The World's First Global Safe Asset: British Public Debt, 1718-1913

Patricia Gomez-Gonzalez* and Gabriel Mathy†

June 11, 2024

Abstract

This study assesses whether British public debt featured a convenience yield during the Classical Gold Standard before World War I, as the US does in modern times. The empirical results support this thesis. Increases in the British debt-to-GDP ratio decrease British public debt's convenience yield between 8 and 20 basis points, qualitatively similar to the behavior of US public debt yields post-1926. Interestingly, the relationship between US yields and US public debt during the Classical Gold Standard counters previous findings for modern US times. The international public debt yield spreads between other Gold Standard core countries and Britain were consistently positive and averaged 55 basis points, even though currency and sovereign risk were negligible at that time for the chosen countries.

Keywords: Convenience yield, Safe asset, Liquidity, Gold Standard
JEL Codes: E42, G15, H63, N23

*Fordham University and Rimini Centre for Economic Analysis (RCEA), pgomezgonzalez@fordham.edu, Corresponding Author. Support from Fordham's FAS Microgrant is gratefully acknowledged.

†American University, mathy@american.edu. We would like to thank John Devereux, Josefin Meyer, Deirdre McCloskey, and attendees at the DIW Berlin 2024 WIMFEH Workshop for helpful comments and suggestions.

1 Introduction

Before New York, London was the world's financial capital, tying together a rapidly globalizing world from the 18th century through World War 1. At the center of the system was the British system of public debt, which was considered safe, even when debt outstanding soared to heights previously thought unimaginable. In modern times, investors value US public debt for its safety and liquidity, referred to as convenience. They are willing to accept a lower yield to hold it vis-à-vis private assets (Krishnamurthy and Vissing-Jorgensen 2012), and the US convenience yield is larger than other countries' (Du et al. 2018). This study empirically assesses whether British public debt featured a convenience yield during the Classical Gold Standard, similar to the one the US has in the present.

A voluminous literature examines crowding out after the large expansion of British public debt in the context of the French and Napoleonic wars of the 18th and 19th centuries. Crowding out refers to a reduction in investment due to higher interest rates stemming from the diversion of loanable funds from the private sector to the public sector when public debt is issued. Some authors simply assumed that crowding out was *a priori* operative (Williamson, 1984), while others found empirical support for crowding out Black and Gilmore (1990); Temin and Voth (2005), and others did not find empirical evidence for crowding out in this period (Barro, 1987; Heim and Mirowski, 1987; Clark, 2001).

Instead, we focus on the effects of changes in the supply of British public debt supply on its yield, following Krishnamurthy and Vissing-Jorgensen (2012) (henceforth, KV). If public debt features a convenience yield, we expect that decreasing the level of debt will make it more valuable, increasing its price and depressing the yield that investors are willing to accept. Conversely, at high debt levels, the price of debt would be low, and yields would increase. One reason for this is the liquidity services public debt offers. A large increase in the supply of safe debt instruments makes financial markets thicker and more liquid, providing additional value to investors beyond a direct pecuniary return. While this hypothesis has the opposite predicted sign as the crowding out hypothesis, it addresses different aspects of the relationship between the quantity of debt and interest rates.

Following Du et al. (2018) (henceforth, DIS), we also calculate international spreads by subtracting the British consol yield from the public debt yields of other major economies in this period. Under certain conditions, which we discuss later, positive spreads imply that the convenience yield of British public debt in this period was larger than that of other core countries. Previous work studying international spreads during this period has focused primarily on the differences in the Gold Standard's credibility in the core and periphery

countries and during the Classical Gold Standard and the interwar period (Bordo and Rockoff 1996, Obstfeld and Taylor 2003, Mitchener and Weidenmier 2015).

Our empirical results are as follows: During the Classical Gold Standard, increases in Britain's public debt decreased its convenience yield, as KV finds for the post-1926 US. The magnitudes, however, are somewhat smaller. An increase in the British debt-to-GDP ratio comparable to what KV considers for modern US times decreased Britain's public debt convenience yield between 8 and 20 basis points (bp), depending on the private yield used.[1]

Interestingly, repeating the KV analysis for the US during the Classical Gold Standard (1879-1914) delivers the opposite sign to what KV finds for the post-1926 period. During the Classical Gold Standard, increases in the US debt-to-GDP ratio *increased* the convenience yield. An increase in the debt-to-GDP ratio of the same magnitude as in KV increases the convenience yield by 9 bp in that period.

Our international spread calculations show that the spread between the core countries' public debt yields and the British consol yield averages 55 bp for the period for which each country was in the Gold Standard, somewhat higher than what DIS found for the US between 2000 and 2009.[2] Like them, we also find variability across countries, with spreads ranging from 42 to 65 bp. By contrast, spreads were positive for all countries throughout the study period.

Literature This study is related to several strands of literature. First, it is related to public debt's special attributes of safety and liquidity and their effect on public debt yields (Krishnamurthy and Vissing-Jorgensen 2012, 2015, Greenwood et al. 2015, Nagel 2016, Du et al. 2018, Del Negro et al. 2019). This literature has focused almost exclusively on the modern US. Instead, we study Britain between 1718 and 1913, extending the geographical range, the historical period, and the asset types for which convenience yields can be found. We also find that the US's public debt did not feature a convenience yield during the Classical Gold Standard, consistent with our hypothesis.

Second, it contributes to the literature on safe assets (Gorton 2017, for a review, and Gourinchas and Jeanne 2012, Farhi and Maggiori 2017, Caballero and Farhi 2017, He et al. 2019, Gorton and Ordoñez 2022, Choi et al. 2023 among others). Conversely, we concentrate on the world's first safe asset, British public debt between 1718 and 1913, and empirically test for a convenience yield using historical data.

[1] KV finds a decrease in the AAA spread of 44 bp for the same magnitude increase in the US debt-to-GDP ratio.

[2] DIS finds an average premium of 21 bp before the global financial crisis, which increases to 90 bp during the crisis and declines to -8 bp after the crisis.

Third, it relates to the literature on the US's exorbitant privilege of borrowing in US dollars for cheap because of the convenience yield investors attach to US public debt (Gourinchas and Rey 2007a,b, Eichengreen 2011). As before, most of this literature focuses on the US in modern times, with Choi et al. (2023) and Chen et al. (2022) being prominent exceptions. The former studies the secular decline in the demand for UK public debt between 1933 and 2017. The latter analyzes the fiscal implications for the UK of losing its exorbitant privilege. Some of the methods used by Choi et al. (2023) are similar to ours, but our period of interest precedes theirs. The period of interest for Chen et al. (2022) is between 1729 and 2020, extending into the past almost as much as we do. However, their question of interest is different: how much of the UK's public debt issuance between 1729 and 2020 was backed by its macroeconomic fundamentals, and how much was facilitated by being the world's supplier of safe assets? Additionally, van Hombeeck (2020) studied Britain's exorbitant privilege by constructing a dataset on individual financial assets for the UK between 1871 and 1914, and Coppola et al. (2023) provided a theoretical framework to study changes in the world's dominant currency.

The remainder of this paper is structured as follows. Section 2 discusses the historical background and data availability. Section 3 reviews data sources. Section 4 presents the empirical analysis. Finally, Section 5 concludes.

2 Historical Background

After the English Civil War between the forces of the monarchy and Parliament, the Restoration of 1660 brought Stuart monarchs back to the English throne. The ascension of the Catholic James II to the English throne in 1685 quickly led to conflict with many English Protestants, particularly the Protestant-dominated Parliament. Conflicts over religious toleration and the balance of powers between king and Parliament led to the Glorious Revolution of 1688. William of Orange sailed from the Netherlands and deposed James II with broad-based popular support in England. Parliament would now make the rules, and the executive's powers and prerogatives would be sharply curtailed. Of particular relevance was the power of the purse, which was unambiguously in Parliament's hands. William also brought Dutch financial institutions across the Channel, sparking rapid financial development and the development of securities markets, especially for sovereign debt (North and Weingast, 1989).

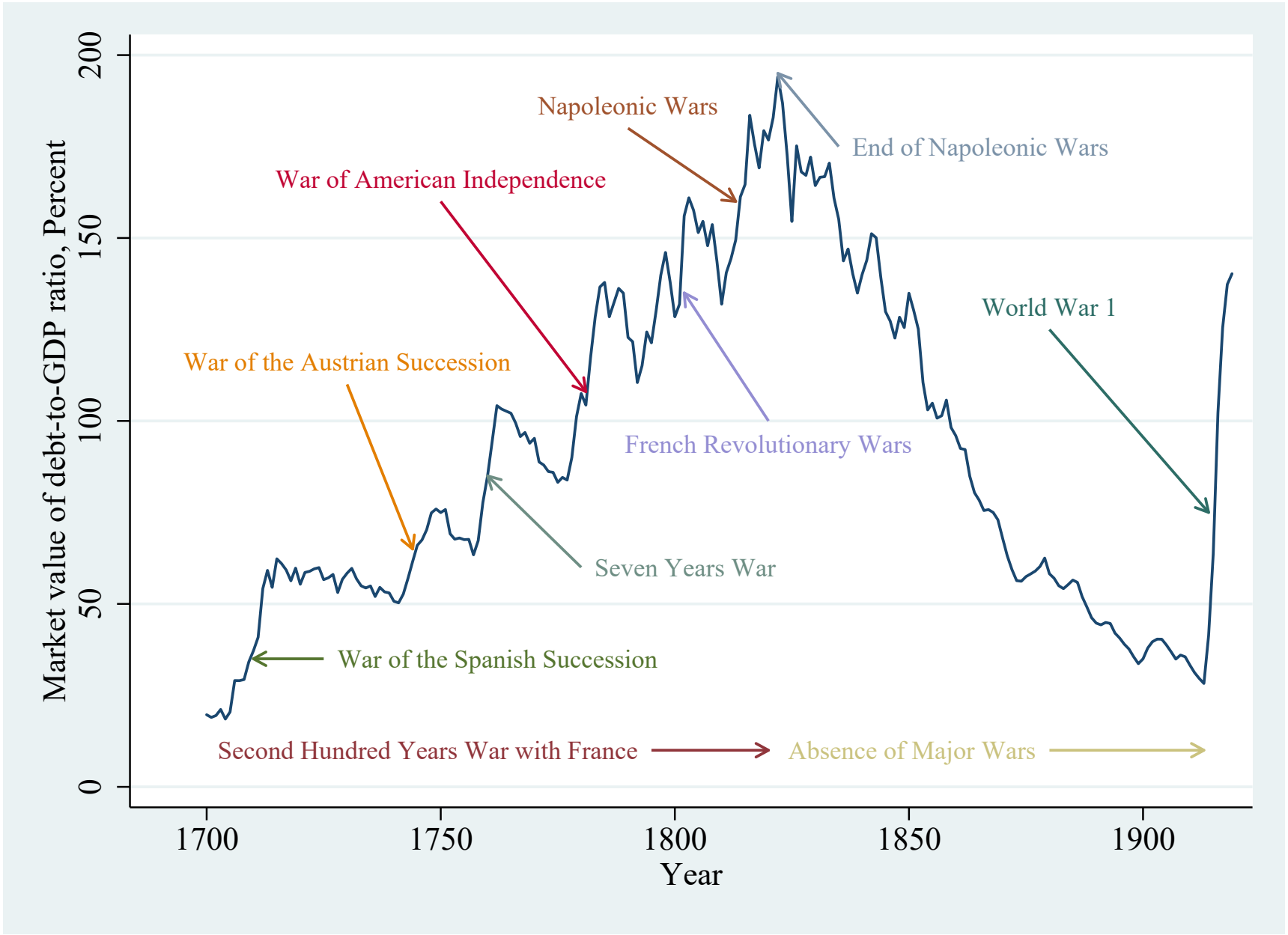
By the 18th century, British interest rates on public debt had fallen rapidly from what had prevailed under the Stuarts. While North and Weingast (1989) argue that the constraints

on the English executive's ability to expropriate property was essential for the revolution in British public finances, interest rates remained high under William III. Initially, the Tories, representatives of landed interests, were dominant in Parliament. However, the Whigs, representatives of the urban bourgeoisie, regained the upper hand a few years later, coinciding with the decline in interest rates. A political party like the Tories, representing those who based their wealth in land, might consider a debt default under dire fiscal circumstances. The bourgeoisie, who owned most of the debt, would not default on themselves however, and so it was clear that the self-interest of the Whigs would effectively eliminate any risk regarding full repayment. Unsurprisingly, interest rates fell, and the British state's ability to issue debt became essentially unlimited (Stasavage, 2007).

The period in British history from 1688 to 1819 has been referred to as the "Second Hundred Years War," as it featured frequent warfare with France over the course of a century, as the first Hundred Years War had (Scott, 1992). With any check on the legislature by the monarchy ended by the Glorious Revolution, Parliament could engage in a century of warfare at will. Public finance at the time was dominated by military expense, and a solid base in public finance was essential for success on the battlefield (O'Brien, 1988; Dincecco and Prado, 2012).[3] The increases in the debt-to-GDP ratio from these wars can be seen in Figure 1, with the debt-to-GDP ratio falling in the century between the end of the Napoleonic Wars and the UK's entry into the First World War. With low borrowing costs, debt was cheap, and Britain borrowed heavily, amassing a debt exceeding twice the national income, a feat that would have been impossible before the events of 1688 (Brewer, 1990). This financial revolution cemented Britain's position as the most powerful empire on the globe by the 19th century (Dickson, 1967; O'Brien, 2011; Sissoko et al., 2019). A similar phenomenon occurred in William of Orange's homeland, as interest rates fell as the bourgeois state developed in the Netherlands, with an accompanying financial revolution (C't Hart, 1993; Neal, 2000; Fritschy, 2003). The Industrial Revolution in Britain was accelerating at the time, bringing broader economic growth and development alongside growth and development of the financial sector. During the French Wars, Britain was locked in an existential struggle with Republican France, and later Napoleonic France, and their allies.

[3]While debt rose significantly due to insufficient revenues to cover wartime spending, government involvement in the British economy during this period was much smaller than it would be in the 20th century. Government expenditure excluding interest payments as a share of GDP averaged 7% from 1700 to 1815, while the same ratio would average 27% from 1920 to 2016, almost four times as large. Source: A Millennium of Macroeconomic Data for the UK, Series A9, A27.

Figure 1: British Debt-to-GDP ratio, 1700-1919



Source: Thomas and Dimsdale (2017)

While Britain had joined the gold standard earlier in the 18th century, the Bank of England suspended convertibility into gold given the potential strains from financing these wars (Duffy, 1982). This period saw the introduction of a paper pound, which Britain's modern monetary and financial structures were able to manage successfully (O'Brien and Palma, 2020). A promise to redeem paper money for gold after the end of hostilities was sufficient to keep the value of the pound stable, and the British government was able to issue record amounts of debt with little difficulty. After the cessation of hostilities in 1815, the 19th century marched on. The Industrial Revolution spread and financial development increased across the globe, increasing controlled by European empires. This first age of globalization had London as its financial capital, with British debt as the global safe asset (Neal et al., 2003).

3 Data

Our data are primarily drawn from two sources. The first is the Bank of England's "A Millennium of Macroeconomic Data" (MMD) database (Thomas and Dimsdale, 2017). This is an expanded dataset, with a description of an early version to be found in Thomas et al. (2010). These data are based on primary sources from the British Treasury and the Bank of England, among others, explained in these sources. The debt to GDP ratio is from MMD. The centerpiece of British public finance during this period was the perpetual consol bond, which can also be found in MMD. The Bank of England's short-term lending rate is the main short-term interest rate, from MMD as well. We also use a corporate bond rate, the prime paper yield, and the UK mortgage yield from MMD. The second source utilized was Global Financial Data (GFD), which has many useful historical series. Stock volatility is computed by taking the standard deviation of a stock index representing the London Stock Exchange, with the underlying data coming from GFD. The private discount rate series is also derived from GFD. The data for the interest rates for the other core nations is also drawn from GFD, as is the data for the USA.

Panel A of Table 1 reports the mean and standard deviation for each private spread used in the empirical analysis. The prime paper and private discount spreads have the lowest averages of 19 and 29 bp, respectively. The average mortgage and bank spreads were the largest at 99 and 109 bp, respectively. The last column reports the coverage in our sample. Except for the mortgage spread, our data covers the entire 1718-1913 period.

Table 1: Summary Statistics of British and International Spreads

Panel A: British Private Spreads			
	Mean	Standard deviation	Number of years
Bank rate	1.09	1.05	196
Prime paper rate	0.29	1.10	196
Mortgage rate	0.99	0.73	158
Private discount rate	0.19	1.00	196
Panel B: International Spreads			
	Mean	Standard deviation	Number of years
USA	0.50	0.29	34
Belgium	0.42	0.23	35
France	0.47	0.32	35
Germany	0.65	0.15	42
Netherlands	0.54	0.22	38

Note: Average and standard deviation for British private yield spreads and core countries' spreads (in %). Each spread was calculated as the corresponding yield minus the British consol yield. For Panel A, the last column gives the number of years for which data is available. For Panel B, the number of years corresponds to each country's respective Gold Standard adhesion dates and the end of the Classical Gold Standard (1913).

4 Empirics

4.1 Effect of British Public Debt Supply on British Spreads

Given the data limitations, we tried to match the types of interest rates for the historical British case to those in KV's study of the modern US. However, public finance functioned differently during this period. The center of British public finance in this period was the British consol. This was a perpetual bond, which was callable at a set price by the British government, but which paid interest indefinitely until that decision was made (Odlyzko, 2016). This corresponds to a long-term bond in the US case. The US issued consol bonds in the 18th and 19th centuries, but no longer issues these debt instruments (Payne et al., 2022).

Shorter maturity debt is harder to find. In general, bills were issued during wartime, when funding needs were acute and long-term prospects for debt repayment were uncertain. These bills were then refinanced into longer-term debt instruments, such as consols, after the cessation of hostilities. This makes it difficult or impossible to find a consistent series for shorter-maturity debt. Instead, we use bank interest rates or other short-term instruments.

Following KV, we estimate the following regression equation using yearly data for the British

Gold Standard period (1718-1913):

$$Spread_t = a + \beta log(debt/GDP)_t + \gamma X_t + \epsilon_t \tag{1}$$

where $Spread_t$ is the corporate spread calculated as a corporate yield minus the yield on the British consol, the debt-to-GDP ratio is the market value of outstanding British public debt over Britain's GDP, and X_t is a vector of controls, namely, a measure of the stock market volatility and a measure of the state of the business cycle.

Our stock volatility measure is the annual standard deviation of the monthly log stock returns, which controls for default risk. KV uses Moody's Analytics expected default frequency (EDF) for the period for which it is available for the US and stock market volatility for the period in which EDF is unavailable. As Moody's EDF measure uses the price of options, which are unavailable for this period in Britain, we follow KV's second route and use stock market volatility based on the London equity index.[4]

To capture the state of the business cycle, we use real import growth and real GDP per capita growth as proxies with data available, as can be seen in Equation 1. KV uses the yield curve. However, Britain did not issue short-term debt instruments outside wartime, making the construction of a consistent yield curve series impossible for the entire sample. Furthermore, long-term inflation expectations were near zero owing to the credibility of Britain's commitment to the gold standard, implying that the yield curve was flat and even inverted, even when a recession was not expected imminently (Wood et al., 1983). This would make the yield curve uninformative for the state of the business cycle during this historical period, even if it were available.

We estimate Equation 1 using ordinary least squares (OLS). Unlike KV, we do not use instrumental variables (IV). This is because, during the period studied, increases in public debt were because of exogenous reasons, namely, foreign wars involving the British Empire. These debt increases were not primarily related to domestic economic conditions, as they would be in modern times. See Figure 1 and the historical background section.

Standard errors are corrected for heteroskedasticity and first-order autocorrelation because the Durbin-Watson tests for autocorrelation in the OLS regressions, reported under the F

[4]We calculate stock returns as the log difference of the London Stock Exchange Index, which is available monthly. Annual stock volatility is calculated as the standard deviation of monthly returns. It must be said that for the first century of this series, only quotes from the Bank of England, the South Sea Company, and the East India Company were included in the index. However, these were large companies and it would stand to reason that their equity prices would be affected in a fashion similar to other equity prices. Because we use return volatility as a control for aggregate risk, a small sample size is less problematic than in an application using the average equity return, where the law of large numbers would not hold.

statistics in Table 2, showed signs of autocorrelation since they are all outside the [1.5-2.5] range.

As corporate yield to calculate the dependent variable in Equation 1, we use four alternative measures: the bank rate, the prime paper yield, the UK mortgage yield, and the private discount yield. To calculate the spread, we subtract the public consol yield from all the aforementioned private yields.

As argued in KV and later by Del Negro et al. (2019) and others, the difference between the corporate spread and the public yield is a measure of the convenience of public debt owing to its safety and liquidity. Public debt's safety and liquidity increase investors' demand for this asset, increasing its price, driving its yield down, and increasing the corporate spread.

A negative β coefficient on Equation 1 supports the hypothesis that public debt exhibits a convenience yield because it implies that an increase in the supply of public debt decreases the value investors place on public debt's convenience. In other words, the lower the supply of public debt, the scarcer this asset is, making investors eager to pay more for its key attributes (safety and liquidity) and pushing yields down.

Table 2 reports the results of estimating Equation 1. For each measure of the spread used, we report the coefficients for two specifications depending on whether we use import growth or real GDP per capita growth as the measure of the state of the business cycle. An Online Appendix contains the results for additional specifications where different explanatory variables are omitted. The coefficient of interest β is relatively stable across specifications, therefore, our explanation below focuses on the specification with all explanatory variables given in Table 2.

The results in Table 2 indicate that β is negative and statistically significant for all measures of the convenience yield studied, supporting the hypothesis that, during the Gold Standard, Britain's public debt was valued for its special attributes vis-à-vis its corporate counterparts. Britain's public debt had a liquidity effect, like money has.

The magnitude of the effect depends on the corporate yield. An 11% increase in the logarithm of the debt-to-GDP ratio from its mean value between 1718 and 1913 of 4.44 to 4.94, equivalent to a one standard deviation increase, decreases the convenience yield between 2 bp and 5 bp, depending on the measure of the corporate spread used. The mortgage spread exhibits the largest effect, whereas the prime paper spread exhibits the smallest decrease.

Table 2: Effect of the debt-to-GDP ratio on different private spreads in Britain (1718-1913)

	(1) Bank rate	(2) Bank rate	(3) Prime paper	(4) Prime paper	(5) Mortgage rate	(6) Mortgage rate	(7) Private Discount	(8) Private Discount
Log(debt/GDP)	-0.762***	-0.764***	-0.514***	-0.507***	-1.143***	-1.127***	-0.585***	-0.586***
	(0.150)	(0.149)	(0.163)	(0.163)	(0.118)	(0.117)	(0.178)	(0.178)
Volatility	-0.309*	-0.307*	0.00587	0.0140	-0.299*	-0.309**	0.147	0.150*
	(0.163)	(0.171)	(0.113)	(0.113)	(0.158)	(0.144)	(0.0896)	(0.0894)
Import growth	-0.214		0.866*		0.153		-0.152	
	(0.423)		(0.516)		(0.354)		(0.423)	
GDP growth		-1.777		1.241		2.964**		-1.702
		(2.151)		(2.179)		(1.269)		(2.096)
Intercept	4.552***	4.579***	2.549***	2.518***	5.968***	5.864***	2.758***	2.783***
	(0.694)	(0.688)	(0.734)	(0.732)	(0.488)	(0.484)	(0.793)	(0.793)
F statistic	9.207	9.977	4.434	3.298	35.21	36.50	5.560	5.582
Durbin-Watson statistic	1.23	1.24	1.17	1.16	0.48	0.47	0.95	0.95
Observations	196	196	196	196	158	158	196	196

Notes: This table shows a series of OLS regressions where the dependent variable is a measure of the private minus public spread. The corresponding private yield used is given by the numbers labeling the columns. We subtract the public consol yield to each private yield to get the spread. The controls are the logarithm of the debt-to-GDP ratio, the British stock market volatility, growth in real import volumes, and real GDP per capita growth. The standard errors in parentheses are robust to first-order autocorrelation and heteroskedasticity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

For the modern US times, KV finds that a one standard deviation increase in the US debt-to-GDP increases the convenience yield by 44 bp, a larger effect than what we find for Britain during the Gold Standard. This difference is partly because increases in the British debt-to-GDP ratio in this period were smaller than they are today for the US. Assuming an increase in the debt-to-GDP ratio of the same magnitude as KV considers (a 44% change) quadruples the effects on the convenience premia, bringing our estimates closer to what KV finds for the post-1926 US, albeit still somewhat smaller. Choi et al. (2023) estimates Equation 1 using the UK prime paper spread as the dependent variable between 1933 and 2017 and finds effects of similar magnitudes to KV's.

We also estimated Equation 1 separately before and after the Napoleonic Wars. An online appendix provides the results for the two subsamples: 1718-1815 and 1816-1913. Three key takeaways emerge from this. First, the β coefficient in Equation 1 is negative and statistically significant in both subsamples for all spreads, except for mortgage spreads after the Napoleonic Wars, where the negative point estimates become insignificant. Second, the coefficient on the prime paper spread is rather stable across subperiods. Third, the coefficients on bank and private discount spreads differ across subperiods, with the subsample of post-Napoleonic Wars exhibiting smaller β coefficients.

Overall, the analysis of the subsamples suggests that British public debt featured a convenience yield throughout the period studied and that this relationship was notably stable before and after the Napoleonic Wars for the prime paper spread only.

4.2 US Public Debt Supply and US Spreads

So far, the negative relationship between British debt-to-GDP and private-public spreads in Table 2 supports the hypothesis that British public debt was a special asset during the Classical Gold Standard, qualitatively similar to US behavior in modern times. A natural follow-up question is whether the findings in KV about the US extend to the Classical Gold Standard. We answer this question as follows.

We estimate Equation 1 using US data between 1879 and 1913, the period during which the US was under the Classical Gold Standard. We focus on the AAA spread as our dependent variable, as it is the main variable of analysis in KV. As before, we run our regression using OLS and correct the standard errors for heteroskedasticity and first-order autocorrelation because the Durbin-Watson tests show signs of autocorrelation. The results are summarized in Table 3.

Interestingly, we find that for the US in this period, the coefficient of the logarithm of the

debt-to-GDP ratio is positive, which is opposite to the results in KV for the modern US. A positive sign on β in Equation 1 suggests that US public debt during this period lacked the moneyness that investors associate with US public debt today, consistent with our thesis. Across specifications, the magnitude of β implies that a one standard deviation increase in the US debt-to-GDP ratio increases the AAA spread by approximately 7 bp. Unlike today, the US financial system was highly underdeveloped and chaotic during this period. Even compared to a similar peripheral economy in Canada, the US stands out for its crisis-prone and fragile financial system (Bordo et al., 2015). Unlike today, restrictions on branch banking and banking across state lines meant that the New York financial center remained a backwater until World War I and did not assume the hegemonic position it holds today until after World War II. Coppola et al. (2023) models the transition in dominant currencies throughout history. The different signs in the debt-to-GDP ratio coefficient in Table 2 for Britain and Table 3 for the US can be explained through the lens of their model, as the British pound, not the US dollar, was the dominant currency in this period.

Further evidence of the special features of British public debt compared to US public debt during this period is the consistently positive international spread. The international US spread is calculated by subtracting the British consol yield from the long-term US public debt yield. Figure 2 illustrated that the US spread was positive throughout the analysis period, with an average of 50 bp (see Table 1). Under some assumptions discussed in the next section, a positive international spread implies that the British convenience yield was larger than the US convenience yield during this period. The next section extends the study of the international spreads to all core countries.

4.3 International Core Spreads

This section extends the calculation of international spreads to the remaining four core countries: Belgium, France, Germany, and the Netherlands.[5] The rationale for focusing on core countries only is twofold. First, the Gold Standard has solid credibility for core countries (Mitchener and Weidenmier 2015, Eichengreen 2019), implying that currency risk is negligible. Second, core countries exhibited low sovereign risk, particularly during the classical Gold Standard period (Obstfeld and Taylor 2003).

Each country's spread is calculated by subtracting the British consol yield from the corresponding country's public debt yield. The series –illustrated in Figure 2– start in the late 19th century because the countries considered joined the Gold Standard much later than

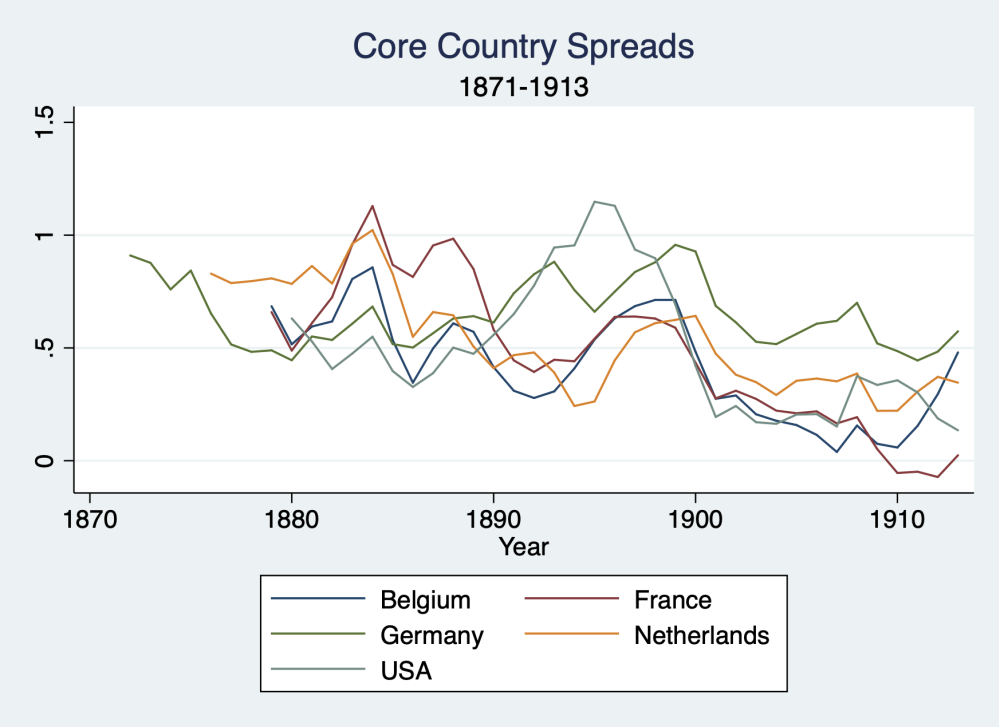
[5]To classify a country as a core country, we follow Obstfeld and Taylor (2003) and Mitchener and Weidenmier (2015).

Table 3: Effect of the US debt-to-GDP ratio on the AAA spread in the US (1879-1913)

	(1)	(2)	(3)	(4)
	AAA spread	AAA spread	AAA spread	AAA spread
Log(Debt/GDP)	0.576***	0.576***	0.558***	0.589***
	(0.0811)	(0.0815)	(0.0723)	(0.0708)
Stock market volatility		-0.290	-0.771**	-0.376
		(0.404)	(0.332)	(0.337)
Import growth			-0.895**	
			(0.421)	
GDP per capita growth				-1.294**
				(0.617)
Intercept	0.0966	0.201	0.423***	0.232*
	(0.142)	(0.146)	(0.145)	(0.133)
F statistic	50.51	27.32	22.42	33.91
Durbin-Watson statistic	0.59	0.76	0.76	0.78
Observations	34	34	34	34

Notes: This table shows a series of OLS regressions where the dependent variable is the yield of AAA-rated US corporate bonds minus the yield on 10-year US government bonds. The controls are the logarithm of the US debt-to-GDP ratio, US stock market volatility, growth in US real import volume, and US real GDP per capita growth. The standard errors in parentheses are robust to first-order autocorrelation and heteroskedasticity. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 2: Core countries' spreads for five core countries during the Classical Gold Standard.



Note: Each country's spread, in %, is calculated as its public debt yield minus the British consol yield. The period considered depends on when countries formally joined the gold standard: Belgium and France (1878), Germany (1871), the Netherlands (1875), and the US (1879).

Britain.

One stark pattern emerges from Figure 2: the spreads are consistently positive throughout the sample for all countries, with the only exception being France starting in 1910.[6] The average spread for all countries is 55 bp. There are some differences across countries, with Belgium exhibiting an average spread of 42 bp and Germany having an average spread of 65 bp. Panel B of Table 1 presents the averages, standard deviations, and number of years included for each country. All means are statistically different from zero.

How should these spreads be interpreted? DIS argues that two assumptions must hold for raw spreads to provide information about convenience yields in modern times. First, investors should regard the countries analyzed as default-free. Obstfeld and Taylor (2003) suggests that this is the case for core countries under the classical Gold Standard. Second, financial markets should be frictionless, particularly with regard to FX swap contracts. DIS discusses FX swap contracts because the bonds they study are in local currency. However,

[6]Kindleberger argues that the Bank of France was almost as important as the UK as a financial center before World War 1, consistent with this finding (Kindleberger et al., 2005, p. 252-4).

the Classical Gold Standard was a fixed exchange rate regime, and the countries we focus on were strongly committed to it, making currency risk negligible (Mitchener and Weidenmier 2015). Thus, these consistently positive spreads between British public debt and the public debt of countries equally committed to the Gold Standard and with virtually no default risk can be interpreted as British public debt's convenience yield being larger than that of the remaining core countries.

5 Conclusions

This study establishes that British public debt, similar to modern US Treasuries, featured a convenience yield during the Classical Gold Standard (1718-1913).

Two exercises allow us to reach the aforementioned conclusion. First, the data clearly shows a negative and significant relationship between the British public debt-to-GDP ratio and several corporate spreads. Increases in public debt decrease its price, increasing the return investors require to hold public debt, and consequently, decrease corporate spreads. Second, the spreads between the British public debt yields and other core countries' public debt yields were consistently positive throughout the Classical Gold Standard. The period and countries considered make both currency and sovereign risks negligible, indicating the greater convenience of British public debt as a likely explanation.

Contrary to previous findings in modern US times, US public debt did *not* feature a convenience yield during the Classical Gold Standard in the US (1879-1913). Increases in US public debt-to-GDP ratio increased corporate spreads instead of decreasing them. This is consistent with the US being somewhat peripheral in this period, with an underdeveloped financial market, and the UK playing the role of the central issuer of safe, liquid debt, a role that the US would later assume.

Finding a convenience yield on British public debt during the Classical Gold Standard underscores the importance of the public debt issuer vis-à-vis the public debt's characteristics. In modern US times, short-term debt is the most money-like (Greenwood et al. 2015), and it is nominal, and not real or inflation-protected, debt that investors value for its safety and liquidity (Fleckenstein et al. 2014, Andreasen et al. 2021). However, during the Gold Standard, public debt was perpetual and essentially real in the long term, as the gold standard provided a long-term anchor for the price level.[7]

[7]That said, the price level could vary significantly in the short run, seeing inflations and deflations of about 50% four times in the century from 1814 to 1913 (Triffin 2005).

Our results support the idea that the moneyness of public debt depends not only on the intrinsic characteristics of the asset (nominal vs. real or long-term vs. short-term), but also on the financial architecture in place when debt is issued. In particular, perpetual real debt can be valued for its safety and liquidity when it is the primary debt issued by the world's financial center or *hegemon* in Farhi and Maggiori (2017) terminology. Even in a historical period with a significantly different financial architecture, the importance of a liquid and safe asset market can be observed in the data. While there were many different institutional features in this period, we find that the major safe asset in this period looked a lot like the major safe asset in the present.

References

Andreasen, M. M., J. H. E. Christensen, and S. Riddell (2021, 10). The TIPS Liquidity Premium*. *Review of Finance 25*(6), 1639–1675.

Barro, R. J. (1987). Government spending, interest rates, prices, and budget deficits in the united kingdom, 1701–1918. *Journal of monetary economics 20*(2), 221–247.

Black, R. A. and C. G. Gilmore (1990). Crowding out during britain's industrial revolution. *The Journal of Economic History 50*(1), 109–131.

Bordo, M. D., A. Redish, and H. Rockoff (2015). Why didn't canada have a banking crisis in 2008 (or in 1930, or 1907, or...)? *The Economic History Review 68*(1), 218–243.

Bordo, M. D. and H. Rockoff (1996). The gold standard as a "good housekeeping seal of approval". *The Journal of Economic History 56*(2), 389–428.

Brewer, J. (1990). *The sinews of power: War, money, and the English state, 1688-1783*. Harvard University Press.

Caballero, R. J. and E. Farhi (2017). The safety trap. *Review of Economic Studies 85*(1), 223–274.

Chen, Z., Z. Jiang, H. Lustig, S. Van Nieuwerburgh, and M. Z. Xiaolan (2022, May). Exorbitant privilege gained and lost: Fiscal implications. Working Paper 30059, National Bureau of Economic Research.

Choi, J., D. Dang, R. Kirpalani, and D. J. Perez (2023). The secular decrease in uk safe asset market power. *AEA Papers and Proceedings 113*, 120–24.

Choi, J., R. Kirpalani, and D. Perez (2023). Us public debt and safe asset market power. *Mimeo*.

Clark, G. (2001). Debt, deficits, and crowding out: England, 1727–1840. *European Review of Economic History 5*(3), 403–436.

Coppola, A., A. Krishnamurthy, and C. Xu (2023). Liquidity, debt denomination, and currency dominance. Technical report, National Bureau of Economics Research.

C't Hart, M. (1993). *The making of a bourgeois state: war, politics and finance during the Dutch revolt*. Manchester University Press.

Del Negro, M., D. Giannone, M. P. Giannoni, and A. Tambalotti (2019). Global trends in interest rates. *Journal of International Economics 118*, 248–262.

Dickson, P. G. M. (1967). The financial revolution in england: A study in the development of public credit, 1688-1756. new york: St.

Dincecco, M. and M. Prado (2012). Warfare, fiscal capacity, and performance. *Journal of Economic Growth 17*, 171–203.

Du, W., J. Im, and J. Schreger (2018). The u.s. treasury premium. *Journal of International Economics 112*, 167–181.

Duffy, I. P. (1982). The discount policy of the bank of england during the suspension of cash payments, 1797-1821. *Economic History Review*, 67–82.

Eichengreen, B. (2011). *Exorbitant Privilege. The Rise and Fall of the Dollar and the Future of the International Monetary System*. Oxford University Press.

Eichengreen, B. (2019). *Globalizing capital: a history of the international monetary system*. Princeton University Press.

Farhi, E. and M. Maggiori (2017, 08). A Model of the International Monetary System*. *The Quarterly Journal of Economics 133*(1), 295–355.

Fleckenstein, M., F. A. Longstaff, and H. Lustig (2014). The tips-treasury bond puzzle. *Journal of Finance 69*(5), 2151–2197.

Fritschy, W. (2003). A'financial revolution'reconsidered: public finance in holland during the dutch revolt, 1568-1648. *Economic history review*, 57–89.

Gorton, G. (2017). The history and economics of safe assets. *Annual Review of Economics 9*(1), 547–586.

Gorton, G. and G. Ordoñez (2022). The supply and demand for safe assets. *Journal of Monetary Economics 125*, 132–147.

Gourinchas, P.-O. and O. Jeanne (2012). Global safe assets. BIS Working Papers 399, Bank for International Settlements.

Gourinchas, P.-O. and H. Rey (2007a). From world banker to world venture capitalist: Us external adjustment and the exorbitant privilege. In *G7 Current Account Imbalances: Sustainability and Adjustment*, pp. 11–66. University of Chicago Press.

Gourinchas, P.-O. and H. Rey (2007b). International financial adjustment. *Journal of Political Economy 115*(4).

Greenwood, R., S. G. Hanson, and J. C. Stein (2015, August). A comparative-advantage approach to government debt maturity. *Journal of Finance LXX*(4), 1683–1722.

He, Z., A. Krishnamurthy, and K. Milbradt (2019, April). A model of safe asset determination. *American Economic Review 109*(4), 1230–62.

Heim, C. E. and P. Mirowski (1987). Interest rates and crowding-out during britain's industrial revolution. *The Journal of Economic History 47*(1), 117–139.

Kindleberger, C. P., R. Z. Aliber, and R. M. Solow (2005). *Manias, panics, and crashes: A history of financial crises*, Volume 7. Palgrave Macmillan London.

Krishnamurthy, A. and A. Vissing-Jorgensen (2012). The Aggregate Demand for Treasury Debt. *Journal of Political Economy 120*(2), 233–267.

Krishnamurthy, A. and A. Vissing-Jorgensen (2015). The impact of treasury supply on financial sector lending and stability. *Journal of Financial Economics 118*(3), 571–600.

Mitchener, K. J. and M. D. Weidenmier (2015). Was the classical gold standard credible on the periphery? evidence from currency risk. *The Journal of Economic History 75*(2), 479–511.

Nagel, S. (2016). The Liquidity Premium of Near-Money Assets. *The Quarterly Journal of Economics 131*(4), 1927–1971.

Neal, L. (2000). How it all began: the monetary and financial architecture of europe during the first global capital markets, 1648–1815. *Financial history review 7*(2), 117–140.

Neal, L., S. Quinn, and S. L. Engerman (2003). Markets and institutions in the rise of london as a financial center in the seventeenth century. *Finance, intermediaries, and economic development*, 11–33.

North, D. C. and B. R. Weingast (1989). Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century england. *The journal of economic history 49*(4), 803–832.

O'Brien, P. (2011). The nature and historical evolution of an exceptional fiscal state and its possible significance for the precocious commercialization and industrialization of the british economy from cromwell to nelson. *The Economic History Review 64*(2), 408–446.

O'Brien, P. K. (1988). The political economy of british taxation, 1660-1815. *Economic history review*, 1–32.

O'Brien, P. K. and N. Palma (2020). Danger to the old lady of threadneedle street? the bank restriction act and the regime shift to paper money, 1797–1821. *European Review of Economic History 24*(2), 390–426.

Obstfeld, M. and A. M. Taylor (2003). Sovereign risk, credibility and the gold standard: 1870-1913 versus 1925-31. *The Economic Journal 113*(487), 241–275.

Odlyzko, A. (2016). Economically irrational pricing of nineteenth-century british government bonds. *Financial History Review 23*(3), 277–302.

Payne, J., B. Szőke, G. Hall, and T. J. Sargent (2022). Costs of financing us federal debt: 1791-1933. Technical report, Working Paper, Brandeis University.

Scott, H. M. (1992). The second 'hundred years war', 1689–1815. *The Historical Journal 35*(2), 443–469.

Sissoko, C. et al. (2019). The monetary foundations of britain's early 19th century ascendency. *Economics Working Paper*.

Stasavage, D. (2007). Partisan politics and public debt: The importance of the 'whig supremacy'for britain's financial revolution. *European Review of Economic History 11*(1), 123–153.

Temin, P. and H.-J. Voth (2005). Credit rationing and crowding out during the industrial revolution: evidence from hoare's bank, 1702–1862. *Explorations in Economic History 42*(3), 325–348.

Thomas, R. and N. Dimsdale (2017). A millennium of macroeconomic data for the uk. *The Bank of England's Historical Macroeconomic and Financial Statistics: Version 3*, 1.

Thomas, R., S. Hills, and N. Dimsdale (2010). The uk recession in context—what do three centuries of data tell us? *Bank of England quarterly bulletin*, Q4.

Triffin, R. (2005). The myth and realities of the so-called gold standard. In *Gold Standard In Theory & History*, pp. 108–122. Routledge.

van Hombeeck, C. E. (2020). An exorbitant privilege in the first age of international financial integration? *Journal of International Money and Finance 101*, 102092.

Williamson, J. G. (1984). Why was british growth so slow during the industrial revolution? *The Journal of Economic History 44*(3), 687–712.

Wood, J. H. et al. (1983). Do yield curves normally slope up? the term structure of interest rates, 1862–1982. *Economic Perspectives 7*(Jul), 17–23.