

**“Debt Sustainability in Historical Perspective: The Role of Fiscal
Repression”***

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Abstract

This paper examines the debt history of two contenders for European hegemony: 16th century Spain and 18th century Britain. We analyse their fiscal behavior using measures of overborrowing and fiscal policy functions. Our results suggest that stringency was not key for Britain’s success in avoiding default. Instead, fiscal repression allowed the UK to borrow at below-market rates, thereby outspending its continental rivals.

(JEL: E4, F41, N23)

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Introduction

Debt sustainability matters. Sovereign defaults are often cataclysmic events involving wide-spread damage to the financial sector, the economy, and the political and social fabric of countries in trouble. Assessing what level of debt is sustainable therefore carries special importance. To this end, the IMF uses a range of methods (IMF 2003). These assessments can lead to austerity programs involving wrenching fiscal adjustments (Stiglitz 2003), both before or after crises.

We analyse two historical cases using the existing metric for debt sustainability. We focus on hegemonic powers of their time, 18th century Britain and 16th century Spain. Both had access to advanced financial markets and networks, and their finances were under severe pressure due to constant warfare. One became a synonym for fiscal disaster – Spain is a record holder for default, reneging no less than 13 times on its debts between 1500 and 1900. Philip II started this tradition, going bankrupt no less than four times during his reign (Braudel 1966). The other, Britain, not only prevailed in early modern power struggles, but emerged without defaults and with a widely-admired fiscal structure as well.

We are not the first historians to analyse these two cases. Britain is traditionally seen as a paragon of fiscal virtue. Scholars have stressed the government's willingness to increase fiscal pressure as debts escalated

during the 18th century (Brewer 1990). Others have pointed to the UK's solid institutions as the deeper cause of her ability to borrow without any difficulty (North and Weingast 1989). Finally, some scholars have emphasized the deep, liquid financial markets that emerged after 1700 – a “financial revolution” that followed the Glorious Revolution (Dickinson 1967, Ferguson 2002). Spain, on the other hand, is traditionally seen as being hopelessly overstretched, both financially and militarily (Kennedy 1987). Because it was almost continuously at war, its fiscal position is normally described as beyond repair – a view that is apparently confirmed by the frequency with which Philip II had to reschedule his obligations (Thompson 1994).

We will use two popular measures of debt sustainability to shed additional light on these apparently polar opposite cases – an indicator of overborrowing, as used by the IMF (2003), and the Bohn (1998) measure of the fiscal response to accumulating debts. The conclusion offers some comments on what the historical record can teach us about the emergence of sustainable debts.

Indebtedness and surpluses

The IMF recently presented simple estimates of overborrowing, calculated by taking averages of the primary surplus, interest rates, growth rates, and the debt stock. The sustainable debt level was then calculated as

$$D^*=PS/(r-g)$$

where D^* is the sustainable debt level, PS is the primary surplus, r is the interest rate, and g is the growth rate of GDP. Actual debt levels D_t are then compared with D^* . The IMF found that industrial countries broadly had debt levels in line with the long-term sustainable ones. By the same yardstick, there is evidence that many emerging countries overborrow – the net present value of their future surpluses is less than the debt stock. While industrial countries have an overborrowing ratio around 1 (suggesting no overhang), Latin American countries show a factor of 2.5, and those with a history of defaults, of 3.5 (IMF 2003). At a minimum, such high ratios imply that a sharp fiscal adjustment is necessary to make debt burdens bearable. They therefore give strong analytical support of typical “fiscal austerity” packages, as prescribed by the IMF in numerous recent financial crises around the globe.

Table 1 here

We begin by analysing the Spanish case. We draw on a new, comprehensive dataset of Spain’s fiscal position (Drelichman and Voth

2007). For the main estimate, we combine this with the new GDP estimates by Álvarez Nogal and Prados de la Escosura (2007).¹ For the period as a whole, average debt levels are about equal to the maximum sustainable debt level, despite constant wars and relatively high interest rates. The second half of the sixteenth century saw what historians call the “price revolution”, with metal imports from the Indies pushing up prices. The fact that D^* approaches half of GDP is partly a consequence of this inflation, which boosted nominal GDP and eroded the real value of debt.

The average for the period as a whole hides substantial variation. During the final decade of Philip II’s reign, when debt levels reached 62 % of GDP, the rise in the primary surplus generated a D^* of 60 %. Based on these figures, it is hard to conclude that Habsburg Spain overborrowed. However, if we use the alternative GDP estimates compiled by Carreras (2003), this is not so clear – because of lower growth, debt levels now exceed the sustainability threshold by more than 10 %.

In contrast, the UK appears to have overborrowed, based on the IMF measure. Its debt level was 10 percentage points higher than could comfortably be serviced, despite low interest rates. The period estimate masks sharp swings of the primary balance from surplus in peacetime to

¹ We use their lower-bound estimates of silver currency per capita incomes, combined with estimates of population size, to derive GDP estimates.

deficit in wartime. While many authors have stressed the rise of the tax state in 18th century Britain, the primary surpluses generated are not impressive compared to those of Philip II. Moreover, Philip's surpluses were all generated during war years; Britain was borrowing to cover even interest expenses when at war. If there is one factor that allowed Britain to accumulate larger debts, and to outspend its continental rival, it was lower interest rates. Had Britain had to face the same interest rates as Philip II, it would have been able to borrow 22 % of GDP, not 85 – far less than Habsburg Spain. Given that Philip II defaulted four times during his reign, part of the difference in the interest rates may reflect this risk. We return to this issue below.

Modern-day evidence suggests that highly variable government revenues limit the amount of debt a state can take on (IMF 2003). Not only did Britain fail to pursue particularly stringent fiscal policies – its revenues were also not very stable. Both Britain and Spain suffered relatively wide swings in tax revenues, with coefficients of variation around 0.12 and 0.18 – modern economies have a range of 0.02 to 0.2, with a median of 0.07. Yet while Philip II could compensate the volatile silver revenues from the Indies with the extreme stability of farmed revenues from Castile, Britain's tax system eschewed the use of farming altogether. While seen by many

historians as a sign of fiscal virtue, it left the UK with revenues that were hardly more stable than those of Spain two centuries earlier.

The evidence presented so far may seem surprising. The country traditionally seen as a paragon of fiscal virtue in the historical literature on sustainable sovereign debt, Britain, appears no better – if not worse – than the standard villain in most histories of default. Tax pressure was not markedly higher in the UK. Revenue relative to GDP stood at 8.7 % relative to GDP, compared to 7.3 to 7.6 for Spain. At their peak, both Spain and the UK were generating revenues to the tune of 11 % of GDP. Standard indicators of fiscal rectitude, such as primary surpluses and debt levels, seem to be of little help in understanding the contrasting experiences of Britain and Spain. How, given the evidence in Table 1, can we account for the fact that Spain, and not Britain, became the most frequent serial defaulter in history?

Fiscal policy functions

Traditional debt sustainability analysis examines if debt to GDP ratios are going to stabilize or rise in the future, given current policies and a range of possible alternatives. Since we do not know with any degree of precision what a sustainable level of debt for a country is, this approach often leads to conclusions that are much too optimistic (Celasu et al. 2007). One

alternative is based on fiscal policy rules that ensure sustainability. For example, as Bohn (1998) showed, if the primary surplus increases strongly when debt levels rise, the discounted present value of surpluses will always be equal to or exceed the value of outstanding debts.

The Bohn approach has recently been applied more widely to contrast good and bad fiscal policies around the globe (IMF 2003). The IMF concluded that sharp increases of the primary surplus in response to the accumulation of debt is common amongst industrial countries, and much less frequent in the developing world. Typically, an LDC will raise the primary surplus from 0 to 3 % when debt increases from 20 to 50 % of GDP, and then leave it largely unchanged. Industrial countries generate higher surpluses throughout, with a rate of 2 % when debt stands at 20 % of GDP, increasing it to around 8 % when debt reaches 100 % of GDP.

How did Britain and Spain react to the accumulation of debt? Spain showed a relatively strong response (figure 1). At a debt level of 20 % of GDP, its primary surplus would be exactly zero, rising to 3.75 % when debt reached 50 % of GDP. While primary surpluses rise rapidly with the increase in bonds and loans outstanding, the intercept is actually negative. This means that the Habsburg kings started out with very low primary surpluses when their debts were low, and only raised them to higher levels when debts grew.

Figure 1 here

Figure 2 looks at the evolution of Britain's debts and primary surpluses over the eighteenth century. While primary surpluses increased in absolute value after every war, they hardly changed at all relative to GDP. In 1700, Britain had a primary surplus of 7 % of GDP; by 1790 it stood at 7.8 %. Given the enormous accumulation of debts relative to GDP – rising from 28 to 116 % – this is surprising. As can be seen in figure 1, there is only a mildly upward-sloping relationship between primary surpluses and debt levels in Britain. The regression implies that, when debt/GDP stood at 20 %, the typical surplus was 3.3 % of GDP, rising to 3.6 % when debt reached 50 % of GDP. These values are far below the ones found by the IMF for developed countries today, and they are not different at higher levels of indebtedness than the ones in emerging markets today.

Figure 2 here

In Figure 3, we repeat the analysis for Spain. While the primary surplus fluctuates from year to year, it is clearly rising over the period. It peaks at over 3 % at the end of our sample. The increase parallels the rise in the debt/GDP ratio, which shows an increase from 25 to over 45 %.

For a more systematic comparison, we estimate Bohn-style regressions. Table 2 compares the results for Habsburg Spain and Britain. The Bohn coefficient is 0.038 for the reign of Philip II. It is either negative

or small and positive for Britain. Even if we restrict ourselves to the peace years in the UK, the fiscal reaction to accumulating debts was less only one third as vigorous as in 16th century Spain.

Surprisingly, we find that the financially most successful early modern state, Britain, showed almost no fiscal response to changes in debt levels. Instead, it maintained primary surpluses at broadly constant levels, despite the rapid accumulation of a large national debt. We contrast this experience with the much sharper Bohn reaction functions found in a much less successful rival – Habsburg Spain. Our results suggest that fiscally weak states may not be capable of generating rapid *changes* in the surplus; even if they do, success is not assured.

Table 2 here

The Role of Fiscal Repression

The evidence from fiscal policy rules appears to deepen the mystery revealed by overborrowing ratios. Philip II, well-known for his lavish spending and repeated bankruptcies, showed fiscal behavior that was highly responsible according to the Bohn approach. The coefficient on debt in the fiscal reaction function is larger than the one for the US in the 20th century (Bohn 1998), and it was 10 times bigger than the UK's in the 18th century. What is different is the much lower surplus at low levels of debt. Here,

Britain is far above either contemporary LDCs or industrial countries.

Britain therefore combined only a minimal response of the primary surplus with a high degree of fiscal conservatism at low levels of indebtedness. One possible interpretation focuses on the fact that peacetime brought reliable primary surpluses that could repay the debt eventually, even at low levels of debt. Since Britain had small debts initially, the willingness to engineer primary surpluses and actually reduce debt levels in the early 18th century (in peacetime) may have created a virtuous cycle, where greater commitments lead to lower interest rates, which again made repayments easier in peacetime.

In contrast, Philip II never built a reputation for prudence based on observable fiscal behavior in the early stages. Interest rates were high and did not decline, making it harder to hit primary surplus figures that rendered debts sustainable. The importance of low interest rates has been emphasized above. It is apparent in the fact that, while tax pressure was about the same in Great Britain and Spain, the UK could still accumulate sustainable debts almost twice as large as her continental rival. The experience of 18th century Britain may suggest a degree of path-dependence in debt accumulation and the prospects for repayment. The responsiveness to accumulating deficits, as measured by the Bohn rule and its variations, could be secondary if a

country uses its “only chance to leave a first impression”, and worked hard to engineer surpluses at (initially) low levels of government debt.

We favor an alternative interpretation – financial repression. British fiscal rectitude in the early 1700s is an unlikely explanation for the progressively lower interest rates later in the century. When the UK showed the most favorable ratio of primary surpluses to debt, in the early 18th century, its interest rates were not particularly low. In real terms, they were as high as those paid by Philip II. It is only from the 1710s and 1720s onwards that British interest rates decline precipitously (Sussman and Yafeh 2006). Since this places the discontinuity a good quarter of a century after the Glorious Revolution, institutional quality and the restraints imposed by parliamentary rule are also unlikely candidates. Instead of earning a right to lower interest rates, Britain carefully ensured privileged access by the government to citizens’ savings. Interest rates were heavily regulated. Usury laws reduced the private sector’s competition for funds, and created artificially easy borrowing conditions for the government (Temin and Voth 2008). It is no coincidence that it was only after 1714, when usury laws were tightened and private borrowers were not allowed to charge more than 5 % per year, that government debt service became much cheaper. Other limitations on private loan contracts, such as restrictions on their maximum duration, worked in the same direction. There is ample

evidence that government borrowing crowded out private investment on a large scale. Every time wartime spending surged, private borrowers were effectively shut out of the loan market (Williamson 1984, Temin and Voth 2005).

Simple reflections on investor rationality reinforce this point. At its peak in 1822, the UK government had contracted loans equivalent to nearly three times GDP (Barro 1987). Whenever the country fought a war, debt surged – from 50 % of GDP after the War of the Spanish Succession to 140 % after the Seven Years War, and to 275 % after the Napoleonic Wars. Yet repay Britain eventually did, while many of the lenders to Philip II saw their claims reduced as part of the reschedulings. However, it took the long *Pax Britannica* after 1815 to reduce debts to negligible levels. For 64 out of 97 years in our historical sample from the eighteenth century, the UK's actual debt level was above the sustainable level, often by a factor of 1.3 or more. Investors buying government debt carrying interest rates of three % stood a chance of being repaid only if the frequency of war declined sharply relative to their historical experience. Only then, with Britain using large peacetime surpluses to pay down its debts, was there a chance of sustainability. Whether investors could have foreseen peace breaking out with a vengeance in the nineteenth century is highly doubtful. That the *Pax Britannica* did take hold after 1815 is no proof of *ex ante* investor

rationality. We simply do not know how much luck at Trafalgar and Waterloo was necessary to ensure the eventual triumph of Britain, but few historians would argue that success was a foregone conclusion at any stage. The fact that investors purchased consols may well tell us more about their lack of alternatives than the inherent attractions of UK government paper. By the same token, Philip's bankers could not foresee the utter ruin of the "Invincible Armada" – its name was not meant ironically. Instead, it initially reflected the expectations of contemporaries accurately.

Part of the contrast in the experiences of Spain and Britain then has to do with access to domestic savings. While Britain could squeeze domestic borrowers and lenders through interest rate regulations and the like, Philip II had to turn to German, Genovese, and Portuguese bankers. Since he relied on imported capital, this limited the extent to which non-market rates could be obtained at which to borrow.² If our interpretation is right, both Hanoverian England and Habsburg Spain paid their lenders less than they could have expected in a free market setting. While Philip chose to reschedule periodically, 18th century Britain decided to pay its creditors below market interest rates. In this sense, Britain secured access to resources by means other than taxation, by paying investors in government

² The extent to which Britain borrowed abroad is not well-established, but it likely did not exceed 8 to 10 % of total debt (Neal 1990, p. 211).

bonds less than the market rate of return. While tax pressure was similar in the two countries, fiscal pressure measured comprehensively (including the costs of financial repression) was higher in Britain.

Conclusions

A history of defaults seems to predict future defaults to a substantial extent, above and beyond traditional indicators of debt burdens (Reinhart et al. 2003). Yet where does “debt intolerance” come from? And what can we learn from the emergence of fiscally successful states in early modern Europe? Many accounts of how Britain defeated France and Spain on the financial battlefield, and succeeded in its bid for European hegemony, emphasize fiscal discipline and the willingness to increase taxes after each war (Brewer 1990, Ferguson 2002, Bordo and White 1991).

The data presented in this paper call this interpretation into question. Judged by the standards of modern debt sustainability analysis, Britain was not in much better shape than Habsburg Spain. Its debts relative to its sustainable borrowing capacity were not particularly low, and the primary surpluses it generated not particularly high. Nor did the UK government react quickly and decisively to rising debt burdens. The crucial factor that made British borrowing sustainable was a low cost of borrowing.

The markedly lower interest rate faced by the British government was only partly a result of financial discipline and the default-free track record of the United Kingdom. Even at the initially low levels of indebtedness, the UK had generated primary surpluses. If path-dependence mattered for creditor perceptions, then the strict financial discipline of the early Hanoverian regime might have had a significant influence on the long-run viability of Britain's finances, despite a war-induced borrowing binge. We favor an alternative view: Early surpluses – the only dimension of traditional debt sustainability analysis in which the UK shines – are probably irrelevant. Instead, a deft dose of financial repression rendered Britain's debt position sustainable. Just as the majority of industrial countries did in the period 1950-1975, the UK did not allow the market to set interest rates on its debt. Instead, a wide range of direct and indirect rules channeled money to the government at preferential interest rates.

In this paper we have argued that today's developing countries share many of the same fiscal problems that European states faced between 1500 and 1800. We explored these similarities. If our argument so far is right, neither tough fiscal policy rules nor the standard rules of prudence in terms of indebtedness proved decisive in avoiding "debt intolerance" in Britain and Spain. Simplistic calculations of sustainable debt burdens, based on either overborrowing ratios or fiscal policy rules, are insufficient to

assess if debts can be serviced. We suggest that a previously neglected factor was crucial –financial repression. Given that European states and the US engaged in very similar practices as recently as the 1960s and 1970s (Wyplosz 2001), we question if freely set interest rates and free international capital flows are compatible with the emergence of “debt tolerance” in the Third World today.

References

- Alvarez Nogal, Carlos, and Leandro Prados de la Escosura. 2007. Searching for the Roots of Retardation: Spain in European Perspective, 1500-1850. Universidad Carlos III de Madrid working paper.
- Barro, Robert. 1987. Government Spending, Interest Rates, Prices, and Budget Deficits in the United Kingdom, 1701-1918, *Journal of Monetary Economics* 20: 221-47.
- Bohn, Henning. 1998. The Behavior of US Public Debt and Deficits. *Quarterly Journal of Economics* 113 (3):949-963.
- Bonney, Richard. 2007. *European State Finance Database 1995-2007* [cited September 5, 2007]. Available from <http://www.le.ac.uk/hi/bon/ESFDB/>.

- Bordo, Michael, and Eugene White. 1991. A Tale of Two Currencies: British and French Finance During the Napoleonic Wars, *Journal of Economic History* 51: 303-16.
- Braudel, Fernand. 1966. *The Mediterranean and the Mediterranean World in the Age of Philip II*. Second Revised Edition ed. Glasgow: William Collins & Sons.
- Brewer, John. 1990. *The Sinews of Power: War, Money and the English State, 1688-1783*. Cambridge, MA: Harvard University Press.
- Carreras, Albert. 2003. "Modern Spain." In J. Mokyr (ed.). *The Oxford Encyclopedia of Economic History*. New York: Oxford University Press, 5 vols. 4, pp. 546-53.
- Celasu, Oya, Xavier Debrun, and Jonathan Ostry. 2007. Primary Surplus Behavior and Risks to Fiscal Sustainability in Emerging Market Countries: A "Fan-Chart" Approach. *IMF Staff Papers* 53 (3).
- Dickson, P. G. M. 1967. *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756*. New York.
- Drelichman, Mauricio, and Hans-Joachim Voth. 2007. The Sustainable Debts of Philip II: A Reconstruction of Spain's Fiscal Position in the Age of Philip II. UPF manuscript.
- Ferguson, Niall. 2002. *The Cash Nexus. Money and Power in the Modern World, 1700-2000*. New York: Basic Books.

- IMF. 2003. *IMF World Economic Outlook*. Washington.
- Kennedy, Paul M. 1987. *The rise and fall of the great powers : economic change and military conflict from 1500 to 2000*. New York, NY: Random House.
- Neal, Larry, *The Rise of Financial Capitalism: International Capital Markets in the Age of Reason*, Cambridge: Cambridge University Press, 1990.
- North, Douglass C., and Barry Weingast. 1989. Constitutions and Commitment, *Journal of Economic History* 49: 803-32.
- Stiglitz, Joseph E. 2003. *Globalization and its Discontents*. New York: Norton.
- Sussman, Nathan, and Yafeh, Yishay. 2006. Institutional Reforms, Financial Development and Sovereign Debt: Britain 1690-1790. *Journal of Economic History* 66: 906-935.
- Temin, Peter, and Hans-Joachim Voth. 2008. Interest Rate Restrictions in a Natural Experiment: Loan Allocation and the Change in the Usury Laws in 1714, *Economic Journal*, forthcoming.
- Temin, Peter, and Hans-Joachim Voth. 2005. Credit Rationing and Crowding Out During the Industrial Revolution: Evidence From Hoare's Bank, 1702-1862, *Explorations in Economic History* 42: 325-48.

- Thompson, I. A. A. 1994. Castile: Polity, Fiscality, and Fiscal Crisis. In *Fiscal Crises, Liberty, and Representative Government, 1450-1789*, edited by P. T. Hoffman and K. Norberg. Stanford: Stanford University Press.
- Williamson, Jeffrey. 1984. Why was British Growth so Slow during the Industrial Revolution?, *Journal of Economic History* 44: 687–712.
- Wyplosz, Charles. 2001. Financial restraints and liberalization in postwar Europe. In: Caprio G, Honohan P and Stiglitz J, eds., *Financial Liberalization: How Far? How Fast?* Cambridge: Cambridge University Press.

Table 1: Standard indicators of debt sustainability

	<i>D</i>	<i>D</i> *	<i>PS</i>	<i>r</i>	<i>g</i>
Spain, 1560-1598					
Main estimate	42	40	2.4	0.09	0.03
Alternative GDP	47	36	2.8	0.09	0.012
UK, 1698-1794					
Main estimate	85	74	1.65	0.035	0.0138
War years	83		-1.12		
Peace years	87	189	4.2	0.035	0.0138

Sources: Bonney (2007), Drelichman and Voth (2007).

Table 2: Fiscal policy reaction functions

	Beta	t-statistic	adj. R²	N
Spain, 1560-1598				
OLS	0.038	1.75	0.09	31
UK, 1698-1794				
OLS	-0.06	0.58	0.003	97
War years (OLS)	-0.026	2.1	0.07	46
Peace years (OLS)	0.013	3.2	0.15	51

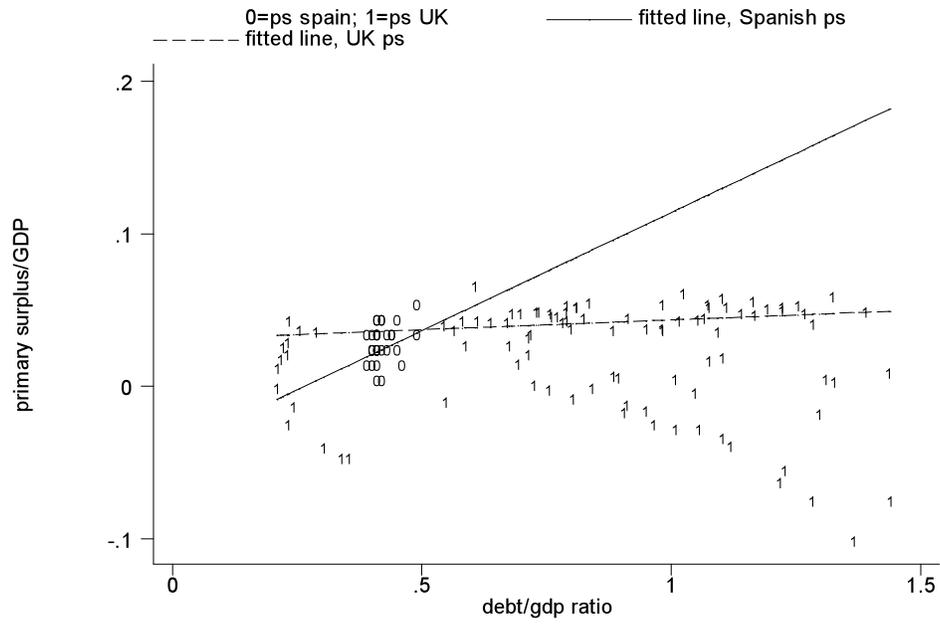


Figure 1. Primary surpluses and debt in 16C Spain and 18C Britain

Source: authors' calculations

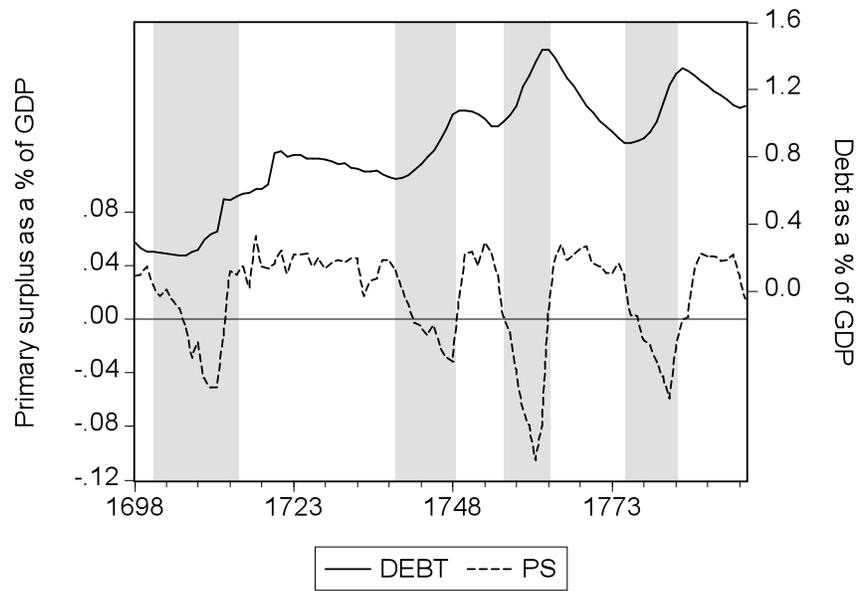


Figure 2: Britain's debts and primary surpluses, 1698-1794
(shaded areas represent major wars)

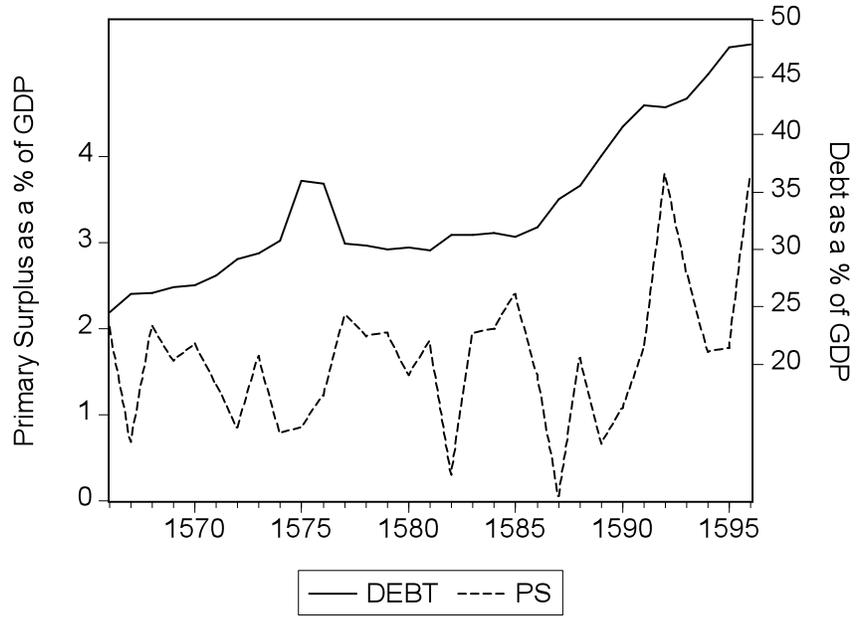


Figure 3: Spain's debts and primary surpluses, 1566-1596