Britain’s Paper Army: How the Pound beat Napoleon

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Program: MSc Economic History, 2014

Word count: 5,738

Abstract

This paper argues that it was a necessity that Britain left the gold standard in 1797, but that it ended up being a blessing in disguise. The Bank of England turned out to be a very capable weapon against Napoleon through the issuance of cheap credit to finance the war, whilst the British economy overall also performed better than the French. By extending Chadha and Newby’s (2012) balance sheet approach, I show how the flexibility enabled under a fiat system allowed the Bank of England to finance Britain’s war effort more effectively than Napoleon’s Banque de France. Looking at interest rates, Britain was able to borrow at lower rates than France throughout the war, even with higher levels of borrowing. Britain’s price level was also less volatile than France’s. This, in the end, played a significant role in the outcome of the war.
1. Introduction

Britain undertook a twenty-four-year regime change in its monetary policy, starting with the suspension of specie payments in 1797 and lasting until 1821. The Napoleonic Wars are well described in history, but most of the literature has been written with little emphasis on the economic questions. This is surprising, since the actions of the Bank of England in the early nineteenth century are a fascinating story of how a country can pay for war.

The literature on the Napoleonic Wars often contrasts Britain and France, where Britain undertook expansionary monetary policy, while France adhered to a more orthodox monetary regime. Britain could, it is argued, afford to go off the gold standard because of its history of prudent monetary policy, while France, who had just been through a period of hyperinflation, could not. This paper argues that it was a necessity that Britain left the gold standard, but that it ended up being a blessing in disguise. The Bank of England turned out to be a very capable weapon against Napoleon through the issuance of cheap credit to finance the war, whilst the British economy overall also performed much better than the French. This was in large part because of a well-functioning financial system.

Previous papers have investigated the Bank of England’s actions but what this paper contributes to the literature is a new approach. Chadha and Newby (2012) developed a model to understand the Bank’s actions, setting up a valuable balance sheet approach and using periodic data to support that specific model (the paper had ample data). What this paper does is it places figures on the balance sheet to show how the Bank of England was forced off the gold standard through a liquidity crisis in 1797. Extending this method of understanding to the aggregate war effort, I show how the flexibility enabled under a fiat system allowed the Bank of England to finance Britain’s war effort more effectively than Napoleon’s Banque de France. Recreating a stylized balance sheet of the Bank of England will help to understand why this occurred. Aggregating data from some of the classic texts on the period, the Bank of England, Global Financial Data, and data provided by Chadha and Newby will allow me to show how Britain was forced to suspend specie payments, but also how this enabled the Bank of England to support a more robust monetary system than France’s.

To make sense of the specific period in time, one must first establish the events leading up to the war as part of the broader historical context. This will help us better understand the underlying

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1 Gayer (1953) and Duffy (1982) are the prominent texts used for data.
2 Global Financial Data is not used directly, but merely to source the original data.
challenges the Bank of England faced. It will be done by looking at the period leading up to the war, focusing on institutional differences. Showing the different histories of the two countries will help to answer how and why Britain and France undertook different monetary policies and war financing strategies, and importantly how Britain was able sustain a long period off the gold standard in a world where it was the normal to convert notes to gold on demand. The history will thus help both to place the paper in its correct context, but will also play an explanatory role for the events that happened during the Napoleonic Wars.

The rest of the paper is structured as follows. Section 2 is a literature review to understand how this paper is located within the literature, both in regards to Britain and France’s history before the wars. Section 3 will explain how Britain was forced off gold, which provides evidence for my hypothesis that the move was not voluntary. Section 4 will look at the Bank of England specifically to understand its actions and how they affected the war economy. I will use a balance sheet approach to explain the actions of the Bank of England. Section 5 will look at Britain’s war financing during the Napoleonic Wars in general, attempting to show how Britain’s system was superior vis-à-vis France’s. Section 6 concludes.

2. Literature review

The finance literature on the Napoleonic Wars struggled to pick a direction for some time. Friedman (1990) pondered that France’s credit reputation had been superior to Britain’s, yet it was Britain – not France – that ended up printing money to pay for the wars. This had its origin in the careless way in which France managed its finances in the years leading up to the French Revolution of 1789, and the expropriation that followed it, rendering France unable to use money printing after its hyperinflation. There are numerous case studies on the divergent path of the two countries before the revolution.³ It is important to understand both Britain and France’s history, because it shows why the Bank of England case study is of greater interest in economic history, as Napoleon’s France relied very little on central bank funding as a consequence.⁴

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³ For France, see e.g. Harris (1930); Hawtrey (1930); Bonney (1992); and Brezis and Crouzet (1995).
For Britain, see e.g. Feaveraryear (1931); Cone (1951); Gayer et al. (1953); Fetter (1965); Brewer (1988: 88-134); North and Weingast (1989); Bordo and White (1990, 1991); Bushinsky and Polak (1993); Wright (1999); and Janssen et al. (2002).
⁴ For an overview of Napoleon’s France, see Bergeron (1981).
France emerged from the Revolution in terrible financial condition, while Britain entered the 1790s in a good economic position. White (1989) argues that France’s debt problem could have been avoided if addressed earlier, but by 1789 a budget crisis was inevitable. Weir (1989) provides a useful case study, analysing the role of tontines and their role as a vehicle of public finance. Tontines are life annuities and were used in both France and Britain. France mismanaged its tontines by issuing too many at the wrong price, and ended up repudiating them in 1770, causing antipathy with annuity holders, who were the state’s most important creditors. This promoted resentment, leaving France with hardly any alternatives during the fiscal crisis of the late 1780s, and consequently without an important constituency when the Revolution came. France had fewer options to pay its increasing expenditures, and its complex and inefficient taxation system meant revenues were hard to collect. As Bonney (1992) puts it, “the French revenue system had become very complex towards the end of the ancien-régime.” Britain, on the other hand, was more prudent in its use of tontines, valued them correctly, and did not repudiate. Britain’s fiscal discipline originated from the Glorious Revolution of 1688, where one of the most important developments was the idea of funded public debt.\(^5\) In the literature on institutions, North and Weingast (1989), in their seminal paper,\(^6\) argue that institutions matter for economic growth, and that the Glorious Revolution created the foundation needed for Britain to grow sustainably. It was, they argued, the institutions set up after 1688 that made it possible to borrow at low interest rates, because it set up a sustainable system of checks, incentives, private property rights, and established budgetary transparency through opening its budgets. ‘Open budgets’ are understood in the sense that the general public had access to the Treasury Department’s books, both for revenue and expenses. This data was available in Britain, whilst it was not in France.\(^7\) Those institutions were still in place during the Napoleonic Wars and made it possible for Britain to pursue different war financing from France.

France’s budget deficit as a percentage of GNP rose from 8% in 1789 to 64% in 1793,\(^8\) with total output one-third lower in 1799 than it had been in 1789. Trade almost disappeared.\(^9\) Before the Revolution in 1789, France spent an increasing amount of money on debt service, and after the Revolution financing needs increased 35-fold from 497 million \textit{livres} in 1790 (government

\(^{3}\) Carter (1968: 5-7).
\(^{6}\) This literature was later expanded creating a large literature on institutions (New Institutional Economics).
\(^{7}\) Bordo and White (1991).
\(^{8}\) This data is from Harris (1930) and Braesch (1934), as suggested by Brezis and Crouzet (1995).
\(^{9}\) Here the stat is from Crouzet (1990). In terms of trade, the war with Britain – the dominant sea power – obviously played a significant role in lowering France’s trade options.
expenditures was 657 million *livres* to 17,305 million *livres* in 1795 (where government 
expenditures were 16,380 *livres*).\(^{10}\) The Assembly ruled repudiation of debt was out of the question. 
Given the already high aggregate debt level and the Assembly’s unwillingness to increase taxes due 
to a belief held by the population that it was already overtaxed, only monetary financing was left.\(^{11}\) 
To raise money France started to issue *assignats*, which were interest-bearing promissory notes, 
guaranteed by church land and redeemable as the land was sold. This meant that paper in circulation 
would gradually go down as they were paid in or cancelled. *Assignats* ended up playing a plethora 
of roles due to ambiguity from the beginning: first they were debt, then they became money (legal 
tender), and lastly they were the vehicle through which the government erased its debt service via 
inflation. *Assignats* have often been blamed as the evil,\(^{12}\) however as Brezis and Crouzet (1995) 
show *assignats* were merely the tool with which France mismanaged its economy. The 
hyperinflation of the 1790s coincides with increases in the government budget deficit,\(^{13}\) and as 
inflation became hyperinflation France’s good credit reputation was destroyed. 

The French monetary history help explain why France behaved the way they did during the 
following Napoleonic Wars. Bordo and White, in three papers from 1990, 1991, and 1993, 
emphasised this difference in economic management leading up to the Napoleonic Wars. They 
noted that, before the Revolution, both countries’ fiscal policies were one of tax smoothing, with 
large borrowings during wartime, which was then paid off during peacetime. This strategy hinged 
critically on each country’s credibility to actually pay off the debts. The Revolution squandered 
France’s reputation and, as explained earlier, the French Revolutionary Wars\(^{14}\) led to hyperinflation. 
In Britain, meanwhile, the initial war effort was financed 90% by borrowing, as was normal in the 
eighteenth century. This caused a doubling of the debt by 1798, forcing two radical changes: 
introduction of an income tax in 1798; and – more relevant for this paper – the suspension of specie 
payments in 1797. Bordo and White’s (1991) conclusion was that Britain’s ability to go off gold 
gave, “*the government critical flexibility in short-term finance and debt management.*” This is an 
important conclusion, because it answers the question of why British war financing was superior to

\(^{10}\) Numbers in current prices, from Brezis and Crouzet (1995), table 1. 
\(^{11}\) Weir (1989). 
\(^{12}\) E.g. Marion (1914) wrote: “Among all the causes of the problem of subsistence and famine... paper money was the 
principal.” 
\(^{13}\) Brezis and Crouzet (1995) show this by recreating a new price index. Their results are that it was the expenditures for 
the 1792 war against Austria and Prussia that was the cause; *assignats* were the tool. 
\(^{14}\) The French Revolutionary Wars were fought from 1792 to 1802 against various enemies, including Prussia, Spain, 
and Britain. France and Britain were at war from 1792 to 1800, and again from 1801 to 1802. For an overview of the 
Revolutionary Wars, see Blanning (1996).
France’s during the Napoleonic Wars. However, much of the literature does not cover the specifics of how and why suspension of gold convertibility was a necessity. This is interesting because it can help explain early central bank operations, and it gives a window to look at exactly how the gold standard worked – and when it did not work. This difference will not show up by looking just at discount rates (see chart 1), so the remainder of this paper will detail what happened at the Bank of England, how it contributed to war financing, and what happened to the economies of Britain and France – which were crucially influenced by the chosen monetary policy regime.

Chart 1: Central bank discount rates

3. How Britain went off gold

In most of the literature, Britain’s suspension of specie payments in February 1797 is treated with a quick comment, but is generally not covered. This is surprising, as the process provides us with important information, most notably the fact that Britain had no choice but to let the Bank of England stop converting notes into gold. From its establishment in 1694, the Bank of England had adhered to the gold standard, by maintaining the value of its notes to a fixed weight of gold (and

16 For a general overview of the classical gold standard, see Meissner (2002) and Eichengreen and Flandreau (1997).
17 See Bordo and Kydland (1995) for an overview of how the pre-1914 gold standard was intended as a ‘contingent rule’, allowing authorities to temporarily suspend convertibility during wartime.
18 The exceptions are Lovell (1957); Duffy (1982); Duryea (2010); and Chadha and Newby (2012).
other metals, such as silver, although to a much lesser extent). It did this by buying and selling gold at a fixed price on demand.\(^{19}\) While the Bank of England was not the official central bank – it was not nationalised until 1946\(^ {20}\) – it was the banker to London businesses and banks,\(^ {21}\) and a failure of the Bank of England would have meant bankruptcies across Britain, as well as possible bank runs at other banks.\(^ {22}\) The gold standard meant that all notes were redeemable against gold, so the gold-to-notes ratio was of the utmost importance as long as specie payments remained the rule.

The Bank of England had a gold reserve of around £7 million in early 1794. By the late 1795, that had fallen to just about £3.3 million. Neal (1990: 201-3) shows that this was due to orders from the government to support Continental Europe in its war efforts, something that required largely bullion. Chart 2 shows the bullion reserve at the Bank of England.

![Chart 2: Bank of England bullion reserve](image)

By the end of 1796, the risk of an invasion by France caused a mild run on the Bank’s gold reserves, making the drain both external and internal.\(^ {23}\) Local banks ran out of gold when farmers

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\(^{19}\) This means it was always a seller of gold in exchange for notes at the set price.  
\(^{21}\) Banks held their reserves at the Bank of England, and the Bank’s notes were used as the medium of exchange (see Chadha and Newby 2012). The Bank also acted as a lender of last resort during crises (see Lovell 1957). For a general overview of English money, see Feaveraryear (1931), and for the Bank of England specifically see Clapham (1944).  
\(^{22}\) Thornton (1802: 113).  
\(^{23}\) An external drain is when bullion is used for loans and other banking activities. An internal drain is when people require gold in exchange for their notes, shrinking the balance sheet. See Chadha and Newby (2012).
came to exchange notes – first in Newcastle on February 18, 1797, later in Sunderland and Durham two days later\textsuperscript{24} – and when French soldiers were rumoured to have been sighted on February 22, George III convened the Privy Council on February 25 as the news reached London. By that time, to stop a run on the gold reserves suspension was necessary.\textsuperscript{25} Chart 3 shows the ratio of bullion-to-notes.\textsuperscript{26} The data is yearly, which is why it rebounds a little in 1797 (since gold flowed into the Bank after suspension in February), but it shows the dramatic fall in bullion reserves, as people flocked to exchange their notes for gold.\textsuperscript{27}

Chart 3: Bullion-to-notes ratio

On February 26, 1797, the Order of the King’s Privy Council suspended the gold convertibility of notes. This was largely unchartered territory for a prevailing monetary policy regime.\textsuperscript{28} The order stated:\textsuperscript{29}

\textsuperscript{24} Fetter (1965).
\textsuperscript{25} Chadha and Newby (2012).
\textsuperscript{26} The data is from Chadha and Newby (2012), which sourced it from the Third Report of the Committee on Secrecy, 1797. The authors kindly shared their data.
\textsuperscript{27} Since the Bank’s bullion-to-notes ratio was <1 any redemption of notes would cause a fall in this ratio unless bullion was acquired elsewhere.
\textsuperscript{28} There had been two minor suspensions: one in 1696-7 and one in 1745.
\textsuperscript{29} The Times, February 28, 1797. It was made public on February 27.
“It is the unanimous opinion of the Board, that it is indispensably necessary for the public service, that the directors of the Bank of England should forbear issuing any cash in payment until the sense of Parliament can be taken on that subject and the proper measures adopted thereupon for maintaining the means of circulation and supporting the public and commercial credit of the kingdom at this important conjuncture.”

While the Privy Council could suspend convertibility, George III still needed an Act of Parliament to make it permanent. He therefore sent the following message to the House of Parliament:30

“In recommending this important subject to the immediate and serious attention of the House of Commons, His Majesty relies, with utmost confidence, on the experienced wisdom and firmness of his Parliament, for taking such measures as may be best calculated to meet any temporary pressure, and to call forth, in the most effectual manner, the extensive resources of the His Kingdoms, in support of their public and commercial credit, and in defence of their dearest interests.”

On the next day, February 27, the Bank of England issued a statement re-iterating that the value of its notes would not be in question, and that the Bank of England would continue to discount its commercial loans.31 Following George III’s message to Houses of Parliament, and after having consulted the Bank of England, Parliament made it illegal to continue to convert notes to gold. On May 3, 1797, The Bank Restriction Act passed. It stated that:

“all Sums of Money, which now are or shall become payable for any Part of the Public revenue shall be accepted by the Collectors, Receivers and other Others at the Revenue, authorised to receive the same, in Notes of the said Governor and Company, expressed to be payable on Demand, if offered to be to paid.”32

With the passing of the Bank Restriction Act, the Suspension Period had officially begun. It was to last twenty-four years, where notes from the Bank of England were backed by a promise to pay in the future – but not necessarily in gold per se. The tale of Britain’s suspension of gold convertibility is often described, as I have just done, drawing on the big picture. However, looking at the details

30 Ibid.
31 Reprinted in Gilbart (1834: 34.) I was made aware of it in Chadha and Newby (2012).
32 Note that legal tender is not used to describe Bank of England notes. According to Fetter (1965) this was to avoid the association with assignats, where the permanent money base had shifted. Bank of England notes were made legal tender in 1811 by the passage of Act 51 Geo III, c. 127. See Chadha and Newby (2012).
of the Bank of England, one can get a better understanding of why this was necessary, and why it did not create a panic. The next section will do just that.

4. The Bank of England

With the French assignats debacle having occurred only a few years earlier, it is natural to ask how this move did not create panic or cause inflation. This is likely because of Britain’s credibility, and the Bank of England’s in particular. The day after the suspension was first announced, on February 28, a large number of business leaders of London wrote in *the Times:*³³

“[...] we will not refuse to receive Bank Notes in Payment of any Sum of Money to be paid to us, and we will use our utmost Endeavours to make all our Payments in the same Manner.”

This is crucial in explaining why the announcement was met with relative calm. The business community, money markets, and the government stood by Bank of England notes, all being prepared to receive and pay as if they were still backed by gold. This meant ‘business as usual’ could continue, and did. Two important points are worth noting. First, this is only the initial reaction, and having suspended convertibility twice before, albeit shortly, there was trust that the Bank of England would return in due course. Second, there was an understanding that the Bank of England was significant to the entire system – it was the central bank already, even if it was privately owned – and all other banks held reserves in the Bank of England. It was in the interest of the collective business and banking community to stand by the Bank.

The behaviour of the Bank Directors is important here, and their behaviour is well explained by Duffy (1982). The paper is also one of the best overviews of the Bank’s discount policy. Duffy found that, “there was no discrepancy between the Bank’s monetary theory and its actual performance during the suspension of cash payments,” and that using discounts (i.e. providing short-term cash in exchange for collateral) as a policy was a good 'middle of the road' tactic for avoiding the dangers of extreme bullionists and anti-bullionists alike. He also found that, until 1808, the opportunities presented by the Restriction Act were abused neither by the government nor the Bank, and that inflation was kept relatively stable. As the war went on, however, the strains on the government’s finances started to stretch thin and the amount of credit extended by the Bank increased (see chart 4).

³³ Again, I was made aware of this passage in Chadha and Newby (2012).
This brings us to the interesting question: Could the Bank of England have continued gold convertibility while still providing Britain credit? I would argue it could not. There was a reason George III convened his Privy Council and asked for the suspension. A run was underway, as people exchanged notes in return for gold. Plotting the money stock (notes plus deposits at the Bank, which could be exchanged to notes) versus the gold stock at the Bank of England shows that it fell dramatically (see chart 5, which is chart 2 but where deposits are added to the denominator). Increasing the balance sheet of the Bank was not an option unless specie payments were stopped.
Duffy (1982) argues that the Bank had no choice but to give up on gold convertibility. As the chart above shows, I would agree, as there was no way the Bank could honour all of its notes. Another way to look at this is demonstrated in chart 6, where the Bank’s liabilities are charted. The equity value was falling rapidly, and notes in circulation fell 18 percent in the first four months of 1797 (all charts are annual data only so do not capture this).
Two things are crucial here. Firstly, all notes were not backed by gold even then (see chart 2) and the ratio was falling fast. Secondly, during February 1797 suspending convertibility averted a regular bank run, but there had already been the beginnings of a run outside of London. The Bullion Report – a report on the suspension issued in 1810 by the Bullion Committee – argued otherwise. Chadha and Newby (2012) argue that The Bullion Report was, “inarguably one of the most important documents in British monetary history,” and it was critical of the Bank who it branded as being ‘anti-bullionism’. The report argued for going back to gold convertibility, and it held sway with society since it was issued at a critical time of accelerating inflation. Its recommendation of going back to gold convertibility within two years was wildly unrealistic, as there were simply too many notes in circulation, and not enough gold in the Bank’s reserves (see charts 2 and 5). Importantly, though, was the idea that it probably helped uphold the confidence in the currency, as a large group of society were adamant in their desire to return to the gold standard at some point.

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34 For the politics of the Bullion Report, and its important place in the history of British monetary history, see Fetter (1959).
35 Chadha and Newby (2012).
It is useful to clarify that banks are in the business of maturity transformation, meaning that their liabilities’ duration is shorter than their assets’. If we think in terms of a stylized balance sheet of the Bank of England, as it would have looked like in the eighteenth century, we have:

Table 1: Stylised balance sheet

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
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<tbody>
<tr>
<td>Public loans</td>
<td>Notes</td>
</tr>
<tr>
<td>Private loans</td>
<td>Deposits</td>
</tr>
<tr>
<td>Discounts</td>
<td>Equity</td>
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<tr>
<td>Bullion</td>
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</tbody>
</table>

It is the mismatch, which – to this present day – render banks prone to runs. The Bank’s liabilities function as money (in this particular case, it became legal tender in 1811), and the duration of the liabilities was very short. Notes were redeemable against gold on demand, while deposits could be exchanged into notes on demand (a few deposits were term deposits). On the asset side, public and private loans were longer-term and illiquid, while discounts had fixed terms. Banks make money on the difference in interest rate paid on its liabilities, and the interest rate received on its assets. This is called net interest margin. If we think of the Bank of England this way, we can construct a model in which the suspension makes intuitive sense. Table 2 is an attempt to create the Bank of England’s balance sheet before (1797) and after (1798) the suspension. Data for a full balance sheet throughout history is not available, but we have time series data for all elements from the ‘stylised’ balance sheet in table 1. Given the lack of a full balance sheet, I have constructed it by adding up both sides, incorporating all available data, and then assuming both assets and liabilities total £100 million for 1797. For 1798 I have increased the balance sheet by 14.7% on both sides, which is the average increase of assets and liabilities in the real data. This means that the balance sheet balances, while it does not if we take the raw data. It also is not £100 million in 1797. I believe it is a reasonable construction, as the important thing on the liabilities side – notes in circulation – and on the asset side – bullion – are accounted for. This is an extension of the Chadha and Newby (2012) model, as I here show the composition of a

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36 Ibid.
37 It is, however, much less likely today for two reasons: almost everywhere deposits are covered by deposit insurance (no need to exchange for notes), and notes are no longer officially convertible into gold.
38 Here we distinguish between ‘private’ money (e.g. bank deposits and bank specific notes) and ‘public money’ (legal tender: coins and notes issued by the central bank backed by the full credit of the Treasury).
39 This is a simplified view of banking. Banks can also make money on capital appreciation, fees, and so on.
40 This is essentially the approach Chadha and Newby (2012) takes. They construct a mathematical model, while I attempt to construct a balance sheet, using data from the Bank of England, Duffy (1982), and data provided by Chadha and Newby (2012).
hypothetical, but representative, balance sheet as it looked before and after suspension of specie payments.

<table>
<thead>
<tr>
<th>Table 2: Bank of England balance sheet</th>
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<tr>
<td><strong>£ million</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Public loans</td>
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<tr>
<td>Private loans</td>
</tr>
<tr>
<td>Discounts</td>
</tr>
<tr>
<td>Bullion</td>
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<tr>
<td>Total assets</td>
</tr>
</tbody>
</table>

Sources: Duffy (1982); Chadha and Newby (2012); Bank of England; author’s calculations

Accepting the initial assumptions, table 2 shows that the suspension of 1797 succeeded in lengthening the duration of the Bank’s liabilities by changing ‘notes’ from on demand exchangeable to gold, into claims on the Bank with a maturity until the war was over. Notes could still be used to buy goods and services, but the Bank of England controlled the amount in circulation (and was therefore not forced to shrink its balance sheet). Since the notes-to-bullion ratio before February 1797 was 3.6 and rising\(^{41}\) – i.e. there were 3.6 times as many notes as could be backed by the Bank’s gold reserves – the extension of the Bank’s liabilities meant it could stay liquid, as investors could not redeem notes for bullion. This was a liquidity crisis, not a solvency crisis.\(^{42}\) It also meant that depositors stopped exchanging deposits to notes, thus strengthening the entire capital structure. By stabilising the Bank’s funding, there was no need to sell assets or stop providing loans, as would have been the only option if notes were exchanged for gold. These loans were primarily to the government to keep the war going. As Chadha and Newby (2012) write, “The driving force of much of the expansion in leverage in the 1790s was unfunded loans to the government. As a result of the French War these loans had an uncertain duration and the Bank was not able to control their volume. On these occasions the Bank directors felt obligated to satisfy the wartime demand and bought exchequer bills at the direct request of Treasury brokers.” I show this in chart 7, where the spike from 1795 represents the Bank’s increase in unfunded debt holdings as a percentage of total unfunded debt issued by the government.

\(^{41}\) Here my data is wildly different from Lovell (1957), which has the notes-to-bullion ratio at 11.2 in 1797. He thus paints a far more pessimistic picture. However, even with my data the convertibility was, I argue, impossible to uphold.\(^{42}\) This is clear, although I would be careful putting too much faith in the equity numbers in the balance sheet. That the Bank was solvent without convertibility is, I think, evident through consequent events.
It was this inherent weakness in the Bank of England’s business model that is critical to understanding why the Bank was facing the terrible problem. It had, in essence, four options: 1) stop gold convertibility, risking currency debasement and inflation; 2) do nothing, almost ensuring a bankruptcy as the run got underway and turned the liquidity crisis into a solvency crisis; 3) stop giving loans to the government, and risk losing the war and the future of Britain; or 4) stop giving loans and discounting to private actors, risking money market turmoil, business insolvencies, a banking crisis, and an economic slowdown.

The Bank of England – and Britain – followed option number one, understandably as number two was inconceivable, and options three and four were equally as undesirable, and probably would not have solved the underlying problem. After February 1797, the Bank was once again able to absorb much of the government’s short-term debt. The share of unfunded loans – critical to the war effort – kept increasing as a share of the Bank’s balance sheet, rising from a low of 19.3 percent in 1797 to a peak of 76 percent in 1808, totalling about 50% of the unfunded debt stock.43

These banking policies helped Britain have a well functioning economy. The Bank of England’s ability to absorb government debt meant the Treasury could issue large amounts without fear of not

43 See Bordo and White (1990) for the balance sheet data; Gayer et al (1953) and chart 7 for the percentage of total unfunded debt stock holding.
being able to sell it to the market. It also meant that the medium of exchange in Britain – Bank of England notes – was not disrupted. This was of the utmost importance. In this section, I have attempted to explain banking policies, and the role they played in financing the war. In the next section I will turn to war financing in general, and how it relates to monetary financing.

5. War financing during the Napoleonic Wars

Having looked at the Bank of England, and how they went off gold, it is worth going back to the big picture. How did Britain and France pay for their wars? The answer is, as one would expect, in very different ways. As showed by Bordo and White (1991), each country’s war finance was a function of its credibility. While France had low credibility after its revolution and the ensuing inflation, Britain’s finances were in good shape. This allowed Britain to be more flexible in its methods of war financing. There are always three ways of paying for a war: Borrowing, taxation, and printing money. Here we will look at how both countries utilised those.

The Revolutionary and Napoleonic Wars had three phases: 1793-1801, 1803-1810, and 1811-1815. For Britain, government borrowing was highest during the first phase, as it borrowed 11.6 percent of its national income, as opposed to 4.3 percent in 1802-1810, and 9 percent on average in 1811-1815. Borrowing was highest in absolute numbers between 1811 and 1815 for Britain (£25.3 million per year) but Britain’s reliance on steady inflation and taxation income increased throughout the wars. As can be seen in chart 8, Britain increased its debt stock and debt-to-GDP ratio continuously.

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44 Data can be found in Duryea (2010: 11).
45 The outstanding debt stock data in chart 8 is compiled by the Bank of England, which has its data from Mitchell (1988) and the ONS. The debt-to-GDP ratio is from the Reinhart and Rogoff (2011) database.
Meanwhile, France initially relied almost exclusively on money printing, as showed earlier, leading to the hyperinflation starting in 1795. Assignats were relatively stable as long as the Jacobin government was in control but after April, 1795 when the Jacobins lost control it was no longer illegal to sell and people flocked to sell assignats, flooding the market and causing a collapse in their price. Sargent and Velde (1995) characterize assignats as “guillotine-backed currency,” before that. Assignats were by mid-1795 just a “vehicle of speculation,” and no longer a medium of exchange. After that France relied almost exclusively on taxes and non-monetary forms of financing.

Britain was overall much more unorthodox than France was in its war financing measures. Britain pulled on all three levers while France financed its expenditures by taxation. Napoleon’s wars were financed almost entirely by the fiscal system until 1806, and even when it looked liked finances were starting to get stressed, the Banque de France adopted the ‘Palmer Rule’ on February 12, 1806. The ‘Palmer Rule’ says that the metallic backing of the currency would constitute at least a third of notes in circulation. Napoleon was in general wary of borrowing short-term from the central bank (as Britain did heavily). Bordo and White (1991) wrote about the Banque de France’s

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46 Relatively. The face value of assignats fell to 51, which is still a lot. They later fell to less than 1.
47 Hawtrey (1918).
buying of debt that, “Even at the peak of 80 million francs in 1805, it was less than 10 percent of expenditures. While the emperor's borrowing from the Banque was generally restrained, the government did press the bank too far once, forcing a partial suspension in 1805. Unlike the British, the government could not fully or permanently suspend payment, given its history, and hope that the public would maintain its real balances. In the next few years, imperial borrowing from the bank was more restrained until the empire's collapse.” Bordo and White (1991) make the argument that France’s war financing strategy worked relatively well until around 1810, but that Napoleon was destroyed by the enormous cost of the Russian Campaign.

At the end of 1812, Napoleon covered, “his enormous expenses by raising direct taxes rather than relying on paper finance or long term borrowing,” as Chadha and Newby (2012) write. Britain might have had the option of going off gold, but in France it was impossible because of its reputation. Even if Napoleon would have liked to do monetary financing – and it is important to note that he did not as he was painstakingly afraid of inflation – it is doubtful that it would have been possible. France’s monetary system can best be described as ‘rigid’, and Banque de France’s function was not to promote growth and ease credit, as opposed to the Bank of England. Banque de France notes were not a substitute for specie payments, and Banque de France was more selective in what type of collateral it accepted for its discounting business. This caused rigidity in financing strategies, leading to higher taxes, political revolt, and less money available for war. As can be seen in chart 9, Britain had lower borrowing costs at all times, and as can be seen in chart 10 Britain’s real GDP growth was stable throughout the wars.

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49 Chadha and Newby (2012).
50 Both series in chart 9 are found through Global Financial Data. The original source for French government bond yields is INSEE, Bulletin Mensuel Statistique; the data for England is taken from Neal (1993).
51 Data from chart 10 is from Broadberry and van Leeuwen (2010), made available by S. Broadberry. I have normalised the Real GDP and the GDP deflator data so 1790 = 100.
Which strategy was better? Often it is too easy to say that Britain won the war, so its system was. However the data does seem to suggest Britain’s system was superior. Napoleon’s monetary system was rigid, based on circulation of specie. This can be seen in the inflation data. Because of France’s
closed budget books (as explained earlier), there is no data for French GDP during the time.\textsuperscript{52} It is possible, however, to find year-on-year price data as shown in chart 11.\textsuperscript{53} Note that even with limited monetary financing, France experienced higher price volatility from political and supply shocks. They did, thus, not gain from price increases as it was because of scarcity of resources.

\textbf{Chart 11: Inflation, year-on-year change}

\includegraphics[width=\textwidth]{chart11}

\textsuperscript{52} The INSEE and other government statistical offices do not have data that far back. The Maddison Project has GDP data for the year 1820 only and is therefore not useful. Reinhart and Rogoff (2011) have data from 1880 only.

\textsuperscript{53} The data for France is sourced through Reinhart and Rogoff’s (2011) database, available on their website. The data they have is originally from Dick and Floyd (1997). The data for Britain is from Allen (2014) and is his ‘new CPI’ index in local currency, which incorporates prices and wages in London and Southern England.

\textsuperscript{54} According to Bordo and White (1991).

Chadha and Newby (2012) write that, “notes of the Banque de France were not substitutes to specie. Dependency on specie made the system sensitive for supply shocks that were political in nature: the main sources of specie were the invaded nations, especially Prussia, which supported the circulation with 311 million in 1807, and 171 million in the next 23 months.” This is important, because France actually fared relatively well. It is difficult to know exactly because of limited data, but a significant element was because it was able to confiscate large amounts of bullion from conquered territories, as well as putting on large levies for them to pay. This meant that France’s armies in Prussia paid for themselves.\textsuperscript{54} This goes to show that, when the offensive and the wars
went well, the system cleared, but at signs of stress it could crumble. This is exactly what happened. As the Russian campaign went sour, financing went awry, and the weakness of the system was exposed.

Britain’s system was much more resilient, being able to withstand long stretches of the war going against it. Furthermore, by not imposing heavy taxes, political unrest was kept in check. While high inflation can definitely create political unrest, Britain’s skill in controlling it – particularly in the first two phases of the war – meant this was kept to a minimum. In terms of the smoothing of revenues, Britain was able to finance its war by borrowing from the future and pay off its debt in increments. Not having to rely on taxes meant some expenditure could be pushed into the future. Both in theory and practice, this is true. Looking at interest rates, Britain was able to borrow at lower rates than France throughout the war, even with higher levels of borrowing, and its price level was less volatile than France’s. In all, it is hard to find a metric where France performed better.

6. Conclusion

In this paper, I have looked at how Britain and France financed the Napoleonic Wars. The standard way of looking at the differences between the two is to look at the history leading up to the wars, showing that the distinct strategies were due to differences in economic fortunes in the decades before. While Britain had better institutions, less volatile inflation, and a sounder credit standing, France underwent a revolution, which squandered its reputation as a credible borrower. I showed this by looking at France’s hyperinflation period, where assignats were used to finance a large deficit, originating from sizeable war expenditures. France debased its currency and hyperinflation created turmoil. Britain, meanwhile, was able to use monetary financing in the 1790s and during the Napoleonic Wars.

I have showed that the initial suspension of gold convertibility by the Bank of England was forced, but that the system that eventuated was efficient and worked well. While Chadha and Newby (2012) built a mathematical model that explains the duration problem of the Bank’s balance sheet, I have found further data to support the hypothesis that the suspension was successful. I then looked at the overall war financing of the Napoleonic Wars and found that the system that emerged in Britain was superior to that of France, because it was much more flexible, allowing the Bank to absorb government debt and Britain to fund the war using taxation, debt, and, money printing – not
mainly taxation, as the French did. This, in the end, played a significant role in the outcome of the war.
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