

# *Institutional Reforms, Financial Development and Sovereign Debt: Britain 1690–1790*

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We revisit the evidence on the relations between institutions, the cost of government debt, and financial development in Britain (1690–1790) and find that interest rates remained high and volatile for four decades after the Glorious Revolution, partly due to wars and instability; British interest rates co-moved with those in Holland; Debt per capita remained lower in Britain than in Holland until around 1780; and Britain did not borrow at lower rates than European countries with more limited protection of property rights. We conclude that, in the short run, institutional reforms are not rewarded by financial markets.

The idea that the protection of property rights is of utmost importance for economic growth and financial development has become extremely influential in economics in recent years. In a famous article, Douglass North and Barry Weingast argue that institutions and property rights are the reason why Britain was the first country to undergo an industrial revolution and to embark on modern economic growth.<sup>1</sup> They argue that the power-sharing institutions that evolved in Britain following the Glorious Revolution (1688) made the government (and the Crown) credibly committed not to renege on its debt and to uphold the

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<sup>1</sup> North and Weingast, “Constitutions.”

property rights of individual creditors to whom the government owed money. North and Weingast also argue that, following these institutional changes, the cost of capital to the British government declined substantially, a phenomenon which they interpret as a fall in the required risk premium. They claim that this decline in interest rates prompted the development of financial markets in Britain and lowered the cost of capital to private entrepreneurs. As a result, economic development in Britain far exceeded the relatively slow economic progress experienced by France and the Netherlands in the eighteenth century, two countries that had been as developed as Britain up to the seventeenth century.

The discussion of institutions and property rights has spread far beyond Britain of the seventeenth and eighteenth centuries. In a series of studies that have dramatically changed the academic discourse in financial economics, Rafael La Porta, Florencio Lopez de Silanes, Andrei Shleifer, and Robert Vishny argue that countries whose legal system is of the British common law tradition offer better protection to outside investors.<sup>2</sup> As a result, financial markets in common law countries tend to be more developed, and entrepreneurs enjoy better (cheaper) access to external finance. Other authors, such as Ross Levine and Sara Zervos have emphasized the empirical relation between such financial development and economic growth.<sup>3</sup> Daron Acemoglu, Simon Johnson, and James Robinson also view institutions transplanted from Europe as crucial for economic growth (although they do not emphasize the relation between institutions and financial development).<sup>4</sup> In what follows we re-evaluate some of the empirical evidence on the relations between the quality of Britain's institutions, the cost of British government debt, and the financial development of Britain between 1690 and 1790.

Before proceeding, we emphasize that the present study does not attempt to challenge the importance of "good" institutions and of well-established property rights for economic growth and financial development. The evidence presented in this article suggests, however, that the notion that financial markets swiftly reward countries for the establishment of investor-friendly institutions is not grounded in historical facts, both for the case of Britain after the Glorious Revolution, and for other historical examples (for example, nineteenth-century Japan).<sup>5</sup>

<sup>2</sup> La Porta, Lopez de Silanes, Shleifer, and Vishny, "Legal Determinants" and "Law."

<sup>3</sup> Levine and Zervos, "Stock Markets."

<sup>4</sup> Acemoglu, Johnson, and Robinson, "Rise."

<sup>5</sup> North and Weingast, "Constitutions," p. 805, seem to suggest that institutional changes in seventeenth-century Britain did bring about an *immediate* change—"In just nine years . . . government borrowing increased by more than an order of magnitude . . . reflect(ing) a substantial increase in the perceived commitment of the government . . ."

More specifically, we use several newly constructed series on British interest rates throughout the eighteenth century to contrast two conjectures. The first, in the spirit of North and Weingast's work, suggests that the institutional reforms of the late seventeenth century should have led to a low cost of British government debt, both relative to earlier periods and relative to other European governments.<sup>6</sup> The second conjecture draws on our own earlier research and suggests that institutional reforms are rarely associated with lower interest rates in the short run.<sup>7</sup> Figures 1A and 1B, which are discussed in more detail below, suggest that the latter view is better supported by the data: both the domestic interest rate in Britain and the interest rate differential between Britain and Holland imply that financial markets did not appreciate Britain's superior institutions until around 1730. One possible reason for this is that the credibility of the new institutions of the late seventeenth century was only established over time; another interpretation is that the high interest rates observed early in the eighteenth century can be attributed to the unstable environment in Britain in the decades following the Glorious Revolution. Figures 1A and 1B suggest that wars, especially in the early decades of the eighteenth century, in contrast with institutional reforms, often had an immediate impact on the cost of capital.

Our empirical analysis of Britain's cost of debt is based on several newly constructed (and reconstructed) measures of British interest rates starting in the late seventeenth century and continuing throughout the eighteenth century. The analysis takes into account explicitly the fact that Britain's cost of debt was affected not only by the perception of property rights by local investors, but also by the perception of Britain's creditworthiness by foreign investors, most notably in Amsterdam. We therefore study changes in interest rates in Britain and the Province of Holland between the late-seventeenth and the late eighteenth centuries, taking into account the existence of international capital movements from Holland to Britain.<sup>8</sup>

Our main empirical results are the following. First, we show that the level of interest rates in Britain continued to be fairly high for several decades following the Glorious Revolution, and increased substantially in response to the outbreak of military conflicts. Moreover, we find that during the period 1690–1720, much of Britain's government debt was illiquid, casting doubt on the conjecture that the development

<sup>6</sup> North and Weingast, "Constitutions."

<sup>7</sup> Especially Sussman and Yafeh, "Institutions"; and Mauro, Sussman, and Yafeh, "Emerging Market Spreads."

<sup>8</sup> On the interaction between financial markets in Amsterdam and in London see Wilson, *Anglo-Dutch Commerce*; Dickson, *Financial Revolution*; Neal, *Rise of Financial Capitalism*; and Oppers, "Interest Rate Effect."

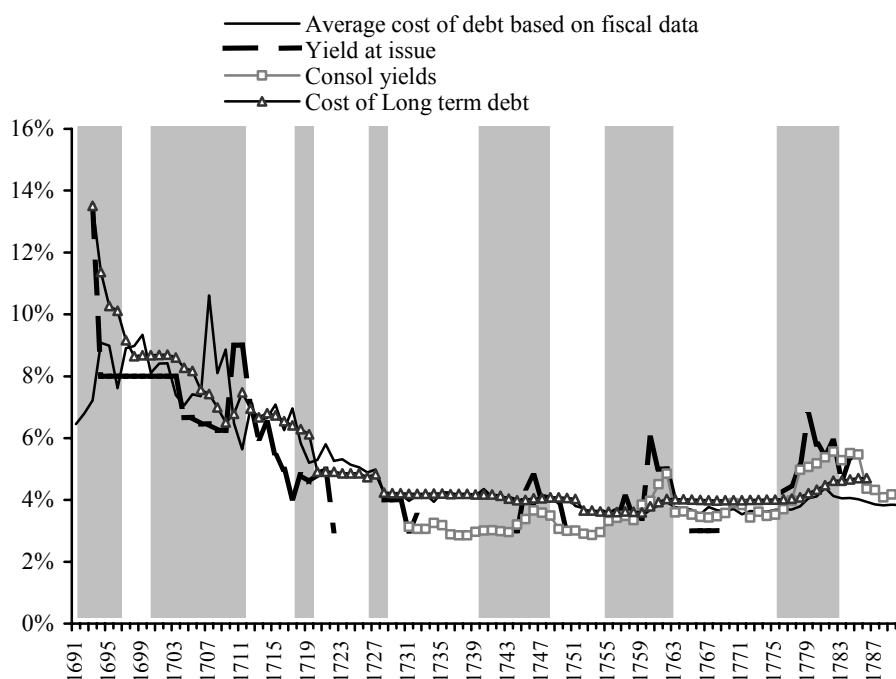


FIGURE 1A  
ESTIMATES OF THE COST OF DEBT, BRITAIN 1692–1790

*Sources:* See the text. War years (shaded) are the following: 1688–1697: War of League of Augsburg; 1701–1712: War of the Spanish Succession; 1718–1720: War of the Quadruple Alliance; 1727–1729: war with Spain; 1740–1748: War of the Austrian Succession; 1755–1763: Seven Years War; 1775–1783: War of American Independence. The Consol yield series is based annuity prices before 1753.

of financial markets was due to the development of a secondary market for government debt soon after the institutional changes of the late seventeenth century.<sup>9</sup>

Second, as can be expected in global open financial markets, we find that interest rate dynamics in Britain were often shared by Holland as well. Moreover, some of our statistical tests suggest that interest rates in Britain were determined, to a large extent, by the volume of borrowing in Holland and by interest rates there.<sup>10</sup> This suggests that, despite the new institutions, British interest rates did not follow a unique trajectory.

<sup>9</sup> On the liquidity of British government debt, see also Carlos, Neal, and Wandschneider, “Origins.”

<sup>10</sup> Oppers, “Interest Rate Effect,” shows, using a different methodology, that Dutch lending was important in keeping British borrowing rates low until the 1770s. A comparison with interest rates in France would have been interesting, but, to the best of our knowledge, data are not available for the early eighteenth century. Existing evidence on French interest rates in the second half of the eighteenth century is discussed below.

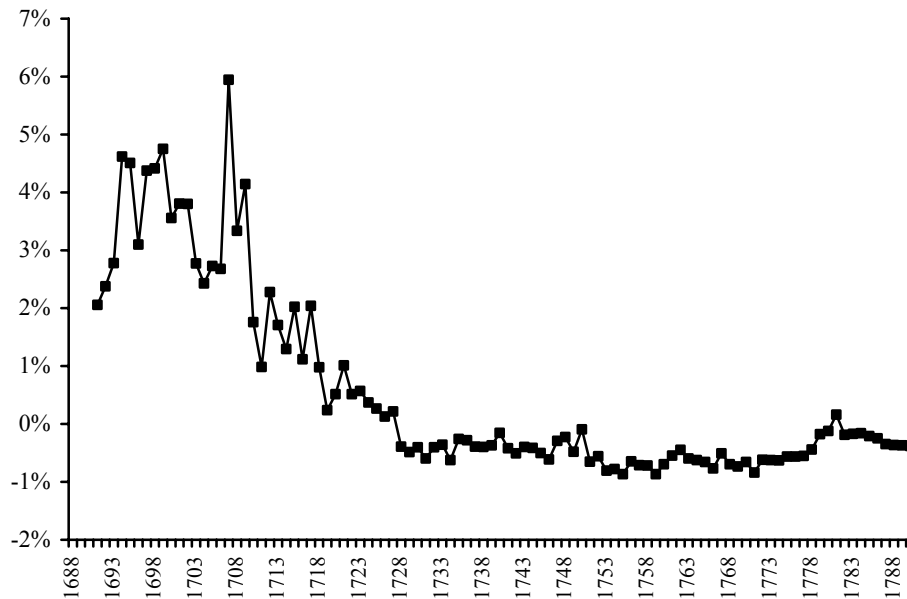


FIGURE 1B  
THE INTEREST RATE DIFFERENTIAL, BRITAIN VS. THE PROVINCE OF HOLLAND,  
1688-1790

Sources: See the text. Interest rates are measured as the ratio of debt service to debt.

Third, moving from prices (interest rates) to quantities (volume of debt), we find that, on a per-capita basis, Holland continued to be a larger borrower than Britain for the entire eighteenth century.

Finally, although the British government could certainly borrow from foreign investors, a comparison of Britain’s cost of debt with that of several other European countries suggests that Britain did not borrow at very different rates from other countries.

These findings notwithstanding, there is no doubt that British capital markets became important in the second half of the eighteenth century. The long time lag between the institutional reforms of the late seventeenth century and the emergence of London as the world’s main financial center suggests that the link between the two is, at best, a long-run phenomenon; even if institutions do affect interest rates and financial development, the effect tends to be slow. Moreover, it is not impossible that the development of financial markets in Britain was in response to developments other than institutional reforms, such as political changes, improved debt management techniques, or newly developed asset trading networks.<sup>11</sup>

<sup>11</sup> On political changes, see Stasavage, *Public Debt*; on debt management, see Riley, *Seven Years War*; and on asset trading networks, see Carlos, Neal, and Wandschneider, “Origins.”

Going beyond Britain, the conclusion that financial markets do not reward positive institutional changes in the short run seems to hold also for a number of other historical examples that are discussed below, such as nineteenth-century Japan and other “emerging markets” of the 1870–1914 era of globalization. Indeed, there is little evidence that financial markets ever rewarded the establishment of the “right” institutions with a swift reduction in the cost of capital, or that countries with good institutions could borrow at lower costs than countries without institutional investor protection. We conclude that the link between institutions and ability to borrow appears to be more complex than what some of the literature on institutions might imply.

#### A LITERATURE SURVEY

The present article is related to several previous studies on the changes in Britain’s financial markets starting in the late seventeenth century and on the institutional changes of that period. Writing long before North and Weingast, John Ramsey McCulloch describes the determinants of interest rates in Britain as follows: “In the beginning of the funding system, the term fund meant that the taxes or funds (were) appropriated to the discharge of the principal and interest of loans . . . . Owing perhaps, to the scarcity of disposable capital, but far more owing to the supposed *insecurity of the Revolutionary establishment* (our own emphasis), the rate of interest paid by the government in the early part of the funding system was comparatively high. But, as the country became richer, and the confidence of the public in the stability of the government was increased, ministers were enabled to take measures for reducing the interest, first in 1716 and then in 1749.”<sup>12</sup> This view, dating back to 1837, suggests that the decline in interest rates in 1716 and 1749 followed the high interest rates caused by instability following the Glorious Revolution (not by the Stuart regime). It also suggests that the British funding system started out by assigning specific tax receipts to pay for interest and principal, a measure that was common in Europe at the time and among problematic sovereign borrowers of the nineteenth century, such as the Greece or Egypt.

Moving to more recent studies, one related line of research has focused on the evolution of private (nongovernment) interest rates in Britain. Gregory Clark, for example, examines private (real) rents on agricultural land.<sup>13</sup> Stephen Quinn, studies archival bank interest rates, and Peter Temin and Hans-Joachim Voth report fragmentary data on interest

<sup>12</sup> McCulloch, *Dictionary*, p. 585.

<sup>13</sup> Clark, “Political Foundations.”

rates at Hoare's Bank.<sup>14</sup> In general, these studies suggest that private interest rates in eighteenth-century Britain did not decline substantially or (in the case of Temin and Voth), that changes in interest rates can be attributed to changes in usury laws, not to improved protection of property rights. John Wells and Douglas Wills use Bank of England stock price information to examine the impact of threats to the institutional changes of the seventeenth century.<sup>15</sup> Their analysis ends in 1714, but up to that period they find that stock prices declined in periods of threats to the newly established institutions, such as the Jacobite rebellion of 1708. Finally, Carlos, Neal, and Wandschneider do not examine interest rates directly, but focus on a related issue - the extent to which individuals became involved in holding British government bonds and trading in them.<sup>16</sup>

In addition to these attempts to provide evidence based on British interest rates, several studies cast some doubt on the relative importance of institutional changes in the protection of property rights, in comparison with other institutional changes in seventeenth- and eighteenth-century Britain. John Brewer, for example, attributes Britain's economic and military success to the emergence of a strong government, which he views as the most important transformation that took place at the time.<sup>17</sup> Patrick O'Brien attributes Britain's success to the administrative foundations for a fiscal state, which were put in place in the seventeenth century, and made the British government far more able to collect taxes than her European rivals.<sup>18</sup> Riley attributes the British government's ability to borrow to superior debt management techniques in comparison with France's.<sup>19</sup> Niall Ferguson studies long-run fluctuations in British interest rates, and reaches the conclusion that political events (not institutional reforms) were the most important determinant of these fluctuations.<sup>20</sup> David Stasavage also emphasizes politics, especially political representation of the "bourgeoisie" (through the Whig Party).<sup>21</sup> Other authors relate Britain's rise to pre-eminence to developments that took place before the Glorious Revolution: Robert Allen, for example, attributes the rise of Britain to patterns of intra-European trade that predate the Revolu-

<sup>14</sup> Quinn, "Glorious Revolution's Effect"; and Temin and Voth, "Private Borrowing."

<sup>15</sup> Wells and Wills, "Revolution."

<sup>16</sup> Carlos, Neal, and Wandschneider, "Origins."

<sup>17</sup> Brewer, *Sinews*.

<sup>18</sup> O'Brien, "Fiscal Exceptionalism."

<sup>19</sup> Riley, *Seven Years War*.

<sup>20</sup> Ferguson, *Cash Nexus*.

<sup>21</sup> Stasavage, "Credible Commitment," *Public Debt*, and "Partisan Politics."

tion.<sup>22</sup> Henry Roseveare emphasizes some financial developments that date back to the first half of the seventeenth century.<sup>23</sup>

Beyond Britain, the present study is also closely related to studies of the relation between the cost of capital, institutional changes, and political events more generally. Robert Barro and J. F. Wright document the relationship between long-term interest rates and wars for the eighteenth and nineteenth centuries.<sup>24</sup> Stephan Epstein argues that differences in formal constitutional arrangements do not account for differences in interest rates across Europe between 1300 and 1750.<sup>25</sup> Finally, there are a number of studies inspired by the North and Weingast view of the world using non-British data which are very relevant to the present investigation: Francois Velde and David Weir study the impact of default risk on French interest rates in the second half of the eighteenth century.<sup>26</sup> William Summerhill, who uses data on Brazilian debt in the nineteenth century, finds some impact of institutional changes on the government's ability to borrow (mostly domestically), although most of the "structural breaks" he identifies seem to be closely related to revolts and instability.<sup>27</sup> Richard Sylla emphasizes the relation between the establishment of a modern financial system in the United States and Hamiltonian institutional changes; he does not, however, investigate financial market responses to these changes.<sup>28</sup> Perhaps most directly related is our earlier study, in which we investigated the importance of institutional changes and political events in determining the cost of Japanese government bonds traded in London between 1870 and 1914, an era of dramatic institutional change in Japan.<sup>29</sup> We found that reforms, a constitution, and other similar factors had little impact on yields on bonds issued by the Japanese government at that time. By contrast, political developments (such as the war with Russia) were far more important factors affecting Japan's cost of (foreign) capital. The main conclusion that emerges from that analysis is that a country's cost of (foreign) capital does not respond immediately to institutional reforms, very much like our findings here.

<sup>22</sup> Allen, "Progress."

<sup>23</sup> Roseveare, *Financial Revolution*.

<sup>24</sup> Barro, "Government Spending"; and Wright, "British Government Borrowing."

<sup>25</sup> Epstein, *Freedom*, chapter 2.

<sup>26</sup> Velde and Weir, "Financial Market."

<sup>27</sup> Summerhill, "Political Economics" and "Inglorious Revolution."

<sup>28</sup> Sylla, "Financial Systems."

<sup>29</sup> Sussman and Yafeh, "Institutions."



METHODOLOGY AND DATA

*Methodology*

Our investigation of the evolution of Britain’s cost of government debt during the century that followed the Glorious Revolution begins around 1690, and makes use of several newly constructed and reconstructed interest rate and government debt series, which are described in the next subsection. Methodologically, as noted in the introduction, a central feature of the present article is the treatment of Britain as an international borrower, whose cost of capital is calculated relative to that of the Province of Holland. This approach does not necessarily require that Holland be viewed as a completely risk free borrower; it is sufficient to acknowledge that Holland was an established borrower by the end of the seventeenth century, whereas Britain a relatively new one. This view is certainly consistent with descriptions of the Dutch Republic (sixteenth through eighteenth centuries) by Jan de Vries and Ad van der Woude as the “first modern economy,” whose society, economic efficiency, urbanization, and educated workforce were admired by contemporary and later observers.<sup>30</sup> The fact that Britain and Holland fought the same wars (on the same side) in the first half of the eighteenth century makes the comparison of the Dutch and British borrowing costs particularly appropriate.

To study the dynamics of the determination of interest rate on government debt we use a VAR (vector auto-regression) analysis describing the relation between interest rates in Britain and the Province of Holland in more detail:

$$i_t^{uk} = \alpha_1 + \eta_1 i_{t-1}^{uk} + \phi_1 i_{t-1}^{nl} + \varphi_1 X + v_{1t} \quad (1)$$

$$i_t^{nl} = \alpha_2 + \eta_2 i_{t-1}^{nl} + \phi_2 i_{t-1}^{uk} + \varphi_2 X + v_{2t} \quad (2)$$

In this specification, interest rates in London are determined by a weighted average of lagged interest rates in London and Amsterdam (denoted by  $i$ ) and by a vector of additional explanatory variables (denoted by  $X$ ).

Modern uncovered interest rate parity specifications relate the interest rate differentials to expected depreciation and to country risk. In practice, for nearly 90 years, between 1698 and 1785, the British pound-Dutch schilling (Banco) exchange rate was virtually constant, fluctuat-

<sup>30</sup> de Vries and van der Woude, *First Modern Economy*.

ing slightly within a very narrow band of 34 to 37 schilling per pound (European State Finance Database). It is therefore reasonable to assume that the expected depreciation was zero, so that changes in relative interest rates should reflect primarily changes in the risk premium.

The control variables we use in the estimation of the determinants of the risk premium on British government debt are in line with the modern literature on emerging market risk premia.<sup>31</sup> These include two variables: the first is the trade surplus, which serves as a measure of the flow of revenues that can be used to repay (foreign) debt (therefore its coefficient is expected to be negative); exports may also be viewed as a proxy for a country's output (the concept of GDP did not exist at the time).<sup>32</sup> The second is the fiscal deficit, which proxies for "leverage" or default risk, (therefore its coefficient is expected to be positive).<sup>33</sup>

### *Data Issues*

In support of their argument that there exists a relation between interest rates and institutional reforms, North and Weingast provide evidence on a decline in interest rates on British government debt following the Glorious Revolution.<sup>34</sup> This evidence is based on an incomplete interest rate time series, with observations for several years in the late seventeenth and early eighteenth centuries. They also offer evidence on an increase in the volume of British government debt around the same time period, supplemented by a general description of the development of the London Stock Exchange in the eighteenth century.<sup>35</sup>

Data constraints have made the design of a more precise test of the determinants of the cost of government debt in the seventeenth and eighteenth centuries virtually impossible. High frequency time series of government borrowing rates or government bonds yields are available only starting in 1753, when British Consol prices become available for

<sup>31</sup> See Mauro, Sussman, and Yafeh, *Emerging Markets*.

<sup>32</sup> Exports in absolute figures or exports per capita can be used instead of the trade surplus without changing the empirical results.

<sup>33</sup> Another macroeconomic variable that we examine is inflation, which turns out to be insignificant, perhaps because this variable did not vary much during the period.

<sup>34</sup> North and Weingast, "Constitutions."

<sup>35</sup> Part of the rise in the volume of trade on the London Stock Exchange during the period was related to the South Sea Bubble. There is no doubt that the bubble had ramifications that did not lead to financial development that could contribute to economic growth, and, in fact, it led to popular resentment that hindered the growth of British equity markets for over a century. In particular, the Bubble Act of 1720 limited the use of joint stock companies (Neal, *Rise*, p. 62). For further details on the South Sea "Scheme," see, for example, Roseveare, *Financial Revolution*, chapter 6. Recently, Carlos, Neal, and Wandschneider, "Origins," suggest that a possibly positive effect of this episode was an improved microstructure of trading on the London Stock Exchange and greater liquidity of securities markets.

the first time (although annuity prices are available earlier). Attempts to bridge this gap have generally followed three different routes. The first is based on examinations of interest rates on private loans, and attempts to infer from them whether or not interest rates declined starting in the late seventeenth century.<sup>36</sup> These studies essentially test the conjecture that the (assumed) reduction in the government's cost of capital led to a decline in the private cost of capital, but do not examine directly if, indeed, interest rates on government bonds experienced a significant change starting in the late seventeenth century. Moreover, this conjecture is based on the assumption that British capital markets were integrated, an assumption that contradicts Moshe Buchinsky and Ben Polak, who show that British capital markets were segmented until the late eighteenth century.<sup>37</sup>

The second route is based on substitute financial assets from which inference is made about government borrowing rates. Thus, Wells and Wills use the Bank of England shares as a proxy for government bonds, an approach which requires that the Bank of England stock be correlated with British government bonds.<sup>38</sup> This, however, need not be the case because, at the time, the Bank of England was a private lending institution that made out loans to the government. With the exception of a very severe threat to the existence of the London capital market, the Bank's profit could increase with the rate of interest charged to the government, so that Bank of England stock prices may well have been inversely related to government bond prices. In practice, for the period 1731 to 1753, we find that prices of 3 percent annuities and Bank of England stock prices are not co-integrated at all, and the *R*-squared of the first differences equation is quite low (0.18). During the Seven Years War (1756–763), the correlation between the yield on government bonds and the total return on shares of the Bank of England is close to zero (–0.07).

The third approach is based on using the fragmentary available data on the cost of government debt at issue. This series (first compiled by P. G. M. Dickson using British Parliamentary Papers, 1890–1891 and 1898) has been used more recently by Clark and Stasavage.<sup>39</sup> The advantage of this series is that it enables direct measurement of the cost of debt faced by the British government. The main disadvantage, however, is the incomplete nature of this series. Note also that an important fea-

<sup>36</sup> See, for example, Clark, "Political Foundations"; Quinn, "Glorious Revolution's Effect"; and other studies mentioned in the literature review.

<sup>37</sup> Buchinsky and Polak, "Emergence."

<sup>38</sup> Wells and Wills, "Revolution."

<sup>39</sup> P. G. M. Dickson, *Financial Revolution*; Clark, "Debt"; and Stasavage, *Public Debt*.

ture of borrowing in the eighteenth century was that once a “permanent” debt level was established at a given interest rate, 3 percent, additional borrowing was made by issuing similar bonds with the same coupon. Variations in the risk premium were typically not reflected in new bonds carrying different interest rates, but rather in discounts on the purchasing price of new issues.<sup>40</sup> Therefore, the fact that the coupon on British securities declined, for example, with the introduction of 3 percent coal duties in 1731, does not necessarily imply that from then on the British government borrowed at these rates.<sup>41</sup> In order to draw firm conclusions on the actual cost of debt, primary yields should be adjusted to reflect the discount at which the bonds were sold.

Rather than follow one of the existing routes in the literature, we construct a novel fiscal measure of Britain’s cost of capital, the ratio of debt service payments to total government debt. This variable is constructed by dividing total government debt service expenditures (from Brian Mitchell) by a newly constructed total debt series, which includes both long term and short term debt obligations.<sup>42</sup> The long-term debt series is based on the British Parliamentary Papers, where all issues of long-term debt are listed, and the evolution of the stock of debt is tracked by recording redemptions and refinancing of older debt (this is one of the primary sources used by Dickson).<sup>43</sup>

The calculation of short-term debt is more involved; short-term notes were issued by the Exchequer (“Tallies” or IOUs) and by the Army and Navy, and were not fully accounted for in the British Parliamentary Papers.<sup>44</sup> Mitchell does not provide data on short-term debt, and Dickson offers only a rough estimate of short-term debt in the late seventeenth century, which he himself describes as “orders of magnitude rather than . . . strict accountancy.”<sup>45</sup> We therefore impute the short-term debt for the period 1694 to 1703 as follows: Denote short term borrowing by  $B^S$ ; long term borrowing by  $B^L$ ; the stock of short term debt by  $D^S$  and the government deficit by spending,  $G$ , minus taxes  $T$  ( $G-T$ ). Time sub-

<sup>40</sup> According to McCulloch, *Dictionary*, this form of borrowing became a feature of British debt management during the reign of George II (starting 1727). It continued into the twentieth century.

<sup>41</sup> See North and Weingast “Constitutions and Commitment,” pp. 823-824. The discussion on p. 823 suggests that with the issue of 3 percent bonds, Britain achieved a permanent decline in government borrowing rates.

<sup>42</sup> Mitchell, *British Historical Statistics*.

<sup>43</sup> British Parliamentary Papers, *History*. Because Mitchell, *British Historical Statistics*, provides data for fiscal years whereas the information in the British Parliamentary Papers is listed per calendar year, there may be minor dating discrepancies. See a comment on this issue in Dickson, *Financial Revolution*, p. 525.

<sup>44</sup> British Parliamentary Papers, *History*.

<sup>45</sup> Mitchell, *British Historical Statistics*; and Dickson, *Financial Revolution*, p. 525.

scripts are denoted by  $t$ . Using the government's budget constraint, short term borrowing is defined as:  $B_t^S \equiv (G_t - T_t) - B_t^L$ . The stock of government debt is therefore the accumulated sum of short-term borrowing (redemptions appear as negative borrowing):  $D_t^S = \sum_{t=1688}^t B_t^S$ .

Starting in 1704, we use the short term debt series provided by Dickson which includes the Exchequer "Tallies" and IOUs (called "Fictitious Loans").<sup>46</sup> The plausibility of the imputed short-term debt series for the pre-1704 period is verified as follows: We extend the imputed short-term debt series to 1711 and compare it with Dickson's short-term debt series for the period 1704–1711, when Dickson's series is complete, and prior to the refinancing of government short term debt through the South Sea Company; the two series are very similar (see Appendix Table 1).<sup>47</sup>

We complement this fiscal measure of Britain's cost of debt by constructing, using the British Parliamentary Papers, a yield at issue series of actual interest rates on newly issued debt, which is conceptually similar to that of Dickson but takes into account the discount at which bonds may have been sold.<sup>48</sup> In order to overcome the discontinuity of this series, in the 21 years with no borrowing we impute the preceding yield at issue.

Finally, to verify the robustness of the results we report, we calculate yet another proxy for the government's cost of debt—the coupon interest rate on long-term bonds, which includes both "funded" and "unfunded" long-term debt. (The term "unfunded" means that no specific tax revenues were earmarked for repaying this debt).

All of the measures we use have shortcomings: The fiscal proxy for the cost of debt, the ratio of debt service to total debt, measures the average (not marginal) cost of debt. In the first years following the Glorious Revolution this average is highly influenced by the short duration of the debt, and therefore the series may exhibit more volatility than in subsequent years when marginal debt issues affect the average much less. On the other hand, this volatility conveys important information to the extent that it reflects the inability of the government to borrow at reasonable long-term rates in those years. Another possible shortcoming is that the debt service series for the initial years may also include debt redemptions, causing an upward bias in the series. In practice, there were no substantial redemptions before the second decade of the eighteenth century, so this is unlikely to constitute a significant problem.

<sup>46</sup> Dickson, *Financial Revolution*.

<sup>47</sup> Dickson, *Financial Revolution*.

<sup>48</sup> British Parliamentary Papers, *History*; and Dickson, *Financial Revolution*.

The yield at issue series captures the marginal cost of long-term borrowing faced by the government, but because the government did not borrow in every year, this series has missing observations for 21 years. In addition, the series does not take into account the cost of short-term debt.

The interest rate on long-term debt also ignores the substantial short-term debt in the beginning of the sample period; after 1712, when much of the short-term debt was refinanced, the series becomes very similar to the fiscal series.

The three series, together with annuity prices between 1731 and 1753, followed by daily market Consol yields are presented in Figure 1A.<sup>49</sup> This latter series, and the yield at issue series, exhibit more volatility, which is somewhat smoothed in the fiscal series and the yield on long-term debt. However, for the period we are mainly concerned with—the end of the seventeenth century and the early decades of the eighteenth century—the fiscal series exhibits considerable volatility. In Appendix Figure 1 we verify that the picture that emerges from Figure 1A is consistent with available fragmentary data on monthly market yields on a variety of government-issued securities in the early eighteenth century.<sup>50</sup> All yields begin the century at high levels, increase around 1710 and then steadily decline starting around 1712, the period when short-term government debt was first refinanced through the South Sea Company.

We now turn to variables other than measures of the British government's cost of debt which are used in this study. Data on Britain's population, total government expenditure, and exports are all drawn from Mitchell.<sup>51</sup> Data on borrowing rates of the Province of Holland, the largest and wealthiest in the Netherlands, are not readily available.<sup>52</sup> We construct a fiscal measure of the Dutch cost of debt similar to that of Britain, using the ratio of debt service to debt from the European State Finance Database. Throughout the century, the Dutch cost of debt is very stable at a level slightly above 4 percent (somewhat higher during

<sup>49</sup> Annuity prices are from Sinclair, *History*, appendix 2, pp. 28–33. Consol yields are from European State Finance Database. In addition to the shortcomings listed above, none of the measures takes into account the fact that lenders to the British government in the early years were often the Bank of England or the East India Company, which were granted monopolies, partly in exchange for providing loans. Ignoring this form of repayment may lead to an underestimate of the cost of British government debt; see Broz and Grossman, "Paying for Privilege."

<sup>50</sup> From Castaing, *Course*.

<sup>51</sup> Mitchell, *British Historical Statistics*.

<sup>52</sup> Although precise data are not available, in the eighteenth century the Province of Holland accounted for about 60–70 percent of total Dutch debt, and its population, around 800,000, constituted about 40 percent of the total population in the Netherlands (based on private communication with Wantje Fritschy).

the War of the Spanish Succession, see Appendix Figure 2), making it a convenient benchmark for comparison with British borrowing rates.<sup>53</sup> We also use the European State Finance Database to construct similar fiscal measures of the cost of debt for Denmark. Data on the population of Holland are from de Vries and van der Woude.<sup>54</sup>

#### EMPIRICAL ANALYSIS AND RESULTS

Before turning to a detailed discussion of Britain's cost of capital, we briefly discuss the liquidity of government debt using *The Course of the Exchange*. Surprisingly, although this source provides continuous quotes on equity prices and exchange rates, it rarely quotes prices or yields of long-term government bonds. Table 1 shows the fraction of long term government bonds quoted relative to the total number of outstanding bonds in public hands: the market for these bonds was extremely illiquid, almost nonexistent.<sup>55</sup> It is therefore implausible that trade in government bonds was a precursor to trade in private securities, or that trade in government bonds provided the infrastructure for the development of the London stock exchange, as North and Weingast suggest.<sup>56</sup>

#### WARS, REFORMS, AND BRITAIN'S COST OF CAPITAL IN THE EIGHTEENTH CENTURY

Figure 1B displays the interest rate differential ("spread" in modern parlance) between British government debt and debt issued by the Province of Holland using the fiscal cost of capital series. Early in the eighteenth century, when Britain was involved in the War of the Spanish Succession, the spread was very high and volatile. It began to decline in 1709, and especially in 1711–1712 when short-term debt was converted into capital of the South Sea Company, but the spread remained positive

<sup>53</sup> In comparing British to Dutch interest rates, differences in monetary standards between the two countries may be an issue. The use of a fiscal proxy for interest rates (nominal interest payments divided by nominal debt) mitigates this concern, because interest rates are not expressed in terms of a currency unit. Nevertheless, the Dutch Gulden, which was based on a silver standard, was stable from 1681—each Gulden contained 9.61 grams of silver. Following the Glorious Revolution, the British currency, which at the time, was also based on a silver standard, was clipped and large quantities of silver were exported. In 1696 the British currency was stabilized, and in 1717 the value of the gold guinea in terms of silver was reduced by Newton from 21.5 to 20 shillings, thus putting Britain on a de-facto gold standard.

<sup>54</sup> de Vries and van der Woude, *First Modern Economy*.

<sup>55</sup> See Carols, Neal, and Wandshneider, "Origins," for a description of the development of a liquid market for British government debt in the second and third decades of the eighteenth century.

<sup>56</sup> North and Weingast, "Constitutions."

TABLE 1  
 NUMBER OF BRITISH GOVERNMENT LONG-TERM BONDS  
 QUOTED IN *THE COURSE OF THE EXCHANGE*

Year	Outstanding Long-Term Bonds	Number of Long-Term Bonds Quoted
1694	4	0
1695	4	0
1696	4	0
1697	5	0
1698	5	2
1699	5	0
1700	5	1
1701	5	1
1702	5	0
1703	6	0
1704	7	0
1705	8	0
1706	9	0
1707	10	0
1708	11	0
1709	12	1
1710	13	1
1711	13	3
1712	13	3
1713	15	2
1714	15	3
1715	16	2
1716	16	3
1717	17	3
1718	17	2
1719	21	2
1720	23	2

*Source:* Castaing, *Course*.

until around 1730.<sup>57</sup> Despite the newly established institutions, the four decades following the Glorious Revolution can be characterized as a period of a high and fluctuating cost of capital, rather than as an era of permanently low interest rates. In both Figure 1A and in Figure 1B, interest rates and the Britain-Holland spread are clearly higher during some of the major military conflicts of the eighteenth century. This is especially pronounced in the yield-at-issue series and the Consol rates which are more sensitive to marginal changes than the other proxies for the cost of debt (Figure 1A). These observations suggest that wars and military conflicts had a more direct effect on interest rates than the establishment of “good” institutions.

We now turn to a more detailed discussion of the decline in British interest rates (and spreads) between 1711 and 1730. As noted, part of

<sup>57</sup> See also Dickson, *Financial Revolution*, pp. 474–75.



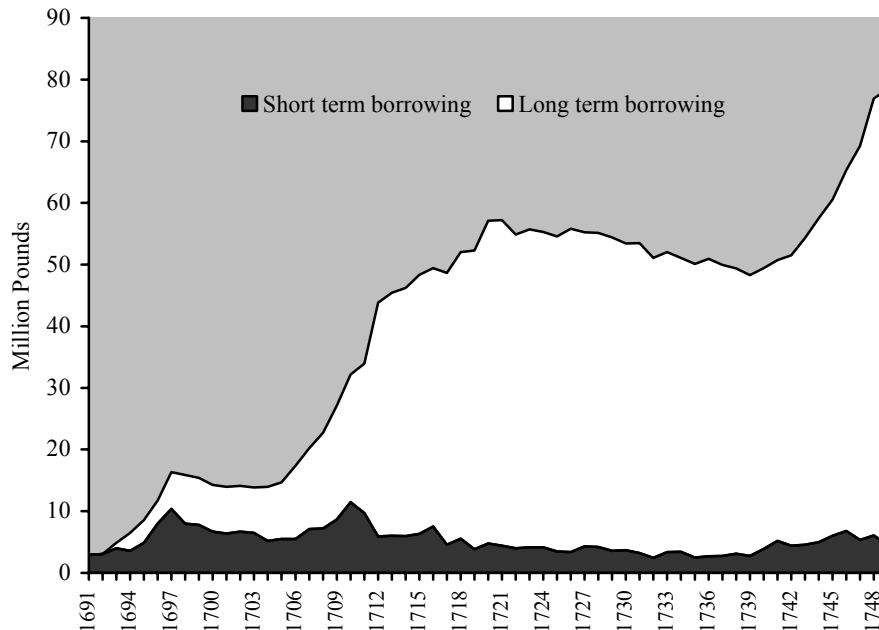


FIGURE 2  
THE COMPOSITION OF BRITISH GOVERNMENT DEBT, 1691–1750

Sources: See the text.

the decline during this period coincided with the use of the South Sea Company as a mechanism to refinance the expensive government debt issued following the Glorious Revolution (conversion to cheaper government bonds was apparently impossible). The first debt refinancing in 1711—when creditors were to be incorporated as the South Sea Company—involved 9.2 million pounds of short-term debt in arrears.<sup>58</sup> This refinancing enabled a reduction of interest rates from about 9 percent (the interest rate at which 4.9 million pounds of long-term annuities were issued in 1711) to 6 percent on government debt obligations held by the South Sea Company. More generally, Figure 2, which displays the composition of British government debt during the period 1691–1750, suggests that, prior to 1712, almost a generation after the institutional changes of the late seventeenth century, the government’s ability to issue long-term debt was constrained.

The second refinancing scheme of 1719 involved about 22 million pounds of debt; as a result, annual interest payments were reduced by

<sup>58</sup> Somewhat in contrast with the importance that Stasavage, “Partisan Politics,” attributes to Whig governments, it was the Tory government of Harley which initiated this conversion scheme.

415,000 pounds.<sup>59</sup> Much like the previous refinancing scheme, the resulting reduction in the cost of debt was not due to the government's improved reputation; the government could not have been considered a very creditworthy borrower, or else bondholders would not have been willing to exchange government bonds yielding more than 7 percent per annum for risky shares of the South Sea Company. New government bonds were only issued in 1726 (annuities of the South Sea Company were issued a few years earlier, in 1723), so that a real convergence of market yields on bonds issued to the public between Britain and Holland took place in the late 1720s, 40 years after the Glorious Revolution.

In sum, the institutional changes of the seventeenth century clearly did not suffice to guarantee a permanently low cost of capital for the British government. A comparison with the pre-Glorious Revolution borrowing rates would have been interesting, but it is made difficult by the fragmentary nature of the available data. Nevertheless, Roseveare cites interest rates of about 7 or 8 percent for the 1670s, and in some cases interest rates of 6 percent were observed as well, figures which are lower than those for the early decades of the eighteenth century (Figure 1A).<sup>60</sup> Only in the 1720s did interest rates revert to their levels in the pre-Glorious Revolution decades.

In order to shed further light on Britain's financial development, Figure 3 portrays government debt per capita in pounds for Britain and the Province of Holland during the eighteenth century (see the European State Finance Database for the exchange rate). It is evident that the government of Holland could borrow relatively more than her British counterpart without paying higher interest rates: despite the large increase in British government borrowing, as late as 1749, on the eve of issuing the first Consols, debt per capita in Holland was almost three times as large as in Britain.<sup>61</sup> Figure 4 portrays the ratio of debt services to government expenditures; other measures of the cost of capital of the two governments portray a similar picture. Evidently, interest rates in the two countries moved together so that Britain did not embark onto a different "path" in the eighteenth century.<sup>62</sup> Government borrowing cycles in Britain and Holland were often related to European wars, and, especially

<sup>59</sup> The converted debt carried an interest rate of about 7 percent, which was reduced to 5 percent on government debt obligations held by the South Sea Company. For more detailed data on the South Sea conversion scheme, see Dickson, *Financial Revolution*, appendix B.

<sup>60</sup> Roseveare, *Financial Revolution*.

<sup>61</sup> See also Riley, *International Government Finance*.

<sup>62</sup> See also Dickson, *Financial Revolution*, p. 483, on the common trends of British (government and private) bonds and bonds of the Province of Holland. Neal, *Rise of Financial Capitalism*, discusses the financial integration of the two countries in the eighteenth century.

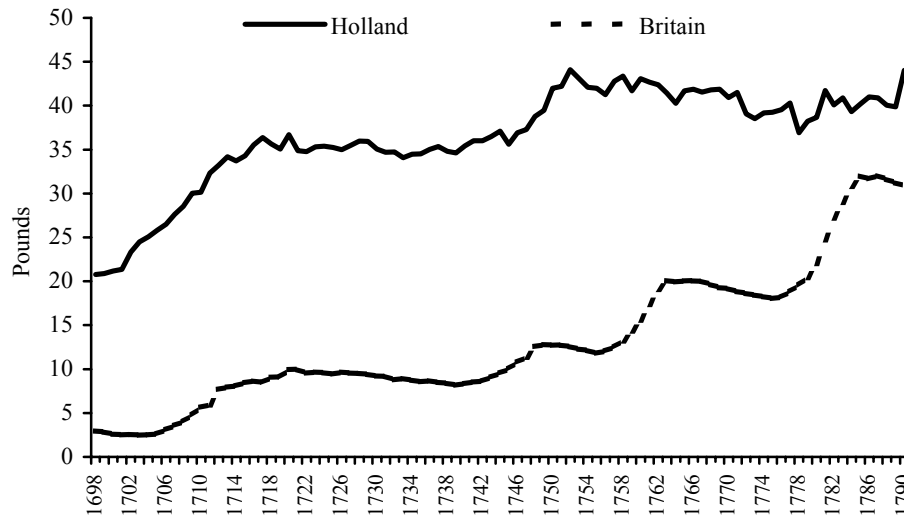


FIGURE 3  
 GOVERNMENT DEBT PER CAPITA: BRITAIN VS. THE PROVINCE OF HOLLAND,  
 1698–1790  
 (pounds Sterling)

*Sources:* See the text.

in the first half of the eighteenth century, when the two countries were involved in the same conflicts, the cycles seem very similar. Nevertheless, the British cycles appear to have been more volatile. Overall, the evidence in Figures 3 and 4, combined with the evidence on the cost of debt (Figures 1A and 1B), shows that, in comparison with Holland, the British government borrowed much less (per capita), and prior to 1750, borrowed to finance the same military conflicts at a higher cost.

Moving to a more formal treatment of the relation between interest rates in Britain and Holland, Table 2 displays the results of the VAR analysis, which suggest that the cost of debt of the government of Holland affected the cost of debt of the British government. During the first half of the eighteenth century the effect of interest rates in Holland on the cost of British debt was particularly pronounced. By contrast, Dutch interest rates prior to 1750 were not very sensitive to British rates.<sup>63</sup> However, the financial relationship between the two countries changed in the second half of the eighteenth century, as the London capital market gradually gained importance. After 1750 the two markets seem to have been equally important: the impact of interest rates in Amsterdam

<sup>63</sup> During this period, other potential determinants of British interest rates such as the export surplus or the government deficit are insignificant.

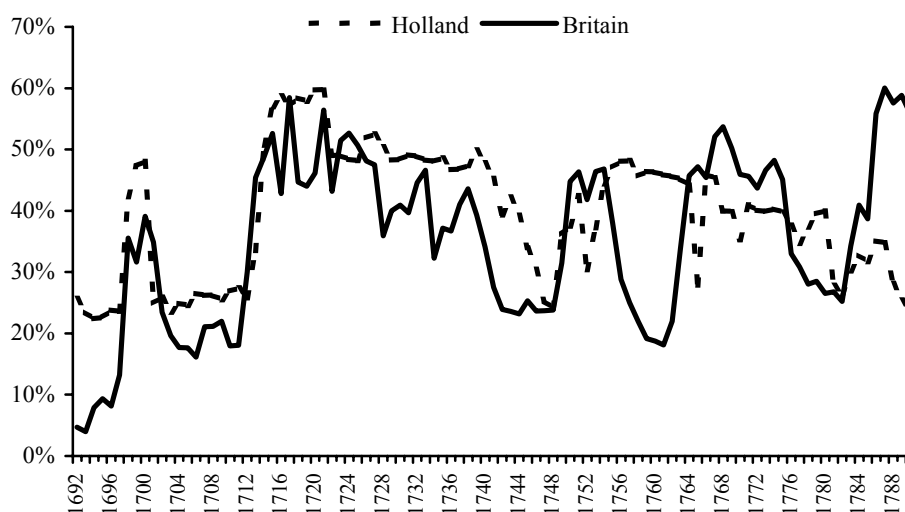


FIGURE 4  
GOVERNMENT DEBT SERVICE TO EXPENDITURES: BRITAIN AND THE PROVINCE  
OF HOLLAND, 1692–1795

Sources: Mitchell, *British Historical Statistics*; and the European State Finance Database.

on London rates became lower, and, for the first time, British rates had some effect on Amsterdam rates as well. The British trade surplus (or exports per capita) and the government deficit have the expected signs (negative and positive, respectively), and are statistically significant in the 1750–1789 period.<sup>64</sup>

Taken together, the empirical evidence we present suggests that the fruits of the institutional reforms of the seventeenth century did not affect the London financial market immediately; over half a century was needed for these changes to be reflected in the market. This conclusion is consistent with that of Nicholas Crafts who describes the early decades of the eighteenth century as a period in which “there were institutional weaknesses related to banking, finance and company legislation which must have had some inhibiting effects both on savers and on business investment.”<sup>65</sup> Until at least 1750, despite the protection of

<sup>64</sup> The regression specification includes a dummy variable for the beginning of the second refinancing of government debt through the South Sea Company after 1718. The regression does not include the trade surplus for the Province of Holland which is not available; the government deficit for Holland is available only after 1727 and is therefore included in the later sample regressions only.

<sup>65</sup> Crafts, “Industrial Revolution,” p. 52. See also Allen, “Great Divergence,” on the standards of living in London and on the Continent in that period, and Clark “Debt,” and “Conditions” who does not identify any “break” in British growth rates and standards of living in the seven-

TABLE 2  
VAR ANALYSIS OF THE CROSS-EFFECTS OF INTEREST RATES ON BRITISH  
GOVERNMENT DEBT AND DEBT OF THE GOVERNMENT OF THE PROVINCE OF  
HOLLAND

Dependent Variable	1698–1749		1750–1790	
	British Borrowing Rate	Government of Holland Borrowing Rate	British Borrowing Rate	Government of Holland Borrowing Rate
British borrowing rate (–1)	0.547* (0.112)	0.017 (0.020)	0.596* (0.094)	0.136* (0.055)
Government of Holland borrowing rate (–1)	0.750* (0.194)	0.974* (0.027)	0.368* (0.085)	0.875* (0.058)
British trade surplus <sup>a</sup>	–1.63 (1.23)	0.200 (0.171)	–0.328* (0.113)	0.095 (0.066)
British government deficit	0.481 (0.702)	–0.073 (0.097)	0.135* (0.043)	–0.028 (0.025)
Government of Holland deficit <sup>b</sup>			–0.034 (0.036)	0.004 (0.021)
1718 dummy	–0.012* (–0.004)	0.000 (0.001)		
<i>N</i>	53	53	41	41
Adjusted <i>R</i> <sup>2</sup>	0.83	0.72	0.66	0.30

\* = statistically significant at the 5 percent level.

<sup>a</sup> Similar data are not available for Holland.

<sup>b</sup> Not available for most of the pre-1750 sample.

Notes: Standard errors are in parentheses. Interest rates are measured as the ratio of debt service to debt.

investor rights, the London capital market could not supply enough cheap funds to meet the borrowing needs of the government, which relied also on capital inflows from Amsterdam.<sup>66</sup> Even in the second half of the eighteenth century, Britain still lagged behind Holland on a debt per-capita basis; the financial “ranking” of Britain and Holland was reversed only in the second half of the eighteenth century, after the onset of the industrial revolution, several significant British military victories, and about a century after the completion of the institutional reforms that followed the Glorious Revolution. It was not the Glorious Revolution that established the unambiguous supremacy of London’s financial markets over Amsterdam’s, but rather Napoleon’s conquest of the Low Countries and the flight of capital from the Continent to Britain.

teenth century. In fact, Clark, “Conditions,” p. 1313, shows explicitly that growth slowed down at the end of the seventeenth century, a fact which he describes as an “uncomfortable revelation” for economists who see institutions as the explanation for growth.

<sup>66</sup> For an early treatment of this issue, see Wilson, *Anglo-Dutch commerce*.

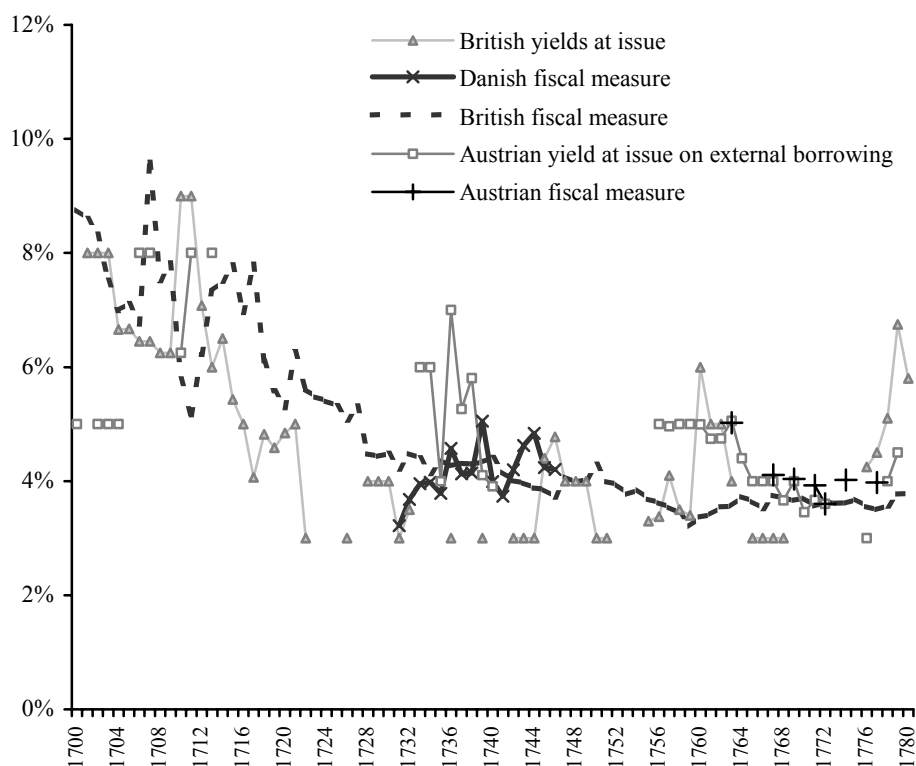


FIGURE 5  
GOVERNMENT BORROWING RATES IN EUROPE, 1700–1780

Source: European State Finance Database; and Dickson, *Finance*.

#### ADDITIONAL EVIDENCE FROM AROUND THE WORLD

Moving from eighteenth-century Britain to Continental Europe, we briefly discuss the fragmentary available evidence on the cost of borrowing of several other European countries, see Figure 5. Data on Austrian external borrowing rates (in Amsterdam and elsewhere), drawn from Dickson and the European State Finance Database, suggest that this absolute monarchy borrowed at rates that were similar to those of Holland and far lower than the British cost of debt early in the eighteenth century.<sup>67</sup> For example, between 1700 and 1713, the average yield at issue on Austrian debt was 6.5 percent vs. about 7.2 percent for Britain; interest rates for Austria and Britain were comparable afterwards, for example 4.9 percent for Austria during the Seven Years War vs. 4.3 percent for Britain. During the War of American Independence (1776–1780), yields at issue on Austrian bonds were considerably lower than

<sup>67</sup> Dickson, *Finance and Government*, volume 2.

the corresponding figure for British bonds: 3.8 percent vs. 5.3 percent, respectively.<sup>68</sup> These low rates are consistent with the findings of Riley, who describes Austria as a frequent borrower on the Amsterdam capital market in the second half of the eighteenth century.<sup>69</sup> A fiscal-cost-of-debt series for Denmark (also drawn from the European State Finance Database) suggests that Danish borrowing rates did not differ substantially from the British rates: for the period 1731–1746 the average cost of debt is virtually identical for the two countries at about 4.1 percent.<sup>70</sup> As for France, Velde and Weir discuss interest rates in the second half of the eighteenth century, and show that in that period interest rates in France were usually higher than in Britain.<sup>71</sup> Similar results are reported by Stasavage.<sup>72</sup> It is not clear, however, if this was due to Britain's superior institutions—a string of unsuccessful wars (with Britain) strained the French economy and, because of monetary instability and debasements, nominal interest rates must have reflected also inflation risk, on top of the various default risks discussed by Velde and Weir.<sup>73</sup> The institutional similarity between British and French debt management policies in the early decades following the Glorious Revolution can be inferred from the contemporaneous schemes to refinance war debts through a swap of government bonds for shares of the South Sea Company and the Mississippi Company, which resulted in the South Sea Bubble in Britain and the Mississippi Bubble in France; both schemes ended in a major setback to financial market development. Overall, although Britain was regarded as an attractive borrower in Amsterdam, there is little in the available interest rate figures to suggest that financial markets viewed Britain as fundamentally different from other European countries, at least during the four decades that followed the Glorious Revolution.<sup>74</sup>

<sup>68</sup> According to Dickson, *Finance and Government*, volume 2, pp. 402–15, Austrian borrowing in the first half of the eighteenth century and during the Seven Years War was secured by taxes and proceeds from silver mines, a feature which may have lowered the Austrian cost of capital. However, in Britain, too, specific taxes were earmarked for debt repayment as late as 1748 (Dickson, *Financial Revolution*, p. 242), so that there was no fundamental difference between the two countries in this respect in the first half of the eighteenth century. Like British bonds, Austrian bonds starting in 1764 were typically of long maturity (10–20 years), albeit not perpetuities.

<sup>69</sup> Riley, *International Government Finance*.

<sup>70</sup> Kroner, "Public Debt," shows that interest rates for Switzerland in the second half of the eighteenth century were comparable to, or even lower than, those of Austria and Holland. Both Denmark and Switzerland managed to borrow at long maturities.

<sup>71</sup> Velde and Weir, "Financial Market."

<sup>72</sup> Stasavage, *Public Debt*.

<sup>73</sup> Velde and Weir, "Financial Market."

<sup>74</sup> Riley, *International Government Finance*.

We now turn to the nineteenth-century experience of two belligerent regimes, Tsarist Russia and the Ottoman Empire. For these regimes, that did not advocate the rule of law, the absence of secure property rights was not much of a constraint when it came to foreign borrowing—both countries were among the largest borrowers in the 1870–1914 period.<sup>75</sup>

Moving away from Europe, the conclusion that institutional changes in Britain were not immediately translated into a lower cost of government debt is in line with our earlier findings.<sup>76</sup> We found that in Meiji Japan too, institutional reforms did not generate an immediate response in the risk premium on government debt (traded abroad), and sharp changes in spreads were associated with other events, such as the victory over Russia. These results are also consistent with the results of Mauro, Sussman, and Yafeh, which document events associated with sharp changes in the cost of capital of nineteenth-century emerging markets: none of the sharp changes is associated with institutional changes; many are due to wars, rebellions, and instability.<sup>77</sup> Some of these results are reproduced in Appendix Figure 3 and Appendix Table 2.

#### CONCLUDING REMARKS

The main conclusion that emerges from the present study is that financial markets do not reward countries for institutional reforms in the short run. “Good” institutions may well be important for long-run growth, but the mechanism relating institutions and growth is apparently something other than an immediate reaction of financial markets and a reduction in the cost of capital. By contrast, financial markets do respond immediately to domestic instability and to major wars. This was the case in eighteenth-century Britain, and this was the case a century and a half later in Meiji Japan; in both cases, it was not a constitution that made a big impact on the cost of government debt. We believe that Britain’s ascendancy to a position of supremacy in Europe and in the world was the outcome of very long processes, perhaps related to the development of the legal system, science, and government tax collection. The evidence on the importance of the Glorious Revolution and the institutional changes of the seventeenth century as a turning point remains elusive.

<sup>75</sup> Stone, *Global Export*; and Mauro, Sussman, and Yafeh, *Emerging Markets*.

<sup>76</sup> Sussman and Yafeh, “Institutions.”

<sup>77</sup> Mauro, Sussman, and Yafeh, “Emerging Market Spreads,” table 5.

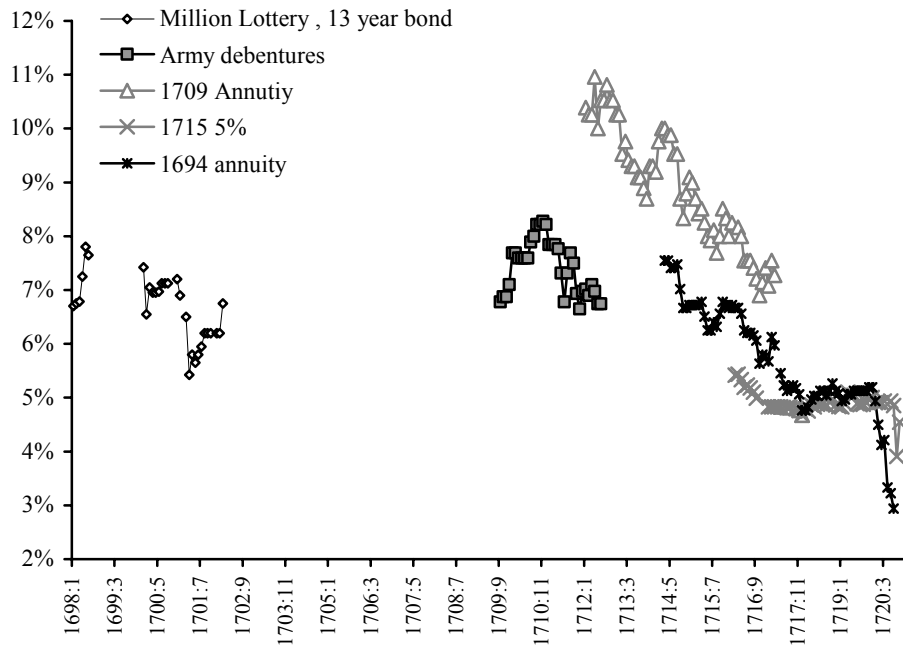


Appendix

APPENDIX TABLE 1  
 IMPUTED SHORT TERM DEBT: BRITAIN, 1691–1711

Date	Imputed Short-Term Debt (million pounds Sterling)	Short-Term Debt from Dickson (million pounds Sterling)
1704	5.2	4.3
1705	5.3	5.5
1706	4.1	5.5
1707	6.1	7.1
1708	6.3	7.2
1709	7.3	8.7
1710	9.6	11.5
1711	10.9	9.7
Total 1704–1711	60.4	59.5

Source: Dickson, *Financial Revolution*, appendix c, p. 526.



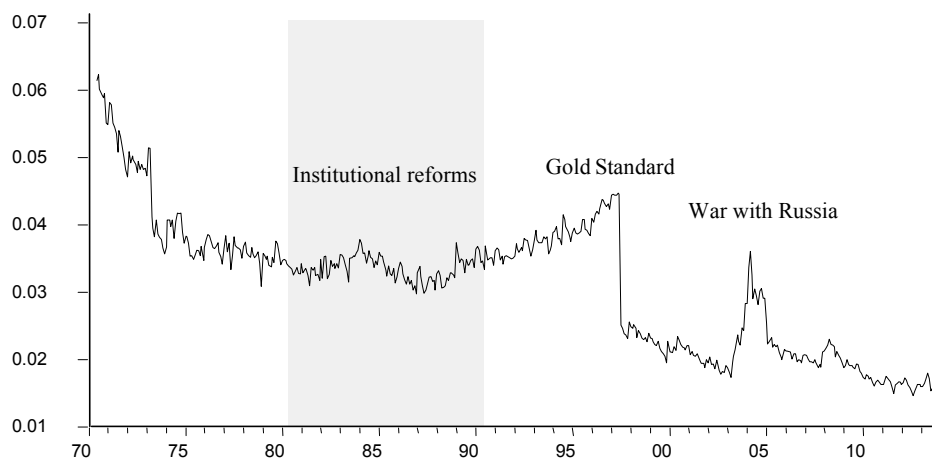
APPENDIX FIGURE 1  
 ADDITIONAL YIELDS ON THE LONDON MARKET

Source: Castaing, *Course*.



APPENDIX FIGURE 2  
COST OF GOVERNMENT DEBT, THE PROVINCE OF HOLLAND, 1692–1789

Source: European State Finance Database.



APPENDIX FIGURE 3  
INTEREST RATE DIFFERENTIAL, 1870–1914: JAPANESE GOVERNMENT BONDS  
TRADED IN LONDON VS. BRITISH CONSOLS

Note: Shown are spreads on Japanese Bonds traded in London during the Meiji Period and events associated with “structural breaks” in the spreads of nineteenth-century emerging markets.

Sources: Sussman and Yafeh, “Institutions,” figure 1.

APPENDIX TABLE 2  
EVENTS ASSOCIATED WITH “STRUCTURAL BREAKS” IN THE SPREADS OF  
NINETEENTH CENTURY EMERGING MARKETS

Country	Date	Spread Change	Event
Argentina	March 1876	Increase	Period of revolution and crisis
	June 1890	Increase	Baring Crisis
	July 1891	Increase	Failure of national bank
	April 1879	Decrease	Success against rebellion
Brazil	April 1896	Decrease	Improvement in the fiscal position
	April 1898	Increase	Following the crushing of Canuda rebellion
	October 1890	Increase	Going off the gold standard, Baring crisis
	September 1895	Increase	Between revolt of military school and dissolution of congress
Canada	February 1912	Decrease	Pro-British Conservatives win important elections
Chile	November 1896	Decrease	Establishment of a financial inquiry commission?
	September 1891	Decrease	End of civil war
	March 1886	Decrease	New regime
	November 1879	Decrease	Doing well in a war with Bolivia and Peru
	July 1876	Decrease	New information provided to market about financial position
China	June 1885	Decrease	?
	May 1896	Decrease	End of war with Japan
Egypt	July 1900	Increase	Boxer Rebellion
	May 1879	Decrease	July, Ismail pasha deposed
	September 1881	Increase	Armed uprising
Greece	April 1885	Increase	War against Sudan
	July 1893	Increase	Financial crisis
Hungary	April 1897	Decrease	End of war with Turkey
	May 1877	Decrease	Hungary to be neutral in Balkan conflict between Turkey and Russia
Japan	August 1897	Decrease	Introduction of the gold standard
	March 1904	Increase	War with Russia
Mexico	March 1879	Decrease	?
	August 1886	Decrease	Ease of tensions with the United States?
	July 1894	Decrease	?
Portugal	July 1902	Decrease	Renegotiation of debt
	March 1891	Increase	Going off the gold standard; bank moratorium
	September 1907	Increase	Franco dictatorship; end of monarchy
Queensland	January 1891	Increase	Banking Crisis
	April 1893	Increase	Banking Crisis
Russia	April 1877	Increase	War with Turkey
	February 1903	Increase	Tensions with Japan?
Sweden	June 1881	Decrease	?
Turkey	July 1875	Increase	Trouble in Bosnia
	May 1878	Decrease	End of war with Russia, introduction of the gold standard
	September 1895	Increase	War against Greece
Uruguay	October 1912	Increase	War in the Balkans
	March 1892	Decrease	End of a financial crisis
	April 1877	Increase	Beginning of military rule
	February 1895	Increase	Instability leading to war
	January 1905	Decrease	End of civil war

Source: Mauro, Sussman, and Yafeh, “Emerging Market Spreads,” table 5.

## APPENDIX TABLE 2 — continued

*Data Sources: The Economist's Investor's Monthly Manual.* The “breaks” are listed in the order in which they are obtained; see Mauro, Sussman, and Yafeh, “Emerging Market Spreads,” for details.

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