perpetual-interest Bonds (*Apólices*), 1827-1886

Periods	Purpose	Amount Issued
1830-1883	Fund pre-1827 Obligations	2,000,000
1886	Consolidate Floating Debt	50,000,000
Circulation		52,000,000

NOTES: amounts issued in milréis.

Table 4—Brazilian National Loans

Loan	Interest Cost	Place of Issue	Purpose	Coupon	Amount Raised	Amount Issued	Period (Years)
1868	8.0	Rio de Janeiro	War Finance (Gold)	6	27,000,000$	30,000,000$	33
1879	6.24	Rio de Janeiro	Deficits/Floating Debt	4.5	50,000,000$	51,885,000$	20

Note: Loans were issued in Rio de Janeiro, interest payable in Brazil, Britain and Continental Europe. Dividends and amortization on the 1868 loan were paid in gold. Dividends and amortization on the 1879 loan were payable in specie, or in Brazilian currency at the current rate of exchange, at the discretion of the government. Interest cost is the internal rate of return, ex ante, that equates the net present value of the loan (the amount received at issue) with the future stream of dividends, amortization, and fees.

Table 5. Implied probability of default and repudiation on Brazilian loans, at time of issue, 1824-1889

Loan	Coupon	Period	Consol Yield	Issue Price	Expected Return	Probability of Default	Probability of Repudiation
1824	5	30	3.16	75	7.6	0.584	0.041
1825	5	30	3.69	85	6.6	0.441	0.027
1829	4	30	3.21	52	9.2	0.651	0.055
1829	4	30	3.21	52	9.2	0.651	0.055
1839	5	30	3.26	76	7.5	0.566	0.04
1843	5	20	3.08	85	6.9	0.553	0.036
1852	4.5	30	2.96	95	5.5	0.461	0.024
1858	4.5	20	3.06	95.5	5.3	0.422	0.021
1859	5	30	3.09	100	5.35	0.422	0.021
1860	4.5	30	3.20	90	5.5	0.419	0.022
1863	4.5	30	3.30	88	5.7	0.422	0.023
1865	5	37	3.43	74	7.7	0.555	0.04
1871	5	37	3.25	89	6.1	0.467	0.027
1875	5	30	3.20	96.5	5.6	0.429	0.023
1883	4.5	38	2.99	89	5.5	0.457	0.024
1886	5	38	2.99	95	5.65	0.472	0.025
1888	4.5	38	2.85	97	4.95	0.424	0.020
1889	4	56	2.83	90	4.7	0.398	0.018

NOTE: Consol yield is the end-of-year observation in London. For London loans the issue price is that for which merchant banks contracted to create the loan. For Rio loans (1868 and 1879) the issue price is that of the Treasury. The expected return of the subscribers of these loans, and the probability of default at the time of issue, are calculated in the manner discussed in the text.

Table 6. Paid-in Capital of Domestic Joint-Stock Companies traded on the Rio de Janeiro Stock Exchange, 1851, 1860, 1878, and 1888

Year	Domestic Paid-In Capital	Deflated Paid-In Capital	Real Per Capita
1851	9,340,000	16,235,918	2.21
1860	114,436,000	112,748,901	13.39
1878	151,116,250	133,027,163	11.76
1888	220,856,620	240,371,963	17.58

SOURCES: For 1851 and 1860; RMJ, 1865. For 1878 and 1888, Retrospecto Commercial do Jornal do Commércio for those years.

NOTE: All values in milréis. Figures do not include British firms whose shares traded on the Rio exchange but whose capital was raised in sterling overseas. Deflated figures are expressed in prices of 1880, using the index described above.

Figure 0. Relationship between Limited Government and Financial Development

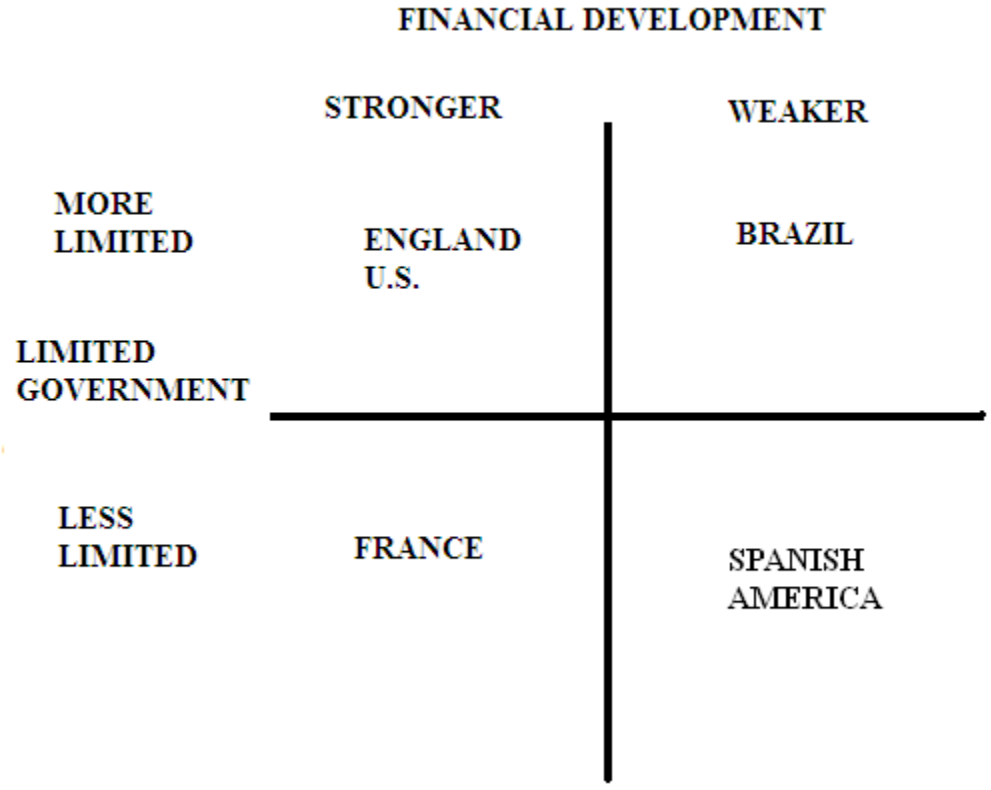
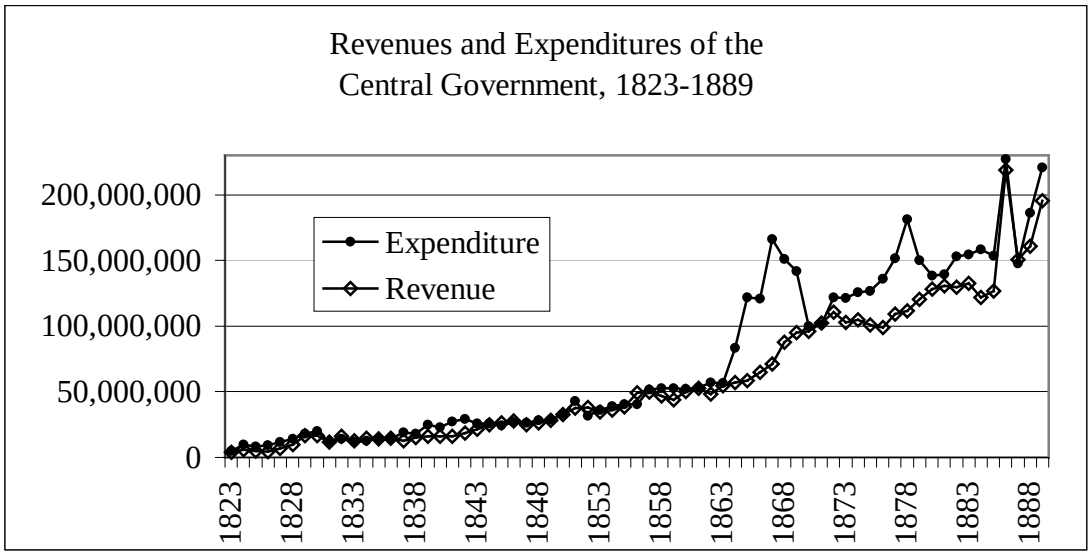
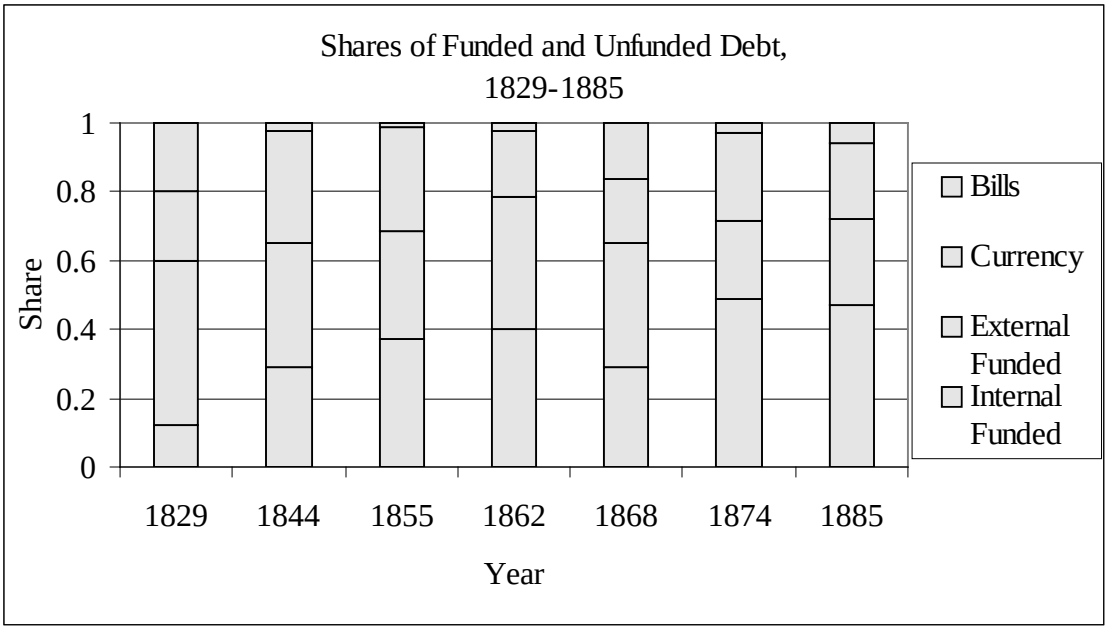


Figure 1



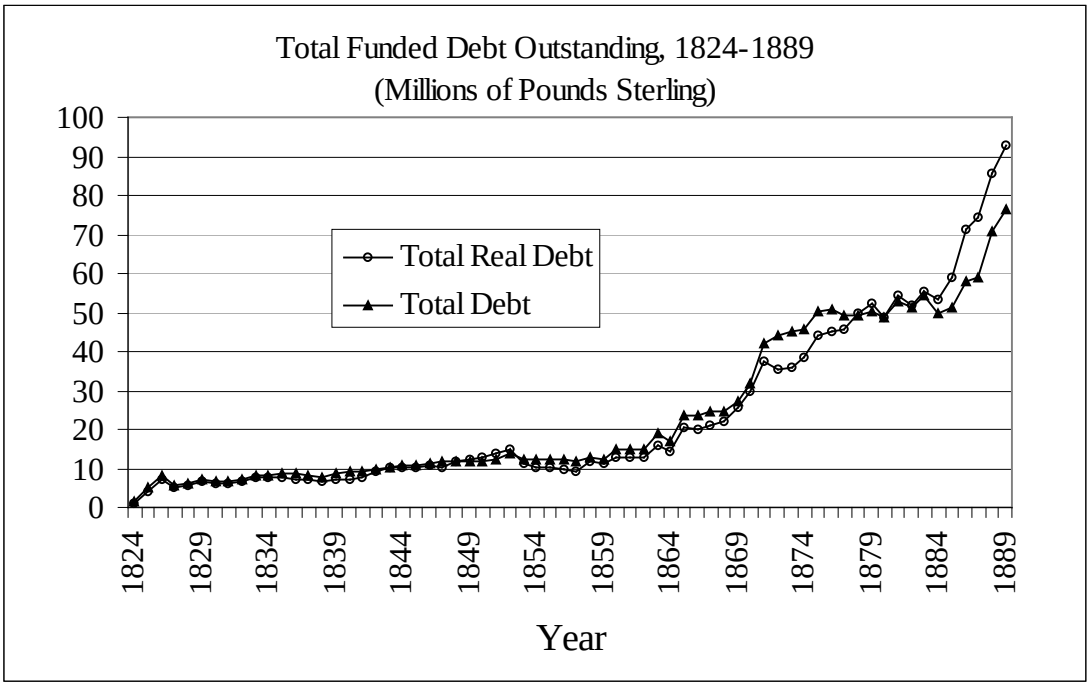
SOURCE: Relatório do Ministério da Fazenda, 1827-1890

Figure 2



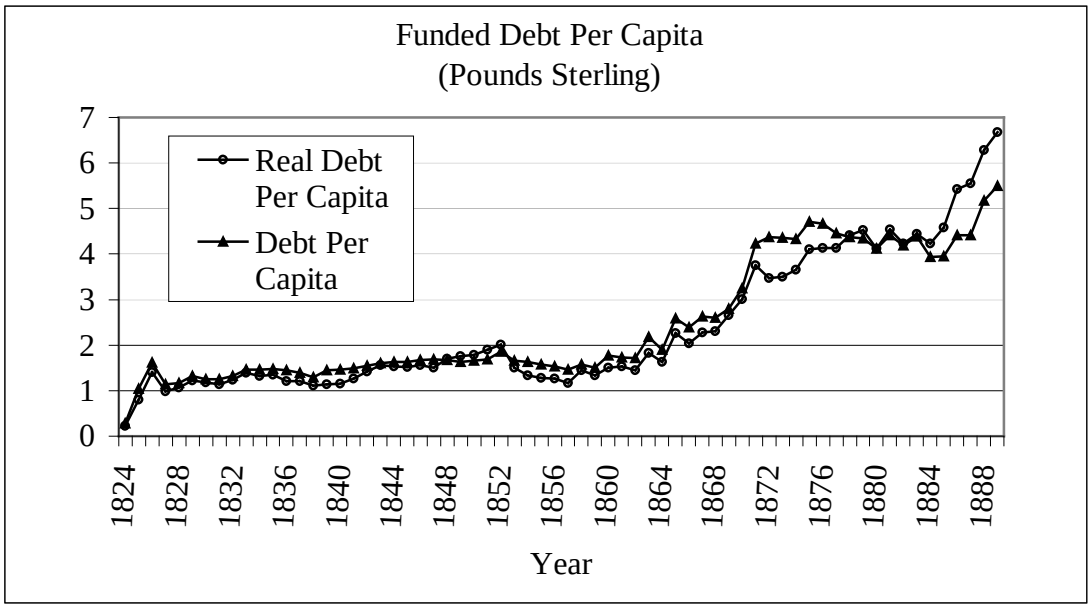
SOURCE: Relatório do Ministério da Fazenda, various years.

Figure 3



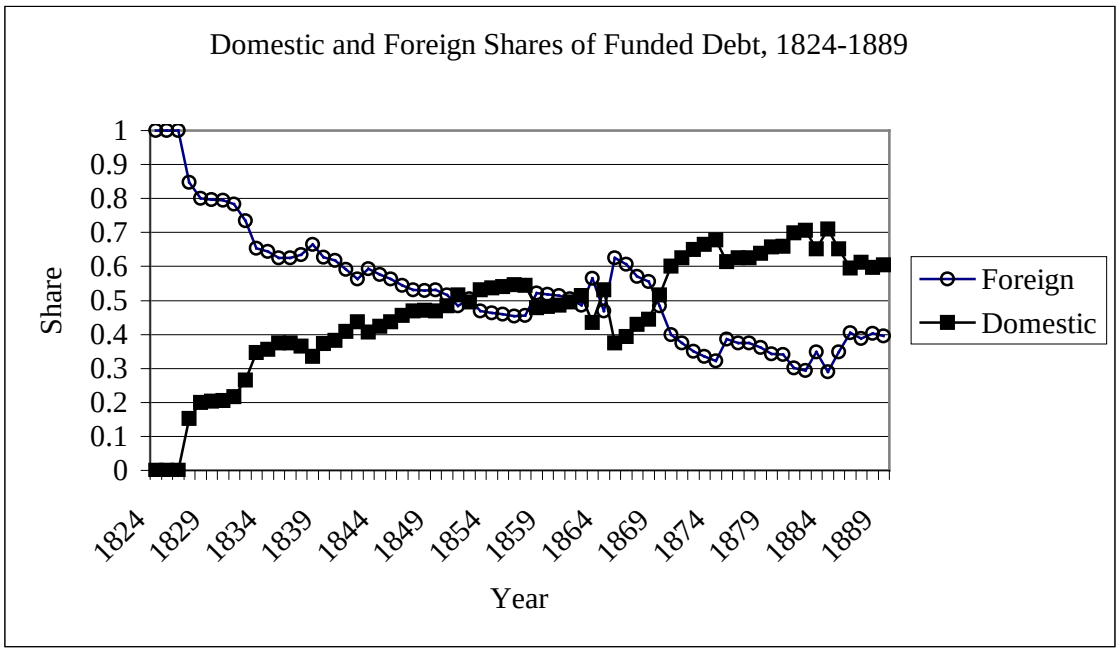
SOURCE: Relatório do Ministério da Fazenda, 1827-1890. Internal debt denominated in Brazilian currency converted to sterling at the average remittance rate of exchange for each period. Current values converted ton constant prices using the Rou

Figure 4



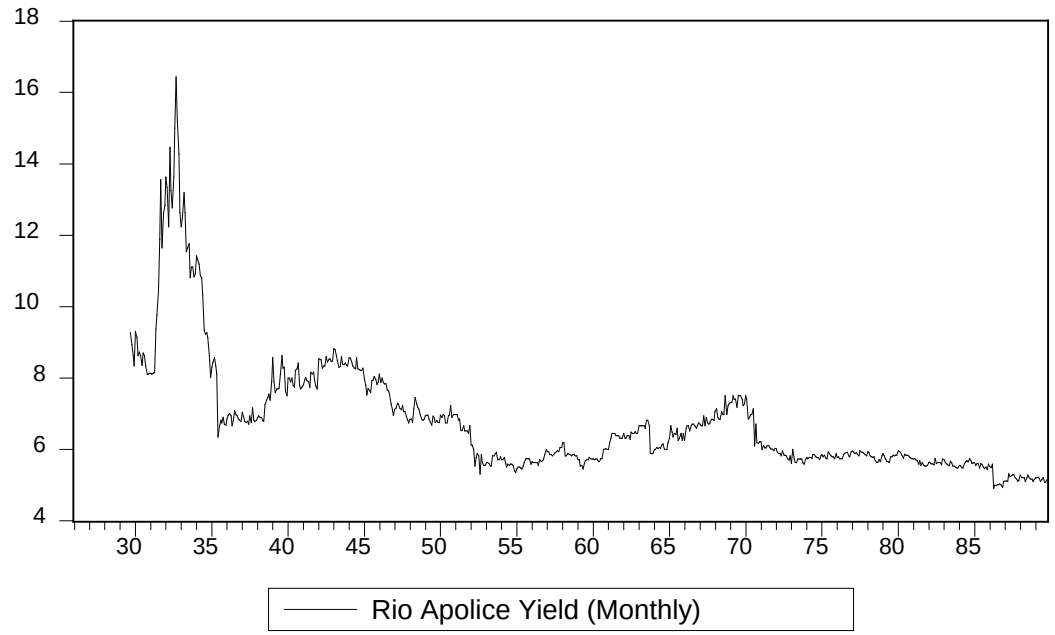
SOURCE: Relatório do Ministério da Fazenda, 1827-1890

Figure 5



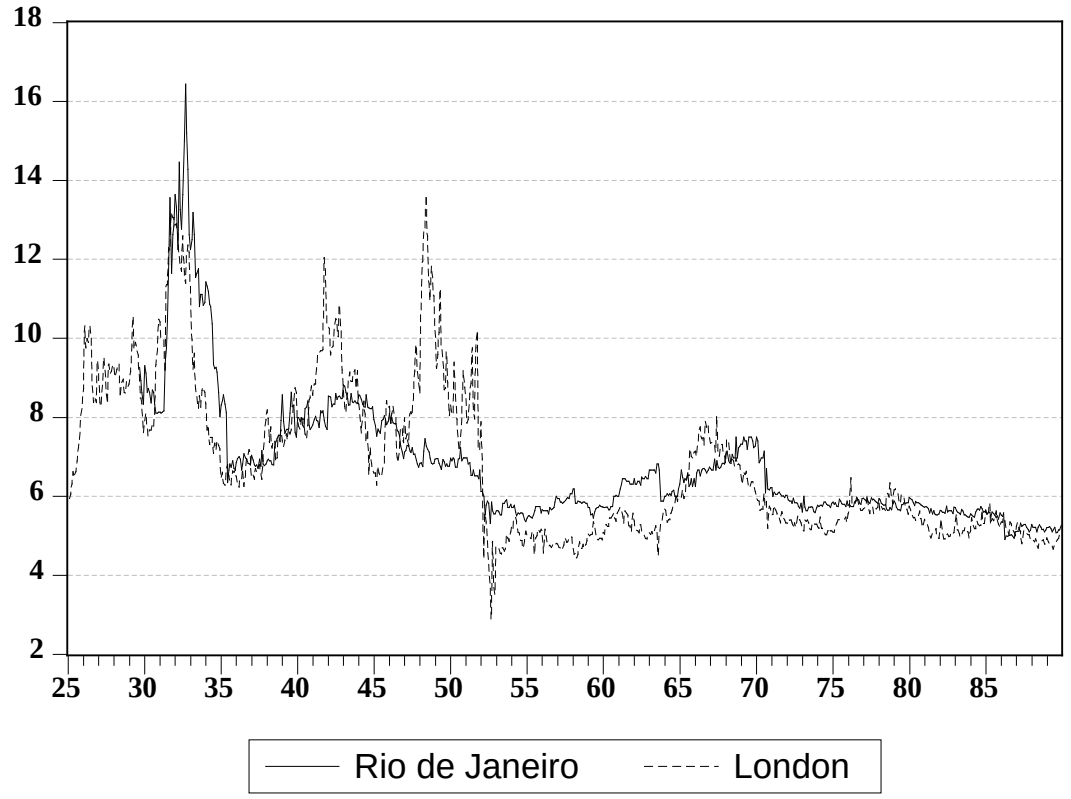
SOURCE: Relatório do Ministério da Fazenda, 1827-1890

Figure 6 Current Yield on Six-Percent Apolices in Rio de Janeiro, 1829-1889 (monthly)



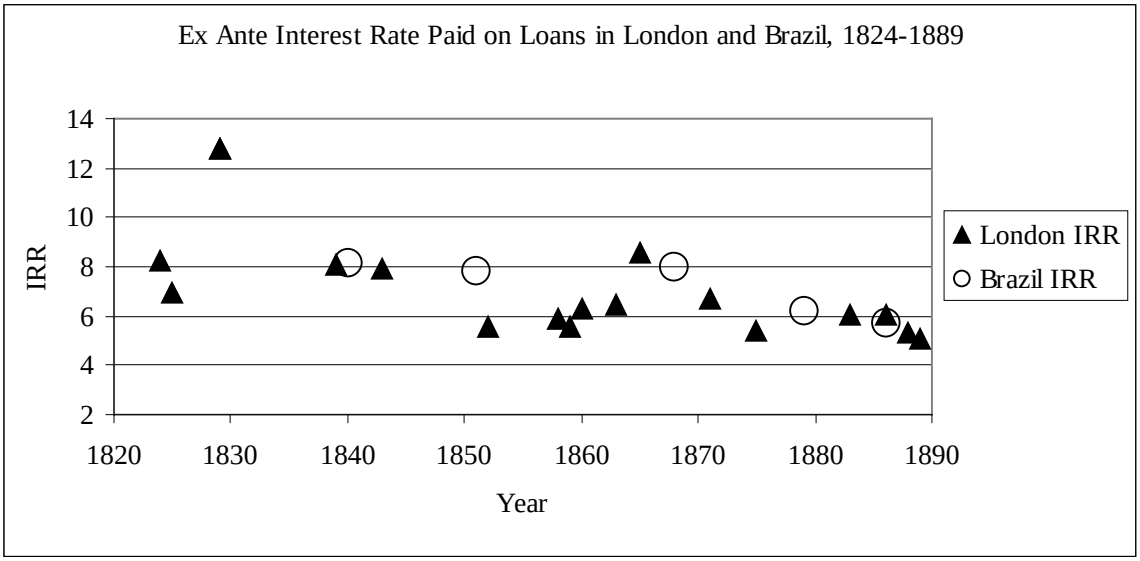
SOURCES: 1829 through 1849, Jornal do Commércio; 1850 through 1889, Livros dos Corretores, Bolsa de Valores do Rio de Janeiro, Arquivo Nacional do Brasil.

Figure 7 Apólice Yields in Rio de Janeiro and Yield to Maturity on Brazilian Bonds in London, 1825-1889



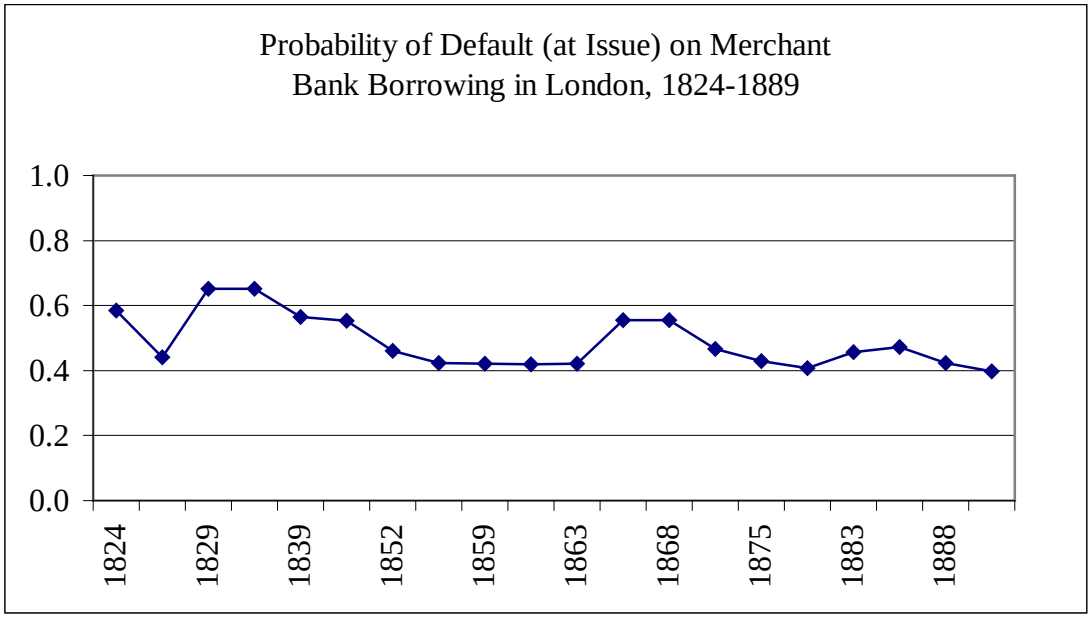
SOURCES: for Rio de Janeiro yields see preceding figure; London yields are yield-to-maturity based on end-of-month observations from the Times of London and from Course of the Exchange.

Figure 8



SOURCE: Internal rates of return on Brazilian issues for 1840, 1851 and 1886 imputed from *apólice* coupon rate, issue price, and assuming 1 percent annual amortization; internal rates of return on Brazilian loans of 1868 and 1879 based on conditions in government decrees established the issues; internal rates of return on London issues based on terms and conditions detailed in each loan contract between the government of Brazil and merchant bankers.

Figure 9



NOTE: Probability calculated as described in text.

Figure 10. Repudiation Probabilities, by Loan

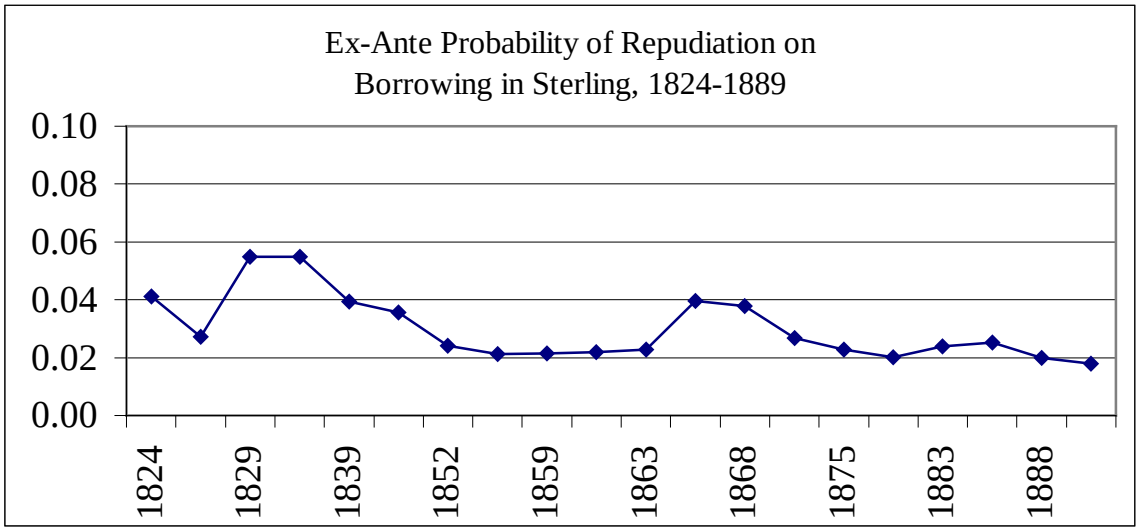
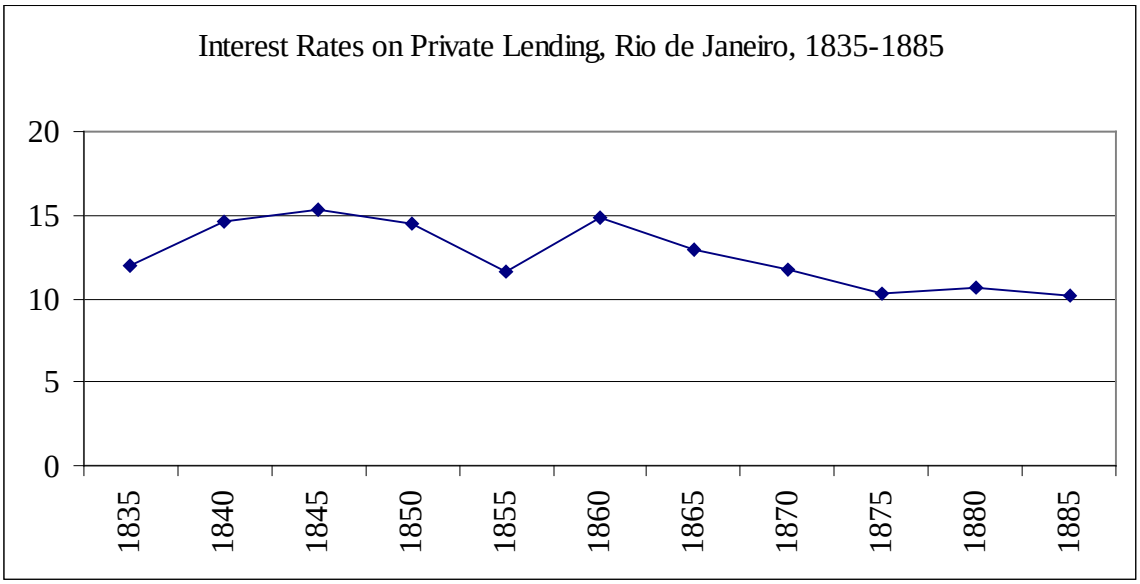
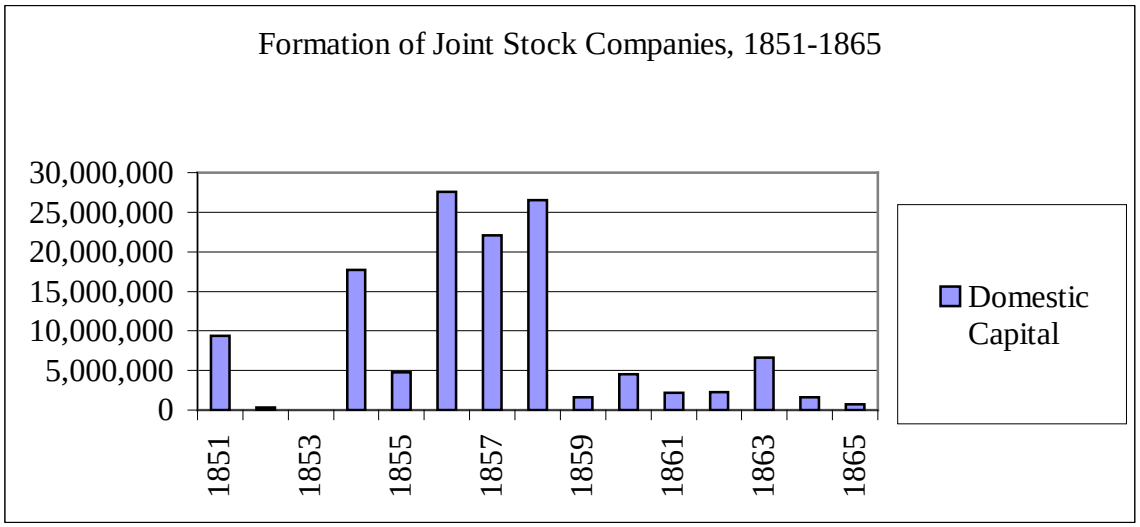


Figure 9



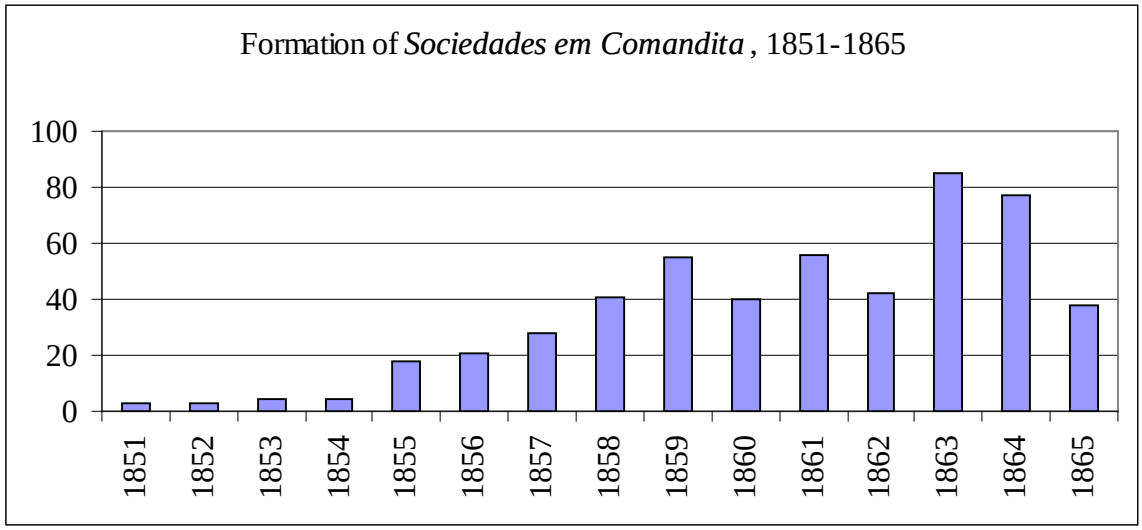
SOURCE: Ryan, "Credit Where Credit is Due."

Figure 10



SOURCE: calculated from Brazil, Ministério da Justiça, Relatório, 1865, Appendix I.
NOTE: The figures here excluded the Banco do Brasil, which incorporated in 1854, and the Estrada de Ferro Dom Pedro II, which incorporated in 1856. Because both of these were high-capital firms (30 million and 38 million milreis, respectively), their inclusion would increase the pre 1861 figures by a good deal.

Figure 11



SOURCE: See Figure 12.