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Jagjit S. Chadha – Elisa Newby

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‘Midas, transmuting all, into paper’: the Bank of England and the Banque de France during the Revolutionary and Napoleonic Wars*

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Abstract

This paper assesses Revolutionary and Napoleonic wartime economic policy. Suspension of gold convertibility in 1797 allowed the Bank of England to nurture British monetary orthodoxy. The Order of the Privy Council suspended gold payments on Bank of England notes and afforded simultaneous protection to the government and the Bank in pursuit of the conflicting goals of price stability and war finance. The government, the Bank of England and the commercial banks formed a loose alliance drawing on due political and legal processes and also paid close attention to public opinion. We suggest that the ongoing solvency of the Bank of England was facilitated by suspension and allowed the Bank to continue to make substantial profits throughout the Wars. It became acceptable for merchants to continue to trade with non-convertible Bank of England notes and for the government to finance the war effort, even with significant recourse to unfunded debt. These aspects combined to create a suspension of convertibility that did not undermine the currency. By contrast, the Assignats debacle had cost the French monetary system its reputation in the last decade of the 18th century and so Napoleonic finance had to evolve within a more rigid and limiting framework.

JEL Classification: C61, E31, E4, E5, N13

Keywords: Monetary Orthodoxy, Suspension of Convertibility, War Finance

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1 Introduction

The Order of the King’s Privy Council, dated Sunday, 26 February 1797, marked a ‘revolutionary’ development in English monetary management: the monetary regime – the gold standard – was suspended and an untested policy of inconvertible paper currency adopted. By declaring that ‘it is indispensably necessary for the public service that the Directors of the Bank of England should forbear issuing any cash until the sense of the Parliament can be taken on that subject’,¹ the Council prevented bearers of Bank of England’s notes from conversion into gold (cash) and, consequently, an exhaustion of the Bank’s gold reserves in the face of a wartime banking panic. From its establishment in 1694 until 1797, the Bank of England had basically followed the gold standard rule by maintaining the value of its note issue in terms of a fixed weight of gold, and to a lesser extent silver, by buying and selling these metals at a fixed price on demand.² Yet, in the absence of gold payments each note simply carried a mere promise of convertibility on some future unknown date. In this paper, therefore, we seek to try and understand why this form of promise was acceptable and why such a promise was not a feasible strategy for the French state.

The Bank of England’s decision to seek political approval for a temporary cessation in the convertibility of paper money to gold in 1797 led to an important paper money experiment.³ In principle, the absence of the gold convertibility rule would have given the Bank of England an opportunity to conduct inflationary war finance during the French Revolutionary and Napoleonic Wars, but when compared to similar experiments in France earlier in the eighteenth century or later war-time hyperinflations in the twentieth century, the suspension did not lead to rampant inflation or a collapse in the circulation of paper currency. The Bank Restriction Period, or the Suspension Period as it subsequently came to be known, lasted much longer than the Bank or the government had probably anticipated. As the war dragged on – the French Revolutionary Wars turned into the Napoleonic Wars – it became clear that resumption of the gold standard would not be possible until, at least, the hostilities had ceased. On 1 May 1821, almost six years after the Battle of Waterloo, which had finally brought the war to an end, the gold standard was resumed at the pre-war par value.

The original narrative of the Restriction Period considers it as a simple straightforward emergency measure to prevent the Bank of England’s gold reserves from vanishing.⁴ In some studies, on the other hand, the suspension has been seen as inflationary policy that helped to increase either the Bank’s proprietors’ private profits⁵ or the government’s seigniorage revenue.⁶ This approach, in our opinion, is a somewhat oversimplified interpretation of wartime economic policy. In this paper we study the extent to which the decision to suspend temporarily gold payments by the Bank of England and to adopt a co-

¹The Times 28 February 1797.

²There had been two minor suspensions in 1696–97 during the Great Recoinage and in 1745, as a result of the Jacobite invasion. We thank François Velde for bringing these to our attention.

³For an outline of the theoretical and early empirical literature, see for example Perlman (1986) and Viner (1937).

⁴See Gilbert, 1834, for example.

⁵See Ricardo (1811) and Andréadès (1909).

⁶See Bordo and Kydland (1995) and Bordo and Redish (1993).

ordinated strategy of gradual resumption can be thought of as a monetary policy, which afforded protection to the government and its central bank in pursuing the conflicting goals of price stability and war finance. We argue that the decision to suspend the payments was not made arbitrarily by the Bank of England but in close collaboration with Prime Minister Pitt (the Younger), Parliament, the Treasury, the Crown and the London Money Markets, which allowed the existing means of payment to continue to circulate rather than jeopardising its existence.

We abstract somewhat from the practical debates in Parliament, the popular press and in the City, which became known as the Bullionist Controversy, and provided the focus for much subsequent monetary analysis of the period. These debates have evoked great interest amongst distinguished scholars such as Horsefield (1949), Fetter (1959) and Perlman (1986). By contrast, we approach the suspension from the viewpoint of monetary and banking theory and interpret the actions of the Bank of England through a number of stylized models on balance sheet management. (i) optimal gold reserve holdings; (ii) asset liability management; and (iii) the importance of stabilising the public's expectations about the future price level under a quasi-gold standard. These models suggest that instead of merely being an emergency measure, the suspension in February 1797 was an appropriate policy response, given the types of shocks that had hit the economy. This is because by suspending the payment of gold on its liabilities until a lasting peace, the Bank of England was able to align the duration of its liabilities and assets more accurately, it could also provide war finance by allowing some leverage in its loans relative to its market value, without *ipso facto* threatening the monetary stock of gold, and so lend for (marginal) unfunded government expenditures. As the suspension allowed the Bank of England to remain profitable it was then also a way of ensuring that Bank of England liabilities were likely to be valuable in the future and, therefore, held and used as a means of payment by merchants.

The success of the suspension alone was unlikely to have been sufficient to placate markets and ensure long-run stability – as maintaining the value of inconvertible paper currency during the French Wars was not a trivial task. The suspension was also not a minor deviation from the gold standard rule, rather it became a monetary regime of its own right that lasted for 24 years. By the 1820's a generation of British merchants and bankers had sold and bought, borrowed and lent without ever having had first-hand experience of convertible currency. Bordo and Kydland (1995) suggested that the gold standard ought to be thought of as contingent rule but instead of necessarily thinking of suspension as credible, we ask how authorities - through a number of devices - were able to maintain the credibility of the future resumption during these turbulent years.⁷

At the point of suspension the duration of the war was, naturally, unknown and so monetary policy decision makers had to have a contingency plan that dealt with the

⁷The extensive empirical surveys by Bordo and Kydland (1995) and Bordo and Schwartz (1997), consisting of over 20 countries that have suspended and subsequently resumed the gold standard, demonstrate that suspensions were successful, because the resumption of the gold standard after the crisis was exogenously credible. The authors call the gold standard a contingent rule: during wartime emergency the gold standard rule could be temporarily abandoned on the understanding that after the emergency had safely passed convertibility would be restored at original parity.

uncertainty over the timing of an expected return to gold. The Acts of Suspension provided an official indemnity for the Bank – protection from any consequences of suspension – for a specific date in the future or until a lasting peace settlement had been agreed. These Acts tied the government and Bank of England into credible monetary strategies and together with a national debate on the correct form monetary constitution, known as the Bullion Debates, helped formulate sustainable plans for a return to gold. We will assess how and why ‘contracts’ were formed between the monetary authorities and the private sector through Acts of Parliament and Committees of both Houses of Parliament and what the consequences were for financial prices from these strategies. Part of the story of continuing credibility lies with a legal obligation, as outlined in several successive Acts of Parliament, to return to cash payments at some point in the future. Note also that although Bank notes became, in effect, legal tender, the government went through ‘legal contortions’ to avoid designating them as such.⁸ To some extent other institutional developments, such as tax revenue raising capabilities and the continuing development of money markets as a conduit for funding government debt, meant that macroeconomic policies did not have to be excessively destabilising.

At first it is difficult to understand why the decision to suspend cash payments, after such a long period of adherence, did not lead to a collapse in the overall monetary unit of account in Britain, particularly give that such a collapse had happened in France earlier in the same decade with the adoption of the Assignats. After the hyperinflation of 1795-1796, the Directorate wound up the Assignats in February 1796 and demonetised all 44 billion Assignats on 4 February 1797, the same month as the Bank of England was to suspend cash payments. At the beginning of the first Napoleonic War in May 1803 the French monetary and fiscal system did, superficially, appear stronger than that of its arch enemy – Britain. Napoleon’s cautious borrowing kept the public debt under control and his domestic tax reforms and extraction of funds from invaded neighbor countries seemed to guarantee a steady flow of revenue for the state. The newly formed Banque de France paid all its obligations in specie, reflecting what might be termed a lack of credibility or, at least, institutional capability. There were a number of key differences in the monetary and financial operations carried out by the governments and central banks of Britain and France during the Napoleonic Wars. Britain was able to adopt a set of flexible policies to finance the war, but Napoleon’s inability to rise large amount of income in a short period time was one of the factors that led to his disastrous Russian Campaign. The connection between sound finance and military success has been explored before (see, for example, Dickson (1967)) and in this paper we add to that literature.

The paper proceeds as follows. Section 2 explores the chain of events that led to the decision to suspend cash payments. In Section 3I we some issues on resumption raised by the Suspension. In Sections 4 and 5 we develop models on the management of balance sheet, gold reserves and public expectations. In section 6 we explore the Bank’s contingency plan plans that maintained monetary stability. In section 7 we compare England’s experience to that of France, and the final section presents concluding remarks.

⁸As we explain later, the Government and the Bank preferred to avoid making notes legal tender as long as the public accepted them, in part to avoid direct comparison with the assignats but also to promote the view that the Restriction was temporary, see Fetter, p59.

2 Maintaining Monetary Stability

2.1 ‘The King’s Decision’ to Stop Gold Payments

The declaration of war by the French Revolutionary Government in 1793 did not result in an immediate outflow of gold on the Bank’s reserves, as can be seen from Figure 1. Considerable sums of specie only started to leave the Bank in 1795 when Prime Minister Pitt made heavy calls upon the Bank to support his allies in Continental Europe.⁹ And so in early 1794 the Bank had about £7 million worth of gold in the vaults, by late 1795 it had fallen to £3.3 million. The Directors of the Bank became increasingly worried that lending huge sums of money to the government would clash with the Bank’s original charter that forbade it to lend to the government without the permission of Parliament. The Directors, nevertheless, felt they had to accede to the government’s wartime demands, as such demands were considered essential for the survival of the country.¹⁰

In 1796, the drain of reserves became internal.¹¹ According to Thornton (1802) a ‘class of persons subject to weak and extravagant alarms’¹² was hoarding guineas in late 1796, which (see Figure 1) created a rapid outflow of the Bank of England’s gold reserve. This ‘class’ consisted of people who were preparing for French invasion and attempted to make their available assets as liquid as possible by withdrawing guineas from both the Bank of England and the country banks. Sightings of French fleets off the coast escalated the outflow of gold and on some days the Bank of England’s daily loss of bullion was over £100,000.¹³ *The Times* had reported already on 13 September 1797 that ‘The apprehension of an invasion of this country seems to have taken possession of men’s minds so strongly that even in every company it becomes a subject of conversation’. The Newcastle banks that were first to run out of reserves after local farmers, on 18 February 1797, had sold their cattle cheaply and had gone, almost in one body, to their local banks to cash the notes they had received. The farmers’ actions alarmed other customers, and two days later the Newcastle banks decided collectively to stop gold payments. Bank runs and subsequent suspensions of cash payments followed in the nearby towns of Sunderland and Durham.¹⁴

The final stroke which precipitated the suspension of the gold standard was a badly prepared landing of a handful of French soldiers at Fishguard in Wales on 22 February 1797. When the news of this landing reached London on Saturday 25 February, an emergency meeting of ‘His Majesty’s Most Honourable Privy Council’ was called for on

⁹According to Neal (1990) previously the government was able to use foreign exchange bills to finance its armies on the Continent. Because the British colonial and manufactured goods were much in demand in Europe, the European merchants willingly accepted the bills drawn in London and used these bills to pay for the import of the goods from Britain. But when Britain’s continental allies suffered repeated military reverses, British merchants lost markets for their exports and the bills of exchange drawn in London had to be extinguished increasingly by means of specie rather than goods. Neal (1990) pp. 201-203.

¹⁰Duffy (1982).

¹¹An internal drain implies that gold is removed from the financial system and hoarded in England or Ireland whereas an external drain implies the export of gold to the continent see, Fetter, p19-20.

¹²Thornton (1802), p. 97.

¹³Clapham (1944), Vol I, p 271.

¹⁴Fetter (1965) p. 21.

Sunday. George III himself came from Windsor and the meeting was held at the Council Chamber, Whitehall, on Sunday the 26th February 1797. The outcome of this meeting was an Order of the Privy Council to suspend the cash payments which was communicated to the Bank of England by the Council late on a Sunday night. The Council ‘ordered that a copy of this minute be transmitted to the directors of the Bank of England, and they are hereby required, on the grounds of the exigency of the case, to conform thereto until the sense of parliament can be taken as aforesaid’.

[Figure 1: The Bullion Reserve of the Bank]

During that weekend in February 1797 the monetary authorities were faced with two options: (i) let the currency exhaust the gold supply, as the ongoing run on the currency would surely bring about; or (ii) suspend cash payments and ensure that the extant monetary gold stock was protected. Anticipating a panic and a bank run to break out on the following Monday, the Privy Council chose the second option and decided to keep the Bank’s doors closed to the public in order to prevent the bearers of the Bank of England’s notes from converting them to gold and, consequently, emptying the Bank’s gold reserves. On Monday 27 February 1797 the following announcement, included in the Order of the Privy Council, but now entitled as a message from the King, came to mark the start of the Suspension Period:

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.¹⁵

The Sunday morning minute of the Privy Council was laid upon the Table of the House of Commons on the following day by the Chancellor of the Exchequer on George III’s direction.¹⁶ The King sent a following message to the House:

His Majesty thinks it proper to communicate to the House of Commons, without delay, the measure adopted to obviate the Effects which might be occasioned by the unusual Demand of Specie lately made from different parts of the country on the metropolis. The peculiar nature and exigency of the case appeared to require, in the first instance, the measure contained in the Order of Council, which His Majesty has directed to be laid before the House. In recommending this important subject to the immediate and serious attention of the House of Commons, His Majesty has relied, 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.

¹⁵ *The Times* 28 February 1797.

¹⁶ Journal of the House of Commons, 1796-7, III, pp348-9.

At the Bank of England, the following notice was issued on Monday morning to people wanting to exchange their bank notes for specie:

Bank of England, Feb. 27th, 1797.

In consequence of an order of his Majesty's Privy Council, notified to the bank last night, a copy of which is hereunto annexed, the governor, deputy-governor, and directors of the Bank of England think it their duty to inform the proprietors of the bank stock, as well as the public at large, that the general concerns of the bank are in the most affluent and prosperous situation, and such as to preclude every doubt as to the security of its notes. The directors mean to continue their usual discounts for the accommodation of the commercial interest, paying the amount in bank notes, and the dividend warrants will be paid in the same manner.¹⁷

Above detailed survey of the historical documents demonstrate three facts that have a fundamental importance for our arguments that we present in this paper. Firstly, both Privy Council and subsequently the Houses of Parliament not only tied the Bank of England's hands by making cash payments *illegal* but also indemnified the Bank against any direct costs from the suspension of cash payments. Secondly, the chain of decisions – the Privy Council's order that was communicated simultaneously to the Bank and the House and immediately after this to the public – shows that the decision to suspend was not an arbitrary decision by the Bank of England alone. Finally, at the point of the suspension all political institutions such as the Bank, Parliament and the government but also the London Money Markets showed considerable concordance. Their objective seemed to have been to ensure smooth operations of the credit markets in spite of the war and suspension of convertibility. In the name of monetary stability the authorities, which were accustomed to making autocratic decisions, on this occasion paid special attention to the communication of their policy actions openly and systematically to the markets, as well as to the wider public. The Bank, as can be read from its announcement, made it clear that its other businesses continued as usual: there were no changes in discounting, private or public loans or in relationship with its proprietors.

2.2 Credit Constraints in the London Money Market

2.2.1 The structure of the Banking System

The English banking system developed as a three-layered pyramid, as shown in Figure 2, consisting of the Bank of England, the rest of the London private banks and the country banks.¹⁸ By the second half of the eighteenth century, Bank of England notes had become the main currency used in large payments in London.¹⁹ Bank of England notes rarely circulated outside the London area, where the country bank notes were the main medium of exchange - especially after 1750 the growth of the country banks had increased regional money supply. The system resembled the gold exchange standard of

¹⁷Reprinted in Gilbart (1834), p 34.

¹⁸Fetter (1965). Pressnell (1956) pp. 75-76.

¹⁹Pressnell (1956).

the twentieth century: the private bank notes were convertible to Bank of England notes, which in turn were convertible into gold on demand. Many of the London bankers kept their reserves in Bank notes or towards the end of the eighteenth century, kept accounts in the Bank. They had, therefore, direct access to Bank of England's notes and bullion. The London private banks integrated small country bank units by supplying links between country banks in agricultural areas, that had excess capital for lending, and the industrial areas, which had excess demand for capital.

[Figure 2: Credit Pyramid in the Eighteenth Century]

The enactment of the Bubble Act of 1720 limited the maximum partners of note-issuing banks in England and Wales to six and gave the Bank of England a monopoly in joint stock banking.²⁰ The capital of any other note issuing bank was therefore limited to what could be provided by up to six partners, which gave the Bank of England a virtual monopoly on note issue in and around London.²¹ The number of the country banks grew hand-in-hand with the Industrial Revolution. The growth was, however, uneven, as it was typical for country bank numbers to fall in an economic crisis with their note circulation down by a third or by half, but one or two years after each crisis both their number and note issue could again be greater. In 1750 there were twelve country banks outside London but in 1793, there were nearly 400.²² The number of London private banks almost doubled in the second half of the eighteenth century. Data on the circulation of country bank notes is not available until 1804 and onwards when the law required stamp duties to be paid on private notes. The value of all notes stamped in 1805 was £10,700,000 implying that private bank notes may have comprised almost forty percent of the total paper money in circulation.²³

The Bank of England's control over the country banks was not mechanical as they did not keep substantial amounts of reserves in the Bank notes or gold, but in rather deposits with London private banks.²⁴ Therefore, the main influence of the Bank over the country banks was through the London money market. If there was a small, urgent, need for money, coin was still the only form of money available as small notes were illegal in England and Wales. The country banks then drew down their gold deposits from London, and London banks drew cash from their accounts with the Bank. According to Pressnell (1956) to some extent the Bank functioned as a lender of last resort: 'when money was scarce country banks in general turned to London much as London firms turned to the Bank of England as the lender of last resort'.²⁵

2.2.2 The Consequences of Bullion Shortages

Let us analyse implications of Suspension to the Bank's private business – in particular from the viewpoint of the Bank's customers: London merchants and entrepreneurs. Low

²⁰6 Geo. I, c. 18.

²¹Dowd (1989) p. 118.

²²Pressnell (1956) pp. 5-7.

²³Pressnell (1956) p. 188. Naturally, we have to be careful in placing too much weight on these estimates.

²⁴Pressnell (1956) p.76.

²⁵Pressnell (1956) p. 76.

bullion levels and a shortage of notes would have resulted in different types of monetary problems. Bullion reserves would enable the continuation of the gold convertibility of the note issue and, traditionally, underpinned the value of paper money. Nevertheless, the credit and payments structure in Britain was not dependent on the gold reserve, rather on the continued circulation of Bank of England notes, which would fall if the public permanently converted their paper currency into gold. London merchants and entrepreneurs were connected by a multilateral payments network rather than a sequence of bilateral agreements. The failure of one house would have the potential to be detrimental for other businesses and a crisis in London may have spread quickly to the rest of the country, as London operated as the financial intermediary between the industrial and agricultural sectors.

[Figure 3: The Bank of England Liabilities]

Figure 3 report the published quantity of Bank of England notes outstanding for the 25th February from 1787 to 1797 and then weekly from 10th June 1796 to 18th March 1787. The reduction in Bank of England notes outstanding in the week of suspension reduced central bank money back to a level not observed for 10 years and from the weekly numbers we can see the magnitude of the run during the course of February 1797, with notes in circulation falling by nearly 20% in a month or so. As a result of diminishing circulation, there was considerable distress arising in London, according to Henry Thornton: ‘[there] was a distress for notes of the Bank of England’,²⁶ which were by far the most important medium of exchange in this commercial and financial centre of the country. The whole credit system, where ‘payments...are most of them promised beforehand’,²⁷ had been built on Bank of England notes. For a few days before the suspension demand for the Bank of England notes was so high that the interest on Exchequer bills rose as high as 16 or 17 percent as people sought to move from short term government debt to convertible currency.²⁸ Thornton estimated that:

A diminution, for instance, of one-third or two-fifths, might, perhaps, be sufficient to produce a very general insolvency in London, of which the effect would be the suspension of confidence, the derangement of commerce and the stagnation of manufactures throughout the country.²⁹

Figure 3 the circulation of the Bank Notes fell seventeen percent between the last quarter of 1795 and last quarter of 1796, meanwhile the gold stock of the Bank reduced almost forty-five percent, shown in Figure1. Despite the variations in the Bank’s monetary gold stock, stabilisation of circulation was crucial for the credit markets at this most critical of times. ‘If they reduce materially their notes in time of difficulty and distress, there are no other Notes which are ready to supply the deficiency in the circulation’.³⁰ Effective alternatives to the Bank of England notes did not exist, as country bank or

²⁶Thornton (1802) p. 113.

²⁷Thornton (1802) p. 113.

²⁸Thornton (1802) p. 113.

²⁹Thornton (1802) p. 114.

³⁰Thornton (1802) p. 288.

private bank notes did not circulate in London. Converted monetary gold did not return to circulation, as it was smuggled from the country or put away in hoards. Sir Francis Baring, London merchant banker, had recognised that the Bank notes were not just a substitute for money, but the basis of the monetary system.³¹ Merchants in London were not interested in specie: ‘The guineas applied for by persons in London, was, generally speaking, account of people in the country’, Thornton explains.³²

[Figure 4: Bank notes (weekly in Feb 1797)]

The Privy Council’s declaration (See Appendix) and orders of the King and the Bank presented in section II reveal how they seemed to have been equally concerned about the state of circulation and credit, as of the bullion reserves of the Bank. The traditional argument (for example Cannan’s Introduction to the Bullion Report, 1810, page x) that the gold convertibility rule was suspended in order only to protect the Bank’s gold reserves seems to us, therefore, an oversimplification in the light of the published announcements.

The direct link between the Bank’s note circulation and private credit becomes even more obvious when we assess the way how the London Money Markets took the news of the suspension. While the order to suspend cash payments by the Privy Council was being published on Money 27 February, the merchants and bankers of London had their own meeting in the Manor House ‘to consider of a general Resolution to promote the universal Circulation of Bank of England Notes instead of Specie’.³³ They declared that:

...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.³⁴

The declaration was then published in *The Times* bearing the signatures of many hundreds of leading business houses. According *The Times* the resolution ‘did credit to the patriotism and loyalty of the Gentlemen present’ as it was supposed to ‘prevent Embarrassments to Public Credit’³⁵ Gilbert (1834) notes that ‘similar resolutions was adopted by other public assemblies’.

The merchants and bankers had common interests with the directors of the Bank. If the Bank notes had fallen on discount – by not being accepted at their face value – there would have been delays in payments and other obligations that would have brought down many large London houses and with them the country banks, which in turn had close links with the local industries. Nevertheless, practical men of the City of London would not have supported policy in which they did not have faith and therefore merchants’ willingness to accept the Bank notes can be seen as a testimony of the Bank’s credibility and initial success of the experiment.

³¹Baring (1797) p. 6.

³²Thornton (1802) pp. 112-113.

³³The Times 28 February 1797.

³⁴Ibid.

³⁵Ibid.

3 Enforcing the contract of resumption

3.1 Lawful Suspension of Cash Payments

The transition between the two ‘monetary regimes’ caused relatively little disturbance and the confidence in the payment system after the bank run in London and the provinces was restored. Figure 1 illustrates the improvement in the gold reserves of the Bank from the lowest point of £982,000 in March 1797 to over £4,000,000 in August 1797, and the reserves continued to grow for the next year and half. Figure 5 shows how the exchanges with Hamburg improved immediately and fluctuations in the exchange rate and price of gold were hardly different from those under convertibility. The long-term interest rate peaked in May 1798, as can be seen in Figure 6, but fell to the pre-suspension level by 1799.

[Figure 5: Nominal Variables during the Suspension]

These reassuring developments in financial markets resulted from a ‘contingency plan’ that aimed at maintaining the value of the circulating medium. The authorities took two courses of action: First, suspension required some development in the functions of note issue, in terms of payments and the eventual convertibility of note issuance. After the gold and silver coins had disappeared to hoards or smuggled abroad, there was practically no legal tender currency in circulation. Only a few days after the suspension Parliament authorised the Bank to issue previously prohibited notes of a face value less than £5 to help with the shortage of circulating medium. Those people who had used only coin in the past, were now introduced to the inconvertible paper money.³⁶ In many regions the Bank of England notes started to circulate alongside the country bank notes for the first time.³⁷ Secondly, the authorities had to confirm the status of the Bank of England notes as *de facto* legal tender currency by legislation. The Bank Restriction Act passed on May 3 assured the public 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 Officers 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.³⁸

According to Fetter at this point the Bank was careful not to call the Bank of England notes legal tender currency, because they could have become associated in the public mind with the failed *Assignats* in France³⁹ and given an impression that the monetary base had shifted permanently. Only after Lord King in 1811 had announced that he would no longer receive his tenants’ payments of their rents in Bank notes at face value, but in revised value according to ‘the amount of paper money which would be required to purchase

³⁶Clapham (1944) Vol. II p. 3.

³⁷Pressnell (1956) p. 153.

³⁸Act 37 Geo III c.45.

³⁹Fetter (1965) p. 59.

it (gold) at the present market price'⁴⁰ Bank notes were made legal tender by Act of Parliament.⁴¹

3.2 Parliamentary Committee on Suspension

Immediately after the suspension, in the spirit of scientific enquiry, the House of Commons passed a motion to appoint a Committee of Secrecy to

examine and state the total amount of outstanding demands on the Bank of England, and likewise of the Funds for discharging the same, and to report the result thereof to the House *and also to enquire in the causes which have produced the Order of the Council*⁴², together with their opinion on the necessity of providing for the confirmation and continuance, *for a time to be limited*⁴³, of measures taken in pursuance of the Minute of the Council on the 26th Instant.⁴⁴

The first amendment was passed by 244 votes to 86. The final motion was carried on 1st March by 161 votes to 67.⁴⁵ The Committee made reports to the House on 3rd and 7th March and on 9th March the House sat in Committee of the whole House to consider the reports. Two main issues emerged: (i) that the Committee of Secrecy requested that a Bill be brought to confirm and continue, for a time limited, the restriction order by the Council,⁴⁶ and (ii) that the terms of enquiry be broadened to consider also the necessity of the Minute of the Council.

The links between cash payments as part of the network of financial and commercial payments and also the Bank's role as mediating between government borrowing and the City of London are underlined on 12th March. It is reported that on 25th February, the Bank had £17,597,280 of assets and liabilities of £13,770,390. But alongside these raw numbers, the government owed the Bank £9,964,413 for advances, which excluded permanent debt of £11,686,800. The House passed motion by 185 votes to 45 to repay the Bank as quickly as possible.⁴⁷

The Bill for confirming and continuing the Minute of Council was passed for the third time on 7th April and an amendment allowing for limited payments was also passed by 103 votes to 31. The Act, c.45, is a remarkable piece of drafting. with provisions for (i) a Bank indemnity for All acts done in pursuance of the Minute of Council; (ii) it became unlawful for the Bank to issue Cash payments except for clearly defined reasons; (iii) that no suit could be brought to force the Bank to pay cash and no costs of any such suit would be allowable; (iv) small amounts under 20 shilling could be payable by cash and any Orders of Council requiring payment of cash to the Military would be payable of up

⁴⁰Feavearyear (1963) p. 204.

⁴¹Act 51 Geo III, c. 127. It is a matter of interpretation as to how clear-cut the Act was, but in practice it made the Bank notes legal tender.

⁴²Added by ammendment.

⁴³Added by ammendment.

⁴⁴JHC, 1796-7, Geo III, p353.

⁴⁵JHC, 1796-7, Geo III, p356.

⁴⁶JHC, 1796-7, Geo III, p383.

⁴⁷JHC, 1796-7, Geo III, p387.

to £600,000; (v) the Bank could pay up to $\frac{3}{4}$ of any cash sum given to it since 7th April i.e. it could pay some fraction of cash on new gold deposits; (vi) the Bank could advance London, Westminster and Southwark bankers up to £100,000 of cash and to the Bank of Scotland and Royal Bank of Scotland up to £25,000 each; (vii) notes were deemed to be cash; (viii) cash was to be used to meet bail requirements and taxes; (ix) could issue cash in proportion to any increase in Bank bullion holdings since 26th February 1797 and (x) finally, that the Act would continue only until 24th June 1797. In the event, Suspension continued throughout the course of the Napoleonic Wars.

The Bill was due to be re-considered by 24th June and duly on 20th June a Bill to continue, the Act for confirming the Minute of Council was passed and the Act was published in the Statute Books on 24th June. In each subsequent case, the Act was passed for a limited time and the date of its expiry or in relation to a Treaty of Peace was explicitly stated. In April 1803 a new war put an end to the discussions about early resumption. The text of the Acts after 1815 increasingly make clear the wish to return to Cash payments at the earliest opportunity but retain and enshrine the Bank of England's ability to effect this return gradually, as conditions permitted. No discussion or possibility of a return to Cash at anything other than the original price was mentioned in the Acts.

Much attention was drawn in the Parliamentary debates into discovering why suspension was necessary, what were its causes and in the emphasis of its nature as a temporary expediency. There is little evidence in the extant Parliamentary records of any great dispute in the choice to suspend. And it was crucial for the success of the experiment that such arguments would not be able to disrupt the system during the Suspension Period. The longest gap between the renewal of Acts was 14 years, and one possible interpretation their purpose was to tie the hands of successive policymakers – amongst them six different prime ministers who were in charge of the cabinet between 1797-1821 and 13 Governors of the Bank who had to be elected biannually according to the Bank's charter. The establishment of a series of Committees of Parliamentary enquiries combined the development of early monetary theory, practical banking observations and considerable statistical analysis of price and financial data.

[Table 1: Bank Restriction Acts of Parliament]

3.3 Re-anchoring the price level

The precise effect of the Acts cannot be verified from the nominal data, i.e. there is no evidence that the long term interest rates – the consol rate – would have reduced after passing the Bank Restriction Act. However, the Acts were an important tool with which the parliament aimed to increase the credibility of eventual resumption of the gold standard, and to ensure that markets expected the government and the Bank to resume the gold standard in the future. In the existing literature, credibility has often been explained by other political and institutional developments: Britain had the most democratic parliament in the contemporary world, the Financial Revolution at the end of the seventeenth century had created an efficient system of public finance, and the country had the world's most developed private capital markets with a centralised exchange system. Furthermore, society was free, with relative freedom of press and speech

that enabled the public to criticise and monitor the authorities.⁴⁸ These factors, the argument continues, forced the government and the Bank not only to consider short-term profit opportunities, but long-term benefits to the whole country. The Directors of the Bank understood that ‘the formidable weapon of unrestricted money creation’⁴⁹ had not been placed in their hands at the beginning of the Suspension Period. The Bank did not use inflationary monetary policy extensively and the war was primarily funded by fiscal innovations, such as income tax and long-term borrowing, which meant that monetary policy did not have to become too accommodating.

During the course of the Suspension Period the Bank’s policy was not always faultless and it received sharp criticism. As can be seen in Figures 3 and 5, during the first ten years of suspension the growth of notes and rise in the price level was moderate, but then, as a result of the commercial boom of 1808-1810, the Bank’s discount policy and the overheating that followed,⁵⁰ the stock of Bank of England notes increased from £17 million in 1808 to £27 million in 1816, the market price of gold raised to 30 percent above the par by 1811 and the exchange rate depreciated sharply. The public found steadily climbing prices confusing, as for centuries prices had simply moved according to the quality of harvests. Fast credit expansion, disparity between British and overseas prices, a high premium on gold (agio) the depreciation in the exchange rate sparked a furious conflict of opinions over the conduct of monetary policy called the Bullion Debates. The bullionists, whose leading figure was David Ricardo, blamed the Bank of England as they tended to consider the inconvertible pound to be something ‘unnatural’ and a reason for all existing monetary problems.

In early 1810, Parliament appointed the ‘Select Committee on the High Price of Bullion’ to inquire into the high price of gold, so as to find out whether the Bank had issued the right amount of money or over-issued. Between February and May 1810 the Committee held thirty-one meetings and examined twenty-nine witnesses, including the directors of the Bank, and on 8 June 1810 the committee published its ‘Report from the Select Committee of the House of Commons on the High Price of Bullion’, in which it took ‘into consideration the State of the Circulating Medium, and of the Exchanges between Great Britain and Foreign Parts’.⁵¹ The Committee did not compile price indexes, but aimed to be objective by presenting time series of the market price of gold, exchange rate and the Bank of England’s note circulation: the market price of gold was at £4.12s. per oz, 15 percent above the Mint price of £3.17s.10 $\frac{1}{2}$ d and that the exchanges, with Hamburg, Amsterdam, Paris and Portugal correspondingly depressed as low as 16 to 20 percent below the par.⁵²

The Committee’s conclusion was that the rise in the price of bullion and the adverse exchanges had been caused solely by an over-issue by the Bank of England and accused the Bank of pursuing real bill policy by accepting all sound paper without considering ‘its desirability in terms of national monetary policy’.⁵³ The influence of the country

⁴⁸North and Weingast (1989).

⁴⁹Andréadès (1909) p. 191.

⁵⁰Duffy (1982).

⁵¹Bullion Report, reprinted in Cannan (1925) p. 3.

⁵²Bullion Report, reprinted in Cannan (1925), pp. 3-5.

⁵³Fetter (1965) p. 41.

bank issue was noted by saying that the quantity of country bank paper was dependent upon the quantity of Bank of England paper, increasing and decreasing with it and ‘by increasing its notes, the Bank made more plentiful the reserves into which every country banker was required to redeem his own notes’.⁵⁴

The Bullion Committee’s Report is one of the most important documents in British monetary history and it has been treated as an authoritative and contemporaneous analysis of the Bank’s monetary policy. Duffy (1982), however, argues that *The Bullion Report* overestimates the Bank’s sentiment towards anti-bullionism and does not accurately describe the Bank’s credit policy. Furthermore, some of the recommendations of the Report such as resumption in two years time, were unrealistic because the paper money stock was high compared with the Bank’s monetary gold stock and the gap between the market and monetary price of gold was wide. In spite of these weaknesses, the Parliamentary Committee and the Report itself were powerful mechanisms that enforced the original contract between the Bank and the society and paved the way to resumption of the gold standard after the war.

4 Asset-Liability Management during the Suspension

4.1 The Private Central Bank

The Bank’s ‘business as usual’ attitude at the point of suspension stemmed largely from the Bank’s desire to safeguard its proprietors’ – share holders’ – interests. The Bank of England might have been the first public bank in the British Isles, but its ownership remained in private hands until its nationalisation in 1946. According to Fetter (1965) the Bank of England was not established in 1694 to perform central banking functions any more than the goldsmiths.⁵⁵ During the course of the eighteenth century the Bank’s ambiguous position as a privately-owned-for-profit establishment that was in charge of public finance was not discussed in any organised manner. Legislation and a number of regulations connected the Bank with the political institutions: Firstly, parliament periodically confirmed the Bank’s existence by passing the Bank’s Charter; secondly, the Bank had received a ‘right’ to grant advances on the exchequer bills; and finally, in return to loans to the government, a set of acts passed between 1697 and 1742 strengthened the Bank’s position by giving it a monopoly in joint stock banking and in the issue of joint stock bank notes.⁵⁶ Yet, the Bank of England’s daily operations, its management and organisational structure manifested that it was a private monied company which issued shares, paid dividends and made profits. The Bank’s owners consisted of London merchants and from the very beginning the highest decision making body of the Bank was the Bank’s Court of Directors that consisted of the Governor, the Deputy Governor and 24 Directors. Members of the Court of Directors – as well as majority of the Bank’s proprietors – came from the merchant class and were thus in social and economic terms

⁵⁴Bullion Report, reprinted in Cannan (1925) p. 61-66.

⁵⁵Fetter (1965) p. 23.

⁵⁶Santoni (1984).

separate from the members of parliament that came from the landed gentry. Furthermore, the Bank's explicit role as a trusted organ of the London merchants and an agency of government finance was displayed by its main sources of revenue: the government's advances and trade credit discounts of London merchants and entrepreneurs.

It was only during the Suspension Period that the idea that the Bank of England might have a special role as a bankers' bank started to develop. The questions of independence of the Bank from the government and the Bank's role as a lender of the last resort were raised during the Bullion Debates and, as affirmed by Fetter (1965), their acknowledgement became the key feature of the pre-1914 monetary orthodoxy. From 1694 until the 1790s the Bank of England operated as a private establishment that was dominantly in private control and, therefore, it is reasonable to argue that the Bank's private concerns had a great weight in decision to suspend cash payments.

4.2 Maturity Transformation via Suspension

In this section we assess what implications the launch of the French Wars in 1793 and increased pressure by the government to the Bank to support warfare had on the Bank's private business. To analyse these concerns in objective manner we will start by constructing the Bank's balance sheet. Then we will calculate the Bank's value and discuss how default of its key policy – management of the gold standard – reduced its operative and its shareholders' risk. At the end of this section we alter our approach slightly and discuss how the decision to suspend pacified the London money markets and provided relief to the Bank's customers: the London merchants and entrepreneurs.

Cannan (1925), Table 2, presents the following stylised version of the Bank of England's balance sheet at the end of the eighteenth century. The Bank of England's assets consisted of securities that were held against the government and against the private sector. Exchequer bills – interest-bearing bills that were issued in return for money lent to the government – made up the largest proportion of the public credit held by the Bank. The Bank's private advances consisted of loans and trade discounts. The Bank's discount business was as old as the Bank itself: In May 1695 the Bank decided that 'any safe man might discount up to £3000, but at 4 $\frac{1}{2}$ percent even if he did not keep his cash in the Bank'. The Bank discounted promissory notes, inland and foreign bills of exchange and papers of various private institutions.⁵⁷ The most liquid asset the Bank hold was its coin and bullion reserve.

Table 2: The Balance Sheet of the Bank of England

Assets	Liabilities
Public Loans	Notes
Private Loans	Deposits
Private Discounts	Equity
Bullion	

⁵⁷Clapham (1944) pp. 123-129.

The Bank of England's liabilities comprised notes outstanding which before the Suspension Period mainly circulated in London and were, towards the end of the eighteenth century, used in all large private business transactions in the capital. The Bank notes promised to pay the bearer on demand in specie and they were more liquid than private bank notes which were usually convertible either to the Bank notes or to specie but only after delay. The Bank accepted deposits from the public which were also convertible to gold on demand. The final category of the Bank's liabilities was its equity held by its proprietors and traded at the London Stock Exchange.

We can understand suspension of convertibility and the specific matching of the return to convertibility to the end of the wars, as a way of minimising the sensitivity of the Bank of England's value to changes in gearing, i.e. the ratio between the value of its debt to equity. Higher levels of gearing will tend to amplify the impact of shocks on underlying value of the Bank but if the scale of maturity transformation can be limited then the sensitivity can be reduced. Suspension allowed the Bank to match the maturity of longer term assets, driven by the duration of the war, to the notes, which would not be payable until the end of the war.

From the balance sheet we are able to calculate the value of the Bank of England, V_t , which is simply the market value of its capital that is equivalent to the difference between the present value of assets, A , and liabilities, L :

$$V_t = A(t, t + \tau_A) - L(t, t + \tau_L) \quad (1)$$

Let us suppose, for the moment that interest rates $r(t)$ across the asset and liability structure are identical. Under usury laws this assumption may be reasonable as all private loans and discounts other than East India Bonds were subject to the legal prohibition of interest above five percent, even though the market rates would have been higher. As can be seen from Figure 6, during peace the market rate of interest rarely increased above the usury ceiling and even then only temporarily, but it did vary.

[Figure 6: Short and Long-term Interest Rates]

The return on assets corresponds to the income from loans to the public and private sector and the payment due to liabilities, which would correspond to the interest paid on notes discounted. Let us abstract from interest rate differentials for the moment and consider the value of the Bank simply in terms of the maturity structure of assets and liabilities:

$$V_t = V[r(t)] = Ae^{-\tau_A r(t)} - Le^{-\tau_L r(t)}, \quad (2)$$

where τ_A and τ_L denote the duration of assets and liabilities. By dividing both sides with V_t we get

$$1 = \frac{Ae^{-\tau_A r(t)} - Le^{-\tau_L r(t)}}{V_t} \implies 1 - \frac{Ae^{-\tau_A r(t)}}{V_t} = -\frac{Le^{-\tau_L r(t)}}{V_t} \quad (3)$$

By taking a partial derivative respect to r we have

$$\Delta = -\frac{1}{V} \frac{\delta V}{\delta r} = \frac{\tau_A Ae^{-\tau_A r(t)} - \tau_L Le^{-\tau_L r(t)}}{V_t}, \quad (4)$$

which can be rewritten as

$$\Delta = \lambda \tau_A + (1 - \lambda) \tau_L, \quad (5)$$

where $\lambda = \frac{Ae^{-\tau_A r(t)}}{V_t}$. The key variables here to understanding interest sensitivity, Δ , is λ .

Parameter λ measures both leverage – a ratio between the value of assets and the value of the Bank – and the duration of assets and liabilities, τ_A and τ_L . Higher levels of leverage λ and a maturity transformation with $\tau_A > \tau_L$, tends to increase the impact of interest rate changes on the value of the Bank. But if the duration of liabilities is matched to that of assets then there is some attenuation in the impact of interest rate changes on the value of the Bank equity.

Proposition 1 *The impact of changes in interest rates on the net worth of the Bank of England increases in leverage and the extent of maturity transformation.*

Proof. see (5). ■

Generally the maturity of banks' assets in the past as in the present day are longer than the maturity of their liabilities. Borrowers tend toward longer-term maturities used to finance long-lived assets compared with the preferences of investors and depositors, who generally want to be able to access their funds quickly. In the eighteenth century the Bank of England was only one of the London financial intermediaries that earned profits by engaging in maturity transformation – borrowing shorter-term to finance longer-term lending. The Bank took deposits and paid out notes for the public's gold deposits, and with this capital it engaged in discounting business.

Modern private banks benefit from various deposit insurance protection schemes which discourage their creditors and depositors from demanding their money back all at the same time and also from national central banks that are willing to extend their credit if necessary and to function as a lender of the last resort. In the 1790s the Bank of England did not enjoy of any protection by any external institution. During the temporary banking panics of the eighteenth century the Bank had protected its bullion reserve by paying out interest bearing notes instead of cash. The Bank could have attempted to reduce the circulation of its notes but its ability to regulate demand for credit was limited as a result of the usury law. The gold standard rule that entitled the bearers of the Bank notes to get their paper money converted to gold on demand made the Bank of England vulnerable especially when gold demand shocks became persistent.

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 easily to control their volume. During the peace the government had been able to raise income via the London Stock Exchange, but during war the markets did not always absorb as many bills as the Treasury wished to dispose of. On these occasions the Bank directors felt obligated to satisfy the wartime demand and bought exchequer bills at the direct request of Treasury brokers.⁵⁸ The heavy responsibility of the Governors was not eased by the fact that the Bank's public advances were subject to parliamentary control and it was technically prohibited from buying Exchequer bills or making advances to the Treasury without Parliament's permission because during time of war Parliament was not, however, keen to enforce the law or limit Treasury's needs.⁵⁹ As

⁵⁸Clapham (1944) p. 62. Gayer et al. (1953) Microfilm appendix p. 1388.

⁵⁹Gayer et al. (1953) Microfilm appendix p. 1386.

can be seen in Figure 7, the ratio of the Bank's unfunded debt holdings to total unfunded debt peaked in 1797 at 80 percent: the Bank was thus the dominant institution that absorbed the government short time paper.

[Figure 7: Ratio of the Bank's unfunded and funded debt holdings]

The Bank faced a problematic situation in 1797: by continuing gold conversion the Bank ran a risk of becoming insolvent, by constraining the government advances the future of the country might have been in danger and, as will be discussed below, by reducing private discounts the Bank might have spread panic in London money markets during a period when other London private banks were cutting credit. Although the suspension was a radical solution, it was sensible one regarding the Bank's balance sheet. With a 'Suspension until Peace' the Bank of England was able to match the maturity transformation which extended the maturity of its liabilities τ_L to match those of its assets τ_A . From (5) we can see that the interest rate sensitivity Δ reduces to a parameter τ_L that measures the duration of liabilities. The Bank's directors understood that the government, which wanted its payments often in cash to be able to support armies on the Continent, would not have been able to repay until after the arrival of peace. War time conditions, especially warfare at sea, meant that the Bank or the government were not able to import gold to replace what left the country. So by suspending cash payments maturity of liabilities – notes and deposits that under normal times were convertible to gold immediately – matched that of assets.

What other implications did the suspension have? At a stroke, for a given level of leverage, the risk in Bank of England share prices was reduced. As can be seen from Figure 3, the value of the Bank of England's equity fell from £20.5 million in 1794 to £13.7 million in 1797 but after the suspension the valuation increased rapidly reaching its pre-suspension level by 1801. During the suspension volume of private and public discounts increased and the Bank's share price reflects its increased profitability. The lower panel of the Figure shows that gearing was closely related to interest rates changes but that by limiting the maturity transformation problem with suspension, the Bank need not have been too constrained in its operations.

4.3 The Pre-suspension 'Palmer rule'

After establishment of the Bank of England in 1694 gold reserve management evolved as a core monetary policy which increased the credibility of the monetary system. The fact that country banks had a right to print and circulate their own notes emphasized the importance of gold reserve policy. Without a monopoly to issue paper currency in the realm any money supply target policies of the Bank would only have had limited efficiency. The Bank's reserve policy was successful: in spite of the recurrent wars of the eighteenth century the Bank of England was able to maintain gold convertibility without any significant distractions until the late 1790s. As the gold supply and minting conditions were secure, a relatively low gold backing rate was sufficient to support the monetary system. According to Fetter (1965) there was no generally accepted theory or even debate on money and banking before the suspension period – the gold standard was

enough to stabilise the price level which laid the basis for positive development of capital markets and trade.

We turn to the consideration of the Bank's balance sheet from the perspective of reserve management, which allows us to think of this as a portfolio problem. It was only from about 1827 onwards when the Bank adopted an explicit rule to target the cash ratio. This rule became known as the 'Palmer Rule' after Horsley Palmer who was governor from 1830-1833, and who first described this rule for the Committee of the Bank Charter in 1832. The Palmer Rule outlined a targeted gold reserve ratio (to notes and deposits) of 30 percent. Some historical sources, however, suggest that some kind of ratio was traditionally targeted by the Bank prior to and even during some stages of the Restriction Period. For example, Horsfield (1953) argues that some informal target was monitored already before the suspension:⁶⁰

Examination of Daniel Giles (Governor) on March 31st 1797:

Q: 'Do not the Bank Directors regulate issues upon discounts by an attention to the proportion of Cash in their coffers and the amount of their outstanding Notes?'

A: 'They ought to do so and generally do regulate their conduct in consequence.'

Examination of Samuel Bosanquet on 14th March 1797:

A: 'It is possible for the Bank to be in a much safer situation, with a much smaller sum in specie when the public affairs are prosperous, than with a much larger sum and an apprehension that the sum is draining away.'

In the next section we consider the Palmer Rule as a balance sheet problem, and ask why the Bank was not able or willing to follow an explicit gold reserve rule in 1797.

4.4 Profits and the Gold Reserve

If we think of the management of cash, or gold, reserves as a portfolio problem, see Chadha and Corrado (2012),⁶¹ we can adopt a simple expression for the Bank of England's reserves within period bank expected returns. Let us first consider the Bank's profits Π_t . We continue to consider the Bank of England as a private establishment. The Bank's problem is to maximize total returns within period subject to the returns from (i) loans L_t , which, as can see from the table in section III, consist of private and public liabilities and are lent out at the gross interest rate of R_t^L ; (ii) bullion reserve that is held at the central bank, A_t^G , that is assumed to pay the expected relative price of gold, $\left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right]$; and (iii) the payment of interest, R_t^D , to holders of Bank of England liabilities, D_t :

$$\max_{r_t} \Pi_t = R_t^L L_t + \left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right] A_t^G - R_t^D D_t. \quad (6)$$

The Bank of England's profits could be considered to be a subject to a side-constraint motivated by concerns about the management of the bullion reserve. We assume that

⁶⁰Horsfield (1953) p 170.

⁶¹We modify to some degree the original set-up in Chadha and Corrado (2012).

there is an exogenous target for the level of reserves, \bar{A}^G , which seems to have been around 30 percent. The costs of reserve management, C_t , are then modelled in two parts: the central bank smooths bullion reserves, for any deviations of reserves from target and will be subject to a liquidity preference term, μ_t .

$$\text{s.t. } C_t = \frac{1}{2}(\bar{A}^G - A_t^G)^2 + \mu_t(\bar{A}^G - A_t^G). \quad (7)$$

The Bank would have smoothed reserves over time, because it did not wish to change the allocation between cash and loans too quickly from period to period, as these may have signalled mismanagement of previous asset allocations or ran reputational risks. The liquidity preference term, μ_t , represents shifts in the Bank of England's chosen level of reserves, or what we might call today liquidity preference. Increase in μ_t corresponds to an increase in the demand for reserves. Note that by choosing the reserve level, banks's asset, $L_t + A_t^G$, are now fully determined and so are liabilities, D_t . From the balance sheet, $L_t = D_t - A_t^G$ so we can substitute out and write the Lagrangian as:

$$\Pi_t = R_t^L(D_t - A_t^G) + \left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right] A_t^G - R_t^D D_t + \chi_t \left(C_t - \frac{1}{2}(\bar{A}^G - A_t^G)^2 - \mu_t(\bar{A}^G - A_t^G) \right). \quad (8)$$

The first order condition respect to A_t^G becomes:

$$\frac{\partial \Pi_t}{\partial A_t^G} = -R_t^L + \left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right] + \chi_t [(\bar{A}^G - A_t^G) + \mu_t] = 0. \quad (9)$$

The Lagrange multiplier χ_t can be interpreted as a measure of the shadow value of reserve management, which is given by the ratio of profits on reserves to the 'precautionary' motives for holding bullion reserves:

$$\chi_t = \frac{R_t^L - \left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right]}{(\bar{A}^G - A_t^G) + \mu_t}, \quad (10)$$

The above relationship can also be considered as a measure of reserves holding. If we consider the numerator, the difference between the return on loans and return on bullion reserves, to be equal to the denominator, penalty from deviating from the bullion target and the shadow value of reserve management, χ_t becomes one and reflects the equal relative importance of the two arguments. From this we can solve for the optimal level of bank reserves:

$$A_t^G - \bar{A}^G = \left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right] - R_t^L + \mu_t. \quad (11)$$

Hence at the optimal profit rate the reserve ratio is determined by the return on reserves minus the returns on loans. If the loan rate is higher than the return on reserves there is an incentive for banks to hold reserves below the target level, \bar{A}^G . But with a sufficiently high preference for liquidity, μ_t , then reserves will be held in excess even if $\left[E_t \frac{P_{t+1}^G}{P_{t+1}} \right] - R_t^L$ is negative. Another way to think about this expression is that the Bank accumulated gold reserve requirements according to this expression, where μ_t is liquidity preference. We could in principle decompose the observed cash ratio into relative returns and preference for liquidity and in Figure 8 we show both the actual gold ratio and that

which would have been in the absence of any explicit liquidity preference.⁶² The gap between the two lines is an illustrative measure of the liquidity preference and we suggest that in 1797 and for some years afterwards there was a sharp increase in the Bank's preference (BoE) for liquidity and again after Waterloo, in the run up to resumption.

4.5 Reserve Management under the Suspension

Figure 8 shows the cash ratio leading up to the Suspension and the subsequent years. We can see four distinct phases here: Firstly, the early years of the war led ultimately to the drain of cash in 1797 and the suspension of convertibility. At the end of the eighteenth century the British economy experienced a series of shocks such as the war, large government expenditure, volatile interest rates and bad harvests, which in past had occurred only occasionally. These long-lasting disruptions, combined with fears of invasion, distorted the economy and increased the public's demand for gold.

[Figure 8: The Gold Reserve Ratio]

Secondly, first three years of suspension led to some judicious farming of Cash and reserves rose again to a more healthy level. The Bank even proposed a resumption of Cash Payments when the ratio rose to over 30 percent in August 1798 and again to over 35 percent in February, but for 'political reasons'⁶³ the suspension was continued. The third and the longest phase lasted from late 1799 to 1815, during which the cash ratio drifted down as suspension was sustained. During this period the Bank used its discretion to finance war and support commerce. Finally, with the war over, a volatile return to a stable cash ratio was effected.

Two points emerge from this analysis. Firstly, the suspension allowed the Bank to operate without any explicit or implicit target for its cash reserve. The Bank was, in effect, optimising with respect to alternate uses of its assets by substituting loans for bullion. Secondly, the Bank was able to economise on bullion as it was not strictly required to meet liquidity needs from its liabilities.

We note that the run on the Bank's reserves was not so much as a result of speculative panic reflecting the lack of credibility of the Bank itself, but rather a pre-emptive measure by the country banks and individuals.⁶⁴ The country bankers were rationally anticipating bank runs and built their gold reserves in order to be well prepared to meet their customers demand for specie. Demand for the Bank of England notes was large, because they were convertible to gold on demand and not with the delay of country bank notes.

5 Managing Expectations

In this section we outline two models that help explain the circulation of Bank of England notes. The first is an exposition of Barro's 1979 model of the gold standard in which

⁶²The dotted line is calculated as the change in the gold price relative to the price level minus the rate of return on Consols. We simply solve (11) for μ_t using the data we have on the cash reserve ratio, the gold and general price level and the consol rate.

⁶³Cannan (1925), xviii.

⁶⁴Fetter (1965) and Flandreau (2007).

we show that a credible expectation of resumption of cash payments sets up inflation expectations that offset destabilising shocks arising from movements in prices, output and the demand for non-monetary gold. In our second model we consider why notes continued to circulate as working capital during the period of suspension and it appears that some positive return compared to holding money as a Bank deposit. We note as well that the Suspension did not change the Bank of England's ratio of notes to deposits until after 1815 and so there seems to have been some implicit target for the liabilities in the main period of suspension.

5.1 Controlling the Price Level

Under a gold standard the supply of money is linked to the value of monetary gold and the scale of backing. Money demand is related to the level of transactions and its own rate of return, which is a negative function of the expected inflation rate. As money was the medium through which transactions were effected, it was well understood that the money market needed to clear. With transactions given, the crucial determinant of the clearing in the money market is thus simply the value of gold and any expected depreciation in the value of money. Even under a temporary suspension of convertibility, it could be argued that the same principles apply, only that the central bank can decide over the extent of gold backing, we explore this point explicitly in this section. We first outline what determines the price level under a standard when the value of gold impacts on the money supply.

Let us first solve for the price level under a gold standard. In Barro (1979) the following relationships for gold demand for monetary and non-monetary purposes are posited:⁶⁵

$$m_t^s = p_t^a + a_t^G - \lambda_t, \quad (12)$$

where the money supply, m_t^s , is a function of the price of gold, p_t^a , and the quantity of monetary gold, A_t^G , and inversely related to the gold backing of money, λ_t at time t . Money demand, m_t^d , moves proportionally to the price level, p_t , with income, y_t , elasticity ϕ and falls at rate k in sustained inflation expectations, π_t^e :

$$m_t^d = p_t + \phi y_t - k\pi_t^e. \quad (13)$$

By equating money demand and supply we note that the price level is thus given by the value of monetary gold, $p_t^a + A_t^G$, and terms in inflation expectations, output and gold backing:

$$p_t = p_t^a + a_t^G + k\pi_t^e - \phi y_t - \lambda_t. \quad (14)$$

Gold supply increases in proportion, ψ , to the relative price of gold:

$$a_t^s = \psi (p_t^a - p_t). \quad (15)$$

⁶⁵In the original paper, implicit functions are used, we simply use a log linear specification.

There is a target demand for non-monetary gold, A_n^T , which is proportional, θ , to the inverse of the relative price of gold, depends negatively on sustained inflation expectations and positively on output:

$$A_n^T = \theta (p_t - p_t^a) - \gamma \pi_t^e + y_t. \quad (16)$$

The flow demand for non-monetary gold is thus error correcting with adjustment parameter, α , for the stock of non-monetary gold, A_t^n and also to replace depreciation, δG_n^T :

$$\dot{A}_t^n = \alpha (A_n^T - A_t^n) + \delta G_n^T \quad (17)$$

We now solve for stability in the demand for monetary and non-monetary gold, see Appendix A for the proof. Note that when the level of non-monetary gold demand is above target, the directional force for \dot{A}^n is negative and when the level of monetary gold, or by reflection (11) the price level, is above target then the directional force for \dot{A}^m is also negative (Figure 9). The slope of $\dot{A}^n = 0$ in $A^m - A^n$ space is found by substituting the steady-state equation for monetary gold, solved for the price level, into that for non-monetary gold and then solving the locus for monetary gold for A^m to give a slope of $\frac{1}{\theta}$:

$$A_{t|\dot{A}^n=0}^n = \frac{1}{\theta} A_t^n + \left(\phi - \frac{1}{\theta} \right) y_t + \lambda + \left(\frac{\gamma}{\theta} - \kappa \right) \pi_t^e, \quad (18)$$

Note that the changes in y , λ and π_t^e will shift the locus. Similarly we can substitute out for p_t in the same way for $\dot{A}^m = 0$:

$$A_{t|\dot{A}^m=0}^m = \frac{\alpha}{\delta\theta + \psi + \alpha\theta} A_t^n + \frac{(\alpha + \delta)(\theta\phi - 1) + \psi k}{\delta\theta + \psi + \alpha\theta} y_t + \lambda_t + \frac{(\alpha + \delta)(\gamma - k\theta) - \psi k}{\delta\theta + \psi + \alpha\theta} \pi_t^e \quad (19)$$

These two locii are drawn with lines of force in Figure 9. From inspection of the lines of force, we note that two stable roots for the locii are guaranteed if the slope of 18 is greater than that of 19. We choose the two shocks outlined to Figure 10 and 11 to understand the policy problem at the point of the decision on whether to suspend convertibility: bad harvests have reduced output and the gold backing of the currency is rapidly falling, because of an internal and/or external drain moving us in Figure 10 to Point B and then Point C in Figure 11. The economy will thus tend to suffer an increase in the price level but note that both of the stable arms have an argument in inflation expectations and so the original equilibrium, Point A, can be recovered if some mechanism can be established to drive the price level back to where it was prior to the shocks, i.e. by establishing sustained negative inflation expectations. From the steady-states for price level, monetary and non-monetary gold stocks, Appendix B, such expectations can reduce the price level and increase the gold stocks. If on the other hand, positive inflationary expectations are formed then prices will continue to rise and the stock of monetary gold to dwindle. The key policy response for a central bank under a gold standard, if it is to

suspend convertibility or gold backing, is for that not to lead to persistent or sustained expectations of higher prices as this will tend to lead to a collapse of the monetary standard.

The mechanism by which dwindling gold reserves and increased note issuance could also be associated with stable, or even negative, inflation expectations combines two clear policy strategies. First in the sense of Gorton (1988), by preventing the exchange of notes for gold the Bank of England reserves stayed relatively buoyant, and so the suspension of convertibility was perhaps a credible mechanism under which there was no need for notes to be exchanged immediately, as they would hold their value in the future: we explore this explanation in the next section. Secondly, to pass Acts of Parliament that would help convince traders and merchants that suspension was indeed temporary. Alongside the political debates leading to these Acts of Parliament, there seems to have been considerable early consensual support for the Suspension with traders and merchants and the Bank of England in favour. In either case, the key to maintaining some form of stability was the maintenance of the belief that the price level would drift back to the neighbourhood of its level prior to the suspension, which it did, of course.

5.2 Notes vs Other Stores of Value

Let us now turn to consider the holders of Bank of England liabilities that, for the time being, we divide in notes and deposits. In the eighteenth century liabilities, either in terms of Bank of England notes outstanding or deposits under the gold standard were both payable in cash (gold) *on demand* and also exchangeable for each other. Each form of liabilities were therefore close substitutes. The key difference, though, is that Bank of England notes were tradable in London and in the provinces they were used as a reserve currency or in some districts, such as Lancashire, circulated widely, whereas the cashing of deposits would require a trip to the Bank of England in London as it did not have any branches until 1826. Notes were therefore part of the circulating medium for trade and deposits operated more as a store of value.

Let us now modify the model of Freeman (1988) to consider the investor's (agent) problem and that of the Bank of England. Agents live for three periods and in every period N agents are born with an endowment of ϱ . At the end of period one, in which they do not consume, they have to decide whether to hold their endowment either in terms of deposits at the Bank which pays a gross interest rate of R^D in cash (gold) every period or in terms of notes, which are used to invest in capital which gives a nominal return in period 3 of κ in notes.⁶⁶ Note deposits can be changed for gold in every period but notes only after two periods in full and within one period at a discount. The rate of return on capita, which we unusually equate to Bank of England notes, is typically greater than that on deposits, which is simply the price of gold in terms of good and services: $\frac{P^G}{P}$.

Even though notes are exchangeable for deposits they are typically tied up as working capital and therefore cannot be traded at face value without paying a liquidation cost of φ . Agents do not initially know whether they will need the return in period 2 or period

⁶⁶Clearly, $\kappa > \chi^2$ so that the consumer gets a premium for tying up his money for two periods. So that $\kappa - \chi^2$ is the liquidity premium.

3 until the start of period 2 and therefore cannot individually decide whether to hold ϱ as a note or a deposit. So agents face the risk of (i) having their notes tied up as capital in period 2 and having to liquidate with a penalty or (ii) having kept deposits for periods 2 and 3 and so losing out on the excess return from having invested in capital. Table 3 shows the rates of return for notes and deposits in each of the two periods following the first:

Table 3: Subsequent Rates of Return

	one period	two period
Notes	$\kappa^{\frac{1}{2}} - \varphi$	κ
Deposits	R^D	$(R^D)^2$

The two period rate of return on notes must be greater than the two period rate of return on deposits, otherwise only deposits would be held. And the one period rate of return on deposits must be greater than the one period rate of return on notes ($R^D > \kappa^{\frac{1}{2}} - \varphi$) otherwise only notes would be held. So the relative rates of return imply a preference for deposits for agents who will consume one period ahead and for notes for those who will extract their return two periods ahead. The present value in period one of notes is $\frac{\kappa}{R^D}$ and for deposits is simply R^D . The Bank of England knows the proportion of people with a demand for deposits (for example, without any loss of generality, $\frac{1}{2}$) and can thus invest one-half of its endowment in two period assets ($\frac{\kappa N \varrho}{2}$), for example, government or private securities, and one-half in liquid assets ($\frac{R^D N \varrho}{2}$), i.e. gold, in the same proportion and match its liability structure to that of its assets. Note this equilibrium is stable because an agent who needs their return in the first period will not gain by delaying their return as they are mandated to spend in the first period and a later period agent will not gain by pretending to be an early period agent as they would then lose the liquidity premium, as:

$$\kappa^{\frac{1}{2}} - \varphi < \frac{\kappa}{R^D}. \quad (20)$$

With the fraction of agents in period one given, instability in note holding derives from any incentive by late period agents to bring forward the liquidation of their notes i.e. to increase velocity. And so any increase in the relative return on deposits (or reduction in the cost of liquidation) compared to the return from capital could in principle bring forward demand for deposits, or other assets, from note holders. In this case any possibility that the gold price might rise in terms of the general price level in the first period or, indeed, any belief that notes would stop circulating would reduce their expected two period rate of return, κ . The Bank of England will hold assets in proportion to the known proportion of early and late period consumers e.g. 50% gold and 50% in securities. But any unanticipated shock to the relative returns from holding deposits, the costs of liquidation or the likelihood that notes will circulate in future may create a run on the Bank of England, as there will be an incentive for late period investors to switch out of notes, even accounting for the costs of capital liquidation. This run will increase the probability of an increase in the first period gold price or the cessation of note circulation

and so bring forward even more late period agents. In the short run, the Bank will be unable to use its note supply for payments.

In this scenario, notes will contract and deposits will be swapped for cash and bullion at the bank will fall relative to securities. If on the other hand, any increase in the rate of return on deposits, which is a function of the expected price of gold, is offset by adopting a restriction of convertibility, then notes may continue to be held. In other words by exchanging the pay-off from gold to the price level alone, $R^D \equiv \frac{1}{P}$ the run can be prevented and notes continue to circulate as they return κ .

Proposition 2 *A bank run can be avoided as long as $\kappa^{\frac{1}{2}} - \varphi < \kappa P$.*

Proof. From (20), and substituting $R^D \equiv \frac{1}{P}$, shows that notes will be held if the nominal rate of return on capital exceeds the liquidation returns from capital in the first period.

■

If deposits and notes are not convertible into cash then, providing notes can be used to circulate as working capital they will continue to be held as, in expectation, they offer a greater rate of return than deposits and first period liquidation. When we examine the ratio of notes to deposits, Figure 12, we observe that the Bank of England seems to have kept these in a proportion of around 2:1 prior to and for most of the suspension and certainly until the end of the war. This means that velocity of note circulation was relatively stable over the suspension period and this reflected the value of notes are working capital, rather than simply nominal claims on expenditure.

6 Across the Channel: Assignats and Hard Franc

6.1 Financing the Revolution

The ruinous assignat period in France from 1790-1796 during the French Revolution differed from the Restriction Period in England in that Assignats' value was inclusively backed by the sales of National Estates during the period when the principle bank of issue in France, *Caisse d'Escompte*, had suspended cash payments⁶⁷. The government and the National Assembly intended to issue Assignats and retire them by allowing holders to purchase confiscated church lands in auctions, and finally destroy returned Assignats. The plan was not irrational, because confiscated lands formed a capital asset that was more than sufficient to cover the accumulated deficits.⁶⁸ Yet, French authorities failed to organize land auctions efficiently and Assignats, especially those with low face value, remained in circulation.

As can be seen in Figure 13 the growth of Assignats was initially moderate, but accelerated during the constitutional crisis in 1793 and after the declarations of war with German Empire, Austria and Britain between 1792 and 1793. In January 1793

⁶⁷The Caisse d'Escompte suspended cash payments on 18 September 1789 as a result of a bank run. White (1995)

⁶⁸Hawtrey (1918). In 1789 the biens nationaux were worth some 3,500 millions of livres, while the public expenditure was some 550 millions and the deficit approximately 162 millions.

the assignat was worth 51 percent of its face value. During the Reign of Terror from 1793-1794 the Jacobin government imposed the laws on the Maximum which criminalised private specie transactions, imposed wage and price controls and turned Assignats into a guillotine-backed currency⁶⁹ These restrictions stabilized the value of Assignats despite the continuous growth in the stock.

Once the Jacobin party was overthrown, controls weakened and in April 1795 the Directorate guaranteed the freedom of transaction in specie. After the repeal both households and merchants were eager to change their accumulated Assignats to commodities flooding the market and producing an abrupt depreciation, and, a year later, suspension of issues from the land sales led to a rapid erosion of the value of Assignats. The Directorate tried to withdraw some Assignats from circulation by accepting them at one percent of their face value in payment of a forced loan.

[Figure 13: Assignats and their Depreciation]

By late 1795 economy was in chaos. The government was unable to raise any tax revenue and opportunities for public lending had long been vanished. Yet, the state still needed to raise revenue, and as other means were not available, the Directorate issued Assignats. After the hyperinflation and a brief unsuccessful attempt to replace the Assignats with a new paper money, the Directorate demonetized all 44 billion Assignats on 4 February 1796, a year before the Bank of England suspended cash payments.

Were Assignats such folly that failure was inevitable? Many economic historians have unreservedly dismissed the experiment.⁷⁰ Nevertheless, in the eighteenth century, when the agriculture was fundamentally the largest sector, mortgages and other land backed securities in addition to land banks themselves were an integral part of the financial system. Many authorities and merchants considered land to be a superior reserve or backing good to gold or silver. ‘Land’, wrote Daniel Defoe in 1697, is the ‘best bottom for public banks’⁷¹. Idea of a land backed capital asset in the 1790s was not, therefore, revolutionary.

Unlike the Ancien Régime, revolutionary governments and assemblies in principal favoured a market economy even though they broke with their principles later on. Assignats were, thus, a rather modern solution to the acute problem of budget deficit. Had the Ancien Régime found abundant lands in its possession, it had most likely imposed forced sales to raise income. The Revolutionary government, on the other hand, understood that the best value could not be received through forced sales especially when finding suitable buyers was not straightforward in short period of time.

A fundamental difference between the Assignats and the paper pound was that the definite value of Assignats was unknown to its holder even though initially the value of confiscated lands exceeded the value of Assignats. The bearer of a paper pound note, by contrast, knew that the Bank of England had promised to convert the note at fixed amount of gold in the future and this promise was not seriously challenged during the Bank Restriction Period. In spite of uncertainties, at the outset the French financial markets

⁶⁹Sargent and Velde (1995).

⁷⁰See detailed discussion in White (1995).

⁷¹Defoe (1697), *Of the Multiplicity of Banks*.

seemed to have believed in Assignats: the yield of French consols fell from 7.5% in late 1789 to 5.3% in early 1790.⁷² In England the consol rate increased ahead of suspension, but fell after the suspension had placated markets.

Whilst the value of paper pound remained relatively stable and notes did not fall on discount, the value of assignat did not just fall but was very volatile. According to Hawtrey (1918) by mid July in 1795 the Assignats were no longer a medium of exchange, rather they had become an object of speculation. Speculators got much of the blame, but together with those who accepted Assignats in hope for getting political favours, they supported Assignats' value. Unlike England France did not have institutions or economic systems such as parliament, public bank or free press that would have been able to tie the hands of the future governments. As Hawtrey (1918) puts it, political leaders, especially during the Revolution, are free to change their minds and nobody 'blames them much for dropping a policy which they have striven in the past'. Honouring the Assignats was one of such policies.

6.2 Rebuilding Credibility of the Regime

Napoleon learned from both the Ancien Régime's and Revolutionary governments' mistakes and fiscal practices of the First Consul were initially sound and sustainable. The Consulate accepted responsibility for the arrears of the Directorate in order to increase the market's confidence towards the new political system.⁷³ By continuing the tax reforms initiated by the Directorate, Napoleon was able to make payments on various public debt instruments. He introduced new direct taxes, duties and sold successfully state monopolies, and in a very short time the chronic budget deficits of the past rulers were eliminated. As a result of improved governance, the interest rate dropped below 10 percent – as can be seen from figure 14 – making the existing debt cheaper to serve. Given the size of his expenditure, Napoleon's achievements on fiscal policy appeared as remarkable as his military victories.

[Figure 14, Long-term interest rates]

Almost as soon as Napoleon came to power he introduced the first rudimentary banking reforms. The coup, which forced the Directorate out of power on 10 November 1799, was supported by a group of influential French bankers. According to Crouzet (1999) the group was probably promised a 'national bank' before the take-over and was certainly closely involved in its establishment.⁷⁴ Concerned that the public would be slow to subscribe the Banque de France's initial capital of 30 million francs (30,000 shares, 1000 francs each), the bankers asked the state to support its establishment. Using the facade of the Sinking Fund the state purchased 5000 shares and deposited 5 million francs on the bank's current account⁷⁵. By contrast, the Bank of England's capital of £1.2 million had sold in London capital markets within 12 days – 'in less time than could have been

⁷²Bordo and White (1991).

⁷³Bergeron (1981), p 41.

⁷⁴Crouzet (1999), p 39.

⁷⁵Crouzet (1999), p 40.

imagined⁷⁶ – without the state having to subscribe initial capital and the Bank having to recycle this back to the state.

On 16 February 1800 the Banque de France had its first shareholders' meeting. It was decided that the General Council of the Banque de France, consisting of 15 regents, was to be elected by the two hundred largest stockholders. The Council chose the governor and deputy governors, set the discount rate and decided which bills were suitable for discounting⁷⁷. Like the Bank of England, the Banque de France had close relationship with the large French banks and Parisian merchants after its establishment as both the regents and governors came from this sector.

In spite of the government's involvement, the Banque de France was set up as a private joint stock company and its management and organisation were at least partly divorced from political circles aiming to provide a guarantee of the government's commitment to sound economic policy. The Banque de France and the Sinking Fund became the part of the 'new start' of Napoleon's regime that was targeted to satisfy the needs of the merchant and banking community⁷⁸, and in return, ensure that bankers supported the state. Three years after its establishment the bimetallic standard and convertibility of notes was firmly resumed. Partly to redefine the bank's relationship with the state Napoleon granted the bank its first official charter in 1803 which gave it an exclusive right to issue paper money in Paris for fifteen years.⁷⁹ At this time the government also limited the maximum annual dividend of the Banque to six percent so that its shares would not compete with government funds which paid 5 percent interest.⁸⁰ If in England the directors of the Bank used discretion over private discounts, their colleagues in France only discounted carefully selected commercial paper. Until 1806 one third of the Banks discount were advances to the government.⁸¹ As the smallest bank note had a face value of 500 francs, they were never a medium of payment used by the general public.

According to Crouzet (1999) the main conflicts between the government and the central bank concerned the suitable level of interest and the extent of note issue. The Banque de France was aware of problems over the channel and argued that higher rate of interest and lower level of advances were crucial in maintaining the convertibility of franc. Napoleon demanded the Banque de France to be more generous towards war contractors forcing it, therefore, lend indirectly to the government.⁸²

Involvement in failed indirect lending project and accommodation of doubtful bills led to sharp increase of note circulation of the bank in 1806. A bank run broke out and on 22 September 1805 the bank's reserve was only 1.2 million francs. Rumors of the Bank's difficulties and false news of creation of new paper currency resulted of currency problems: the bank notes depreciated 10 percent and the rate of exchange fell. To protect its reserves the Banque de France was forced to suspend the bimetallic standard partially and full suspension was avoided by rationing. The redemption of notes was limited to

⁷⁶Clapham (1944), Vol I, p 19.

⁷⁷Goodman (1992), p 41.

⁷⁸Crouzet (1999), p 40.

⁷⁹Crouzet (1999) p.42.

⁸⁰Crouzet (1999), p 42.

⁸¹Bordo and White (1991).

⁸²Crouzet (1999) p. 43.

600,000 francs per day.

According to Crouzet (1999) Napoleon, who did not entirely comprehend the situation, was furious and blamed the bank of these difficulties. Several officials had to give up their positions and Napoleon implemented reforms that gave him more say in the management of the Bank. In 1806 a new law gave the government the right to name the governor and two deputy governors. The bank's capital was doubled so that it could discount more government's obligations. Napoleon claimed the Bank 'belongs more to the Emperor than to the stockholders, because it creates money'.⁸³ On 12 February 1806 the Banque de France was the first central bank to adopt 'the Palmer's rule': the bank declared that its metallic reserves would always be at least one third of its note circulation.⁸⁴

During the first six years of Napoleon's reign the fiscal system was adequate, but after 1806 deficit grew steadily: if his campaigns of Ulm and Austerlitz had cost 60 million francs and the war in Spain about 70 million, the Russian campaign cost 700 million francs. The expenditure in 1806 was 700 million and in 1812 and 1813 went over 1000 million francs.⁸⁵ At the end of 1813 Napoleon had to cover his expenses by enormous increases in the direct taxes. According to Bergeron (1981) it was not a negligible element in the rising political crisis that led to the vote for his deposition.⁸⁶

Napoleon was known to dislike public borrowing: he considered borrowing to be undignified, because it would enforce the state under the powers of bankers and merchants.⁸⁷ Napoleon did modernise the fiscal practises by establishing the sinking fund, but unlike in Britain, where the fund was employed to reduce the public debt, Napoleon's officials used it to support the rate of interest of public funds and providing initial capital for the Banque de France.⁸⁸ The market for government paper was strictly controlled and only a small number of bankers and traders appointed by Napoleon, were allowed to trade with obligations.

According to Crouzet (1999) Napoleon was painstakingly aware of dangers of inflation – its disastrous economic consequences and potential for causing social and political disorder.⁸⁹ Even at the end of 1812, when, using the language of Grossman and Van Huyck (1988), default of strict monetary principle might have been excusable, Napoleon covered his enormous expenses by rising direct taxes rather than relying on paper finance or long term borrowing.

The weakness of the fiscal system, according to White (1995), was that the Empire depended on the continued extraction of foreign resources to support the military and the Treasury. After the fatal Russian Campaign in 1813 the deficit was 122 million francs. By this point Napoleon gave in to Mollien, the a councillor of state ('Chancellor of the Exchequer') and proposed to issue bonds which were to be secured by the sale of village commons. It is not surprising that these bonds did not sell out: by 1 April 1814 only 64 millions had been sold in spite of rumours circulated by the government agents that the

⁸³Goodman (1992) p 41.

⁸⁴Crouzet (1999), p 43, fn 24.

⁸⁵Bergeron (1981), p 40.

⁸⁶Bergeron (1981), p 41.

⁸⁷Bergeron (1981), p 41 .

⁸⁸Bergeron (1981), p 45.

⁸⁹Crouzet (1999) p 45.

common lands were selling rapidly.

The real problem that plagued French monetary and banking system was the lack of reputation. The French banking system was so tarnished even before the Assignats that when a group of protestant bankers established Caisse d'Escompte, a limited joint-stock company with government authorisation, in 1776, they avoided the word 'bank' in its name.⁹⁰ The policy of the Banque de France was to maintain stability and security – and avoid extensive credit – instead of supporting industry or searching profit opportunities for its owners, something with which the Bank of England was closely engaged. The Banque de France followed strict rules when it came to note issues and discounting. The monetary system Napoleon established was rigid and almost entirely based on the circulation of specie, and unlike in England, 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.⁹¹ Even in 1850 93% of all transactions in France were settled in specie compared with 35% in England and 19% in Scotland.⁹² French banking system contributed to the slowness of French industrialization and modernization during the nineteenth century⁹³ Specie was the most credible medium of payment and store of value in a society that was prone to revolutions and in a monetary system that had lost its reputation.

7 Concluding Remarks

We have become used to a dichotomy of sorts between issues connected with the microeconomics of firm profitability and the macroeconomics of money, prices and interest rates. The sense of this dichotomy can be questioned when the firm is itself a nascent central bank. At this time the Bank of England provided the means of payment in London and a settlement service for regional country banks. It also helped the government by funding part of the war effort directly and acted as an advisor in its dealings with the London money markets. Since the inception of the Bank of England, the ongoing convertibility of Bank of England notes into cash, was thought to be an integral part of this function: would merchants or bankers hold liabilities that were not immediately convertible into cash? This was the question for which the French state could not under any circumstances construct a positive answer.

The Bank of England's response and that of the political state was almost the converse - that liabilities would not be held if convertibility was maintained. When faced with a panic for conversion to cash, which could not be satisfied at face value given a high multiple of liabilities to cash, the monetary authorities responded by suspending convertibility and taking a sequence of steps that acted to ensure the future value of Bank of England notes in terms of gold. By ensuring the future value, there was no clear advantage to seeking cash and the advantage of the liquidity arising from holding notes was maintained. As

⁹⁰Crouzet (1999) p 27.

⁹¹Bergeron (1981), p. 43.

⁹²Crouzet (1999), p 47.

⁹³Crouzet (1999), p 48.

long as the Bank of England remained solvent, then it seemed likely that notes would eventually have their gold value re-instated.

At a stroke, this acted to stop the panic. It also handed the Bank of England the opportunity to lend extensively with limited cash reserves and increase its gearing, safe in the knowledge that its liabilities were not especially short term, as the Acts of Parliament has guaranteed that their maturity would now coincide with the duration of the war, and not with the whims of invasion rumour. Naturally, lending was still subject to careful scrutiny⁹⁴, as under the usury laws it would have been very easy to create problematic assets. The Bank of England was, in effect, given the freedom to optimise over its balance sheet, with the constraint of immediate payment in cash removed. This degree of freedom could not be afforded by Napoleon to the Banque de France and so Midas could not in either country transmute all into paper.

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⁹⁴Duffy (1982).

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Appendix A

At the Council Chamber, Whitehall, February 26, 1797.

By the LORDS of HIS MAJESTY'S Most Honourable PRIVY
COUNCIL. Present,

The LORD CHANCELLOR, Earl SPENCER,
LORD PRESIDENT, Earl of LIVERPOOL,
Duke of PORTLAND, Lord GRENVILLE,
Marquis CORNWALLIS,

Mr. CHANCELLOR OF THE EXCHEQUER.

(Signed) W. FAWKENER.

“ Upon the representation of the Chancellor of the Exchequer, stating, that from the result of the information which he has received, and of the inquiries which it has been his duty to make respecting the effect of the unusual demands for specie that have been made upon the metropolis, in consequence of ill-founded or exaggerated alarms in different parts of the country, it appears, that unless some measure is immediately taken, there may be reason to apprehend a want of a sufficient supply of cash to answer the exigencies of the public service. 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; and it is ordered, that a copy of this minute be transmitted to the Directors of the Bank of England; and they are hereby required, on the grounds of the exigency of the case, to conform thereto until the sense of Parliament can be taken as aforesaid.

(Signed) W. FAWKENER.”

Appendix B

Deriving the price stability conditions

The change in the stock of non-monetary gold, \dot{A}^n , thus is the sum of demand, a_t^n , less depreciation, δG_t^n :

$$\dot{A}^n = a_t^n - \delta G_t^n = (\alpha + \delta) (A_n^T - A_t^n) \quad (\text{A1})$$

The change in monetary gold is the difference between supply, a^s , and demand, a_t^n , for non-monetary gold:

$$\dot{A}^m = a^s - a_t^n = \psi (p_t^a - p_t) - \alpha (A_n^T - A_t^n) - \delta A_n^T \quad (\text{A2})$$

The steady-state of the model requires no change in prices or gold flows:

$$\dot{p} = \dot{A}^n = \dot{A}^m = 0,$$

at this point the change in demand for monetary and non-monetary gold are both 0 and so the net supply of gold will equal the depreciation rate on the non-monetary gold stock. Into which we place 15 and 16:

$$\begin{aligned} a_t^n - \delta A_t^n &= a^s - a_t^n = 0 \Rightarrow a^s = \delta A_t^n \\ \psi (p_t^a - p_t) &= \delta A_n^T \\ \psi (p_t^{a^*} - p_t^*) &= \delta [\theta (p_t^* - p_t^{a^*}) - \gamma \pi_t^{e^*} + y_t^*], \end{aligned}$$

to give the steady-state price level:

$$p^* = p^{a^*} + \frac{\delta}{\psi + \delta \theta} (\gamma \pi^{e^*} - y^*). \quad (\text{A3})$$

The steady state demand for non-monetary and monetary gold are given by the following equations:

$$A^{n^*} = \theta (p^* - p^{a^*}) - \gamma \pi^e + y^* (= A_n^T), \quad (\text{A4})$$

$$A^{m^*} = p^* + \phi y^* + \lambda^* - k \pi^e - p^{a^*}. \quad (\text{A5})$$

The total demand for gold is thus:

$$A^{n^*} + A^{m^*} = (1 + \theta) (p^* - p^{a^*}) - (k + \gamma) \pi^{e^*} + (1 + \phi) y^* + \lambda^*.$$

And the dynamics are thus given by:

$$\dot{A}^n = 0 = (\alpha + \delta) (A_n^T - A_t^n) \quad (\text{A6})$$

$$\dot{A}^m = 0 = \psi (p_t^a - p_t) - \alpha (A_n^T - A_t^n) - \delta A_n^T. \quad (\text{A7})$$

Note that when the level of non-monetary gold demand is above target, the directional force for \dot{A}^n is negative and when the level of monetary gold, or by reflection (11) the price level, is above target then the directional force for \dot{A}^m is also negative (Figure 1). The slope of $\dot{A}^n = 0$ in $A^m - A^n$ space is found by substituting the steady-state equation for monetary gold, solved for the price level, into that for non-monetary gold and then solving the locus for monetary gold for A^m to give a slope of $\frac{1}{\theta}$:

$$A_{t|\dot{A}^n=0}^n = \frac{1}{\theta} A_t^n + \left(\phi - \frac{1}{\theta} \right) y_t + \lambda + \left(\frac{\gamma}{\theta} - \kappa \right) \pi_t^e, \quad (\dot{G}^m = 0)$$

Note that the changes in y , λ and π_t^e will shift the locus. Similarly we can substitute out for p_t in the same way for $\dot{A}^m = 0$:

$$A_{t|\dot{A}^m=0}^m = \frac{\alpha}{\delta\theta + \psi + \alpha\theta} A_t^n + \frac{(\alpha + \delta)(\theta\phi - 1) + \psi k}{\delta\theta + \psi + \alpha\theta} y_t + \lambda_t + \frac{(\alpha + \delta)(\gamma - k\theta) - \psi k}{\delta\theta + \psi + \alpha\theta} \pi_t^e \quad (\dot{G}^m = 0)$$

These two locii are drawn with lines of force in Figure 1. From inspection of the lines of force, we note that two stable roots for the locii are guaranteed if the slope of 18 is great than that of 19.

Result 1: Stability is ensured if $m A_{t|\dot{A}^n=0}^n > m A_{t|\dot{A}^m=0}^m$. And is given by $\delta\theta + \psi > 0$, which is satisfied for all positive parameters.

Condition 3 Proof. $\frac{1}{\theta} > \frac{\alpha}{\delta\theta + \psi + \alpha\theta} \rightarrow \delta\theta + \psi + \alpha\theta > \alpha\theta \rightarrow \delta\theta + \psi > 0$. ■

Result 2: For unit elasticity of price with respect to output, ϕ , and for the target demand for non-monetary gold, θ , locus (14) is invariant to output, y_t but locus (15) remains positive: $\frac{\psi k}{\delta\theta + \psi + \alpha\theta}$.

Result 3: Changes in the gold backing of the note issue unambiguously shift both locii in the direction of the change.

Result 4: The direction of the response of the locii to changes in sustained inflation expectations, π_t^e , depends on the responsiveness of the price level to changes in inflation expectations, k . For sufficiently low k the locii will respond in the same direction as the change in inflation expectations.

Proof. From (14) $\frac{\gamma}{\theta} > \kappa$ and from (15) $\frac{(\alpha+\delta)\gamma}{(\alpha+\delta)\theta+\psi} > k$. ■

Result 5: Let there be a negative shock to the output and also a reduction in the gold backing of the paper issue. Figure 10 shows the impact of a negative shock to output. It leads to a fall in both non-monetary and monetary gold stocks, and an increase in the price level. For Figure 11, let us now add a reduction in the gold backing of the note issue, a fall in λ , which leads to a rightward move in both locii. Assuming a once-for-all shock in both cases, the price level is higher ($P^{**} - P^*$) and total stock of both monetary and non-monetary gold is lower.

Table 1: Bank Restriction Acts of Parliament.

Act of Parliament and Date of Ascent	Continuation	
Act 37, Geo. III, c.45, 3rd May 1797	until 24th June 1797	OP.3.03 138
Act 37, Geo. III, c.91, 22nd June 1797	until one month after the commencement of the next session of Parliament	OP.3.03 138
Act 38, Geo. III, c.1, 30th November 1797	until one month after the conclusion of the present war by a definitive Treaty of Peace	OP.3.03 140
Act 42, Geo. III, c.40, 30th April 1802	until 1st March 1803	OP.3.03 146
Act 43, Geo. III, c.18, 28th February 1803	until six weeks after the commencement of the next session of Parliament	OP.3.03 138
Act 44, Geo. III, c.1, 15th December 1803	until six months after the ratification of a definitive Treaty of Peace	OP.3.03 138
Act 54, Geo. III, c.99, 18th July 1814	until 25th March 1815	OP.3.03 179
Act 55, Geo. III, c.28, 23rd March 1815	until 5th July 1815 but highly desirable to return as soon as possible	OP.3.03 182
Act 56, Geo. III, c.40, 21st May 1816	until 5th July 1818	OP.3.03 186
Act 58, Geo. III, c.37, 28th May 1818	until 5th July 1819, unforeseen circumstances rendered expedient continuation	OP.3.03 190
Act 59, Geo III, c.49; 2nd July 1819	until 1st May 1823, but to allow for gradual resumption and exportation of gold and silver	OP.3.03 193
Act 1 and 2, Geo. IV, c.26, 7th May 1821	until 1st May 1823 but to allow for gradual resumption and exportation of gold and silver	OP.3.03 199

Figures

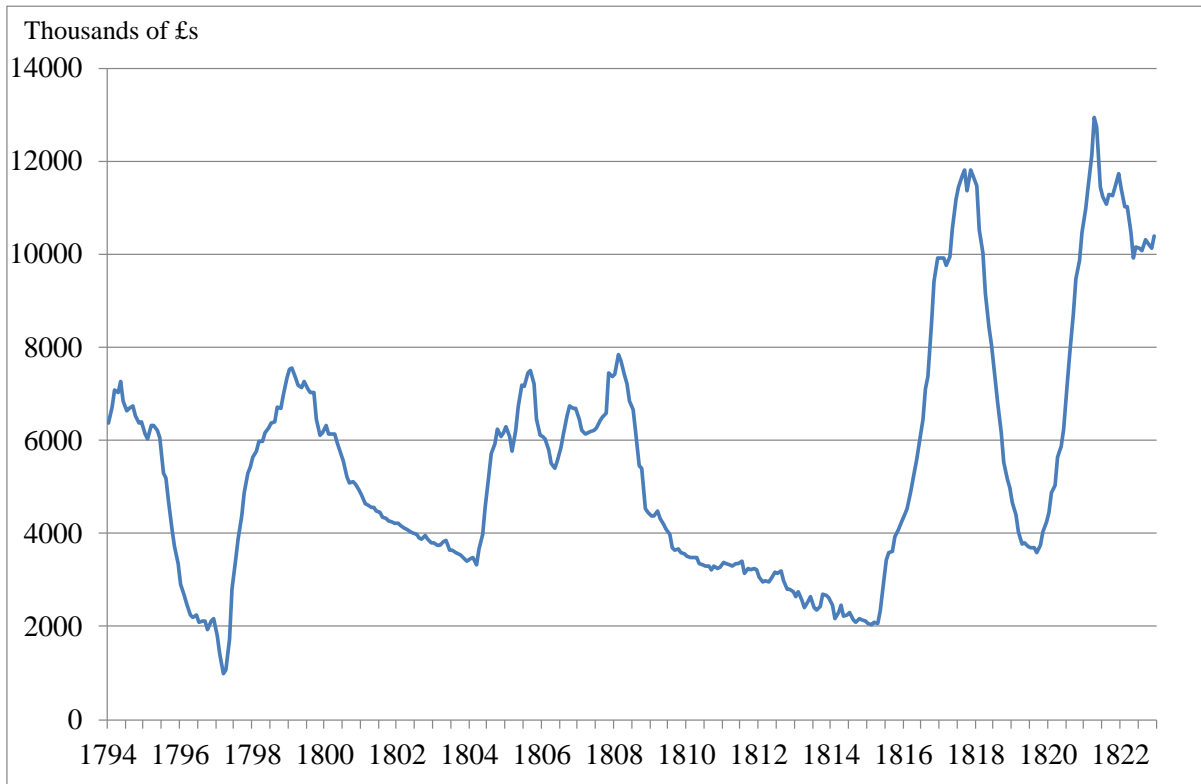


Figure 1: The Bullion Reserve of the Bank of England, monthly, in thousands of £s, Gayer et al. (1953) table 153.

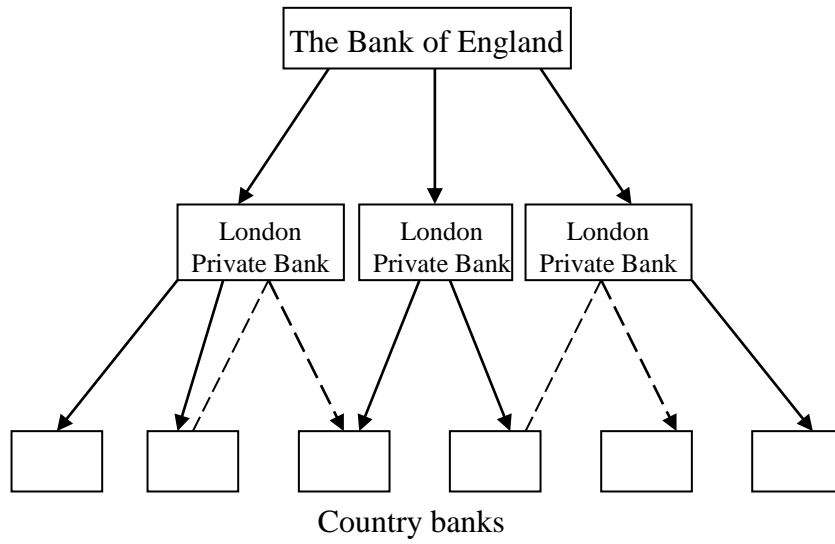


Figure 2: Credit Pyramid in the Eighteenth Century

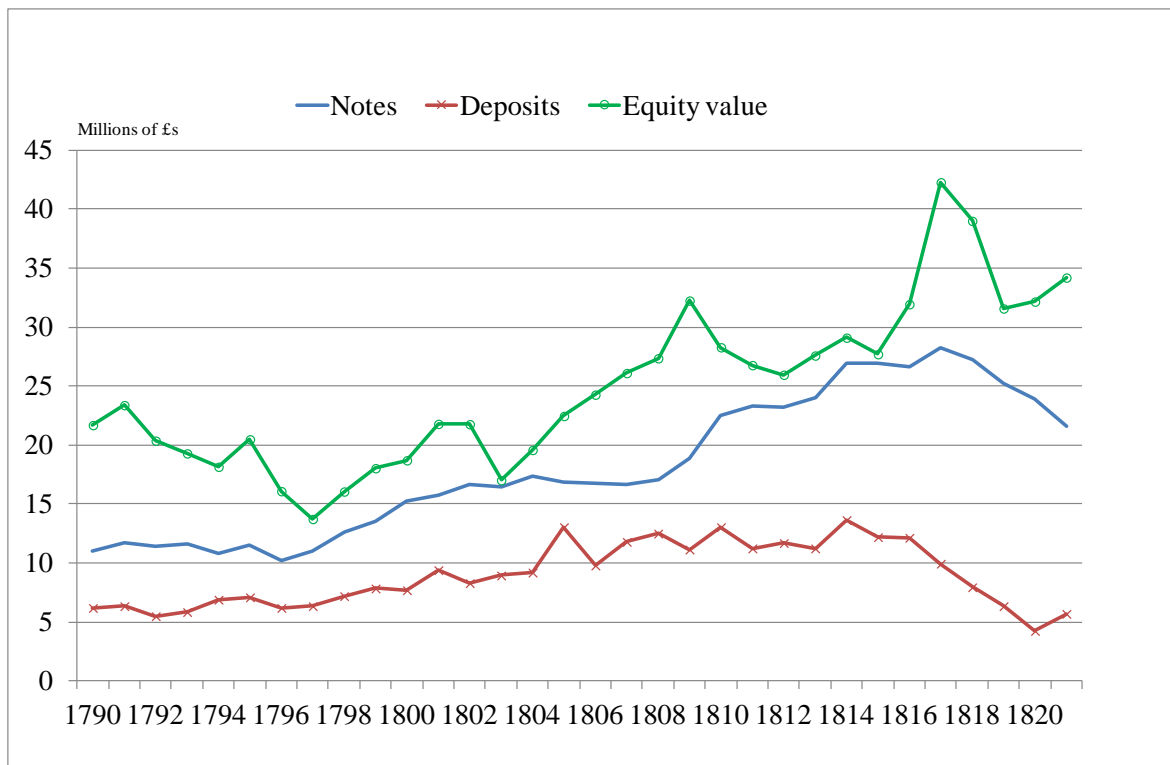


Figure 3: The Bank of England liabilities, in millions of £s, Gayer et al. (1953) tables 138 and 144, and Shea (2007).

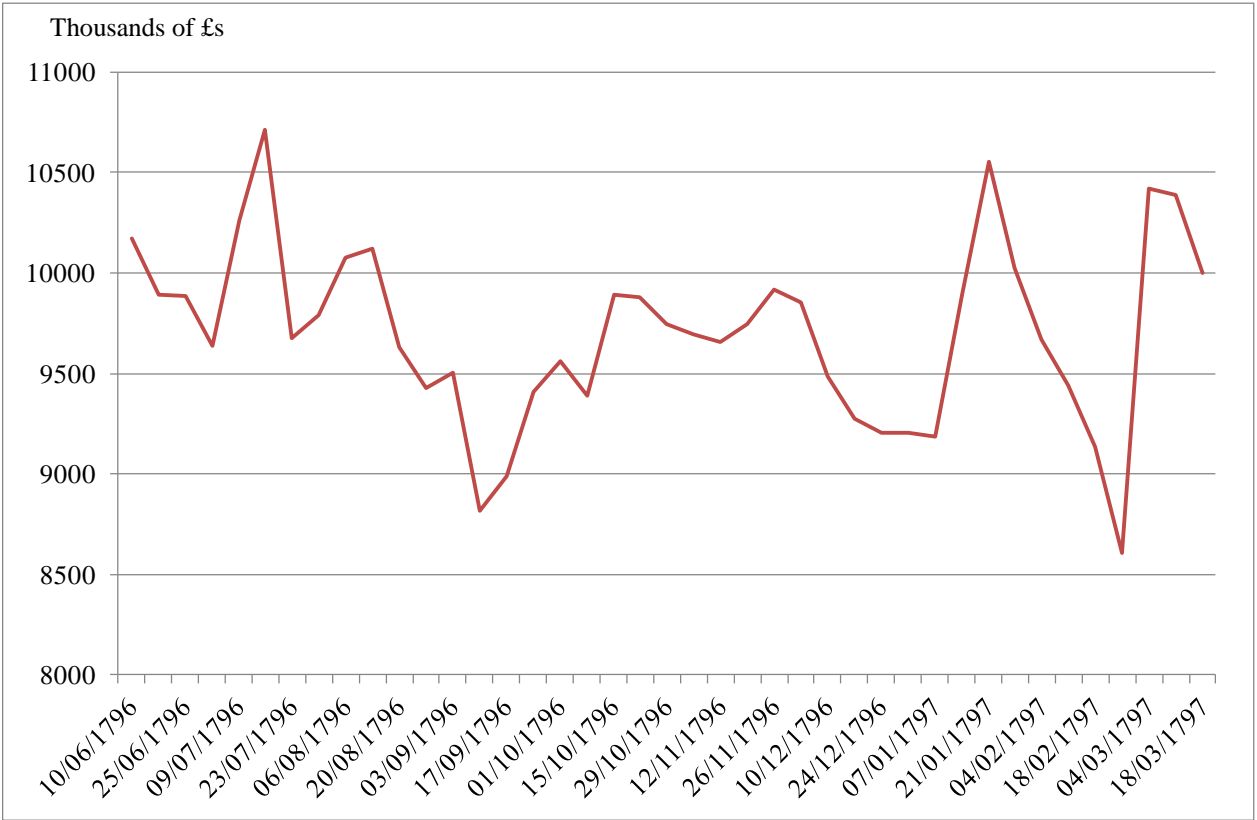


Figure 4: The Bank of England's Notes in Circulation from 10 June 1796-18 March 1797, weekly, in thousands of £s. Recorded at the Appendix of the Third Report of the Committee on Secrecy, 1797.

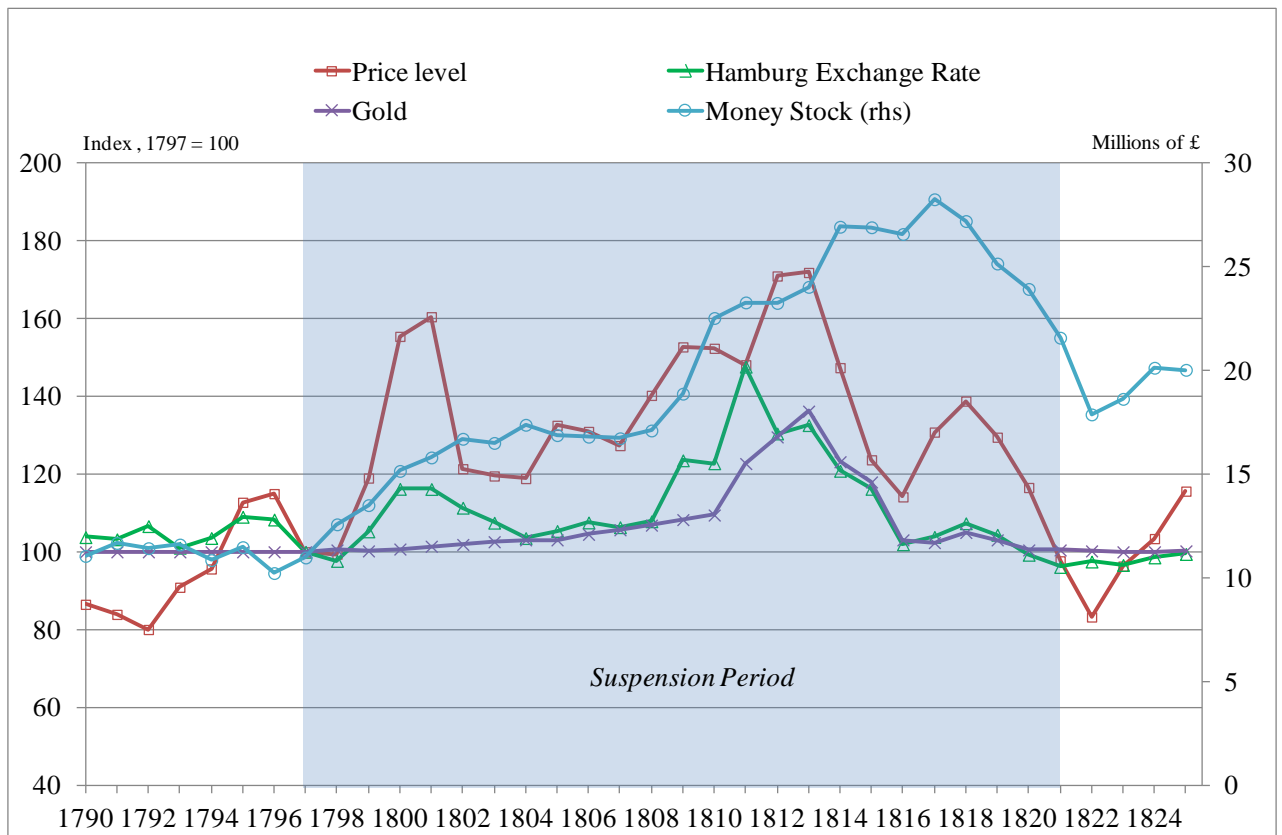


Figure 5: Nominal Variables during the Suspension, annually. Sources: Gayer, et al. (1957) and Officer, L.H. (2006) 'The Price of Gold, 1257-2005' MeasuringWorth.com.

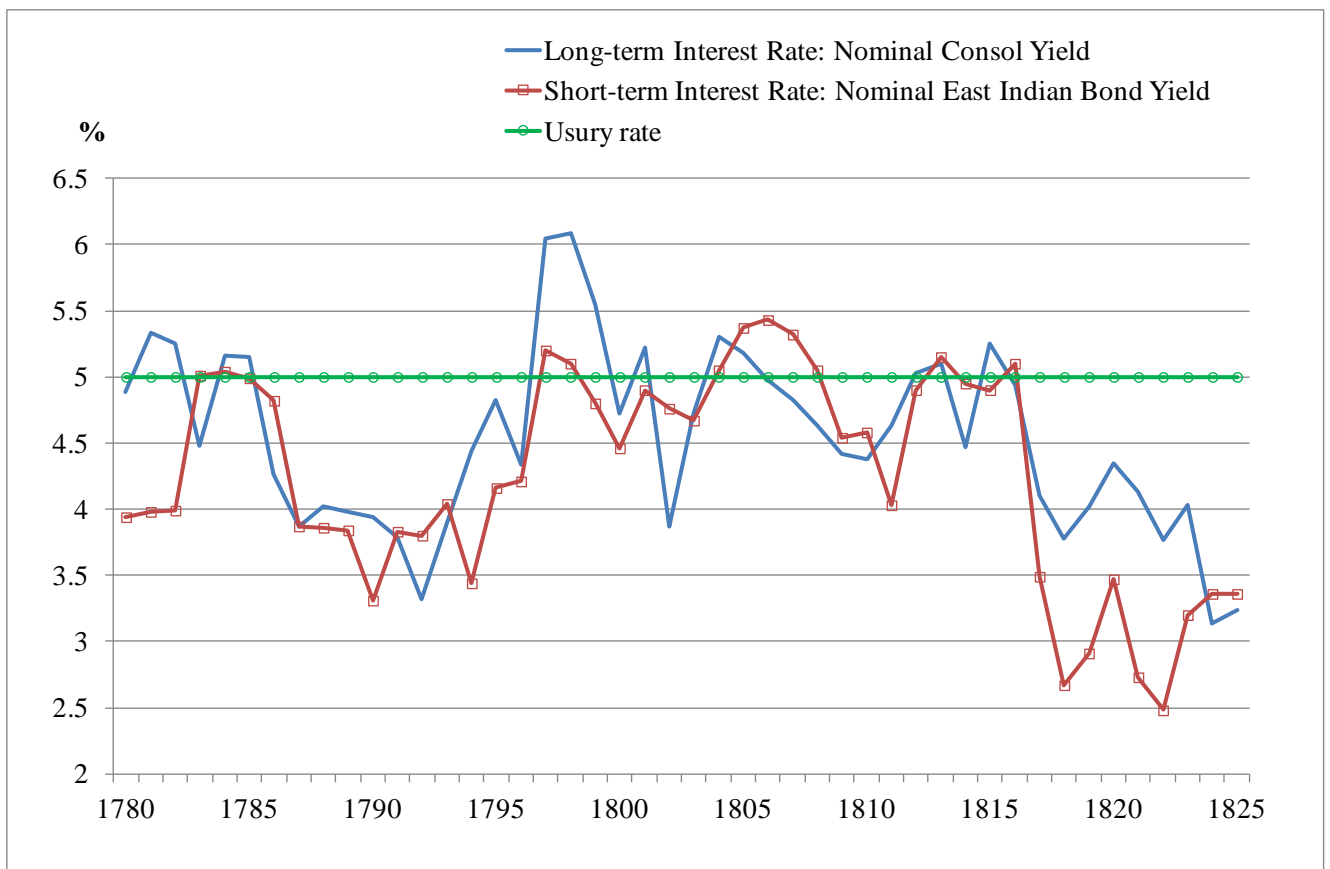


Figure 6: Short and long-term interest rates, Gayer et al. (1953) and Heim and Mirowski (1987).

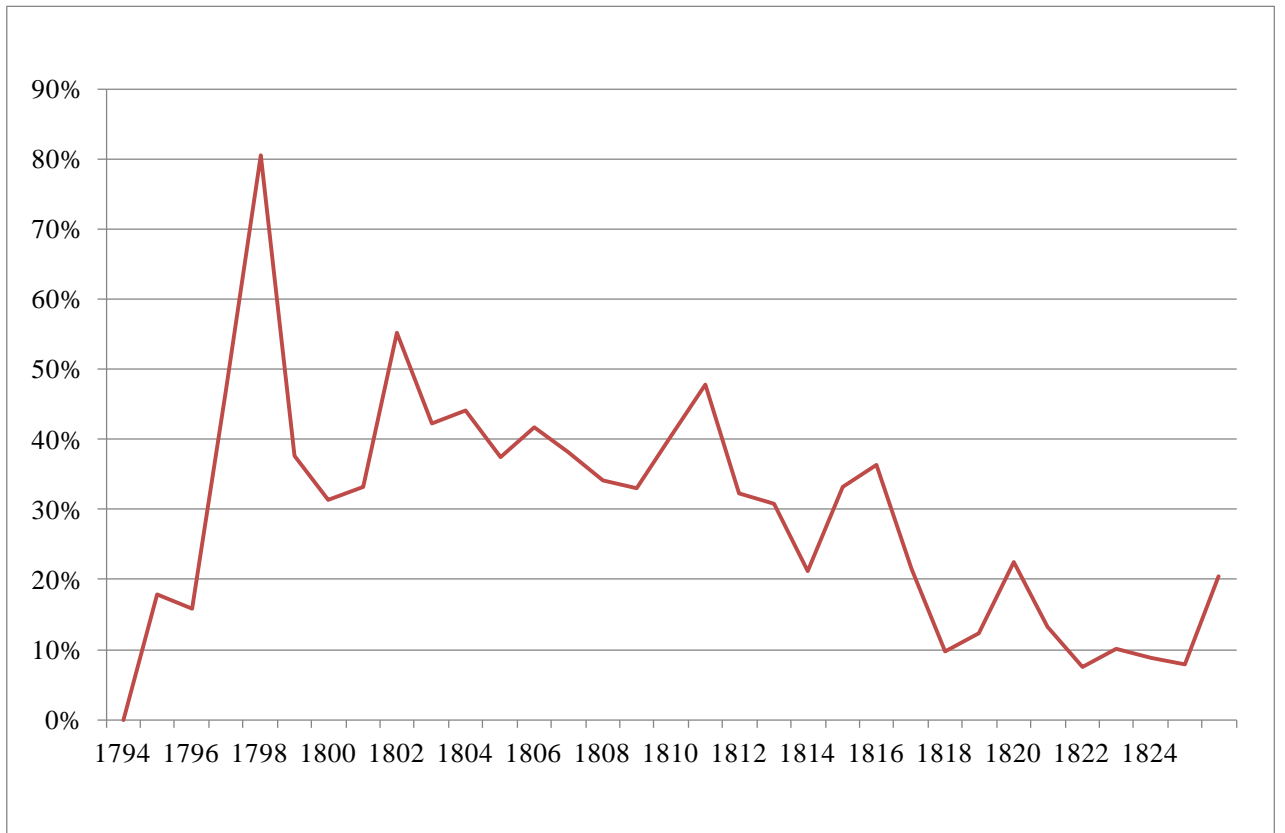


Figure 7: Ratio of the Bank's unfunded debt holdings to the total unfunded debt, Gayer et al. (1953), tables 157 and 231.

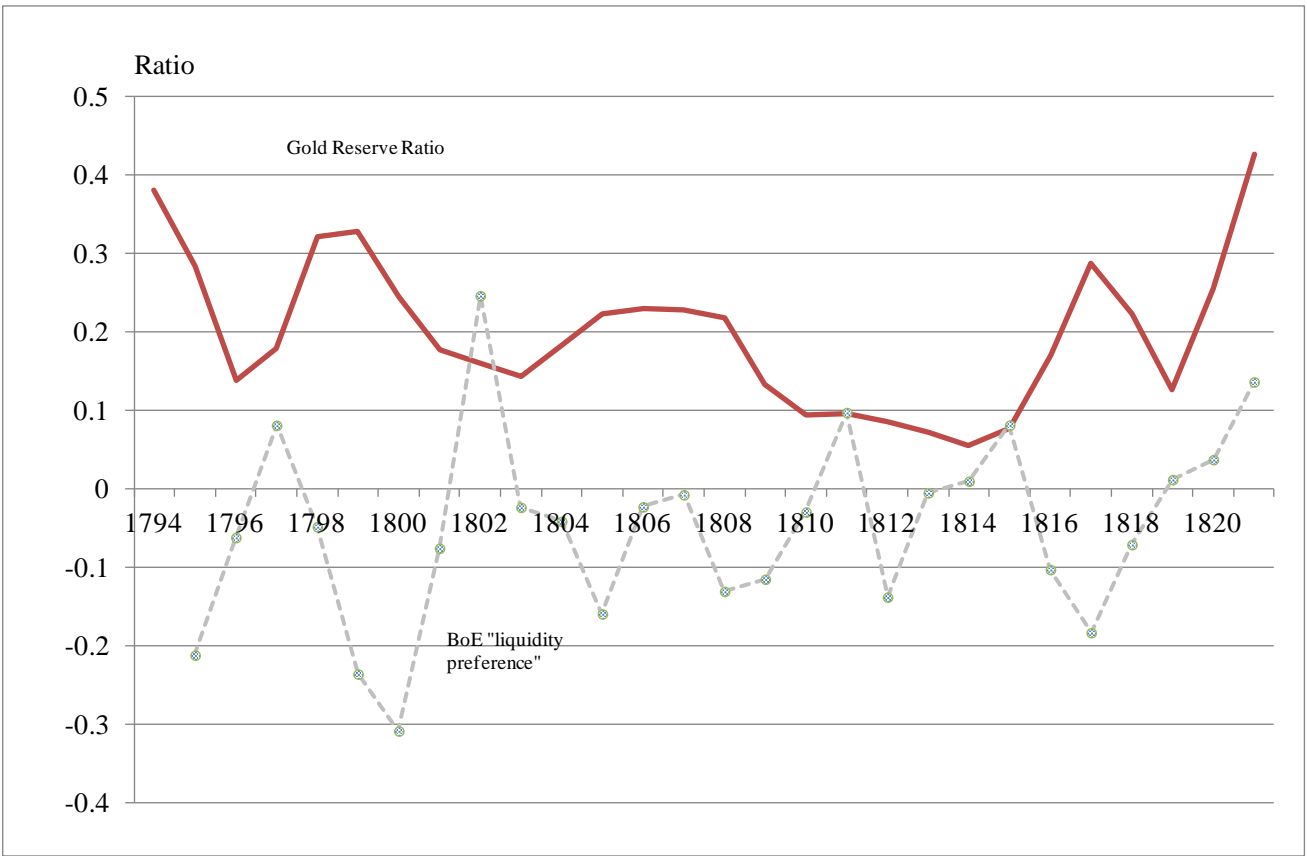


Figure 8: Ratio of the Bank's unfunded debt holdings to the total unfunded debt, Gayer et al. (1953), tables 157 and 231.

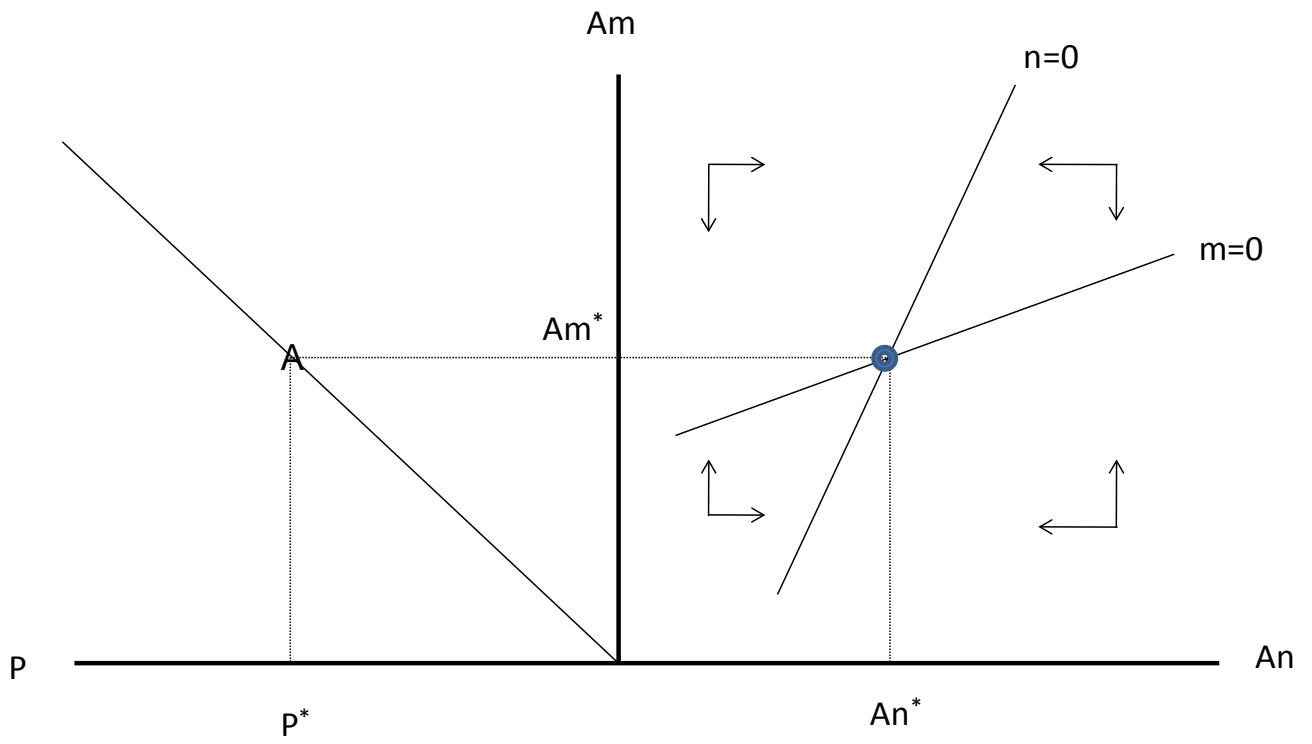


Figure 9: Steady state.

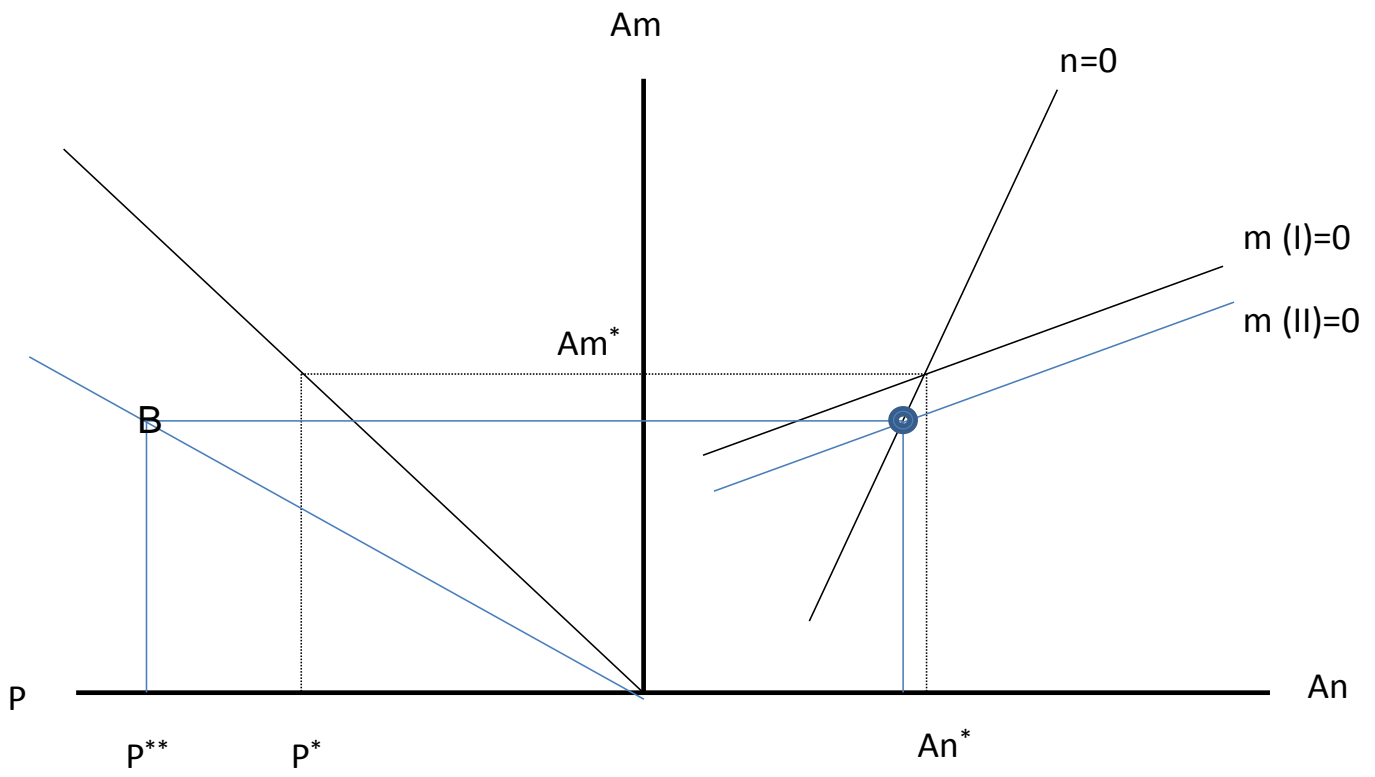


Figure 10: Outflow of Monetary Gold

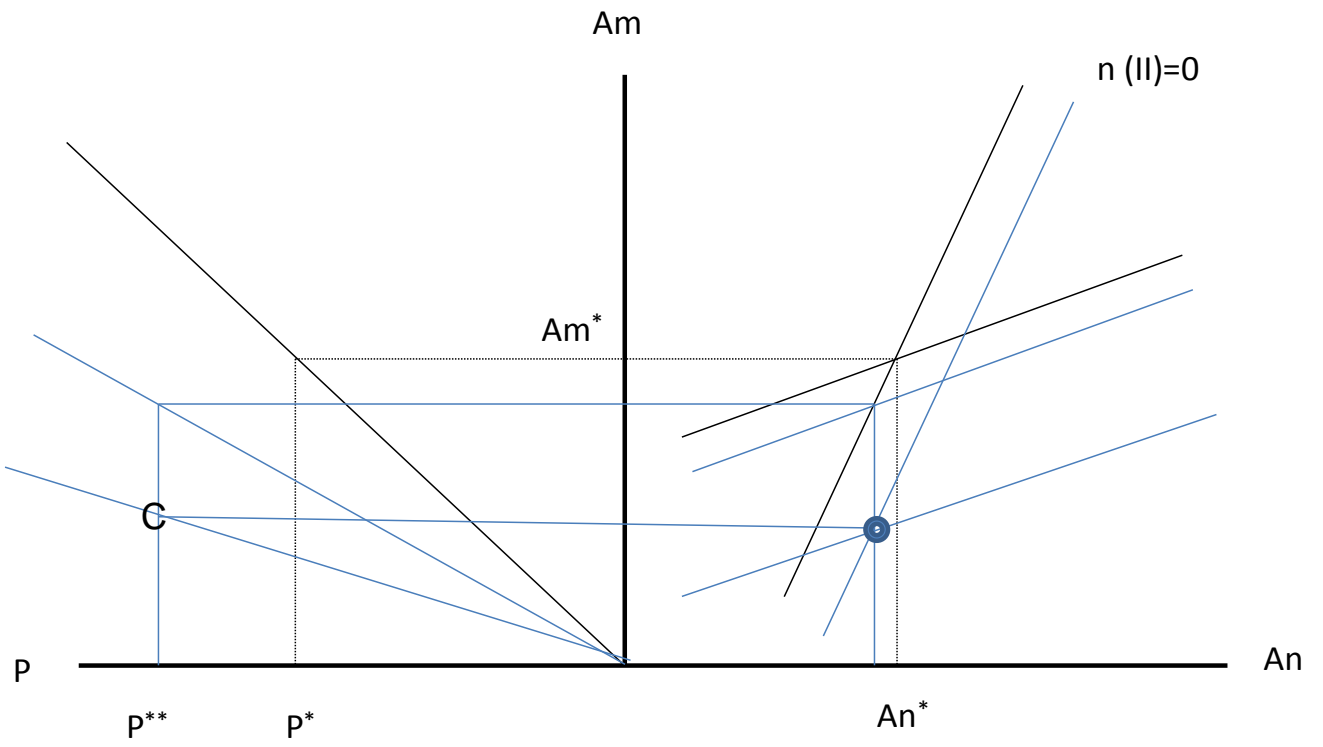


Figure 11: Bad Harvests and Reduction of Gold Backing.

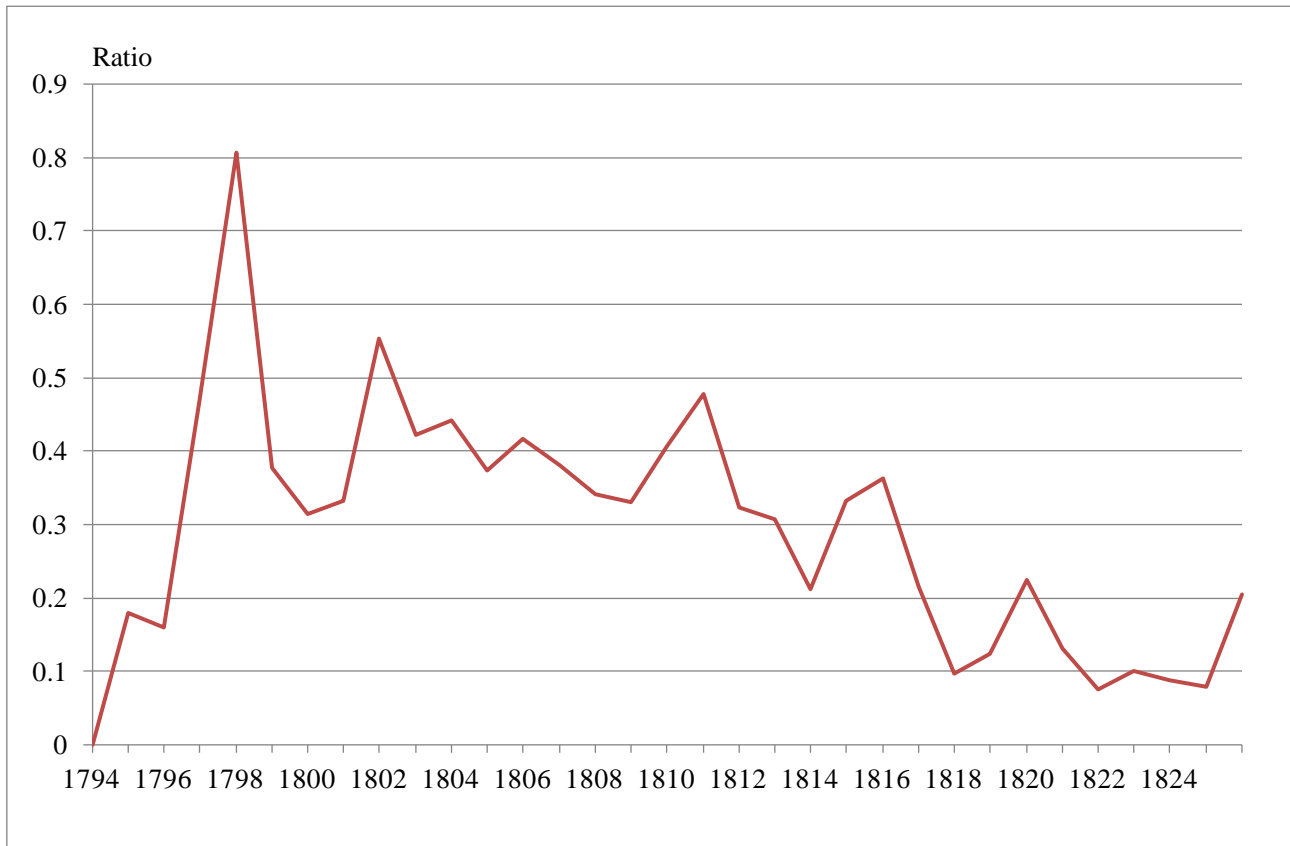


Figure 12: Ratio of Notes to Deposits at the Bank of England

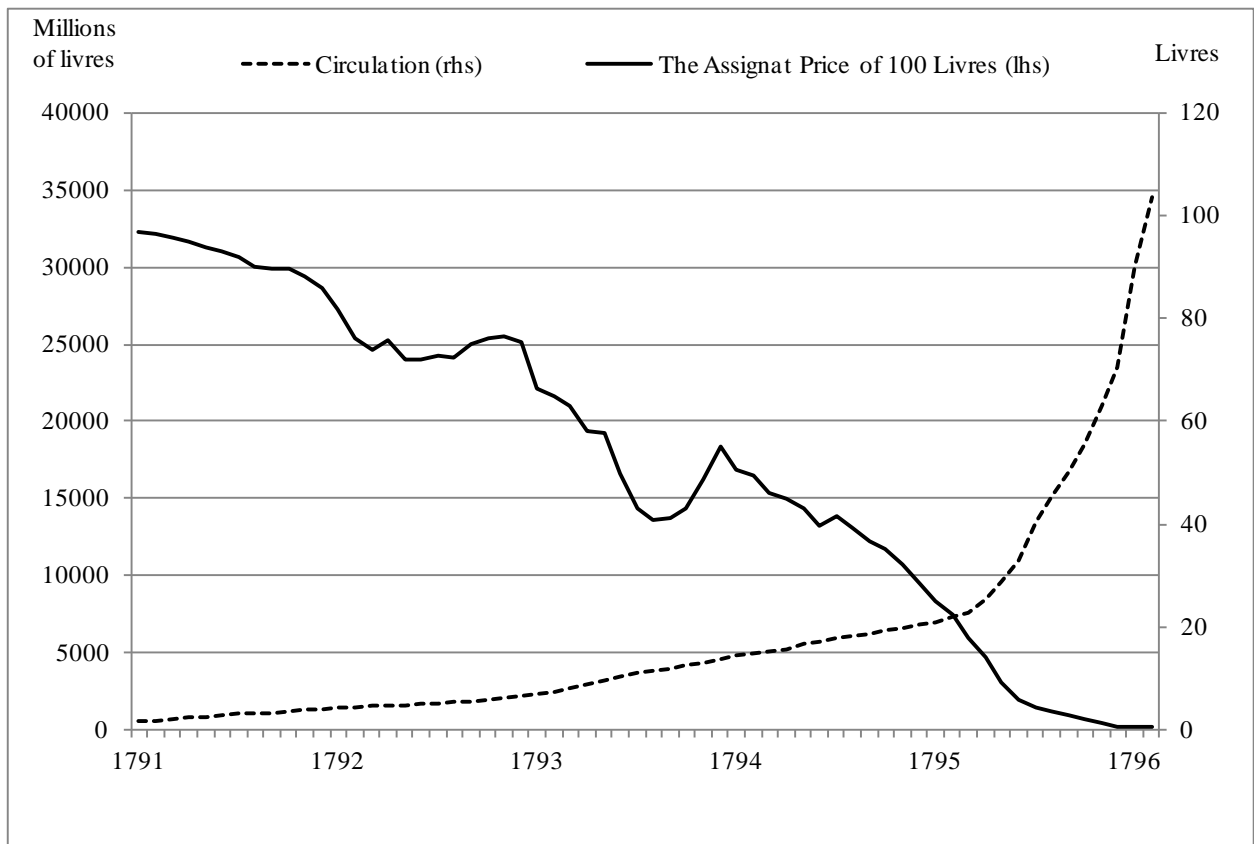


Figure 13: Circulation (right axis) and depreciation (left axis) of assignats Aubin (2008) Tables A1 and A2.

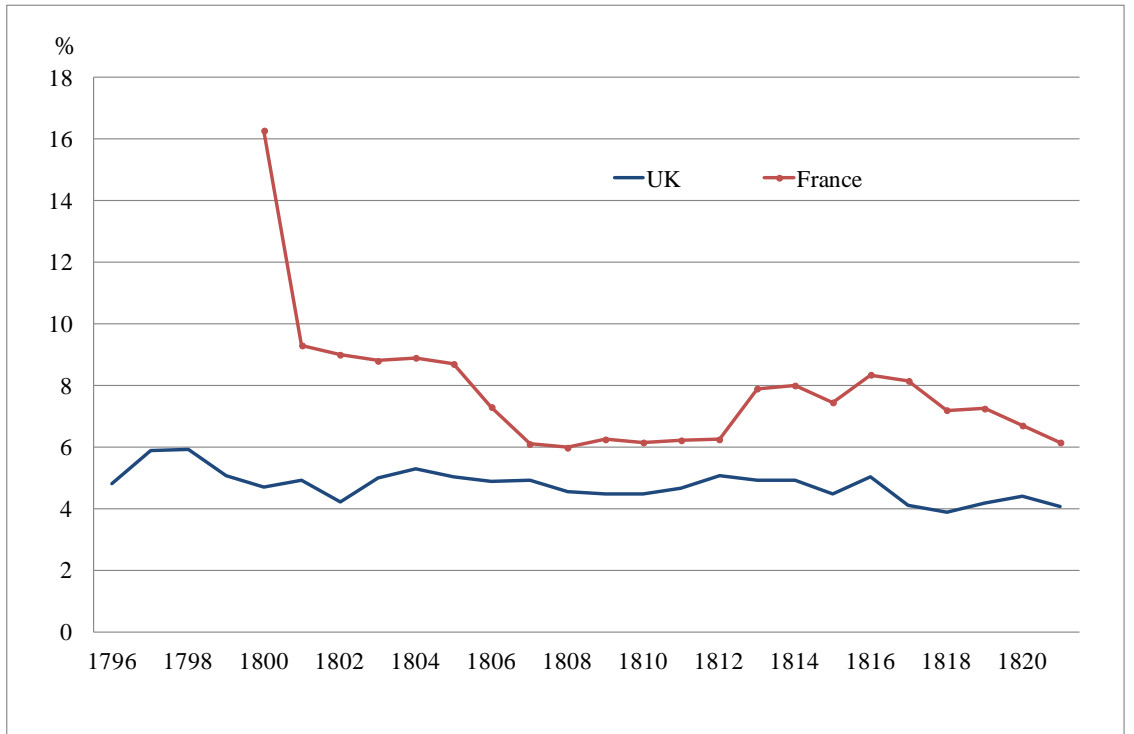


Figure 14: Long-term Interest Rate in France and England, annually.

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