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FUNDING THE GREAT WAR AND THE BEGINNING OF THE END FOR BRITISH HEGEMONY

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Abstract

Britain was the richest country in the world at the outbreak of the Great War, benefitting from all the resources of an industrialised country and a large empire. Funding the war contributed to the beginning of the end for British hegemony. Financiers in London extracted a high price for lending their money to the government to pay for the supplies and munitions needed to win the war. The US extracted a similarly high price for lending to Britain during the war. Russia never paid its war debts to Britain; France, Italy and Belgium got off lightly; but for a long time the US insisted on Britain repaying in full.

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Funding the Great War and the beginning of the end for British hegemony[1]

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Abstract

Britain was the richest country in the world at the outbreak of the Great War, benefitting from all the resources of an industrialised country and a large empire. Funding the war contributed to the beginning of the end for British hegemony. Financiers in London extracted a high price for lending their money to the government to pay for the supplies and munitions needed to win the war. The US extracted a similarly high price for lending to Britain during the war. Russia never paid its war debts to Britain; France, Italy and Belgium got off lightly; but for a long time the US insisted on Britain repaying in full.

1. Setting the scene

The United Kingdom was the world's economic superpower at the beginning of the twentieth century, able to call on the significant resources and wealth of an industrialised economy and the expansive British Empire. However, it was singularly unprepared for the events that unfolded in the summer of 1914. Militarily, the UK had been falling behind in the arms race with Germany from 1900 to 1913, primarily as defence spending failed to keep pace with global trends.[2] Financially, London had great difficulty coping with the international scrimmage for liquidity when the Austria-Hungary ultimatum to Serbia caused market perceptions of the risk of war to shoot up on Thursday, July 23, 1914. Foreign exchange and money markets broke down early the following week and, even though the Bank of England raised the Bank Rate from 3% to 8%, on Friday 31 July the London Stock Exchange closed for the first time in its 117-year history. It was not to open again for five months. Thus, the UK government found itself in dramatic need of increasing its military expenditure at the same time as its financial infrastructure became impaired.

The extent of the problem facing the UK government is shown in Figure 1.[3] In the fiscal year 1912-1913 defence spending was £72.5 million (3.1% of GDP), a proportion of GDP that had remained largely unchanged since the end of the 2nd Boer War in 1902. By fiscal year 1914-1915 defence spending had increased to £437.5 million (14.9% of GDP, £365.2 million at 1913 prices) and by 1915-

[1] We thank Steve Broadberry, Norma Cohen, Era Dabla-Norris, George Hall and Sang Seok Lee for helpful comments and suggestions. Ali Uppal was a highly proficient research assistant.

[2] The Correlates of War Project (Singer et al (1972)) estimates that the UK and Germany had almost identical National Material Capabilities in 1905. By 1913 the UK capability was only 78% that of Germany, driven by increases in German military spending, iron and steel production and primary energy consumption. Moreover, in its 1912 budget Germany had already committed to further increases in military spending out to 1917.

[3] The data are from Mallet and George (1929), Feinstein (1972) and Mitchell (1988), conveniently summarised at https://www.ukpublicspending.co.uk/.

1916 to £1.4 billion (40.8% of GDP, £1.04 billion at 1913 prices), a level where it remained until 1918-1919.[4] Only after the end of demobilisation in 1923 did defence spending return to pre-war levels as a proportion of GDP. The exigencies of war meant that almost all defence spending 1914-1919 was through Votes of Credit that granted lump sum funds to the Treasury to be spent on the Navy, Army, and Ministry of Munitions as the government best decided, without the prior approval of Parliament. The increase in defence spending 1914-18 was partially offset by other line items in the government budget not keeping pace with the GDP of the wartime economy. Most notably, spending on education fell from 2.4% to 1.3% of GDP and on transport from 2.0% to 0.9% of GDP. Overall, civil spending reduced from 10.0% to 5% of GDP during the war, although it rebounded quickly afterwards.

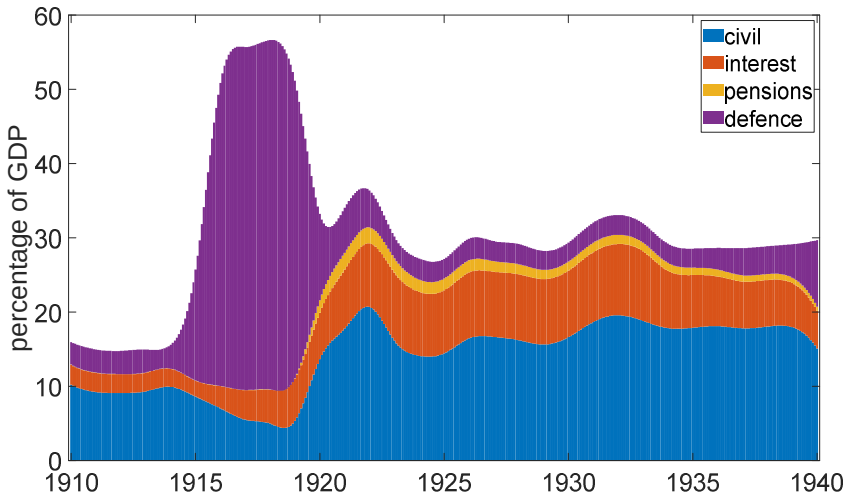

Figure 1: UK Government Expenditures by Types as Percents of GDP

Taxes were raised to provide ongoing financing for the war, as reflected in the development of government revenue in Figure 2.[5] First to rise were income and property taxes, which went from producing £44.8 million in fiscal year 1912-1913 to bringing in £239.5 million in 1917-1918 (£134.8 million at 1913 prices) and £398.8 million by 1921-1922 (£213.3 million at 1913 prices). This was partly due to an increase in the standard rate of income tax from 1s 2d in the pound (5.8%) to 6s in the pound (30%), but also because expansion in coverage meant an extra 2.4 million people became eligible to pay income tax. In fiscal year 1914-1915 the government introduced a new Excess Profits Duty to tax what it deemed 'excessive' business profits at 50%; by 1917-1918 the duty had risen to 80% and receipts amounted to almost one-third of government revenue. Over the period 1914-18, the total take from income and property taxes more than trebled, from 3.0% to 9.6% of GDP. Later to rise were

[4] Estimates in real terms are obtained by deflating the nominal value of defence spending by the price of public authorities' current expenditure on goods and services.

[5] Nason and Vahey (2007) argue that the UK adopted the McKenna Rule when financing World War I. Named after Reginald McKenna, Chancellor of the Exchequer 1915-1916, it required the government to raise taxes to cover normal peacetime spending plus interest on war debt, but not wartime defence spending.

indirect taxes, mostly through increases in customs and excise duties on basic commodities and luxury goods. In fiscal year 1912-1913 these duties generated £71.5 million, rising to £110.1 million in 1917-1918 (although falling to £62.0 million at 1913 prices) and £324.4 million in 1921-1922 (£173.5 million at 1913 prices). As a proportion of GDP, total revenue from indirect taxes fell from 7.7% in 1913-1914 to 5.5% in 1917-1918 before the large increase to 17.8% in 1921-1922.

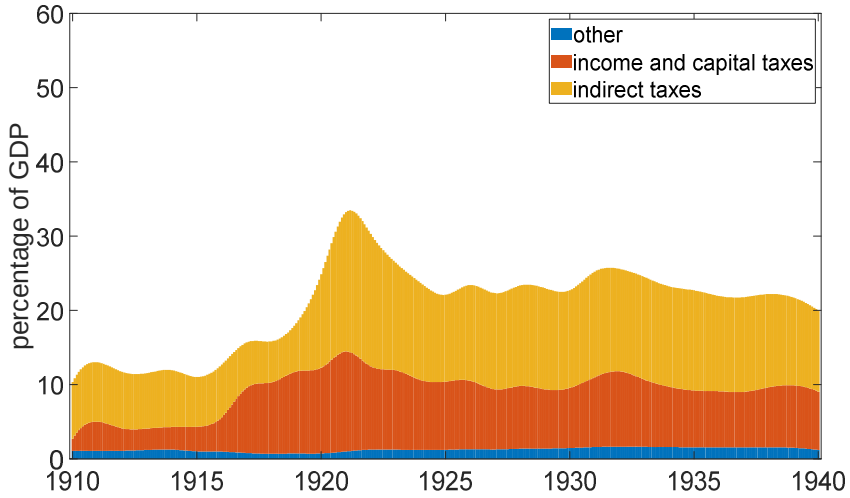

Figure 2: UK Government Revenues by Types as Percents of GDP

However, the increase in defence spending during the Great War massively dominated the impact of this reduction in civil expenditures and higher taxes. The result, as shown in Figure 3, was the government's gross primary deficit being propelled to unprecedented levels as a proportion of GDP. The gross primary deficit was at its maximum in 1917 and 1918, cumulating to 148% of GDP over the period 1914-19. Although deficits of this size were short-lived, the strain they put on the UK economy and London financial markets was extraordinary. The modern concept of 'fiscal space' favoured by the IMF (2018) and the OECD[6] stresses the capacity for governments to raise spending or cut taxes whilst assuring financial market access and debt sustainability. Calculations by Moody's Analytics estimated the fiscal space of 30 OECD countries in 2014, at which time 11 countries (including the United Kingdom) had insufficient fiscal space to raise 148% of GDP, for 11 (including the United States) there would be grave risk in doing so and for the remaining 9 there would still be a significant risk.[7] The fiscal space available to the government at the outbreak of the Great War would likely have been even more restricted.

[6] See Botev et al. (2017).

[7] The methodology used by Moody's Analytics is described in Zandi, Cheng and Packard (2011). The most recent estimates of fiscal space are available at https://www.economy.com/dismal/tools/global-fiscal-space-tracker.

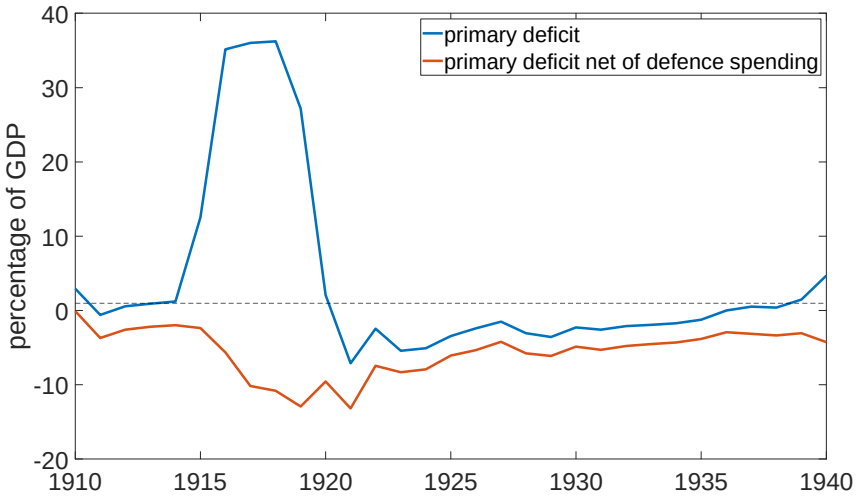

Figure 3: UK Government Primary Deficit as Percents of GDP

With its fiscal space limited in 1914, the UK government had little alternative but to increase either borrowing or the money supply. Britain came off the gold standard with the Currency and Bank Notes Act of 1914, and the money base did indeed almost double from £288 million in 1914 to £531 million in 1918. However, the subsequent upsurge in inflation and depreciation of the pound tempered any desires the government may have had to print more money to further increase the money supply. Instead, the primary deficits of 1914-18 were largely funded by borrowing in domestic financial markets and through inter-governmental loans. The difficulties in doing so contributed to the beginning of the end for British hegemony, and are the subject of this paper.

2. Funding the Great War

The borrowing of the UK government is presented in Figure 4, which distinguishes among different types of debt.[8] Securities quoted on the London Stock Exchange are divided into those not expressly issued to fund wartime expenditure (Exchequer Bonds, Consolidated Stock, Annuities, Funding Loans, Treasury Bonds and Conversion Loans) and those specific to the Great War (War Loans, National War Bonds and Victory Bonds).[9] Securities not quoted on the London Stock Exchange are split between floating debt (short-term liabilities in the form of Ways and Means Advances, Treasury Bills and Treasury Deposits by Banks), other internal debt (longer term liabilities, most notably War Savings

[8] The data are from Pember and Boyle (1950). Slater (2018) provides a very readable and accessible summary of the historical ups and downs of the UK national debt in this period.

[9] The distinction between securities specific to the Great War and those not expressly issued to fund wartime expenditure is useful but somewhat arbitrary. Several Exchequer Bonds were intimately linked to funding the war, for example the 5% Exchequer Bonds of 1919 were specifically issued in connection with the purchase of US-denominated securities following the formation of the American Dollar Securities Committee. A large number of Exchequer Bonds were also offered up for conversion to War Loans when the opportunity arose.

Certificates, War Expenditure Certificates and National Savings Certificates), and external debt payable to foreign governments.

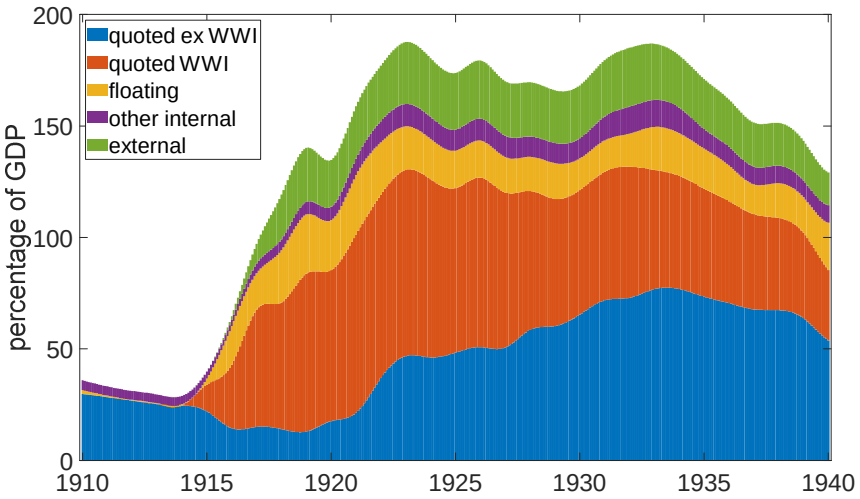

Figure 4: Face Value of UK Government Debt by Types as Percents of GDP

In 1914 the face value of the UK National Debt stood at £706 million, having fallen steadily relative to GDP since the 1820s. The early years of the conflict led to the face value of debt rising to £2190 million by 1916, mostly due to the government issuing war loans on the London Stock Exchange (+£963 million) and extensive use of floating debt (+£573 million, the majority in Treasury Bills) to pay for military expenditure. Subsequent years saw additional war loans issued, further expansions in the use of floating debt, and the arrival of external financing from foreign governments. By 1919 the total debt was £7481 million, the increase since 1916 driven by issuance of securities specific to the war (+£2818 million), floating debt (+£826 million) and external funding (+£1292). The nominal face value of the National Debt remained relatively stable after 1919, albeit with increased emphasis on issuing short-dated Treasury Bonds with a maturity of 1-2 years rather than longer-dated securities explicitly tied to the war. Although there was stability in the nominal value of debt in the 1920s, the value of debt as a percentage of GDP continued to rise due to falling prices and recurrent recessions that combined to depress nominal GDP. Other internal debt not quoted on the London Stock Exchange gained greater prominence with the successful retail launch of National Savings Certificates in 1921.

3. The domestic effort

The prospectus for the first Great War Loan was published on November 17, 1914, accompanied by a widespread advertising campaign encouraging the general public to buy war bonds to help the war

effort. Some examples of advertising posters from the time are shown in Figure 5.[10] The price of issue was £95, with interest at 3½% payable half-yearly on 1st March 1 and 1st September. Redemption was scheduled at par on March 1, 1928, although the government reserved the right to redeem the loan at par any time on, or after, March 1, 1925, subject to giving at least three months' notice. The amount issued was £350 million, of which £100 million was placed prior to publication of the prospectus. The first Great War Loan was not a success as it attracted only £91 million of funding from a very narrow group of investors.[11]

Figure 5: British Posters Encouraging Investment in War Bonds 1914-18[12]

The second Great War Loan was issued on June 21, 1915 at a price of £100, paying a coupon of 4½% and redeemable at the earliest on December 1, 1925 and latest on December 1, 1945. The higher coupon payment reflected the increasing quantity of funding required and the need to compensate financiers for wartime inflation. Unlike when the first war loan was issued, subscribers also benefitted from being offered an additional option to convert some of their existing holdings of government securities into the second war loan. For example, it was possible to exchange £100 of the first loan into £100 of the second loan for a one-off payment of £5. Given the superior interest rate paid on the second loan, it was not surprising that the option to convert proved wildly popular. Of the £901 million total face value of the loan, only £611 million was new money since £137 million came from conversion of the first war loan and £176 million came from the conversion of existing 2.5% and 2.75% Consolidated Stocks. The option to convert was extremely valuable to financiers, especially since the

[10] The aggressive marketing campaign during the war is evidence that these war bonds were designed to deliver low returns. If the bonds had paid market-clearing rates of return then there would have been no need for the government to print posters and recruit movie stars to tempt people to buy. Today, we do not have Benedict Cumberbatch or Emma Watson marketing UK debt.

[11] To cover up the failure, the chief cashier of the Bank of England and his deputy were specially indemnified to purchase the remaining securities in their own names rather than on the Bank's account, a move described by Keynes as a 'masterful manipulation' of the Bank's balance sheet. Anson et al (2017) and Cohen (2019) uncover the historical details from the Bank of England archives.

[12] These images created by the United Kingdom Government are not subject to copyright. They are in the public domain because they were published prior to 1969.

prospectus also contained a pledge of future convertibility should the government need to issue debt at a still higher interest rate:

> *"In the event of future issues (other than issues made abroad or issues of Exchequer Bonds, Treasury Bills, or similar short-dated securities) being made by His Majesty's Government, for the purpose of carrying on the War, Stock and Bonds of this issue will be accepted at par, plus accrued interest, as the equivalent of cash for the purpose of subscriptions to such issues."*

On June 11, 1917 the government published the prospectus of the third Great War Loan, issued at £95, paying a coupon of 5% and redeemable at par anytime between June 1, 1929 and June 1, 1947. The initial yield of nearly 5.4% attracted a flood of conversions.[13] Almost all the second Great War Loan was converted, alongside £281 million from Exchequer Bonds and £130 million from Treasury Bills, meaning that only £845 million on the £2.08 billion raised was new funding.

A damning commentary on domestic efforts to fund the war is provided by Johnston (1934), citing the argument of wartime Prime Minister David Lloyd George that increasing the interest on the second and third Great War Loans was unnecessary. He believed that the threat of conscription of capital for war purposes would have capped interest rates at 2⅔%, which if it had succeeded would have reduced interest payments to money-lenders at the end of the war by more than £30 million a year. The view of David Lloyd George (1918) on raising the interest rate is clear in his War Memoirs:

> *"It cost the country a dozen years of remorseless deflation and concomitant depression to bring interest rates down again to a level that would enable this vast sum to be reconverted to 3½ per cent. Throughout the interval, not only was the country taxing itself to pay a sum ranging at one time as high as £100,000,000 a year more than it would otherwise have done, but the high yield of a gilt-edged Government security kept up rates all round, and made money dearer for all enterprises, industrial, commercial, and national."*

Johnston (1934) goes even further in his criticism of domestic funding arrangements, concluding that "No foreign conqueror could have devised a more complete robbery and enslavement of the British Nation". He is particularly scathing of financial institutions, describing how banks unscrupulously encouraged their customers to take out uncollateralised loans at 3% and invest the proceeds in War

[13] The decision to issue the third Great War Loan at £95 was further advantageous to investors because only income from coupon payments was liable for taxes. Tax revenue could have been higher if the government had priced the loan at £100 and raised the coupon payment appropriately. Lessons from this experience were drawn by the Colwyn Committee of 1923, which recommended that no new debt be issued at a discount and that any refinancing of the War Loan should not include tax privileges.

Loans paying 4½%. The Bank of England comes under fire in 1916 for complicity when exhorting people to invest in 5% Exchequer Bonds by claiming "Unlike the soldier, the investor runs no risk."

The appetite with which financiers converted the previously-issued war loans meant that by 1931 almost all the war securities in circulation were from the third Great War Loan. Interest rates were very volatile in 1931 and at the end of the year there was a run on the pound.[14] The following year interest rates fell from 5% in February to 2.5% in May and 2% in June. As interest rates fell, bond prices soared and Chancellor Neville Chamberlain took the opportunity to announce a conversion of the entire stock of war loans into a new issue of 3.5% consols.

Whatever the view on how funding was raised, the extent to which it was a burden on the UK economy depends on the dynamics of the market value of debt relative to GDP. For the part of the debt quoted on the London Stock Exchange, Hall and Sargent (2011) show that changes in the debt to GDP ratio can usefully be decomposed into four distinct components. Defining B_t as the total market value of debt in period *t* and Y_t as GDP, the ratio of debt to GDP evolves according to:

$$\frac{B_t}{Y_t} = \left(1 + r_{t-1,t} - \pi_{t-1,t} + g_{t-1,t}\right)\frac{B_{t-1}}{Y_{t-1}} + \frac{NI_t}{Y_t}$$

where $r_{t-1,t}$ is the average nominal holding period return on government securities between periods *t-1* and *t* and B_{t-1} is the market value of debt in period *t-1*. Inflation $\pi_{t-1,t}$ is measured by the growth in the GDP deflator between *t-1* and *t*, and $g_{t-1,t}$ denotes the growth in real GDP between *t-1* and *t*. The term NI_t is the net issuance of government securities quoted on the London Stock Exchange. The four components of the decomposition are then the nominal return (coupon payments and any capital gains or losses that accrue with movements in the market prices of securities), inflation (which reduces the real value of nominal debt), real GDP growth (which increases the denominator in the debt to GDP ratio) and net issuance relative to GDP (which increases the numerator in the debt to GDP ratio).

The cumulative contribution of each component to changes in the debt to GDP ratio is presented in Figure 6, constructed using the market price data collated and reported in Ellison and Scott (2019). Nominal returns make almost no contribution until 1920 when coupon payments begin to have an effect and investors start to make capital gains in a bullish bond market. Inflation from 1915 to 1920 brings down the debt to GDP ratio, only for it to rise again with the deflation that followed. The impact of real GDP growth is muted as the UK economy struggled to recover from the Great Depression. Net issuance makes a large contribution at the beginning of the sample with the three Great War Loans of 1914, 1915 and 1917, after which it has little impact.

[14] The events of 1931 and 1932 are further discussed in Section 4 in the context of the foreign funding effort.

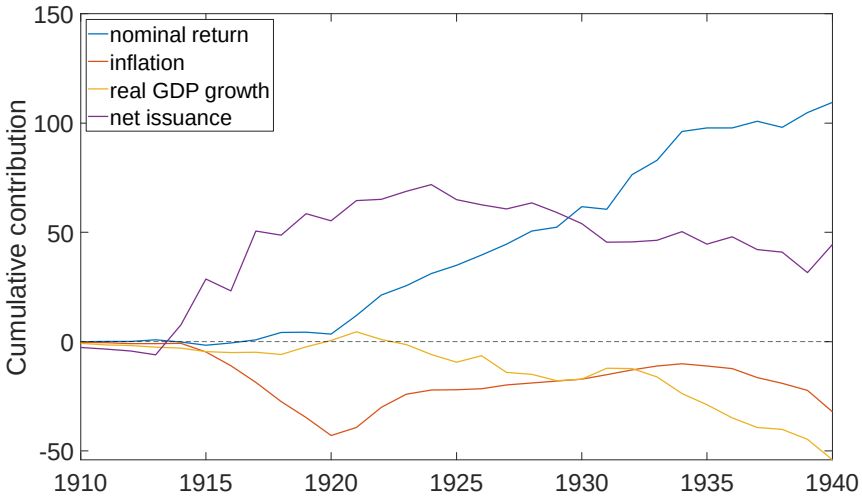

Figure 6: Cumulative Sum of Components of the Change in the Ratio of UK Debt to GDP

The drivers of the debt to GDP ratio are further examined in Table 1. Consistent with Figure 6, the debt to GDP ratio was stable 1910-13, rose 1913-16 because of new issuance, and continued to rise 1916-18 with additional new issuance that was only partially offset by inflation. Coupon payments played a major role in raising the debt to GDP ratio in 1918-23 and beyond, as did deflation which inflated the real value of nominal debt in 1923-31. Real GDP growth only really started to have an effect from 1923-31 when the stock of nominal debt was sufficiently large

Period	1910-1913	1913-1916	1916-1918	1918-1923	1923-1931	1931-1940	1910-1940
Debt/GDP							
start	24.41	18.06	42.70	52.91	82.38	106.30	24.41
end	18.06	42.70	52.91	82.38	106.30	94.46	94.46
change	-6.35	24.65	10.21	29.47	23.91	-11.84	70.05
Contributions							
Nominal return	0.08	-1.76	2.49	20.56	40.34	43.14	104.84
of which coupons	*1.93*	*2.02*	*2.85*	*13.76*	*35.90*	*35.81*	*92.26*
of which revaluations	*-1.85*	*-3.78*	*-0.36*	*6.80*	*4.44*	*7.33*	*12.58*
Inflation	-0.95	-3.74	-13.98	-11.40	12.90	-5.04	-22.21
Real GDP growth	-1.78	-2.72	-0.32	5.86	-18.16	-27.56	-44.69
New issuance	-3.70	32.87	22.02	14.45	-11.16	-22.38	32.11

Table 1: Contributions to Changes in the UK Debt to GDP Ratio

4. The foreign effort

The UK held a special position within the Alliance at the outbreak of the war. As the country with the deepest financial markets and strongest credit rating, it not only borrowed to finance its own defence spending but also made loans to its dominions and colonies to help them fund their war efforts. Figure 7 shows the face value of UK war loans to its dominions and colonies.[15] At its peak in 1918, the total lending was £194 million (45% of the UK's GDP), a significant sum in relation to the UK national debt of £405 million outstanding at the time. With the government acting as an intermediary between financial markets and the dominions and colonies, the lion's share of loans went to Australia, Canada, New Zealand and South Africa, with smaller sums to Newfoundland, British Guiana, Fiji, Jamaica, Trinidad, the East Africa Protectorate, Nyasaland, Uganda and the Federated Malay States. The loans to Australia and New Zealand remained substantial well beyond 1940.

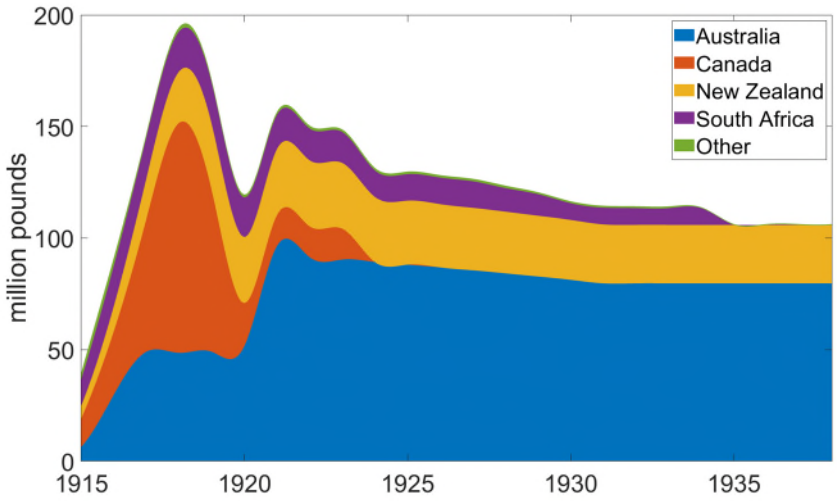

Figure 7: UK War Loans to Dominions and Colonies

The UK government extended even larger war loans to its Allied partners, most notably France, Italy, Russia and Belgium. The pressing needs of war meant that the loans were initially unfunded, i.e. they were short-term floating debt that had no separate repayment schedule. An agreement to convert Italy's war loan into funded debt was reached between the Chancellor of the Exchequer Winston Churchill and Finance Minister Giuseppe Volpi di Misurata on January 27, 1926, whilst a similar arrangement was made for war loans to France with the Churchill-Caillaux settlement on July 12, 1926.[16] No agreement was ever reached to convert the war loan to Russia. It remained as floating debt

[15] Data are from the Statistical Abstract for the United Kingdom, Volumes 69 and 81.
[16] The funding agreement with Italy stipulated payments of £4.5 million a year until 1988, at which time the whole of the £570 million debt would be considered paid off. For France, the total debt of £705 million was discharged in return for 62 annual payments of £12.5 million or equivalent.

throughout, although the likelihood of the loan being paid back quickly diminished after the February and Bolshevik revolutions of 1917. The face value of UK loans to Allied governments is displayed in Figure 8, where the solid lines describe the evolution of unfunded debt and the dashed lines represent the aggregate payments due and outstanding under the respective funding agreements. The favourable treatment of Italy is immediately apparent; the fall from an unfunded debt of £582 million in 1925 to a funded debt of £275 million in 1926 represents a haircut of 53%. There was no noticeable haircut when the war loans of France and others became funded debt.[17]

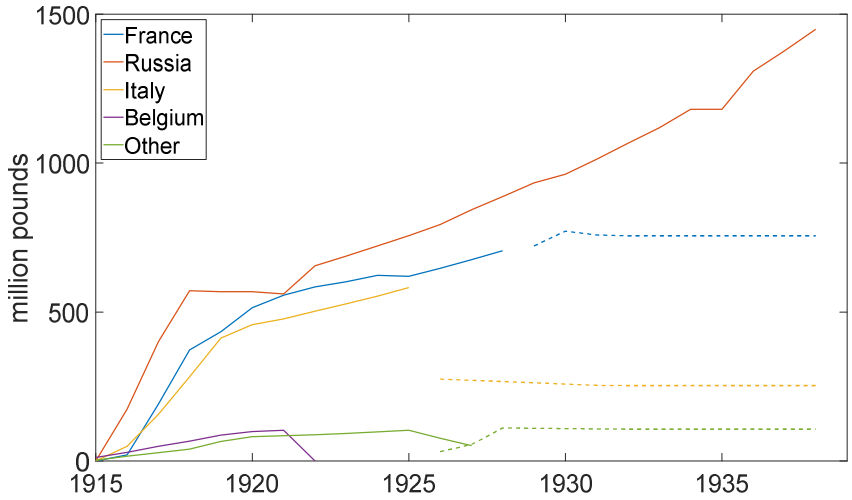

Figure 8: UK War Loans to Allied Governments

The United States lent money to the UK even before it formally entered the war on April 7, 1917. However, the bulk of the advances followed the approval of the Liberty Bond Act on April 24, 1917, which authorised the Treasury Secretary to issue bonds for up to $5 billion and to use a maximum of $3billion to establish credits for other governments by buying their obligations. Table 2 from Wormell (2000) shows the flow of funding from the US to the UK up to 1920. Of the receipts received in 1917, almost three quarters were advanced between April 25 and August 30.

	Receipts (loans)	Expenditure (repayment of loans)	Expenditure (interest)
1916	90	30	
1917	285	21	6
1918	593	111	20
1919	393	98	41
1920	184	155	38
Total	1545	415	105

Table 2: UK Government Transactions in the US (£ million)

[17] The other countries in Figure 8 are the Serb Croat-Slovene Kingdom, including Montenegro (later Jugo-Slavia), Poland, Roumania, Portugal and Greece.

The issuance of war loans by the United States had a profound effect on the global financial landscape. What previously had been a loose network of private and public borrowing between the Allies was transformed into a more formal network of bilateral indebtedness between governments. The US took a central role as the ultimate supplier of global credit, a position that caused consternation in the UK. In the Blackett-Rathbone talks on war debt in September 1919, the UK stressed the importance of inter-allied indebtedness and argued that the repayment of the UK debt to the US should come 'largely if not entirely' from repayments of British lending to the Allies. The US refused to recognise any connection between the debts and expected the UK to honour its commitments to the US irrespective of whether the Allies honoured theirs. The morass surrounding war loans continued to consume political capital and led on February 2, 1922 to the creation of the World War Foreign Debts Commission, under the direction of US Secretary of the Treasury Andrew Mellon. Charged with negotiating repayment agreements with the UK and France, the settlement eventually reduced the UK's debt to the US by 20% and cut the interest rate on the debt from 5% to 3% for the next ten years and 3½% thereafter.

Adding to the uncertain status of inter-allied indebtedness were the reparations that Germany agreed to pay at the Treaty of Versailles on June 28, 1919. Fixed at a level that John Maynard Keynes[18] considered excessive and counterproductive, it was unclear whether Germany would be able to meet its commitments and what possible non-payment would mean for the UK's war debt to the US. Difficulties surfaced almost immediately, with German coal deliveries to the Allied powers falling below agreed quotas from the outset.[19] A minor easement of terms was agreed at the Spa Conference in July 1920, but on January 9, 1923 the Reparations Commission voted that Germany was formally in default and two days later the French and Belgian occupation of the Ruhr began. Tensions were eventually reduced with the Dawes Plan in 1924, under which troops withdrew from the Ruhr, reparations were restructured, and Germany received a loan from the US of about £39 million to aid economic stabilisation.[20] A second restructuring came with the Young Plan of 1929, which was designed to ease the terms of the reparation payments and made a substantial share of the repayment state-contingent. Figure 9 presents the total amount of German reparation bonds outstanding to the UK under the Dawes and Young plans, alongside Britain's war loans from the US.[21]

[18] Keynes was a British delegate to the Paris Peace Conference that negotiated the Treaty of Versailles. He famously predicted that the treaty represented a " Carthaginian peace", Keynes (1920).
[19] See Marks (1978).
[20] For more details, see Reinhart and Trebesch (2014). The funding for the loan was raised by bond issues on Wall Street.
[21] Data are from the IMF Interbellum Debt dataset.

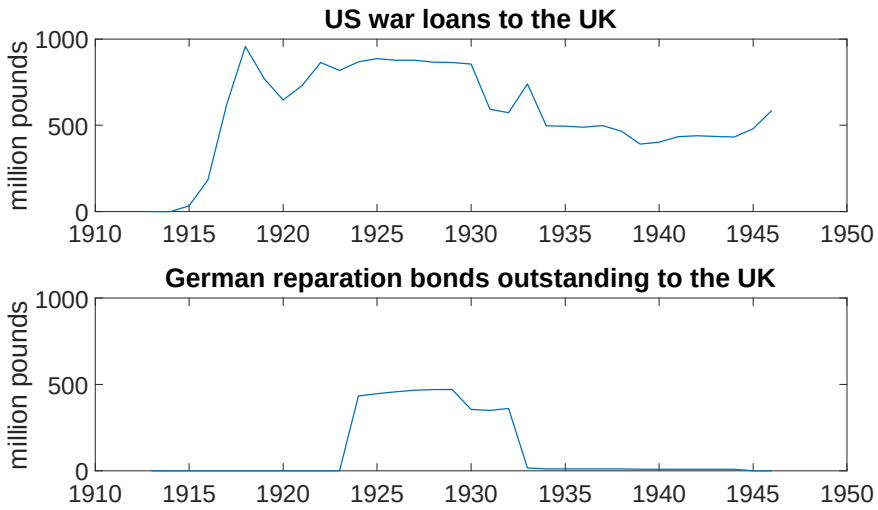

Figure 9: US War Loans to the UK and German reparation bonds outstanding to the UK

The Young Plan came under increasing pressure during the Great Depression and the financial meltdown in central Europe. On June 20, 1931 US President Herbert Hoover issued a one-year moratorium on payments on war debts and postponed both capital and interest payments. The Hoover Moratorium failed to restore confidence and, at Germany's request, an expert committee was called by the Bank for International Settlements to review the reparations schedule in the Young Plan. Following extensive discussions, an agreement was reached at the Lausanne Conference of July 9, 1932 that payments on war debts between the UK, France, Belgium and Italy would be suspended, subject to a revision of their debts to the US. Reparations were effectively, if not legally, cancelled by the Lausanne Agreement.[22]

The UK was by far the most important creditor in Europe and had liabilities only to the US. After German reparation payments under the Young Plan were cancelled in August 1932, it came under increasing pressure to restructure its own debt to the US. In November 1932 the UK asked to postpone the war loan repayments due on December 15. The US refused and the UK did make the scheduled payment; France, Belgium, Poland, Estonia and Hungary did not. The stress on the UK increased still further when the Nazi Party in Germany decided to default on its debts and introduced widespread capital controls. A complete moratorium on all Germany's medium and long term debts was announced on June 14, 1934, including on transfers due under the Dawes and Young Plans. The UK responded by notifying the US of its own decision to defer payment on the war debt instalment due the day after, on June 15. The US war loan remained as a liability on the balance sheet of the UK government, although no repayments were made until it was eventually cleared in full in 2015.

[22] Clement (2004).

5. Messages from domestic bond markets in the UK and US

It is impossible to value intergovernmental war loans with a high degree of precision because they are not traded in financial markets. The various haircuts and restructurings on debt suggest that, had they been traded, war loans would have been priced significantly below par and their market prices would have fluctuated with the perceived probability of default. Hall and Sargent (2019) use the original and renegotiated book values of foreign credits to estimate how the market value of US war loans would have evolved were they traded.[23] This section takes a complementary approach by looking for messages in movements in the market prices of domestic government securities in the UK and US. A rise in the price of UK securities relative to those in the US signals increasing confidence in the UK economy and the UK government's ability to honour its debts.[24]

The analysis starts from Figure 10, which uses the Ellison and Scott (2019) data to plot the ratio of market to par value of domestic UK government debt alongside the corresponding statistic from the US from Hall and Sargent (2019). The large initial discrepancy between the UK and the US is a legacy of fixed coupon payments on consols and rising interest rates at the beginning of the 20th century. In 1900 the yield on UK 2½% Consolidated Stock was 2.51% so they traded at close to par value; by 1910 the yield had increased to 3.09% and the ratio of market to par value had fallen close to 0.8. The subsequent general upward trend in the UK ratio of market to par value primarily reflects issuance of new domestic war bonds, which were offered with a coupon rate designed to ensure that they traded at close to par in financial markets. Abstracting from this trend, there is a strong co-movement between UK and US domestic bond prices. Both fell in 1919 at the time of the Treaty of Versailles and both recovered in early 1924 in anticipation of the successful negotiation of the Dawes Plan. There is a marked dip in the market prices of both UK and US bonds around the time of the Hoover Moratorium in June 1931, although the fall is more pronounced in the UK. Where the prices of UK and US domestic bonds do diverge is 1910-1915 (as financial markets began to price in the possibility that the UK but not the US would go to war), 1915-1920 (when UK domestic bond issuance exceeded that in the US) and from 1938 onwards (run-up to World War II).

[23] In their Figure 16, the capitalised value of promised flows diverges increasingly from the face value of debt each time US war loans are renegotiated. If *ex post* realised payments are used to value debt then the gap is an order of magnitude larger; payments on US war loans ceased after 1934 so US war loans were essentially worthless to an investor who had perfect foresight.

[24] The implications for the value of intergovernmental war loans are potentially ambiguous. A restructuring of UK debt to the US may increase confidence that the UK will respect its domestic debt, in which case the rise in domestic bond prices acts as a signal for a fall in the value of its debt to the US. But if confidence in the UK rises more generally then both domestic securities and debts to the US would rise in value.

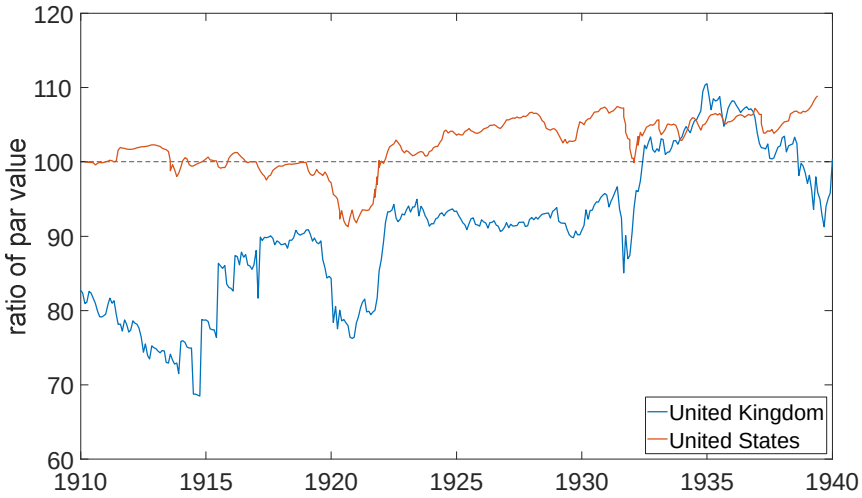

Figure 10: Ratio of Market Value to Par Value of UK and US Government Debt

A more compelling comparison is between the nominal holding period returns on UK and US domestic government debt portfolios. The holding period returns include coupon payments and capital gains or losses arising from changes in the market price of government securities, so avoid the problem of the ratio of market to par value being distorted whenever the government issues new debt.[25] They are presented in Figure 11. As expected, nominal holding period returns in both countries are negative around 1921, positive 1923-1924 and volatile in 1931-32. There is greater instability in holding period returns on the UK than the US debt portfolio, reflecting the longer maturity of UK debt and the greater sensitivity of long bond prices to macroeconomic developments.

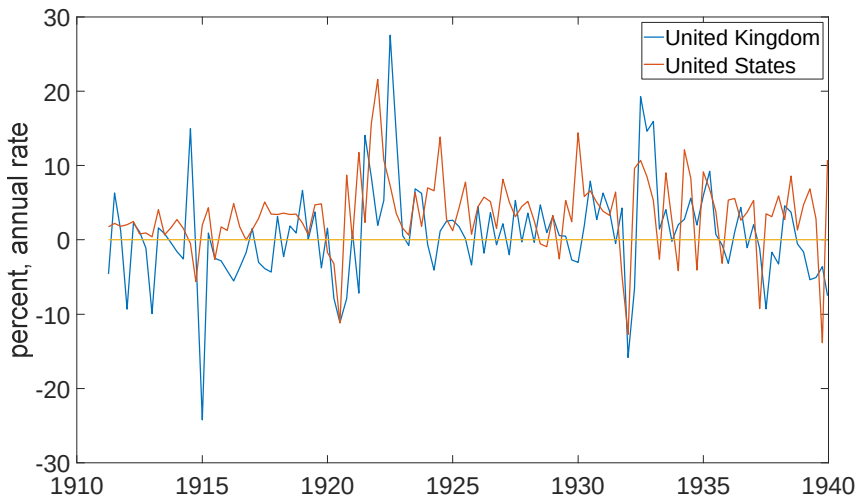

Figure 11: Nominal Holding Period Returns on the UK and US Government Debt Portfolios

[25] The nominal holding period return here is the same as in the Hall-Sargent decompositions in Section 3 of this paper.

Knowing the nominal holding period returns, it is possible to ask the hypothetical question of what would have happened had an investor placed £100 in the UK government's domestic debt portfolio and $100 in the US government's domestic debt portfolio in June 1911. Figure 12 gives the answer, assuming that the investor rebalances their portfolio each quarter to take account of any new issues. The cumulative return on such a UK debt portfolio in pounds is in blue on the left-hand scale; the US equivalent in dollars is in red on the right-hand scale. It is only after the Lausanne Conference that the cumulative return in pounds on the UK portfolio starts recovering compared to the return in dollars on the US portfolio.

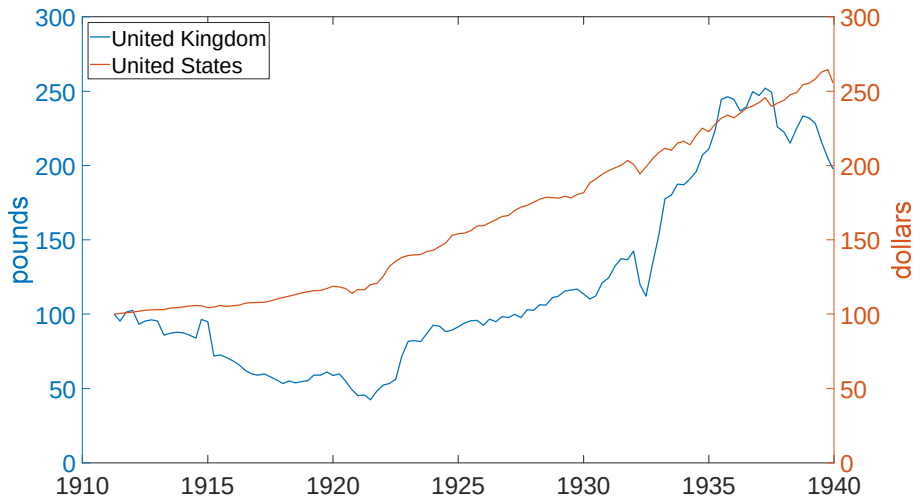

Figure 12: Nominal Values of £100 invested in 1911 in the UK Debt Portfolio (left scale) and $100 invested in 1911 in the US Debt Portfolio (right scale)

It only makes sense to compare a nominal return in pounds to a nominal return in dollars if the UK/US exchange rate is stable. The left panel of Figure 13 suggests this is broadly true for the sample period as a whole, save for the well-known episodes 1919-1925 when the US returned to the gold standard ahead of Britain and 1931-1933 when Britain abandoned the gold standard before the US.[26] If the investor is freely able to exchange dollars for pounds then the correct comparison is between placing $100 dollars in US securities in June 1911 and converting $100 into pounds at the exchange rate prevailing in June 1911 and investing the proceeds in UK securities. The result is shown in the right panel of Figure 13. Temporary deviations of the pound exacerbate the knock-backs to UK nominal returns in 1921 and 1932 and make the speed at which the cumulative UK return recovers after the

[26] It is known that Keynes speculated in currencies during both these periods. Accominotti and Chambers (2016) exploit detailed trading records to show that Keynes' profits were very volatile. He almost went bankrupt in May 1920 shorting continental European currencies and going long in the US dollar. In the 1930s he accumulated large losses betting against the French franc and the Dutch guilder, although the losses were reversed when both currencies were devalued in September 1937.

Lausanne Conference even more noticeable. This is not surprising, given that the dollar value of the UK debt portfolio is heavily dependent on the exchange rate.

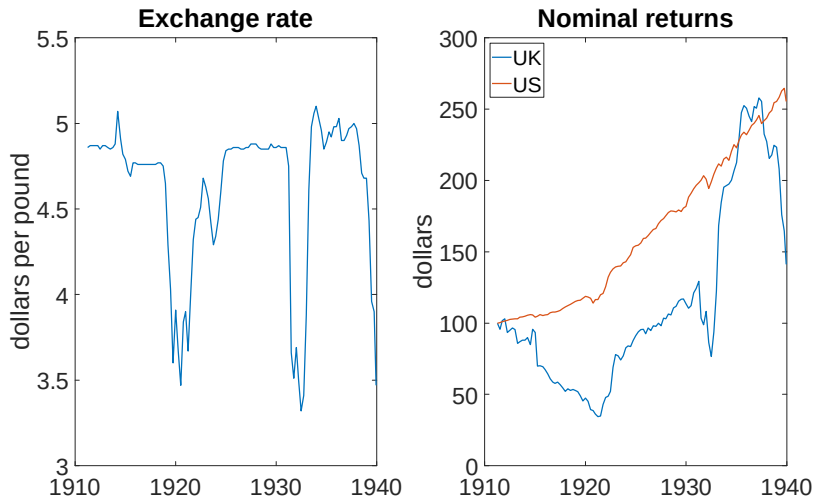

Figure 13: UK / US Foreign Exchange Rate and the Nominal Value of $100 invested in 1911 in the UK and US Debt portfolio

Another concern with the comparison could be related to changes in the purchasing power of pounds in the UK and dollars in the US. The rise and fall in the price level in the left panel of Figure 14 is indeed much more pronounced in the UK than in the US, which depresses the real return in the UK in the right panel of Figure 14 until 1921. However, the lower UK price level at the end of the sample period only serves to accentuate the superior cumulative return in the UK. On the basis of Figures 12, 13 and 14 it is difficult to argue that bondholders in the UK did badly over the period 1911-1938, especially from 1921 onwards.

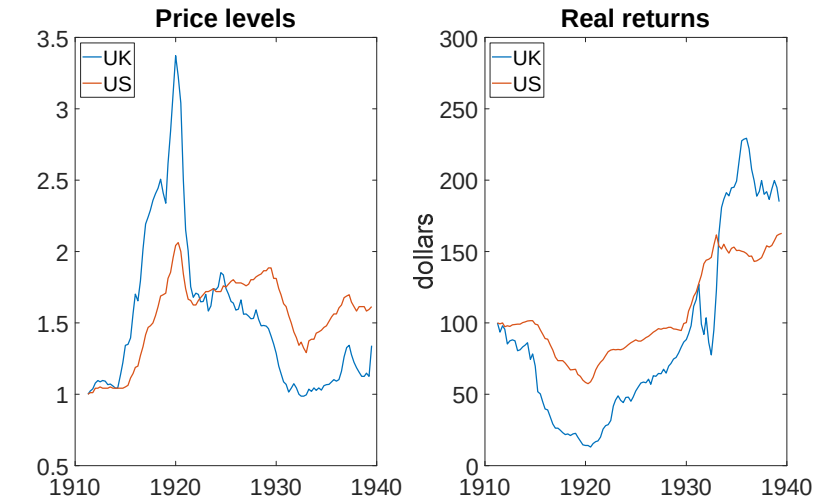

Figure 14: Natural log of UK and US Price Levels and the Real Value of $100 invested in 1911 in the UK and US Debt portfolio

6. Conclusions

The implications of the Great War for the UK economy and the British Empire are manyfold. Two events stand out in the narrative history presented in Sections 3 and 4. Firstly, there is the generosity of the conversion provisions extracted by financial markets that left the UK government more heavily indebted than it needed to be at the end of the war. The view that Britain was subordinate to financial markets in London is borne out by the calculations of Section 5, where it was shown that holders of UK government securities enjoyed both nominal and real returns that matched those on corresponding US government debt. This is true, irrespective of whether returns are adjusted for the pound/dollar exchange rate or domestic price levels. Secondly, there is the repeated refusal by the US to recognise any connection between UK payments to the US and Allied payments to the UK. Britain was subordinate to the hard-nosed US as the loose network of borrowing between the Allies was transformed into a formal network of bilateral indebtedness between governments, with the US at its centre. The US usurped on the dominion of the British Empire when it became the ultimate supplier of global credit in 1917, contributing to the beginning of the end for British hegemony.

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