Constitutions and Commitment: Evidence on the Relation between
Institutions and the Cost of Capital

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Abstract
This paper challenges the North and Weingast (1989) view that attributes Britain’s
ascendancy to economic supremacy to institutions that provided protection of
property rights starting in the late seventeenth century. We show that for much of the
eighteenth century, interest rates in Britain remained fairly high, and fluctuated
considerably in response to political instability. We also show that the volume of
British government debt remained low for nearly a century after the institutional
changes described by North and Weingast. Finally, we show that British interest rates
moved in tandem with Dutch interest rates, suggesting that Britain did not embark on
a different path following the institutional changes of the late seventeenth century. We
conclude that, in the short run, institutional reforms do not lead to higher growth by
lowering the cost of capital. For emerging markets today, this result implies that the
immediate financial rewards for internal stability and peace are likely to exceed the
short-term benefits from institutional reforms, which will only be rewarded in the
long-run.

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acknowledged.
I. Introduction

In a famous article, Nobel Laureate Douglas North and Barry Weingast (North and Weingast, 1989) provide a powerful answer to the old question why was Britain the first country to undergo an industrial revolution and embark on modern economic growth. The explanation offered by North and Weingast focuses on the power sharing institutions that evolved in Britain at the end of the seventeenth century and in the early eighteenth century, following the Glorious Revolution. North and Weingast argue that these institutions made the government (and the Crown) credibly committed not to renege on its debt and to uphold the property rights of individual creditors to which 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 idea that the protection of property rights is of utmost importance for the economic and financial development of nations has become extremely influential in economics in recent years. In a series of studies that have dramatically changed the academic discourse in financial economics, La Porta et al. (e.g., 1997, 1998) argue that countries whose legal system is of the British common law tradition offer better protection to outside investors. As result, financial markets in common law countries tend to be more developed financial markets and entrepreneurs enjoy better access to
external finance. Other authors, e.g. Levine and Zervos (1998) have emphasized the empirical relation between financial development and economic growth. It is therefore both of importance and of relevance to contemporary economic literature to revisit the empirical foundations for the North and Weingast view of Britain’s financial development, and the relation between institutions, financial systems, and economic growth.

North and Weingast’s claim on the importance of property rights in seventeenth century Britain is backed by empirical evidence of three types. First, they provide some evidence on a decline in interest rates on British government debt in the late seventeenth century. This evidence is based on an incomplete interest rate time series, with observations for several years in the late seventeenth and early eighteenth centuries. Second, North and Weingast offer evidence on an increase in the volume of British government debt around the same time period. Finally, they also provide a general description of the development of the London Stock Exchange in the eighteenth century.

In this paper we attempt to contribute in two ways to the discussion of the hypothesis that institutional change promotes economic growth by reducing the risk premium on government bonds, both generally and specifically in the context of Britain in the seventeenth and eighteenth centuries. Our first contribution is an investigation of trends and structural breaks in British interest rates starting in the late seventeenth century and continuing throughout the eighteenth century, a much longer period of observation than North and Weingast’s. The main conclusion that emerges from this investigation is that interest rates in Britain continued to be fairly high throughout most of the eighteenth century, and even increased in response to instability and wars. Similarly, major increases in the volume of British government
debt took place only fairly late in the eighteenth century, much later than the period identified by North and Weingast.

Our second contribution is a comparison of interest rates in Britain and in the Netherlands between the late-seventeenth century and the late eighteenth century. This comparison shows that some of the trends in interest rates in Britain starting in the late seventeenth century were actually shared by the Netherlands as well, during a period in which no dramatic institutional changes took place in that country. Furthermore, on a per-capita basis, the Netherlands continued to be a larger borrower than Britain for the entire eighteenth century. Finally, some of our statistical tests suggest that interest rates in Britain were influenced, to a large extent, by Dutch borrowing and interest rates, not by domestic institutional changes. When British capital markets finally became important (in the second half of the eighteenth century), the industrial revolution had already started, suggesting the possibility that much of the development of financial markets in Britain was in response to economic development rather than the other way around.

We conclude that, while institutional changes and the protection of property rights have probably contributed in the long run to Britain’s ascendancy to economic supremacy, the effect of these changes was much slower and took place much later than the North and Weingast view suggests. The effect of institutional changes on both government borrowing and on financial markets more generally appears to have been protracted. Much like what Sussman and Yafeh (2000) describe for Japan in the nineteenth century, interest rate fluctuations in eighteenth century Britain appear to have been mostly in response to wars and instability, rather than in response to the constitution and commitment that are so well described by North and Weingast.

1 Oppers (1993) shows, using a different methodology, that Dutch lending was important in keeping British borrowing rates low until the 1770s.
Another interpretation of our results is that the difference between Britain and Continental Europe lies in the British common law legal system, which has provided a more adequate environment for financial and economic activity. The origin of this difference, however, is not necessarily related to the institutional changes of the seventeenth century (see Glazer and Shleifer, 2002). Thus, while it is plausible that some institutions promote economic growth more than others, evidence from both eighteenth century Britain and nineteenth century Japan suggest that the establishment of the “right” institutions is not “rewarded” by a swift reduction in the cost of capital.

The rest of the paper is organized as follows. The next section surveys some of the related literature. Section III describes the data used in this study, Section IV presents our econometric approach and results, and Section V concludes.

II. A Literature Survey

The present paper is related to several previous studies of the North and Weingast hypothesis and of the changes in Britain’s financial markets starting in the late seventeenth century. Writing long before North and Weingast, McCulloch (1837) 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 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, 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” (p. 585). This view, dating back to 1837, suggests that the decline in interest
rates in 1716 and 1749 followed the high interest rates caused by the instability of the Glorious Revolution (not by the Stuart regime). It also suggests that initially, the British funding system started out by assigning specific tax receipts to pay for interest and principal, a measure that was common among problematic sovereign borrowers of the nineteenth century, such as the Ottoman Empire – hardly the forebear of institutional reform.

Moving to more recent studies, Clark (1996) examines whether or not private (real) rents on agricultural land declined following the decline in interest rates on government debt in Britain, finding little support for this conjecture. Quinn (2001) also examines the conjecture that private interest rates declined in response to the decline in the government cost of capital. Using archival bank interest rates he rejects this conjecture, and provides a number of explanations why increased government borrowing did not lower private interest rates, as North and Weingast suggest. Wells and Wills (2000) use Bank of England stock price information to examine the impact of threats to the institutional changes of the seventeenth century. 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. Our analysis adds a long-term view to Wells and Wills’ (2000) study, casting some doubt on institutions as the main cause of interest rate fluctuations in eighteenth century Britain.

In addition to these attempts to provide evidence based on British interest rates, several other studies cast some doubt on the relative importance of changes in the protection of property rights, in comparison with other institutional changes in seventeenth and eighteenth century England. Brewer (1990), for example, attributes England’s economic and military success to the emergence of a strong government,
which he views as the most important transformation that took place in England at the time. O’Brien (2001) 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 rival governments.

The present study is also closely related to several studies of the relation between the cost of capital, institutional changes, and political events. Barro (1987) and Wright (1999) document the relationship between long-term interest rates and wars for the eighteenth and nineteenth centuries. Ferguson (2001) studies long-run fluctuations in British interest rates, and reaches the conclusion that political events were the most important determinant of these fluctuations. Epstein (2000, chapter 2) argues that differences in formal constitutional arrangements do not account for differences in interest rates across Europe between 1300 and 1750. Sussman and Yafeh (2000) investigate the importance of institutional changes and political events in determining the cost of Japanese government debt traded in London between 1870 and 1914, an era of dramatic institutional change in Japan. They find that, institutional change, 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 wars (e.g. with Russia), and economic changes (e.g. the Gold Standard) were far more important factors affecting Japan’s cost of (foreign) capital.

The main conclusion that emerges from their analysis is that a country’s cost of capital does not respond immediately to institutional reforms, in contrast with what the North and Weingast view implies, and very much like our findings here.

Finally, methodologically, the present study applies some of the search for structural breaks techniques applied in Sussman and Yafeh (2000) and in Mauro,
Sussman, and Yafeh (2002) to identify important turning points in the series of British interest rates.

III. Interest Rates and Political Changes in Eighteenth Century Britain

Data and Methodological issues

While the North-Weingast argument is very appealing and has won many advocates, its empirical foundations are less than perfectly convincing. The main obstacle is the absence of a high frequency time series of government borrowing rates or government bonds yields for the period following the Glorious Revolution (1688) up until 1753, when British Consol prices become available for the first time. This lacuna is critical for any empirical test of the North and Weingast thesis.

Attempts to bridge this gap have generally followed two 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 (Clark, 1996, Quinn, 2001). 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 in the late seventeenth century. Moreover, this conjecture is based on the assumption that British capital markets were integrated, an assumption which contradicts Buchinsky and Polak (1993), who show that British capital markets were segmented up until the late eighteenth century.

The second route is based on substitute financial assets from which inference is made about government borrowing rates. Thus, Wells and Wills (2000) use the Bank of England shares as a proxy for government bonds. This approach requires that the Bank of England stock be correlated with British government bonds. This,

\[ Data on 3 percent annuities are available from as early as 1729; see Sinclair (1803). \]
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 fact, during the Seven years’ war (1756-1763), when, for the first time, both Bank of England stock prices and Consol daily yields are available, we find that the correlation between the yields on the two assets is close to zero (-0.07). Furthermore, for the period 1730 to 1753, we find that the 3 percent annuities and the Bank of England stock prices are not co-integrated at all, and that the R-squared of the first differences equation is quite low (0.18).

Instead of following the existing two routes, we apply a more direct test of the North-Weingast hypothesis, using an implied measure of the government’s borrowing cost based on the ratio between debt service payments and total government debt (taken from Mitchell, 1988). This measure accounts for the long-term average cost of government borrowing. For the initial years following the Glorious Revolution this measure may be an upward bias of the government’s cost of capital, because most of the loans contracted were of short duration and debt service charges included not only interest payments but also debt retirement. To adjust for this factor we also compute debt charges minus terminable loans. ³

An important feature 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

³ Implicitly, the analysis assumes that the risk premium required by investors is constant, so that changes in the average interest rate trace marginal changes (up to a constant). This assumption could hold if investors have a CARA utility function.
risk premium were typically not reflected in new Consols with different interest rates, but rather in discounts on the purchasing price of new bond issues. Therefore, drawing conclusions from the fact that the coupon on British Consols declined in 1731 (3 percent coal duties) or 1739 (introduction of 3 percent annuities) as reported by North and Weingast does not necessarily imply that from then on the British government borrowed at these rates. To address this point, we use, in addition to average fiscal measures of the government’s cost of capital, data on actual (not coupon) marginal borrowing rates taken from Sinclair (1803). Measures of the government’s cost of capital are combined with data on population, total government expenditure, output, and the Schumpeter-Gilboy price index, drawn from Mitchell (1988).

In addition to providing new estimates of the cost of capital to the British government, we also compare British government borrowing rates with those of the Province of Holland, the largest and wealthiest in the Netherlands. Provincial government borrowing for Holland and the exchange rate between London and Amsterdam are based on the European State Finance Database, data on prices are from Mitchell (1998), and data on population are from de Vries and van der Woude (1996).

According to McCulloch (1837), 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. North and Weingast (1989), 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. 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 W. Fritschy).
IV. Empirical Approach and Results

_Institutional Change and Interest Rates in Eighteenth Century Britain_

Figure 1 describes three measures of interest rates on British government debt; two based on the ratio of debt service to total debt, and one on marginal interest drawn from Sinclair (1803). The picture that emerges using the debt service to debt ratio is that interest rates rose until 1709, and then declined to a plateau until 1717. From then on there is a slow decline until interest rates reach a minimum in the late 1750s, which is followed by a very gradual rise until the end of the century. Using the ratio of debt service to debt minus terminable annuities (i.e. using interest payments only), we observe that interest rates reached the 4 percent level in 1714. We also observe an increase in interest rates in the 1720s. These developments coincide with the following historical events. The initial years following the Glorious Revolution were associated with high levels of interest rates. With the coronation of Queen Anne in 1702, interest rates declined, perhaps due to the successful passing of the throne without Stuart intervention. However, Britain became involved in the War of the Spanish Succession (1701-1713), and interest rates began to rise, at least in the initial war years, and then declined. In 1715 Britain faced a Jacobite rebellion, and interest rates rose, until after the Pretender's defeat in December of that year. In 1717 Britain was again at war with Spain (the War of the Quadruple Alliance, 1717-1720), and interest rates increased, a trend which was reversed following Britain's decisive victories in 1718, when the Spanish fleet was destroyed. The rising interest rates in 1720s appear to have ended with the accession of George II to the throne and the signing of the treaty of Seville, which brought peace to Britain until 1739, when the War of Austrian Succession broke out, causing a (small) increase in interest rates. Following British victories in 1743, interest rates declined steadily, reaching a low
point in 1759, but moderately rose again in the later stages of the Seven Years’ War. Slowly increasing interest rates characterize the rest of the eighteenth century, with a (small) peak during the American War of Independence.

It is interesting to note that the reforms during the period 1695 to 1707 (the Act of Union with Scotland and securing the passage of the Crown to the house of Hanover), were not associated with a decline in interest rates. We conclude that, at least according to calculations of the British government’s cost of capital derived from fiscal accounts, major wars seem to have had a larger impact on the cost of government borrowing than the reforms, much like what Sussman and Yafeh (2000) find for nineteenth century Japan.

Using Sinclair’s interest rate series, we observe average rates of interest during the reigns of different monarchs and during major wars. Because the data used by Sinclair are based on aggregated interest payments by reign, interest rates within regimes are “smoothed,” whereas changes between regimes are accentuated. This series exhibits a gradual decline, more in line with the North and Weingast view, between 1695 and the mid eighteenth century, with an increase around the time of the War of Austrian Succession. However, borrowing rates increased substantially during the American War of Independence. At their peak in 1779, the marginal borrowing rate reached 6.75 percent, a return to a level which prevailed only during the formative years of the reign of William, following the Glorious Revolution. Thus, according to this series, the war in America reversed the entire path of declining interest rates, casting doubt on the credibility and stability of reforms and institutions.

Before concluding, we observe that the various Jacobite rebellions and pretension towards the British throne in the last decade of the seventeenth century and

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7 Sinclair provides annual figures for this period, rather than averages by reign.
in the first decade of the eighteenth century produced no discernable effect on any of the series of British interest rates we use. This supports our general impression that, in a long run perspective, these events seem to have been merely “blips,” especially when compared to major wars and international conflicts.

**Search for Structural Breaks**

We now turn to an iterative search for structural breaks in the interest rate series, identified by repeatedly estimating the following equation:

\[
\log (\text{Risk Premium})_t = \beta_0 + \beta_1 \log (\text{Risk Premium})_{t-1} + \beta_2 \Delta \log (\text{Risk Premium})_{t-1} + \beta_3 \text{EVENT}_{long} + \beta_4 \text{EVENT}_{short}, \tag{1}
\]

where \(\text{EVENT}_{long}\) is a dummy variable that takes the value zero at all times prior to the proposed break and the value one from the time of the break onwards, and \(\text{EVENT}_{short}\) takes the value one at the time of the event, and zero at all other times. If an event had a long-term impact on yields then the “long” dummy variable will be different from zero (assuming the series in not unit root). This method of search for breaks involves repeated estimation of Equation (1) while moving the break date and the corresponding \(\text{EVENT}\) dummy variables one observation at a time and recording their statistical significance. The break date is at the point where the statistical significance of the \(\text{EVENT}_{long}\) dummy is highest (the process can then be repeated within each half of the sample to detect additional break points in sub-periods).\(^8\)

Using this procedure and interest rates calculated as the ratio of debt service to total debt, we identify 1718, the year when the Spanish fleet is defeated, as the year in which the most significant long-term decline in interest rates takes place. We conclude that interest rates in Britain remained high and fluctuated considerably, even

\(^8\) For further details on this methodology, see Sussman and Yafeh (2000).
after the completion of the institutional changes of the seventeenth century. Only after the end of domestic and international instability did rates go down to a long-term lower level. This result is, again, in line with Sussman and Yafeh (2000), who find that in Meiji Japan too, institutional reforms did not generate an immediate response in the risk premium on government debt (traded abroad), and structural breaks were associated with other events, such as the victory over Russia.

**A Comparison of Interest Rates and Debt Levels in Britain and Holland**

We now turn to a comparison of government debt in Britain and in the Province of Holland during the eighteenth century. Figures 2 and 3 portray absolute and per capita debt levels in the two countries. It is evident that the government of Holland could (and did) borrow relatively more than her British counterpart. Even in absolute terms, Britain’s debt exceeded that of Holland only around 1715, several decades after the completion of the institutional and constitutional reforms described by North and Weingast (Britain’s population at the time was more than ten times that of Holland). In per capita terms, Britain’s debt remained relatively small until the 1760s, and did not exceed that of Holland during the entire eighteenth century. Our reading of Figures 2 and 3 is therefore that, even without major institutional changes, the government of Holland appears to have been able access financial markets and raise money more easily than its British counterpart.

Figures 4, 5, and 6 portray the cost of debt for the two governments, measured as the ratio of debt services to government expenditures and the (nominal and real) ratios of debt service to debt. All our 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 (see also Neal, 1990, on financial integration of the two countries starting in the eighteenth century). Figure 4 describes fiscal cycles (debt service to government expenditures), which were related to European wars, and seem to have been quite similar in the two countries, with British cycles being somewhat more volatile. Figures 5 and 6 show that, despite its larger (per capita) volume of debt, interest rates in Holland were lower in the early decades of the eighteenth century than British interest rates, which appear to have been high due to the political instability in Britain described above.

We now proceed to a more formal analysis. Table 1 presents the long-run determinants of the “spread” (interest rate differential) between the Britain and Holland, based on co-integration tests, and measuring interest rates as the debt service to debt ratio. Much like modern “spreads,” the British-Dutch interest rate differential in the eighteenth century was related to Britain’s ability to pay (debt per capita and exports), as well as to the volume of debt in Holland, as measured by the ratio of (absolute) Dutch to British debt. The relative debt of the two countries is used as a proxy for liquidity constraints in the London capital market, caused by demand for capital in Holland. Up until the middle of the eighteenth century, an increase in Dutch debt above that of Britain’s led to “crowding out” (higher cost) of the latter. By contrast, an increase in British debt not accompanied by a commensurate increase in the Dutch debt was associated with a lower interest rate differential, controlling for the effects of Britain’s debt per capita and exports on the risk premium, presumably because of a flow of Dutch capital to Britain. This conclusion is also supported by the vector error correction analysis, which describes short-term dynamics based on the long-term relationship reported in Table 1. The results, displayed in Table 2, indicate

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9 The hypothesis that the series are unit root cannot be rejected, and we therefore use the Johansen co-integration procedure.
that the co-integration relationship generates a plausible short run dynamic relationship, whereby deviations from the long run relationship are corrected within approximately two to three years. The significance of the 1718 break is also evident. Finally, Table 2 suggests the existence of short-term capital movements: the uncovered interest rate parity relationship, which suggests that interest rate differentials should be positively related to the expected change in the exchange rate, holds here.  

Table 3 displays VAR results shedding light on changes in the relation between British and Dutch interest rates during our period of observation. Much like the results in Table 1, this analysis suggests that the volume and cost of Dutch government debt 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. British interest rates were very sensitive to Dutch interest rates, and a high volume of debt in Holland would raise the costs of borrowing in Britain, again, in line with the results in Table 1. However, the financial relationship between the two countries changed in the second half of the eighteenth century, as the London capital market gradually grew in importance. After 1750 the two markets seem to have been fairly integrated. The impact of interest rates in Amsterdam on London rates became lower, and, for the first time, British rates had some effect on Amsterdam rates as well (according to the VAR results of Table 3, prior to 1750 Dutch interest rates were not “caused” by interest rates in Britain).  

Both Table 1 and Table 3 show that, during the second half of the eighteenth century, the relative borrowing needs of the two governments affected both markets in a

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10 Other possible error correction model specifications do not generate plausible results and are not shown.
11 There is some evidence that integration was hindered by the American War of Independence in which Britain and Holland took opposite sides.
similar way (with an increase in debt raising interest rates). Thus, there is no longer
evidence of “crowding out” of British debt by Dutch debt in this period.

Taken together, the empirical evidence we present suggests that the fruits of
the institutional reforms of the seventeenth century did not immediately affect the
London financial market. Until at least 1750, the London capital market could not
supply sufficient liquidity to meet the borrowing needs of the government, which
relied heavily on capital inflows from Amsterdam. Had the institutional reforms
created sufficient liquidity on the London market, interest rates in Britain would have
probably declined much faster than they did. It appears that only with the gradual
growth of the British economy (and of exports) did sufficient liquidity become
available in London so that government borrowing rates in Britain were no longer
subject to liquidity constraints imposed by the Dutch capital market. (Nevertheless, on
a per-capita basis Britain still remained behind the Netherlands). The financial
“ranking” of Britain and the Netherlands 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.

\[12\] This is consistent with Allen’s (2001) findings regarding the standards of living in London and on
the Continent.
IV. 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. While institutions matter for long run growth, the mechanism through which they make a difference is apparently not through 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. Instead, it was a decisive military victory (over the Spanish fleet in the case of Britain, and over a major European power, Russia, in the case of Japan), that brought about a dramatic “break” in the interest rate series. In the future, we intend to examine the impact of institutional changes on the cost of sovereign debt of other countries in other time periods, using information on both contemporary and on nineteenth century emerging markets.
Sources


Neal, Larry, bond prices and exchange rates data from European State Finance Database, www.le.ac.uk/hi/bon/ESFDB/


References


Table 1
The Long-term Determinants of the British Risk Premium:
Co-integration Analysis

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>British to Dutch “spread” (interest rate differential) 1699-1790</th>
<th>British to Dutch “spread” (interest rate differential) 1699-1749</th>
<th>British to Dutch “spread” (interest rate differential) 1750-1790</th>
</tr>
</thead>
<tbody>
<tr>
<td>British exports (million pounds)</td>
<td>-0.133 (-0.077)</td>
<td>-0.75 (-0.267)</td>
<td>-0.070 (-0.022)</td>
</tr>
<tr>
<td>British debt per capita</td>
<td>0.093 (0.028)</td>
<td>0.536 (0.183)</td>
<td>0.013 (0.007)</td>
</tr>
<tr>
<td>Dutch to British debt ratio</td>
<td>3.392 (0.242)</td>
<td>4.156 (0.546)</td>
<td>-0.371 (-0.312)</td>
</tr>
<tr>
<td>N</td>
<td>92</td>
<td>51</td>
<td>41</td>
</tr>
<tr>
<td>Likelihood ratio</td>
<td>70.3</td>
<td>57.0</td>
<td>54.2</td>
</tr>
<tr>
<td>1% critical value</td>
<td>45.6</td>
<td>45.6</td>
<td>45.6</td>
</tr>
</tbody>
</table>

Note: Interest rates are measured as the ratio of debt service to debt. Estimation includes a dummy variable for 1718, when a structural break is identified in the series (except for the period 1750-1790). Standard errors are in parentheses.

Table 2
Short-run Dynamics of the British Risk Premium:
Vector Error Correction Analysis

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>D(interest rate differential) 1699-1790</th>
<th>D(interest rate differential) 1699-1749</th>
<th>D(interest rate differential) 1750-1790</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error correction term</td>
<td>-0.520 (-0.072)</td>
<td>-0.459 (-0.094)</td>
<td>-0.378 (-0.121)</td>
</tr>
<tr>
<td>Change in exchange rate</td>
<td>2.376 (2.216)</td>
<td>3.716 (4.574)</td>
<td>0.870 (0.714)</td>
</tr>
<tr>
<td>Dummy for 1718</td>
<td>-1.062 (0.156)</td>
<td>-1.335 (0.286)</td>
<td>N/A</td>
</tr>
<tr>
<td>N</td>
<td>92</td>
<td>51</td>
<td>41</td>
</tr>
<tr>
<td>Adjusted R-square</td>
<td>0.36</td>
<td>0.32</td>
<td>0.200</td>
</tr>
</tbody>
</table>

Notes: based on the co-integration relationship of Table 1.
Forward exchange rate based on a two-year forward-looking variable.
Standard errors are in parenthesis.
### Table 3
Cross-effects of the London and Amsterdam Capital Markets: VAR analysis

<table>
<thead>
<tr>
<th>Period</th>
<th>1698-1790</th>
<th>1698-1749</th>
<th>1750-1790</th>
<th>1750-1790</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td>British borrowing rate</td>
<td>Dutch borrowing rate</td>
<td>British borrowing rate</td>
<td>Dutch borrowing rate</td>
</tr>
<tr>
<td>British borrowing rate(-1)</td>
<td>0.476 (0.076)</td>
<td>0.007 (0.011)</td>
<td>0.449 (0.104)</td>
<td>0.005 (0.013)</td>
</tr>
<tr>
<td>Dutch borrowing rate(-1)</td>
<td>0.722 (0.140)</td>
<td>0.992 (0.020)</td>
<td>0.675 (0.202)</td>
<td>0.993 (0.026)</td>
</tr>
<tr>
<td>Dutch to British debt ratio</td>
<td>0.010 (0.003)</td>
<td>insignificant</td>
<td>0.014 (0.005)</td>
<td>insignificant</td>
</tr>
<tr>
<td>1718 dummy</td>
<td>-0.015 (-0.004)</td>
<td>insignificant</td>
<td>-0.015 (-0.005)</td>
<td>insignificant</td>
</tr>
<tr>
<td>N</td>
<td>92</td>
<td>92</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>Adjusted r-square</td>
<td>0.92</td>
<td>0.86</td>
<td>0.88</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Note: Interest rates are measured as the ratio of debt service to debt. Standard errors are in parentheses.
Figure 1
Borrowing Rates for the British Government: 1692-1799
Sources: Mitchell (1988) and Sinclair (1803)
Figure 2
Total Government Debt in Million Pounds in Britain and the Province of Holland: 1698-1795
Sources: Mitchell (1988) and European State Finance Database
Figure 3
Government Debt per Capita in Britain and the Province of Holland: 1698-1799 (in Million Pounds)
Sources: Mitchell (1988) and European State Finance Database
Figure 4
Government Debt Service to Expenditures in Britain and the Province of Holland: 1692-1799
Sources: Mitchell (1988) and European State Finance Database
Figure 5
Government Debt Service to Debt in Britain and the Province of Holland: 1692-1795
Sources: Mitchell (1988) and European State Finance Database
Figure 6
Government Debt Service to Debt in Britain and the Province of Holland in Real Terms: 1697-1795
Sources: Mitchell (1988) and European State Finance Database