

Sovereign Debt Sustainability, Financial Repression, and Monetary Innovation: Britain and Currency Black Markets in the mid-20th century

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Declaration

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Garrick Hileman
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Abstract: The 1940s were the last time sovereign debt levels for many advanced economies were comparable to recent times. Following the Second World War the United Kingdom is viewed as having achieved the highest public debt to income ratio while still avoiding default of any country in last three centuries. However, previous research on the UK during this period has largely overlooked British post-war debt sustainability and the role played by financial repression.

This thesis presents a conceptual framework of the mechanisms for achieving sovereign debt sustainability, along with their resultant political economy trade-offs. The conventional historical view that the UK avoided default on its sovereign financial agreements following the Second World War is re-examined and Britain is found to have ‘partially defaulted’ in the years following the Second World War. This thesis provides a historical narrative of the intellectual origins and policies of modern financial repression in Britain and presents alternative qualitative and quantitative measurements of financial repression.

Monetary innovation accompanied 1930s-40s financial regulation, particularly the development of sophisticated currency black markets in New York and Switzerland. Statistical analysis of new daily time series data from these markets provides a quantitative market perspective on historical turning points during the 1940s. A currency taxonomy and discussion of the causes behind the rise and decline of alternative currencies is presented. While alternative currencies also featured during the 1940s they were arguably less numerous and less innovative than during the Great Depression period.

The British case ultimately illustrates the complex dynamics and trade-offs of sovereign debt sustainability vis-à-vis other competing policy objectives, such as a desire for open markets and economic growth, financial stability, and geopolitical priorities.

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1 Introduction

1.1 Topic and time period motivation

Sovereign debt, financial regulation, and monetary innovation are three distinct yet intertwined topics that have recently become relevant to policymakers and practitioners who are seeking a better understanding of current events, such as the Eurozone debt crisis, the regulatory response to the 2008 financial crisis, negative real and nominal interest rates, and the introduction and use of new currencies. This thesis contributes to enhancing both our knowledge of these distinct topics while also highlighting the interplay between them.

While the topics explored in this thesis are contemporary, this thesis is a work of economic history. The time and place under study here is the United Kingdom during the mid-20th century, which provides an attractive case study. Following the end of the Second World War Britain achieved the highest public debt to income ratio of any country in last three centuries. At the same time, the UK, according to some scholars, managed to avoid defaulting on its sovereign debt during the post-Second World War period.¹

Sovereign debt problems in recent decades have been confined to emerging markets. Indeed, prior to the restructuring of Greek public debt in 2012 the last time an advanced economy defaulted was shortly after the Second World War when Germany defaulted on its sovereign debt in the early 1950s.² However, today many advanced economies are either already or on the verge of a sovereign debt crisis. Here an important distinction should be noted between sovereign debt *reduction*, or how to pay-down or pay-off the nominal public debt, over sovereign debt *sustainability*, which is defined simply as maintaining any given level of public debt without triggering a sovereign debt crisis.

¹ (Carmen M. Reinhart & Rogoff, 2009)

² (Ritschl, 2012)

The topic of sovereign debt and default has been studied extensively. However, the ongoing problems suggest that our understanding of sovereign debt dynamics, particularly for advanced countries, remains limited. Much of the sovereign debt literature of the last several decades examined debt sustainability from an emerging market perspective. However, in marked contrast with many of today's developed countries, many developing countries in recent years have achieved comparatively low debt-to-income levels while stockpiling significant reserves. This thesis is motivated to revisit the last period when advanced economies struggled with sustaining large public debts.

The period of the 1940s continues to hold relevance today for several reasons. Many of the institutions and frameworks developed during this decade remain important to the functioning of today's global economic and financial system. True, the Bretton Woods system, GATT, and other institutions have evolved, been modified, or replaced. However, much of the international framework established in the 1940s remains the *status quo*. For example, the 1940s heralded the end of a monetary system featuring two reserve currencies, British sterling and the U.S. dollar, to one where the the U.S. dollar achieved (and still retains) primacy. However, some scholars argue that by the year 2020 we will have shifted to a multi-polar world where the dollar reserves are more balanced against the euro and the Chinese renminbi.³ Revisiting the 1940s provides a window into the last reserve currency transition period and the impact on economic events.

Financial policies promoted by advanced countries since the 1970s-80s, often referred to as the 'Washington consensus', included deregulated markets and free-flowing capital. However, as the case for capital controls and other macroprudential measures associated with financial repression have come back into favour at the IMF and other institutions it is useful to revisit the post-Second World War period, which was the last time restrictions on capital account flows were widely implemented in advanced economies.⁴ In addition, there is renewed interest in how we should define and measure the impact of

³ (B. J. Eichengreen, 2011)

⁴ (Arora, Habermeier, Ostry, & Weeks-Brown, 2013)

financial repression, and a disagreement in the literature has emerged over whether today we are witnessing a return of financial repression in advanced economies. This thesis critiques both recently developed and past methods for measuring financial repression and proposes complimentary approaches that will provide a clearer understanding of this topic.

One important side effect of 1940s financial repression and regulation was widespread *monetary innovation*. The definition of monetary innovation used in this thesis is expanded to encompass both the definition presented by Sylla (1982) of the “development of new forms money” and the *innovative use of pre-existing forms of money and currency*.⁵ This thesis examines 1940s currency black markets, where national currencies such as British sterling were exchanged in New York, Switzerland, and other markets in spite of legal prohibitions and the coordinated efforts of policymakers on both sides of the Atlantic. The 1940s were also a period of fixed exchange rates, and the exchange of national currencies on black markets often occurred at a significant premium or discount to their official (legal) exchange rates.

Following the 2008 financial crisis and subsequent Eurozone crisis we have seen capital controls introduced in countries such as Iceland and Cyprus, while other countries such as China and Argentina have maintained significant restrictions on the use of domestic and international currencies. At the same time new technological advances have made possible the world’s first decentralized alternative currencies. Based on these and other factors, today we appear to be witnessing another period of significant monetary innovation. The 1940s was arguably the last period of significant monetary innovation, and it may be useful to revisit this period for historical insights and perspective on contemporary developments.

During the 1940s currency black markets proliferated in a number of financial centres around the world. This development represented a significant departure from the type of

⁵ (Sylla, 1982, p. 21)

monetary innovation seen in the 1930s. During the Great Depression there was a dramatic rise in the use of new and innovative alternative currencies, such as scrip currencies issued by local towns and organizations featuring *demurrage* (e.g., the Austrian Freigeld).⁶ In the 1940s alternative currencies, such as cigarettes and other types of commodity money, continued to be used.⁷ However, in contrast to the 1930s, there was nothing particularly innovative about 1940s commodity-based alternative currencies. Further, their financial and macroeconomic impact appears to be rather insignificant in comparison to 1940s currency black markets. The 1940s currency black markets were closely monitored by central bankers and other policymakers, and they appear to have played an important role in events such as sterling's 1949 devaluation. In sum, it is useful to revisit the 1940s to better understand the forces that drive and shape monetary innovation, particularly the relationship between monetary innovation and financial regulation.

1.2 Literature motivation

A substantial and authoritative body of scholarly work exists on British economic, financial, and political history for the period surrounding the Second World War. Given this literature a reasonable question to ask is whether another study of this period can contribute anything that materially advances our understanding of mid-20th century British economic history? However, a review of the literature points to several significant gaps. Prior to Reinhart and Sbrancia (2011) the role of financial repression in British debt sustainability in the post-Second World War period received little or inconsistent attention.⁸ There is also an absence of scholarship on the topic of British debt sustainability in the post-Second World War period, and 1940s currency black markets have received limited mention in the literature. There are several possible explanations for these omissions. First, much of the previous scholarship was performed prior to the development of modern techniques for assessing debt sustainability, including commonly used measures such as the ratio of public

⁶ (Schwarz, 1951)

⁷ (Bignon, 2009) Bignon studied cigarette currency, which were used throughout Germany following the Second World War until German monetary reform in June 1948.

⁸ (C. M. Reinhart & Sbrancia, 2011)

debt to gross domestic product (debt-to-GDP ratio).⁹ Second, until recently the study of financial repression was largely confined to emerging markets. Indeed, prior to Reinhart and Sbrancia there had been very little to no prior discussion in the literature of the role played by financial repression on public debts in the latter-half of the 20th century in advanced countries.¹⁰ Third, post-Second World War Britain has also generally been viewed as having successfully avoided default on its large public debt through a combination of economic growth and inflation.¹¹ However, a review of the historical evidence indicates other debt sustainability mechanisms, such as financial repression and financial aid, were also at work in Britain. Rather than completely avoiding a default on its sovereign obligations, the UK in fact 'partially defaulted' multiple times following the war. Finally, new archival data on 1940s currency black markets has been obtained and indicate that these markets were more important in events such as the 1949 devaluation of sterling than previously believed.

One of the strengths of the existing literature is that much of it was written by individuals who could provide first-hand accounts of the events, data, and personalities that shaped this period. One exemplar is Sir Alec Cairncross's recounting of various internal policy discussions on topics like sterling's 1949 devaluation. Cairncross' *Years of Recovery* (1985) is generally considered as the definitive scholarship on the immediate post-Second World War period. Along with Cairncross, Sir Richard Clark, Worswick and Ady, Dow, Robbins, and Gardner occupied various roles inside government. Their inside accounts have brought to light many important facts that would otherwise gone unrecorded by the non-observer/non-participant historian. However, 'official' histories and research conducted by participants raises concerns around arms-length objectivity.¹² For example, one wonders whether part of the explanation for why these participant scholars did not judge Britain as having defaulted

⁹ See for example (Cairncross & Eichengreen, 1983), which does not include any mention of Britain's debt to income ratios in the chapter on sterling's 1949 devaluation.

¹⁰ See for example (De la Torre, Gozzi, & Schmukler, 2007; Easterly, 1993; Galindo, Micco, Ordoñez, Bris, & Repetto, 2002; Goldsmith, 1969; Lanyi & Saracoglu, 1983; McKinnon, 1973; Roubini & Salaimartin, 1992; Shaw, 1973; Todaro & Smith, 2003; World Bank, 1989)

¹¹ (Buiter, 1985)

¹² See for example (Burk, 1989; Clarke & Cairncross, 1982; Dalton, 1962; Dow & National Institute of Economic and Social Research., 1964; Fforde, 1992; Robbins, 1947; Sayers, 1968, 1976; Worswick & Ady, 1952, 1964)

on the Anglo-American Financial Agreement is because many of these individuals were a part of the policy apparatus.

Much of the existing economic and historical literature that focuses on the 1945-51 period, such as Worswick and Ady (1952) and Dow (1964), was written not very long after this period and prior to the public release of certain archival materials. For example, the Bank of England typically releases archival files to the public from the final date in the file series, meaning the year 2000 may be the earliest a confidential data file that covers the period of 1945-1970 may be released.¹³ One relevant example is the subject of hidden bank reserves; the Bank of England allowed London banks to keep some reserves off-balance sheet and hidden from economic historical analysis until Capie (2010).¹⁴ Accurate reserve data is helpful for understanding the impact of financial repression, including how the mix of assets held by banks may have been impacted by the policies associated with financial repression.¹⁵

Thirty years have now passed since Cairncross published *Years of Recovery* in 1985, which is the last major work of scholarship focussed on 1945-51. Since then there have been advances in economic history methods, such as the development contemporary measures of debt sustainability, understanding the impact of growth and interest rates on debt sustainability, financial repression, and the aforementioned public debt-to-GDP ratio. This fact likely explains the absence of these measures in *Years of Recovery*. Cairncross and his contemporaries primarily viewed the key post-war British economic challenges from a balance of payments perspective but provide very little to no discussion of Britain's debt overhang from the war.¹⁶ Surprisingly, there is not a single table showing UK public debt data

¹³ British rules governing how long government materials must be delayed before release to the archives continues to evolve. The previous rule was effectively 60 years, which has been updated to 30 years at present. However, in the case of the Bank of England some files are still protected for 50 and even 100 years.

¹⁴ (Capie, 2010; Dow & National Institute of Economic and Social Research., 1964; Worswick & Ady, 1964)

¹⁵ (Brock, 1989) For example, inaccuracies in bank balance sheet data utilized by (Cipolla, 1956; Worswick & Ady, 1952, pp. 210-211, Tables 1 and 2) may have resulted in inaccurate research conclusions.

¹⁶ (Dow & National Institute of Economic and Social Research., 1964, p. 9)

in Cairncross' collected works, which is a rather significant omission given Britain's record-setting debt burden.

A reoccurring theme expressed in the literature that frustrated many who studied this period is both the imprecision or lack of data available for analysis, along with the major revisions that occurred in economics statistics. Cairncross (1985) noted that:

“even now we do not have the details necessary for a consistent picture of the different elements in the balance of payments. It is necessary to piece things together from figures of different vintages and reliability”.¹⁷

For example, Britain's 1947 capital drain was originally calculated the following year at £349 million, or approximately half of the actual figure of £643 million that was later reported.¹⁸ A further example is Britain's current account deficit in 1947, which was originally estimated at £350 million, later reported to have increased to £675 million, and has since been revised downward to £381 million (much closer to the original estimate) due to improvement in 'invisibles'.¹⁹ It is also worth noting that a number of figures cited in the literature are often perfectly round numbers, which are expressed without the usual 'approximately' or other reservations when rough estimates are given. For example, Dow (1962) states that the cost of rubber tripled, wool and cotton doubled, and numerous other commodities went up in price by 50%.²⁰ Cairncross (1985) states that inflation during Second World War increased by 50%.²¹ A lack of precision with inflation figures can have a significant impact on assessing financial repression and debt liquidation.

Specific to financial repression, much of the historical literature appears to suffer from a blind spot for the subject. For example, Skidelsky states:

¹⁷ (Cairncross, 1985, p. xii, 26) Cairncross references concerns about the Central Statistical Office (CSO) revising stats and originally reported data.

¹⁸ (Cairncross, 1985, pp. 153-154)

¹⁹ (Cairncross, 1985, p. 153)

²⁰ (Dow & National Institute of Economic and Social Research., 1964, p. 55)

²¹ (Cairncross, 1985, p. 14)

“Compulsory savings...restricted working-class consumption without robbing workers of the rewards of greater effort” and the program “drastically restricted the consumption of the wealthy without imposing penal, disincentive tax rates”.²²

Skidelsky’s interpretation here completely overlooks the effects of inflation on compulsory savings. In addition, Cairncross discusses the low levels of post-war personal savings but does not explain why levels could be low other than pent-up demand from the war and post-war restrictions.²³ Worswick and Ady (1952) arguably come closest to describing certain aspects of financial repression. However, their view that the “history of the national debt over the next few years is, in the main, the history of nationalization” completely overlooks the effects of inflation on the real value of public debt.²⁴

While the literature does cover changes in real wages there is only a limited discussion, and very little analysis, of who were financial repressions’ winners and losers. Tax policy is only covered briefly in the literature. Beyond period derogatory mentions of the ‘*rentier*’ not enough information on the institutions and individuals who held British public debt and savings is presented to assess who was impacted by low or negative real interest rates. For example, when Dow (1962) notes the increase in the dividends tax from 5% to 12.5%, he doesn’t link this development with financial repression by noting that such a tax hike made Britain’s sovereign debt more attractive from an investment perspective vis-à-vis equities.²⁵

The existing literature could also perhaps be criticized for a failure of imagination. For example, in the justifications for financial controls, Cairncross (1985) does not include the repayment of debt as one of the possible purposes.²⁶ In his unpublished memo on the convertibility crisis, Sir Hugh Ellis Rees (1962) states there was never a chance of successfully

²² (Skidelsky, 2000, p. 55)

²³ (Cairncross, 1985, p. 37)

²⁴ (Worswick & Ady, 1952, p. 202)

²⁵ (Dow & National Institute of Economic and Social Research., 1964, pp. 27-28)

²⁶ (Cairncross, 1985, p. 302)

making sterling convertible.²⁷ What the literature fails to consider is whether sterling could have been successfully made convertible if sterling's exchange rate had been further reduced. Similarly, there is consistent mention of a "dollar shortage" problem.²⁸ However, the so-called dollar shortage problem could also be recast as a problem of overvalued sterling, which the literature fails to mention.

Numerous inaccuracies and incomplete interpretations are also found in the literature. For example, Cairncross states "for many years to come, an enormous weight of *liquid* liabilities overhung the balance of payments, threatening a flight from the pound, *limiting the freedom of action of the government*" (emphasis added).²⁹ However, given capital controls and other restrictions, characterizing Britain's liabilities in 1945-51 as 'liquid' is inaccurate. Other points made by Cairncross are poorly supported by facts, such as his claim that, following the Second World War, London suffered a catastrophic blow to its position as an international banking capital.³⁰ Cairncross was also incorrect when he stated that there were no cancellations, or forgiveness, of the Sterling Balances (British Second World War debt owed to Commonwealth countries).³¹ He also claims that sterling's devaluation didn't result in inflation, but this argument is unconvincing; Cairncross' own data and charts show that, following the 1949 devaluation, there was in fact a significant increase in inflation in 1951.³² The implications of British policies on other countries are also often given limited attention.³³

A further justification for re-examining this period is the perennial debate over the causes of Britain's relative economic underperformance following Second World War.³⁴ For

²⁷ (Cairncross, 1985, Ch. 6; Ellis Rees, 1962)

²⁸ (Cairncross, 1985, pp. 68-69)

²⁹ (Cairncross, 1985, p. 8) devaluation is an idea rarely considered in the literature, perhaps due in part to the dislike for the idea of devaluation expressed by Keynes at certain times.

³⁰ (Cairncross, 1985, p. 8)

³¹ (Cairncross, 1985, p. 119) Australia and New Zealand both cancelled balances. See (Pressnell 1986, p. 366)

³² (Cairncross, 1985, p. 211) See (Cairncross, 1985, p. 40) for table on inflation.

³³ There are less prominently cited histories covering the colonies, for example (Krozewski, 2001)

³⁴ See for example (Coates, 1994; Crafts, 1993; Dornbusch & Layard, 1987; Elbaum & Lazonick, 1986; Middleton, 2000)

example, Crafts (1993) argues that British post-war economic policy was beneficial in the short-term but detrimental longer-term.³⁵ However, none of the research on Britain's relative underperformance includes Britain's debt overhang. One of the contributions of this thesis is to provide a debt sustainability and financial repression perspective to the ongoing and still very important debate over why Britain's economy lagged during the 'Golden Age of Economic Growth'.³⁶

Overall, one is struck in reviewing the literature on this period by how none of the economic histories by Cairncross, Sayers, Worswick and Ady, Pollard, or Dow expressed Britain's debt position using current methods of analysis, such as comparing the country's growth and interest rates, or expressing public debt in relation to national income.³⁷ This ratio was already being used by prominent economics scholars based in Britain who were researching Britain's fiscal history at the time of Cairncross's account, which was published in 1985.³⁸ According to Buiters's (1985) "not quite exact" arithmetic (he does not describe his calculation method), from 1948-84 government deficits were in line with real income growth, meaning that the reduction in Britain's debt-to-income ratio was equal to the effect of inflation.³⁹

As to why Cairncross et al did not employ the debt-to-income ratio in their research several possibilities come to mind. First, Hatton and Chrystal expressed the view in 1991 that "debt/income ratio alone is a poor indicator of the financial solvency of the public sector".⁴⁰ Perhaps the Hatton and Chrystal view was representative at the time. It appears that there may have also been a misunderstanding by previous economic historians of Britain's debt levels. For example, Hatton and Chrystal state that they "do not see cause for alarm" in

³⁵ (Crafts, 1993)

³⁶ (B. Eichengreen, 1996)

³⁷ See for example (Cairncross, 1985; Dow & National Institute of Economic and Social Research., 1964; Pollard, 1962, 1973, 1983, 1992; Sayers, 1956; Worswick & Ady, 1952)

³⁸ (Buiters, 1985, p. 16)

³⁹ It is unclear why Buiters excludes the years 1945-1947 in his analysis, a time period which covers the peak in British public debt-to-GDP.

⁴⁰ (Hatton & Chrystal, 1991, p. 76) The authors, beyond citing Buiters, also offer no explanation of how Britain was able to sustain such debt load follow Second World War.

Britain's post-Second World War level of debt.⁴¹ Another possible explanation for the literature's omission of debt-to-income analysis may be data availability. Both public sector debt and borrowing requirements were not available prior to 1965, although national debt (a narrower measure of government debt than 'public debt') and GDP are included by Hatton and Chrystal and briefly discussed.⁴² Overall, there is a clear justification for revisiting mid-20th century British economic history around with new data and analysis on the topics of debt sustainability, financial repression, and monetary innovation.

1.2 Thesis structure and methods overview

The research topics of this thesis are explored in five chapters (Chapters 2-6) in the following order: Chapter two examines the literature surrounding sovereign debt sustainability and presents a conceptual framework of the mechanisms for achieving sovereign debt sustainability, along with their resultant political economy trade-offs. Chapter three explores the subject of sovereign credit event determination and default by examining the case of British post-Second World War debt sustainability. Chapter four examines the case of British financial repression, offers a critique of existing methods for measuring financial repression, and suggests alternative approaches to measuring and comparing financial repression. Chapter five examines new archival and quantitative data from the 1940s currency black markets and analyses historical turning points from the perspective of these markets. Chapter six surveys the history of alternative currencies, presents a taxonomy of different types of currencies and alternative currencies, and discusses why alternative currencies rise and decline.

Archival source materials, including new quantitative data and narrative accounts, from the Swiss National Bank, New York Federal Reserve Bank, and Bank of England, are referenced throughout the thesis. A statistical structural break test is performed in chapter

⁴¹ (Hatton & Chrystal, 1991, p. 77)

⁴² (Krugman, 1988; Manasse, Roubini, Schimmelpfennig, & International Monetary Fund. Fiscal Affairs, 2003; Carmen M. Reinhart & Rogoff, 2009, pp. 51-67; Sachs, 1983)

five on new currency time series data obtained from archival sources. It is worth noting that mid-20th century British economic history is well trodden research territory. A literature review of British mid-20th century economic history is presented, and a number of gaps and incomplete interpretations are identified. The critical examination and synthesis of the existing literature, along with alternative interpretations, represent one of the contributions made in this thesis. The literature review also informed other contributions, including a currency taxonomy and compositor indicator for comparison of financial repression across nations.

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2 The Seven Mechanisms for Achieving Sovereign Debt Sustainability

Abstract: This paper surveys the literature on sovereign debt and summarizes the political economy trade-offs of the seven distinct mechanisms for achieving sovereign debt sustainability. Two mechanisms for achieving sustainability – financial aid and asset exchange – are often underemphasized or entirely overlooked by economists even though they frequently play an important role in sustaining public debts. These two mechanisms may receive less attention due to prior emphasis on sovereign debt *reduction*, or how to pay-down or pay-off nominal public debts, over sovereign debt *sustainability*, which is defined as maintaining any given level of public debt without triggering a sovereign debt crisis. Examples of each of the different mechanisms for achieving debt sustainability and their respective policy trade-offs are discussed. In the absence of sufficient economic growth, which is the near universally preferred solution to a debt problem, or financial aid, which typically requires international coordination, financial repression is a relatively attractive for policymakers in advanced economies.

JEL: H63, E58, E61, E62, H12, H27, P24

Keywords: sovereign debt, debt sustainability, economic growth, fiscal consolidation, inflation, asset sales, asset exchange, financial aid, financial repression, debt forgiveness, default, repudiation.

2.1 Introduction

The economic harm inflicted by unsustainable levels of sovereign debt, also often referred to as public debt, can include unemployment, lost output, the destruction of wealth, and other undesirable outcomes. This harm, combined with the seeming perennial nature of sovereign debt problems, has made public debt one of the most extensively studied topics in economics.⁴³ In recent years a vigorous debate has emerged over whether high levels of sovereign debt lead to lower economic growth.⁴⁴ While the debate continues over the impact of debt on growth, what is not in dispute is need for further research on public debt.⁴⁵

In the decades prior to the 2010 Eurozone crisis, sovereign debt sustainability challenges were exclusive to developing countries, and instances of sovereign default tended to bunch together.⁴⁶ For example, modern emerging market default episodes include the one led by Mexico in August 1982, which was followed shortly thereafter by Argentina, Brazil, Nigeria, the Philippines, Turkey and others. The late-1980s and late-1990s again saw several Latin-American countries default, along with several Asian countries.⁴⁷ Argentina's 2001 default, which entailed an approximately 75% 'haircut' on its \$100 billion in debt, represented the then largest sovereign default in history.⁴⁸ Before the 2012 Greek debt restructuring, the now largest default in history, the last time an advanced economy defaulted was in 1953 when Germany restructured debts following the Second World War.⁴⁹

⁴³ In this paper a sovereign debt 'difficulty' or 'problem' refers to whether a government can service its sovereign (public) debt, meaning pay interest and principal) while also meeting agreed upon terms (e.g., payment deadlines). A country which has successfully accomplished both the former and the latter can be said to be 'sustaining' its public debt.

⁴⁴ See for example (Cecchetti, Mohanty, & Zampolli, 2010; Kumar, Woo, & International Monetary, 2010; Panizza & Presbitero, 2012; C. M. Reinhart & Rogoff, 2010)

⁴⁵ It should be noted here that the subject of what meets the criteria of a sovereign default or 'credit event' is the subject of some debate and covered elsewhere (Hileman, 2015)

⁴⁶ (Lindert & Morton, 1989; Marichal, 1989; Suter, 1992)

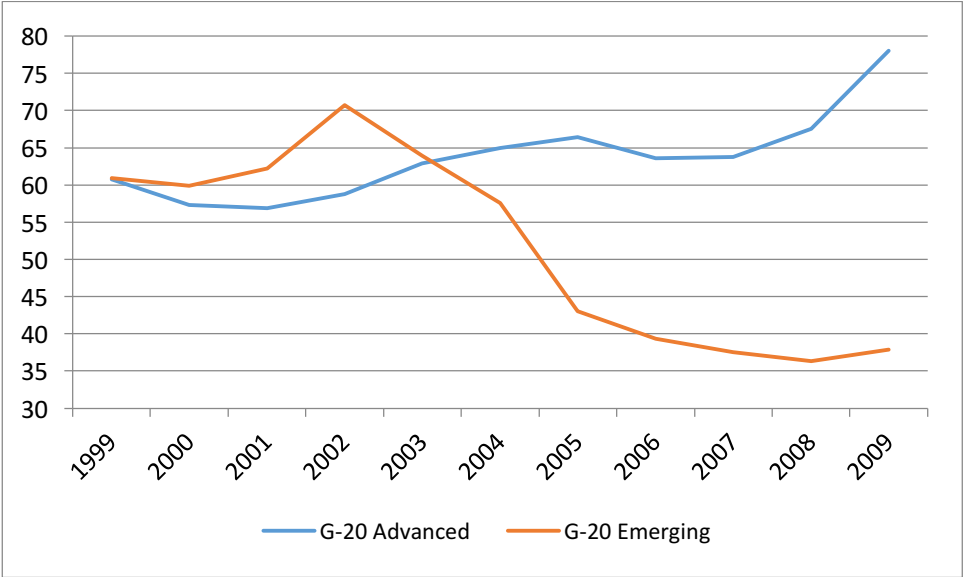
⁴⁷ (Carmen M. Reinhart & Rogoff, 2009, pp. 18, 96; Sturzenegger & Zettelmeyer, 2006)

⁴⁸ (Porzecanski, 2010)

⁴⁹ (C. M. Reinhart, 2010; Ritschl, 2012)

In recent years many developing economies have achieved comparatively low debt-to-income levels while concurrently stockpiling significant reserves. Starting in 2003 debt-to-income ratios in developed countries began diverging from developing countries (Figure 1).⁵⁰

Figure 1: Sovereign Debt Divergence – Public Debt-to-GDP (%) for G-20 Advanced and Emerging Countries, 1999-2009



Note: advanced countries include Australia, Canada, Italy, Japan, Republic of Korea, United States, Germany, France, United Kingdom. G-20 Emerging include Argentina, Brazil, People's Republic of China, Indonesia, India, Mexico, Russian Federation, Saudi Arabia, Turkey, South Africa

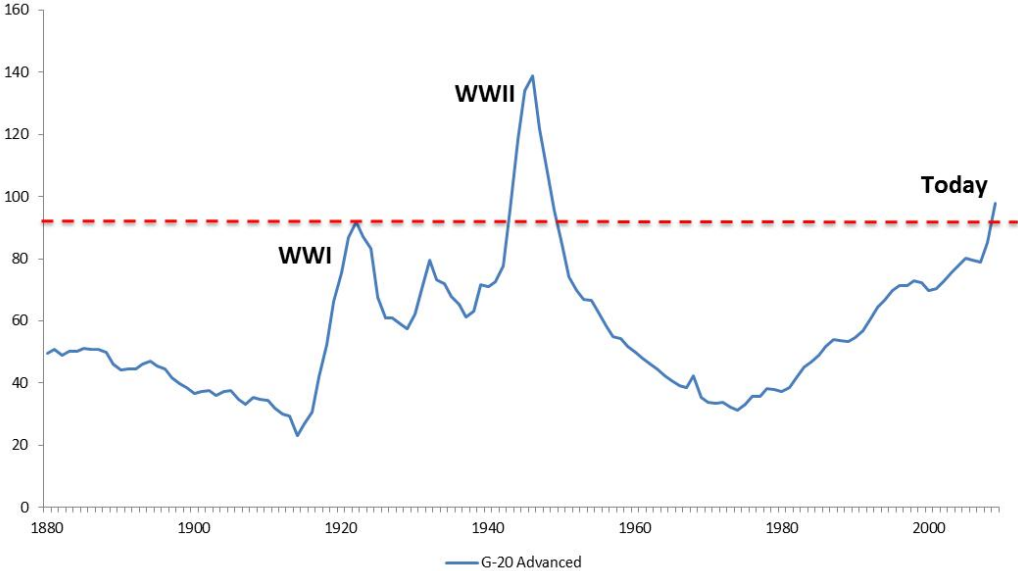
Source: International Monetary Fund

Today, public debt levels for advanced countries as a whole are now in line with the periods following the two world wars (Figure 2). A perhaps important difference between those periods and today is that the accumulation of today's public debts occurred in the absence of a world war. The inability to make large cuts to temporary wartime expenditures, as was possible following the world wars, is perhaps an important factor behind why many advanced economies are currently struggling to manage debt levels. In addition, the absence

⁵⁰ (Blanchard, Faruqee, & Klyuev, 2009; Dominguez, Hashimoto, & Ito, 2011) China's approximately \$3 trillion in foreign reserves receive wide publicity. However, less well known is the fact that according to (Central Intelligence Agency, 2010) Russia, Saudi Arabia, Brazil, India, Thailand, Algeria, Mexico, Malaysia and Indonesia also hold reserves comparable to or in excess of many advanced countries.

of war or other ‘great cause’ behind the accumulation of debt could influence the degree of social commitment to service public debts.⁵¹ Further complicating the current debt picture is the dramatic increase in private debt levels, which in crisis may get shifted onto the public sector balance sheet.⁵²

Figure 2: Public Debt-to-GDP (%) for Advanced Countries, 1880 – 2010



Note: advanced countries include Australia, Canada, Italy, Japan, Republic of Korea, United States, Germany, France, and United Kingdom

Source: International Monetary Fund

The objective of this paper is not to detail the various ways in which a sovereign debt sustainability problem can arise, which has been detailed elsewhere.⁵³ This paper instead outlines the different mechanisms by which countries can address unsustainable public debt, either prior to or once a sovereign debt crisis is underway.

⁵¹ (James, 2011; Ritschl, 1996)

⁵² (C. M. Reinhart & Rogoff, 2011)

⁵³ For more on how countries get into debt, as well as why and when sovereign debt problems arise see (Aizenman & Powell, 1998; Borensztein, Yeyati, & Panizza, 2006; Campos, Jaimovich, & Panizza, 2006; Panizza, Sturzenegger, & Zettelmeyer, 2009pp. 17-20; Tomz & Wright, 2007)

2.2 Literature survey

A major barrier to understanding sovereign debt sustainability is the absence of a definitive quantitative measure, or set of measures, for determining debt sustainability. This gap exists for a number of reasons, including the difficulty of understanding behavioural aspects of sovereign debt such as sentiments and motivations, the challenge of modelling creditor perceptions, the difficulty in measuring both the sovereign's ability and or willingness to repay its debt, and a number of other factors.⁵⁴ However, several quantitative measures of debt sustainability are currently employed to evaluate safe (meaning non-crisis triggering) levels of sovereign debt, including i) the nation's debt-to-income ratio, ii) the government's primary budget balance (whether there is a deficit or surplus before interest expense is accounted for), iii) GDP growth rate compared to the rate of interest paid on public debt, and iv) the average time to maturity of the total government debt portfolio.⁵⁵ It is unclear how much weight should be given to any one measure or set of measures, and attempts to compare debt sustainability measures across different countries over time to identify strong relationships between variables has yielded inconclusive results.⁵⁶ Overall, because a significant portion of public debt is regularly refinanced ('rolled over') in capital markets, sovereign debt sustainability is tied to the fickle confidence of market participants in both the sovereign's *ability* and *commitment* to meet obligations.

The last time a significant number of advanced country defaults took place was in the years following the First World War.⁵⁷ The emerging-market orientation of recent literature may limit its usefulness vis-à-vis advanced economies. Significant socio-political and institutional differences exist between developing and advanced economies which may

⁵⁴ (Neck & Sturm, 2008, p. 1)

⁵⁵ (Economist, 2010)

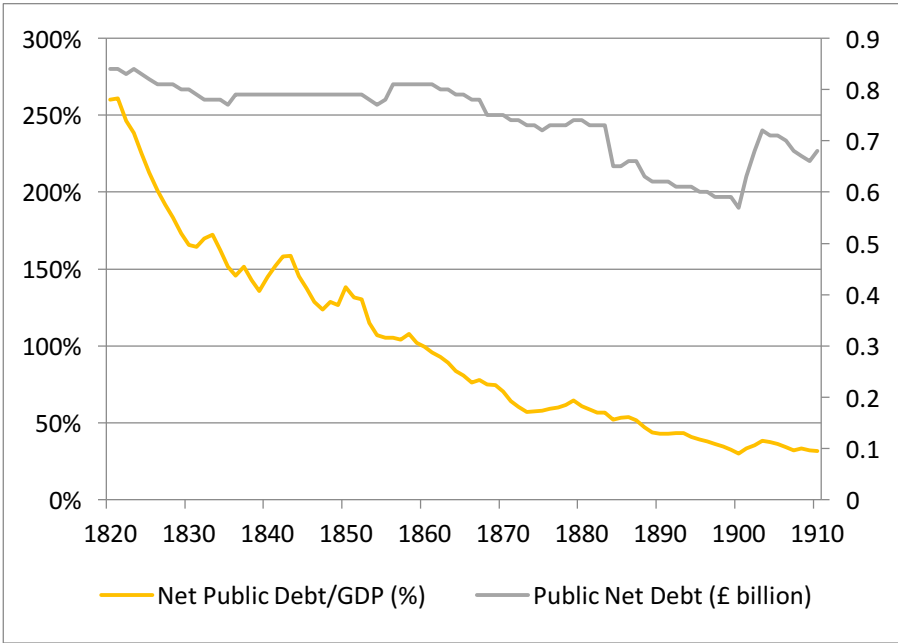
⁵⁶ For example, as of 2011 Portugal's debt-to-income ratio is approximately 60%, which is in line or below that of the U.S., Germany, Belgium, and the UK. These latter countries have thus far not encountered any difficulties in the public debt capital markets. However, Portugal for a time was unable to find private financing at a sustainable rate of interest. Compare and contrast the case of Portugal with Japan, which has a debt-to-income ratio of approximately 220% yet also enjoys one of the lowest borrowing rates of any sovereign. A commonly cited explanation for the financing difficulties encountered by Portugal's government is the country's relatively low rate of economic growth. However, Japan also has a low economic growth rate.

⁵⁷ (M. Winkler, 1933)

shape how debt crises are managed.⁵⁸ Further, the sheer size of debts on advanced country balance sheets may put some frequently employed emerging market debt sustainability options, such as repudiation, in conflict with financial stability. In other words, rather than focus on *debt reduction* advanced economies may instead to focus on *debt sustainability*.

The case of Britain following both the Napoleonic Wars and Second World War illustrates the distinction between sovereign debt reduction and sustainability. Britain’s debt-to-national income ratio in both periods experienced a steady, significant decline, adjusting from approximately 250% to under 50% over the course of several decades (Figure 3 and Figure 4).

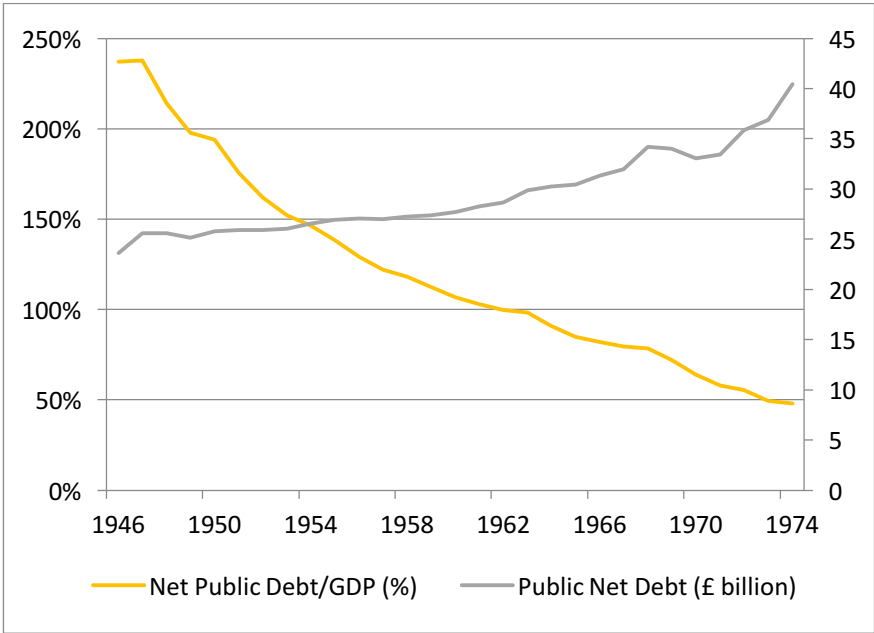
Figure 3: Net Public Debt/GDP (%) for the United Kingdom, 1820 – 1910



Sources: (Mitchell, 1988), UK Central Statistical Office

⁵⁸ See for example (Acemoglu & Robinson, 2012; Aoki, 1996)

Figure 4: Public Debt/GDP (%) for the United Kingdom, 1946 – 1974



Sources: (Mitchell, 1988), UK Central Statistical Office

However, the UK’s nominal level of public debt was comparatively unchanged over the same period, particularly when measured against the change in nominal GDP. The period following the Napoleonic Wars coincided with the classical gold standard and relatively modest inflation, so most of the change in Britain’s debt-to-income ratio was derived from economic growth.⁵⁹ In contrast, inflation played a greater role in the decline of Britain’s debt-to-income ratio following the Second World War.⁶⁰ Overall, the British case highlights how the popular question of “how will we pay-off the debt?” should be substituted with “how will we sustain the debt?”.

A number of leading economists identify up to five options for addressing a sovereign debt problem, and Taylor (2011) describes these five options as collectively exhaustive,

⁵⁹ (Ritschl, 1996)

⁶⁰ (Buiter, 1985pp. 18-19; C. M. Reinhart & Sbrancia, 2011)

stating they are “an iron law that is well known”.⁶¹ These five options (and their respective effects on the debt/GDP ratio) are i) real economic growth (boost the denominator), ii) fiscal consolidation (reduce or slow the numerator); iii) repudiation (reduce the numerator), iv) inflation (reduce the real value of repayment of the principal, increase the denominator relative to the numerator), and v) financial repression (reduce interest rate paid which slows growth of the numerator).

This paper argues that the above five sovereign debt reduction options are not in fact collectively exhaustive, and that two distinct options have been underemphasized or mostly overlooked – financial aid and asset exchange.

⁶¹ See for example (Buiter, 1985, p. 22; Nasar, 2011, pp. 220-221; C. M. Reinhart & Sbrancia, 2011, pp. 1-2; Sbrancia, 2011, p. 1; Taylor, 2011, p. 49) The five options for reducing sovereign debt are listed by all except Buiter, who lists only four (he does not include financial repression).

2.3 The seven mechanisms for achieving sovereign debt sustainability

This section discusses each of the seven distinct mechanisms for achieving sovereign debt sustainability along with their respective political economy trade-offs (Table 1).

Economic growth can reduce a nation's public debt-to-income ratio, which is perhaps the most widely referenced measure of sovereign debt sustainability. An expansion in a nation's products and services typically generates additional tax revenue without necessitating an increase in tax rates. While economic growth certainly has its critics, this feature makes economic growth particularly attractive to a wide cross-section of stakeholders.⁶² It should be noted that in some cases Gross National Product (GNP) growth would be a more useful numerator than Gross Domestic Product (GDP) in evaluating debt sustainability via the debt-to-income ratio.⁶³

Some go as far as to argue that economic growth has historically been the only means by which relief from the burden of large public debts has been achieved. In other words, the presence of sufficient economic growth is the only reliable means for assessing debt sustainability.⁶⁴ However, a misconception has emerged around the role of economic growth in the resolution of the large Second World War public debts. For example, Sen (2011) states that "the big public debts of many countries when the second world war ended caused huge anxieties, but the burden diminished rapidly thanks to fast economic growth".⁶⁵ This view is incomplete as shown by Buiter (1985) and Reinhart and Sbrancia (2011), who both document the effect of inflation on the reduction of sovereign debt burdens for many countries in the post-Second World War period. For example, according to Buiter the positive effects of economic growth on the UK's debt burden were entirely offset by fiscal expansion. In other

⁶² For a brief overview of some of the criticism of economic growth see (K. Rogoff, 2012)

⁶³ For most countries Gross Domestic Product and Gross National Product, which excludes the profits of foreign residents and corporations, are nearly identical. However, present day Ireland, which is home for the regional headquarters and operations of many foreign companies, is an exception. An estimated 20% of Irish GDP is generated by 'ghost corporations' and considered un-taxable under domestic law (Johnson, 2010a, 2010b).

⁶⁴ (A. Winkler, 2011)

⁶⁵ (Sen, 2011)

words, without inflation the UK's debt-to-GDP ratio would have remained unchanged following the Second World War.⁶⁶

While economic growth is often the preferred solution for a debt problem, generating sufficient growth can prove elusive. There is considerable debate and uncertainty over how best to achieve economic growth, and some research suggests that there may be a negative correlation between high debt-to-income levels and economic growth.⁶⁷ Considerable debate also exists over the timeframe required to affect meaningful change in a nation's growth trajectory, as well as how much influence policymakers ultimately wield over growth fundamentals such as demographics and productivity. In other words, even if a country desires growth it may be difficult for technocrats to engineer, particularly in a short timeframe.

⁶⁶ (Buiter, 1985, pp. 18-19)

⁶⁷ See for example (Cecchetti et al., 2010; Kumar et al., 2010; Panizza & Presbitero, 2012; C. M. Reinhart & Rogoff, 2010)

Table 1: Political Economy Tradeoffs of Seven Sovereign Debt Sustainability Mechanisms

Mechanism	Description	Advantages	Disadvantages
1. Economic Growth	Growth of a nation's taxable GDP of sufficient size to service debt	+ Automatically generates increased tax revenue without higher tax rates + High political support	- Potentially difficult to achieve - Opposition to growth (e.g., environmental externalities)
2. Financial Aid	Bridge financing to enable economic growth; debt forgiveness and or restructuring can also constitute aid	+ Large source of funds available internationally + Can engender improved economic efficiency + Expand foreign trade + Rescheduling debt can be mutually beneficial	- Rarely provided with no-strings attached - Unpopular; difficult to implement debtor concessions - Aid arrives too late ('throw good money after bad')
3. Fiscal Consolidation	Reducing government expenditure and or increasing tax revenue	+ Fiscal adjustments are within domestic control + Avoidance of foreign commitments + High transparency	- Counter-growth and may lead to an ill-timed economic contraction - Politically unpopular - Implementation challenges
4. Asset Exchange	The trade of tangible and intangible government assets, such as state-owned enterprises, bullion, geopolitical influence, etc.	+ Source of hard currency + Liberalization may help boost economic growth + May be reversible through later repurchase and or nationalization	- May only reduce debts by small fraction - Reduce government revenue generating assets, exacerbating problem - Slow; 'fire-sale' prices
5. Inflation Surprise	Unexpected spike in inflation, triggered by government action, that reduces the real debt burden and devalues the currency	+ Quickly reduces the real value of debt + Can be implemented at government's discretion + Devaluation can improve exports, attract new capital	- May trigger capital flight - Severe political instability - Only reduces debt issued in domestic currency - Devaluation leads to higher import costs
6. Repudiation (Default)	Suspension and/or cancelation of principal and or interest owed to creditors; restructuring of loan terms may also constitute default	+ Quickly reduces debt + Debtor can target repudiation of certain creditors (e.g., foreigners) + Debate over the degree of negative consequences for debtor + A common approach	- Reduced access to capital markets - Higher interest expense going forward - Only partial repudiation is typically possible - Restructuring can constitute a default and bring negative consequences
7. Financial Repression	Financial controls and interest rate caps that provide government financing on below market rates of interest	+ Can deliver a steady reduction in the real value of the debt over time + Historically compatible with economic growth + Low transparency	- Lower economic efficiency - Complex implementation and enforcement - Slower than alternatives - Can trigger malinvestment - Low transparency

Financial aid to sovereign nations can provide significant debt relief. It can also take many different forms. One not uncommon means by which governments attempt to address a sovereign debt problem is by securing additional funding, often in the form of a loan, for investment or consumption to stimulate economic growth. Such 'bridge' financing can help countries weather temporary economic downturns.⁶⁸ Since the Second World War international lending organizations, such as the International Monetary Fund (IMF), have played a central role in coordinating foreign credit for countries in debt distress. Governments also lend to each other on a bilateral (e.g., 1946 Anglo-American Loan) and regional basis (2010 European Financial Stability Fund). Sovereign funding can also be provided by banks and other private or quasi-private institutions (e.g., pension funds). However, the practice of saddling an already heavily-indebted nation with even more debt is controversial and may prove ineffective, as appears to have been the case recently with Greece.

Both grants and debt forgiveness are, not surprisingly, a popular alternative amongst debtor nations as opposed to becoming further encumbered with new loans.⁶⁹ The concept of 'odious' debts was developed over a century ago following the Spanish-American war and has been used to justify loan forgiveness when an illegitimate regime loses power.⁷⁰ Historical examples of non-odious debt forgiveness include the 1947 decision by Australia and New Zealand to forgive £38 million of British Second World War debt.⁷¹ An agreement by creditors to lengthen the repayment schedule, referred to sometimes as a 'payment holiday', is often employed as a form of financial aid and can provide a country with additional time to re-establish debt service. For example, in 1956-57 the UK negotiated an amendment to the Anglo-American Financial Agreement that added a 'bisque' clause, meaning the UK could elect to suspend payments of principal and interest in any year, up to seven times.⁷²

⁶⁸ (P. Krugman, 1988)

⁶⁹ (Bulow & Rogoff, 1989; Neumayer, 2002)

⁷⁰ (Kremer & Jayachandran, 2002)

⁷¹ (Pressnell 1986, p. 366)

⁷² (Cosío-Pascal & Bankruptcy, 2006, p. 7)

Financial aid, however, often comes with ‘strings attached’. For example, IMF loans are typically contingent on the recipient implementing economic and political reforms, along with regular IMF auditing to ensure compliance. While IMF programs are aimed at improving economic efficiency and competitiveness, which in turn aid the repayment of debts, they often prove unpopular with some political constituencies.⁷³ Other research has shown a statistically significant relationship between debt forgiveness and military grants.⁷⁴ In contrast to asset sales or asset exchange, debt forgiveness and other forms of financial aid have received significant attention in the literature.⁷⁵

Fiscal consolidation can reduce deficits and debt levels by decreasing government expenditure and or increasing tax revenue. Such adjustments, however, can be very unpopular amongst those affected and therefore politically difficult to implement. Further, sovereign debt crises often strike during periods of economic weakness, or precisely when Keynesian demand management theory suggests that governments should be stimulating the economy by spending more or reducing taxes.⁷⁶ However, such government efforts to stimulate the economy may run up against resistance from creditors who view the sovereign as overly-indebted. A loss in the confidence of creditors over the sovereign’s commitment and or ability to service its debt can result in a sudden increase in debt expense, which would only further exacerbate a debt sustainability problem.

From an accounting perspective fiscal consolidation can be viewed as an ‘income statement’ debt sustainability mechanism, whereby a nation’s reoccurring ‘revenue’ is increased by raising taxes, and its reoccurring ‘expenses’ are reduced through budget cuts. In contrast, *asset exchanges* (or asset sales) can be viewed as a ‘balance sheet’ mechanism, where the sale produces a one-time cash flow effect. Fiscal consolidation measures can often be reversed once a debt crisis has abated. In contrast, asset sales produce a one-time cash

⁷³ (Blustein, 2003, 2005; Obstfeld & Taylor, 2004, p. 162)

⁷⁴ (Neumayer, 2002)

⁷⁵ For other studies of debt forgiveness see (William Easterly, 2001; Froot, Scharfstein, & Stein, 1989; Hernandez & Katada, 1996; Iyoha, 1999; Paul R Krugman, 1989; Rajan, 2005)

⁷⁶ (DeLong & Summers, 2012; Keynes, 1936; Paul R. Krugman, 2009)

flow boost, and any future appreciation or reoccurring income generated from a sovereign asset is lost forever unless the asset is later reacquired.

Asset sales have received significant attention in the privatization literature, which has examined the impact of assets sales on economic growth.⁷⁷ However, when considering options for achieving debt sustainability, asset sales are sometimes overlooked. This is perhaps due to the potentially erroneous view that asset sales cannot have a material impact on sovereign debt sustainability. In fact many governments own substantial domestic and foreign assets.⁷⁸ For example, as of 2010 the U.S. Treasury listed total federal non-defence related assets at a book value of \$233 billion, a figure which may in fact be significantly understated; other estimates of the total value of all U.S. federal government assets are upwards of \$128 trillion counting oil and gas resources.⁷⁹

Throughout history asset sales in the form of real estate, bullion, and even warships have been sold by nations to pay off debts.⁸⁰ However, the fact that government assets are sold for a variety of reasons makes it difficult to identify episodes in history when assets were sold primarily for debt sustainability reasons.⁸¹ One example from history occurred in 1940 when, as a prerequisite imposed by the U.S. for obtaining crucial Lend-Lease support, the UK Treasury sold British Imperial Tobacco shares in the U.S.⁸² Looking at the recent Eurozone sovereign debt crisis there is evidence that a number of countries are selling assets to assist with debt sustainability (Table 2).

⁷⁷ See for example (Boycko, Shleifer, & Vishny, 1996; MacKenzie, 1998; Megginson & Netter, 2001; Shleifer, 1998; Shleifer & Vishny, 2002)

⁷⁸ (Ferguson, 2011)

⁷⁹ (IER, 2013)

⁸⁰ The purchase of the Louisiana territory by the U.S. from cash-strapped Napoleonic France is one of the more famous sovereign asset sales.

⁸¹ (Megginson & Netter, 2001, p. 324) cite six different reasons for why governments sell assets

⁸² (Skidelsky, 2000, pp. 75-76)

Table 2: Select Eurozone Government Assets Sales, 2010-2014

Country	Assets sold	Amount raised from sales
Greece	Ports, baseball stadiums, casinos, airplanes, horse racing tracks, islands	\$71 billion
Italy	Real estate	£425 million
Slovenia	Telecom stakes	Approximately €556 million
France	Foreign real estate	€391 million in 2013

Sources: Press accounts taken from the *Wall Street Journal*, *Bloomberg*, *CNBC*, *The Telegraph*

It has been argued in the privatization literature that the sale of state-owned enterprises, in addition to helping pay down debt, may also boost productivity and drive greater economic growth.⁸³ However, liquidating national treasure to pay-off lenders can spark political controversy, particularly when a nation's debts are held by external creditors. Further, national assets often generate reoccurring fiscal revenue which may be lost in the event of a sale, thereby making debt service even more difficult. Selling government assets may also prove a cumbersome and relatively slow process, and a rushed 'fire sale' is unappealing for governments seeking to maximize proceeds.⁸⁴ It may also prove difficult to reacquire – either through trade or nationalization – any assets that have been sold, particularly when those assets reside (or can be moved) outside a country's borders.⁸⁵ All of these factors combine to make the sale of state assets perhaps one of the least attractive options for policymakers navigating a sovereign debt sustainability crisis. However, asset sales can play an important signalling role in a debt sustainability crisis; precisely because asset sales are so undesirable they send a clear message to creditors and market participants that the sovereign is committed to servicing its debt. In other words, even relatively modest asset sales can reduce default fears and interest expense.

Sometimes referred to as the government's 'trump card', *inflation surprise* represents a wilful act by policymakers to generate inflation for the purpose of reducing the real value

⁸³ (Boycko et al., 1996; MacKenzie, 1998; Megginson & Netter, 2001; Shleifer, 1998; Shleifer & Vishny, 2002)

⁸⁴ (Shleifer & Vishny, 1992)

⁸⁵ The seizure of foreign owned assets, in isolation or combination with strategic default, have been referred to as 'sovereign theft' (Tomz & Wright, 2008)

of public debt.⁸⁶ This can be accomplished over a relatively short timeframe through ‘debt monetization’, whereby sovereign debt is purchased and retired by the central bank.⁸⁷ Inflation can also lower a nation’s exchange rate, which over the medium to longer-term may have a positive influence on debt sustainability through greater capital inflows and more competitively priced exports. However, if creditors observe (or simply suspect) significant inflation then large-scale capital flight may commence, thereby negating some of the debt sustainability benefits of inflation (hence the need for ‘surprise’).

Political instability often accompanies high inflation regardless of whether or not capital controls are in place. For example, Germany in 1923 (annual percentage inflation of 2.22E +10), Argentina in 1989 (annual percentage inflation of 3,080), and Hungary in 1946 (annual percentage inflation of 9.63E + 26, the modern record) all represent cases where hyperinflation was followed by significant political instability.⁸⁸ More modest levels of inflation have also been attributed to political changes. For example, low double-digit inflation in the late-1970s is viewed as a factor behind U.S. President Jimmy Carter’s election defeat to Ronald Reagan in 1980.⁸⁹ It is also important to note that inflation only reduces the real burden of non-floating rate (non-indexed) debt that has been issued in a domestic currency controlled by the central bank.

Repudiation (also referred to as ‘default’) is a commonly employed mechanism for addressing unsustainable sovereign debts.⁹⁰ It should be noted that a precise, generally agreed upon definition of sovereign default has proven elusive. For economic analysis, Grossman and Vay Huyck (1988) conceptually define default as “the failure to meet contractually agreed upon obligations in full”, such as the repudiation of debt or the failure to repay the loan on time. The authors go on to note that “window dressing” is often

⁸⁶ (Stella, International Monetary Fund, & Exchange Affairs, 1997, p. 11)

⁸⁷ (Mishkin, 2007) Seigniorage can also generate revenue for the government, which can reduce the real value of debt burdens. However, Buiter shows that “the maximum possible yield of this tax is also small” (Buiter, 1985, p. 26).

⁸⁸ For a further discussion of the history of inflation and hyperinflation see (Sargent, 1982)

⁸⁹ (Carmen M. Reinhart & Rogoff, 2009, pp. 180-189)

⁹⁰ (Carmen M. Reinhart & Rogoff, 2009)

employed to avoid legally classifying a default for regulatory purposes.⁹¹ As is discussed in more detail in Chapter 3.3, further complicating the determination of whether a credit event has taken place is the fact that credit rating agencies and other market facing institutions may employ definitions of default that differ from the definitions used by economists. For example, Reinhart and Rogoff (2009, 2002) suggest that annual inflation of 40% or more is significant enough to warrant designating a country as in default. However, this definition is not officially shared by credit rating agencies.

While repudiating debts is antithetical to debt sustainability, a partial or full default can aid a nation seeking a return to a sustainable public debt trajectory. Default, however, is not without negative consequences for borrowers and lenders alike.⁹² Countries have a number of incentives to avoid default, including reduced access to credit, sudden and forced fiscal spending reductions, reduced international trade and higher tariffs, higher interest rates for both the public and private sector, commercial penalties and seizures, and political instability.⁹³ Default also often leads to significant losses for creditors. However, creditors often wield enough leverage to enforce some level of repayment even if considerable time has passed since the default episode. For example, Russia, following the Soviet Union's collapse, was only able to return to international capital markets after a portion of the debt owed from its Tsarist-era default from eight decades prior was paid.⁹⁴ A common alternative to outright debt repudiation is the amendment of loan terms, such as adjustments to the repayment schedule that were described earlier as a form of financial aid. However, such 'restructurings' or 'partial' defaults can still result in some of the negative consequences noted above.

Financial repression, sometimes referred to as a 'stealth' tax, can encompass a complex and wide range of policies, the net result of which is government borrowing at

⁹¹ (Grossman & Van Huyck, 1988, p. 1088)

⁹² (Pitchford & Wright, 2007, pp. 1-6; C. M. Reinhart, Rogoff, & Savastano, 2003)

⁹³ (Bordo & Oosterlinck, 2005; Cole, Dow, & English, 1995; J. Eaton & M. Gersovitz, 1981; Jonathan Eaton & Mark Gersovitz, 1981; Eaton, Gersovitz, & Stiglitz, 1986; Eichengreen, 1991pp. 155-156; Esteves, 2012; Flandreau & Zumer, 2004, p. 49; Ozler, 1992; Panizza et al., 2009, pp. 25-39; Rose, 2005)

⁹⁴ (Panizza et al., 2009, pp. 5-9; Carmen M. Reinhart & Rogoff, 2009, pp. 61-63)

advantageous (below market) rates of interest.⁹⁵ Financial repression can play a significant role in reducing a government's debt burden, particularly when paired with inflation.⁹⁶ However, the advantages conferred to a government by financial repression are not dependent upon achieving negative real interest rates; government can benefit from financial repression simply through the ability to borrow at a lower rate of interest than would otherwise be possible in the absence of financial repression.

Similar to the challenge of identifying generally agreed upon sovereign credit events, a precise and generally agreed upon definition of financial repression is a source of ongoing debate.⁹⁷ For example, 'prudential' measures aimed at increasing the stability of the financial system like Basel III and Solvency II, which require financial institutions to hold a higher percentage of 'safe' capital (e.g., sovereign debt), have also been characterized as financial repression. Basel III and Solvency II may force private firms to own more government debt than they would otherwise freely choose to hold. Efforts aimed at restricting the actions of credit rating agencies have also been described as financial repression.⁹⁸ Some argue that quantitative easing is a form of financial repression as it reduces the interest paid on public debt.⁹⁹

Regulations placed on the financial system that accompany financial repression, such as capital controls, are often politically unpopular. Prior research has also shown that financial repression can have a negative impact on economic performance and growth.¹⁰⁰ For

⁹⁵ (C. M. Reinhart & Sbrancia, 2011, p. 19)

⁹⁶ (Agénor & Montiel, 2008; Beim & Calomiris, 2001; William R. Easterly, 1989; William Russell Easterly & Schmidt-Hebbel, 1994; Giovannini & Demelo, 1993; C. M. Reinhart & Sbrancia, 2011) Like inflation surprise, the debt reduction benefits of financial repression only work for debt issued in the domestic-currency (K. S. Rogoff & Reinhart, 2011).

⁹⁷ (Turner, 2011)

⁹⁸ (Evans-Pritchard, 7 July, 2011).

⁹⁹ (Treadway, 2012)

¹⁰⁰ (De la Torre, Gozzi, & Schmukler, 2007; W. Easterly, 1993; Galindo, Micco, Ordoñez, Bris, & Repetto, 2002; Goldsmith, 1969; Lanyi & Saracoglu, 1983; McKinnon, 1973; Roubini & Salaimartin, 1992; Shaw, 1973; Todaro & Smith, 2003; World Bank, 1989)

example, unnaturally low interest rates may also trigger ‘malinvestment’.¹⁰¹ However, financial repression can prove a relatively attractive mechanism for policymakers when compared against other options. First, the post-Second World War period, the so-called “golden age of financial repression”, was also the “golden age of economic growth” for many advanced economies, meaning financial repression may be compatible with robust economic growth. The opaque nature of financial repression also offers political advantages over other more visible, politically destabilizing debt sustainability measures, such as inflation, fiscal consolidation, asset sales, and repudiation.

2.4 Foreign and geopolitical considerations

At the onset of a sovereign debt crisis, tensions can emerge between foreign and domestic creditors, whose interests are often pitted against each other. Historically, it is unclear whether it is foreign or domestic creditors who more frequently prevail.¹⁰² However, the popular notion that ‘all politics is local’ is arguably the driving force behind the perception that foreign creditor interests are frequently subjugated to domestic priorities. Foreign lenders, however, are not always willing to quietly accept losses. During the late-19th and early 20th centuries ‘gunboat diplomacy’ was employed to ensure the repayment of foreign debt. Historical examples include British financial control over Egypt in 1883, European control over the finances of Turkey (1881) and Greece (1898) and the 1902 blockade and bombardment of Venezuela, and the establishment by the U.S. of a ‘protectorate’ in Haiti in 1915.¹⁰³ Plundering foreign treasure as a means of shoring up a nation’s finances extends back through the Viking raids to at least early Roman times.

¹⁰¹ (Burton & Williams, 1907; Mills, 1867) Austrian scholars such as Hayek and von Mises are often given credit for developing the economic concept of malinvestment but the problem of low interest rates leading to the misallocation of capital may have been articulated as early as John Mills 1867 address to the Manchester Statistical Society titled *On Credit Cycles and the Origin of Commercial Panics*.

¹⁰² One finding from Reinhart and Rogoff (2009) is the limited data and understanding we have on domestic debt.

¹⁰³ (Coggan, 2011, p. 252; Mitchener & Weidenmier, 2005, pp. 14-18)

The days when both creditors and debtors employed direct military force to achieve debt sustainability objectives appears to have largely passed. However, the use of geopolitical leverage vis-à-vis debt sustainability has continued into more recent times. For example, during the 1956 Suez Crisis the U.S. informed Britain that unless its military forces were withdrawn from Egypt the U.S. would withhold crucial financial support for Britain at a time when its financial reserves were under significant pressure. The threat of withholding financial support posed a significant enough risk that the UK was forced to ignominiously withdraw its forces from the Sinai theatre.¹⁰⁴ The Suez Crisis is often presented by historians as illustrative of how America's financial leverage over Britain helped it to achieve its geopolitical objectives. However, from a debt-sustainability perspective, Britain's abandoned military manoeuvres were not a complete loss. Indeed, they may have helped facilitate significant IMF and U.S. Export-Import Bank financing subsequently provided for Britain, and they also appear to have played some role in Britain's successful renegotiation of the Anglo-American loan to allow for greater repayment flexibility.¹⁰⁵ In other words, Britain's Suez expedition may have been a net positive for Britain from a debt sustainability perspective.

How often does geopolitics influence debt sustainability, as in the Suez-case described above? The financial details and negotiations surrounding such events are often closely guarded state secrets, leaving contemporaries to speculate until official records are declassified decades after-the-fact. For example, in 2012 there was speculation over a U.S.-European deal that banned Iranian oil imports from several European countries facing debt sustainability challenges. In exchange, the U.S. agreed to support additional IMF funds for those same European governments.¹⁰⁶ Limited U.S. weapon sales to Taiwan in exchange for China's on-going support of the U.S. Treasuries market are another area of speculation.

¹⁰⁴ (Kunz, 1991, pp. 131-152)

¹⁰⁵ (Cosío-Pascal & Bankruptcy, 2006, p. 7).

¹⁰⁶ (Talley, 2012)

2.5 Conclusion

Ultimately, sovereign debt sustainability is as much if not more of a political as economic challenge. In order to achieve sovereign debt sustainability countries will often utilize more than one of the seven mechanisms described in this paper. While overly indebted countries often share many economic similarities, optimal debt sustainability solutions must be tailored to a nation's unique political and economic circumstances. The degree to which policy can influence any one of the sovereign debt reduction mechanisms described in this paper also varies from one nation to the next. The ever-evolving sovereign debt landscape will likely make finding a 'one-size-fits-all' debt sustainability formula elusive. In addition, market-driven debt dynamics often outpace the capacity of officials to act.¹⁰⁷ In considering the different policy alternatives a country must balance what is economically achievable against what is politically viable, and also carefully consider the time available to act before forces outside the control of policymakers determine how to make a nation's sovereign debt sustainable.

¹⁰⁷ (Greenlaw, Hamilton, Hooper, & Mishkin, 2013)

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3 Sovereign Credit Event Classification: British Debt Sustainability and Default, 1939-56

Abstract: Economists and credit rating agencies employ different definitions of sovereign default. This paper explores the challenges around classifying sovereign credit events through an examination of the UK, which in 1946 recorded the highest public debt-to-GDP ratio in the 20th century. Britain ‘partially defaulted’ multiple times in the decades following the Second World War. However, the conventional historical view is that the UK avoided a sovereign default, along with many other problems that often plague countries with much lower debt levels. While a number of policies that fall under the heading of financial repression were employed by Britain, financial repression was not Britain’s sole or necessarily most important debt sustainability mechanism. The British case illustrates the complex policy dynamics of sovereign debt sustainability vis-à-vis other competing policy objectives, such as geopolitical priorities.

JEL: H63, E58, E61, E62, H12, H27, P24

Keywords: sovereign debt, debt sustainability, financial repression, inflation, sovereign default, repudiation, British economic history, geopolitics

3.1 Introduction

Shortly after the Second World War ended Britain had the highest recorded level of public debt relative to national income of any country in the 20th century, and perhaps also in all of economic history. The UK's financial crisis 'scorecard' for this period from Reinhart and Rogoff (2009) shows that Britain did not escape this period unscathed: the country experienced three currency crises and three stock market crashes, all of which took place in the latter half of the 1940s (Table 3). However, no British sovereign default is recorded by either Reinhart and Rogoff or the literature following the Second World War. Further, while UK economic growth lagged many of its peers in the decades following the Second World War, the UK managed to avoid many other severe financial problems associated with large sovereign debts that have recently afflicted countries possessing significantly lower levels of public debt, such as exorbitant borrowing costs and lost access to public debt markets.

Table 3: United Kingdom Financial Crises Summary, 1941-1966

	Currency	Inflation	Stock	Sovereign		Banking	Yearly
	crises	crises	market	debt crises	external	crises	crisis
			crash	domestic			tally
1941	0	0	0	0	0	0	0
1942	0	0	0	0	0	0	0
1943	0	0	0	0	0	0	0
1944	0	0	0	0	0	0	0
1945	0	0	0	0	0	0	0
1946	1	0	0	0	0	0	1
1947	1	0	1	0	0	0	2
1948	0	0	1	0	0	0	1
1949	1	0	1	0	0	0	2
1950	0	0	0	0	0	0	0
1951	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0

Source: Reinhart and Rogoff (2010)

The performance recorded for the UK here raises several questions. First, how did Britain manage to avoid default? Or is the conventional historical record surrounding Britain’s post-Second World War battle for debt sustainability in some way incomplete or even erroneous? What can other countries learn from the British example? Or were Britain’s circumstances so unique that any lessons lack applicability to contemporary sovereign debt challenges?

This paper examines the case of British post-Second World War debt sustainability through the framework presented in the preceding chapter and whether historical evidence supports a recent quantitative argument by Reinhart and Sbrancia (2011) that financial repression played a decisive role in British debt sustainability. The evidence presented both in this paper and the subsequent chapter suggest that a number of policies that fall under the heading of financial repression were employed by Britain. However, financial repression was not Britain's sole or necessarily most important debt sustainability mechanism. As has been well documented, financial aid, both in the form of grant aid and debt forgiveness, played a crucial role in British debt sustainability. What has not been previously argued is that Britain 'partially defaulted' several times on the Anglo-American Financial Agreement. Further, these instances of default may be considered 'excusable' as they were conducted with the support of the executive branch of the U.S. government.

The remainder of the paper is structured as follows: section 3.2 presents a historiography of the years and economic circumstances leading up to end of the Second World War, which was the period when the intellectual framework for British debt sustainability, as well as several important financial repression policies, were first developed and implemented. Section 3.3 examines how sovereign default is defined, and more generally the classification of sovereign credit events. Section 3.4 examines the question of whether Britain did in fact default on the Anglo-American Financial Agreement, a \$3.7 billion loan from the U.S. to Britain in exchange for a number of requirements on trade and financial openness that would later prove problematic for a still war-torn Britain. Section 3.5 concludes.

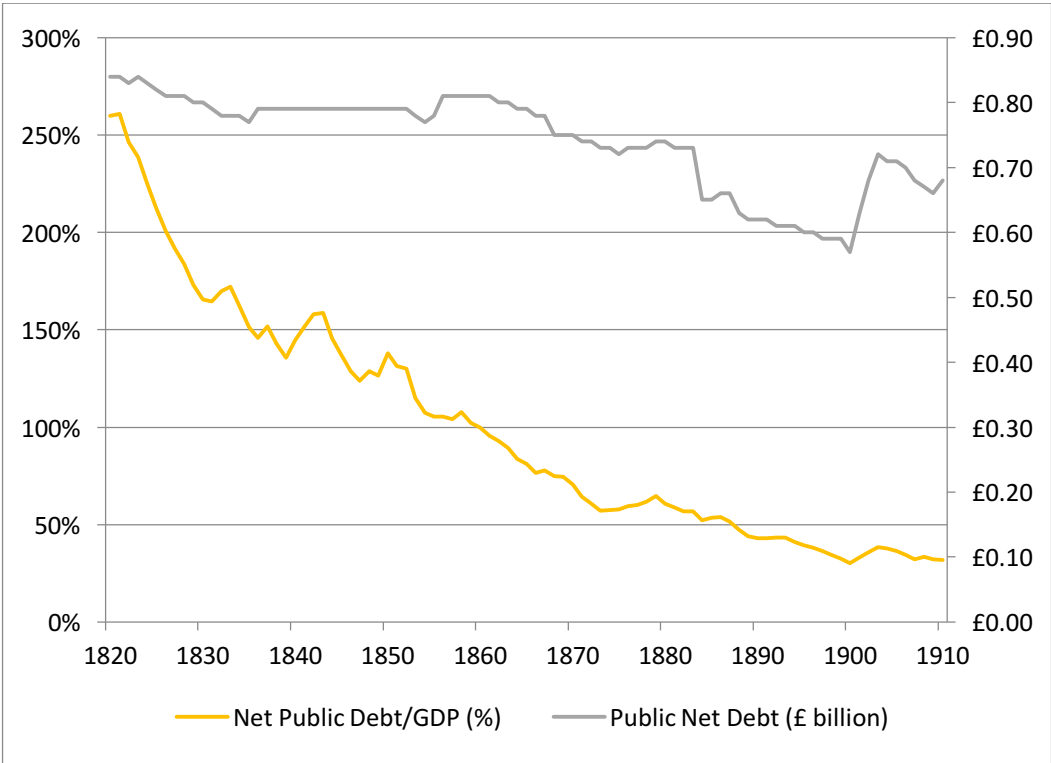
3.2 Literature and Historical Overview

The period following the Second World War was not the first time Britain experienced high levels of public debt. Following the Napoleonic wars in 1821 Britain's debt-to-national income ratio was 261%.¹⁰⁸ Britain then saw a steady decline in its debt-to-GDP ratio, which was under 50% by the eve of the First World War (Figure 5). Of note, the nominal level of British debt remained comparatively constant during much of the post-Napoleonic period, meaning most of the improvement in Britain's debt-to-GDP ratio can be attributed to an increase in the denominator (GDP). As the 19th century was the period of the classical Gold Standard and very little inflation, the vast majority of Britain's improved debt position following the Napoleonic wars can be attributed to real economic growth generated by the Industrial Revolution.¹⁰⁹

¹⁰⁸ (Buiter, 1985, p. 16; Mitchell, 1988; Mitchell & Deane, 1962; Mitchell & James, 1971; Ritschl, 1996) Note for the year 1822 (and all pre-1861 years) Mitchell and Deane calculated income as Total Gross National Income for Great Britain as opposed to the UK. They also omit certain services and therefore may understate GDP, which would result in an upward bias in the ratio for this year (Ritschl, 1996). For comparison, Napoleonic France had a debt-to-GDP ratio in 1815 of only 20%, a testament to 19th century Britain's superior capacity to borrow (Ferguson, 2001).

¹⁰⁹ (Barry J Eichengreen, 1998)

Figure 5: Net Public Debt/GDP (%) for the United Kingdom, 1820 – 1910



Sources: (Mitchell 1988), UK Central Statistical Office

As the 19th century came to a close Britain and the City of London reigned supreme over the global financial system. It has been said that prior to First World War the original ‘Sterling Area’ consisted of not just the group of countries of lesser economic significance that would come to be aligned around Britain during and after the Second World War, but of the entire world.¹¹⁰ However, as the 20th century progressed, and rival industrial powers like Germany grew in power, the cost of maintaining Britain's far-flung empire grew. Britain emerged from the First World War no longer the world’s number one creditor nation but a significant debtor, with large balances in particular owed to America’s governmental and private sectors.¹¹¹ Even though much of Britain’s war debt was owed to foreign creditors,

¹¹⁰ (Strange & Royal Institute of International Affairs., 1971, pp. 55-61; Worswick & Ady, 1952, p. 484) "The Gold Standard was in fact a Sterling Standard"

¹¹¹ (Kunz, 1991, pp. 35-48) For more on the dramatic economic and political transition experienced by Britain during the first half of the 20th century see (Brown & Louis, 1999)

some of the debt was issued under British domestic law rather than foreign law, a testament to London's continued status as a global financial capital.¹¹²

Britain defaulted in 1932, along with many other wartime debtor countries, on war debt owed to the U.S.¹¹³ The 1932 default represents the most recently recorded default by Britain.¹¹⁴ Britain, due in part to the UK's departure in September 1931 from the Gold Standard, managed to turn the economic corner more quickly than other countries mired in depression, such as the U.S., France and Germany.¹¹⁵ While Britain joined other countries in returning to recession starting in the latter half of 1937, the UK's debt-to-GDP ratio declined from 171% in 1931 to 121% on the eve of the Second World War (Figure 6).¹¹⁶

¹¹² (Cassis & Collier, 2006) Most of Britain's debts from the First World War were consolidated into a 3.5% perpetual annuity.

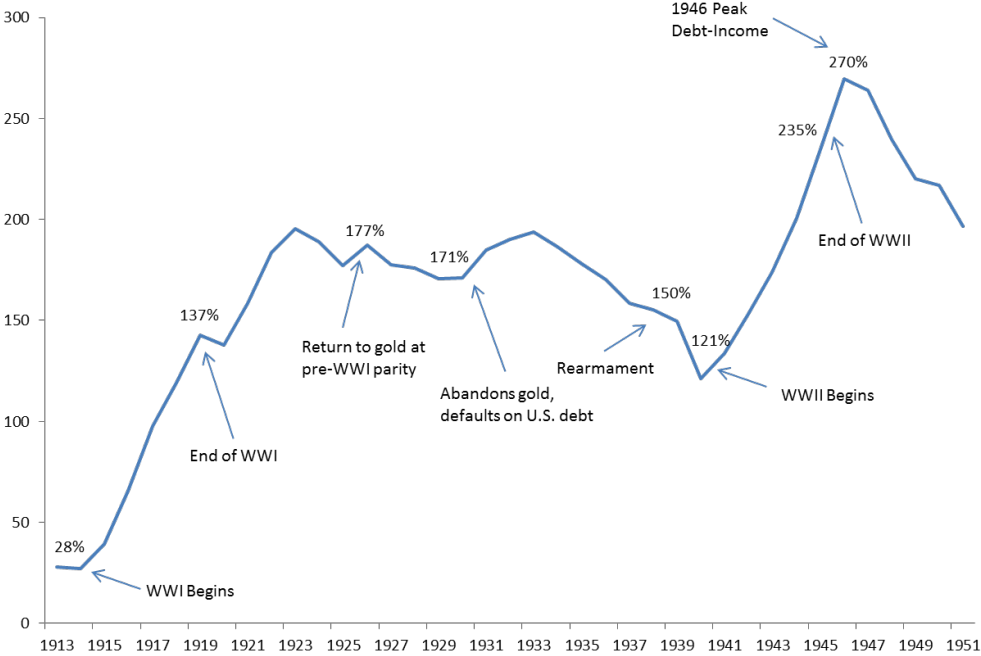
¹¹³ (Winkler, 1933) The UK remained in technical default until 1939 when war broke out and never repaid its First World War debt to the U.S.

¹¹⁴ (B. Eichengreen & Portes, 1986; Carmen M. Reinhart & Rogoff, 2009; C. M. Reinhart & Sbrancia, 2011, p. 9)

¹¹⁵ (Barry J. Eichengreen, 1992)

¹¹⁶ (Skidelsky, 2000, pp. 4-5)

Figure 6: United Kingdom Public Debt-to-GDP (%) and Selected Economic Events, 1913-1951



Source: International Monetary Fund

The onset of the Second World War brought an abrupt halt to the decline in Britain’s debt-to-GDP ratio.¹¹⁷ Approximately 15% of Britain’s net worth was lost in the first Great War as debt expenses mounted and foreign assets were sold. Second World War expenditures were significantly greater than those of the First World War and ultimately led to a loss of 28% of the UK national book value, or nearly double the size of the first world war. To put the comparative costs of the two great conflicts in perspective, Britain was alone among advanced economies in seeing zero increase in national wealth between 1913 and 1951. In sum, the two great wars of the first half of the 20th century effectively bankrupted the British Empire.¹¹⁸

To bridge the budget gap created by the Second World War Britain relied heavily on internal funding sources, such as the Bank of England, which more than tripled the size of its

¹¹⁷ For more in-depth analysis of the British wartime economy see (Chester, 1951) (Sayers, 1956) and (Mills & Rockoff, 1993)

¹¹⁸ (Cairncross, 1985, p. 8)

holdings of British government debt securities from £397.9 million in August 1939 to £1,134 billion in January 1943 (Table 4).¹¹⁹

Table 4: United Kingdom Public Debt Securities Held by the Bank of England, 1939-43

<u>Date</u>	<u>Total</u>
August 1939	£397.9
January 1940	683.4
January 1941	765.1
January 1942	924.0
January 1943	1,134.0

Source: C261, A.I. Bloomfield to R. Sproul, New York Federal Reserve Bank Archive, 13 January, 1943

Funding support also came from the British Empire, particularly India and Egypt. Additional support came from the United States in the form of Lend-Lease, initiated in December 1941. Lend-Lease quickly displaced exports as Britain's dominant source of external finance, and over the course of the war Lend-Lease accounted for more than twice the funding obtained from the Sterling Area.¹²⁰ Britain experienced a dramatic reduction in exports during the war, and Britain's longer-term investments in the U.S. were also liquidated prior to Lend-Lease.

On 14 August, 1941 the Atlantic Charter was enacted, with Articles IV and V of the Charter declaring support for open trade access by all countries.¹²¹ Britain's agreement to bind itself to open trade and to offering favourable peacetime concessions would later feature prominently in the 1946 Anglo-American loan negotiations and subsequent British financial difficulties. Britain and the U.S. later enacted the Mutual Aid Agreement, which included in Clause 7 an element that came to be known as the 'Consideration', which linked wartime aid with later peacetime arrangements. In return for aid Britain should render 'vague but appropriate' benefits to the U.S. 'which the President deems satisfactory'.¹²²

¹¹⁹ C261, A.I. Bloomfield to R. Sproul, New York Federal Reserve Bank Archive, 13 January, 1943

¹²⁰ (Ferguson, 2004; Fforde, 1992)

¹²¹ (Fforde, 1992, p. 35) The exact wording from the agreement states: 'on equal terms, to the trade and raw materials of the world' and for the fullest collaboration with the 'object of securing for all improved labor standards, economic advancement, and social security'.

¹²² (Fforde, 1992, p. 35; Pressnell, 1986, pp. 4-5)

While Britain's debt-to-GDP level was already elevated prior to the war, the onset of conflict saw it quickly rise to levels not seen since Waterloo. Secretary John Simon's war budget in September 1939 called for £600M in additional defence spending, leading to a £1 billion annual deficit (or 25% of GDP). Higher taxes only covered £107 million of the gap, and, similar to the 'proto-war' period of 1937-1939, excessive taxation would negatively impact both employment and tax collections. Later in the conflict British government expenditures and taxes represented 60% and 33% of the total economy, respectively.¹²³ Heavy borrowing had to fill the gap.¹²⁴ Total wartime borrowing at home from 2 September, 1939 to 25 August, 1945 totalled £14.8 billion, with approximately £2.2 billion coming in the form of Treasury Deposit Receipts, £2.1 billion in Treasury Bills, and £770 million in newly issued banknotes.¹²⁵ By 1945 Britain's public debt-to-GDP stood at 235% (Table 5).

¹²³ (Worswick & Ady, 1952, p. 7) Cairncross (1985) puts the government's share of the economy at 50%.

¹²⁴ (Skidelsky, 2000, p. 52)

¹²⁵ (Sayers, 1956, p. 223)

Table 5: United Kingdom Public Debt-to-GDP Ratio (%), 1940-1960

Year	Reinhart & Rogoff (%)	IMF (%)
1940	110.0	121.1
1941	119.8	133.7
1942	137.5	153.2
1943	156.8	174.0
1944	182.3	200.6
1945	215.6	234.7
1946	247.5	269.8
1947	237.9	264.1
1948	214.0	239.6
1949	197.8	220.3
1950	193.9	216.9
1951	175.3	196.8
1952	162.0	180.9
1953	152.2	169.8
1954	146.7	163.2
1955	138.2	154.2
1956	129.0	143.8
1957	122.2	135.7
1958	118.1	131.1
1959	112.4	124.9
1960	106.8	117.9

Source: IMF (2010), Reinhart and Rogoff (2010)¹²⁶

Many wartime policies carried over into peacetime, due in part to the unexpected quick end to hostilities. While Germany's surrender on 7 May, 1945 was expected, Japan's early-August surrender came as a surprise. The U.S. terminated Lend-Lease just one week following V-J Day.¹²⁷ Thus ended two-thirds Britain's external deficit funding, which totalled £10 billion over six years.¹²⁸ The net negative change in Britain's capital account during the war was £4.7 billion, prompting Keynes to famously warn that Britain now faced a 'financial

¹²⁶ The calculations of Britain's public debt-to-GDP ratio differ between the IMF (Abbas et al, 2010) and Reinhart and Rogoff (2010). For example, Reinhart and Rogoff calculate peak British debt-to-GDP of 248% in 1946. IMF calculations are based on nominal GDP at factor cost for scaling and debt figures are used for fiscal years, which may explain some of this difference.

¹²⁷ (Barnett, 1995)

¹²⁸ (Sayers, 1956, pp. 478-485) for gold and dollar reserves see Table 7 on p. 496.

Dunkirk'.¹²⁹ Sir Stafford Cripps would later add "the war has been won, but the price has not yet been paid."¹³⁰

Conflicts promptly arose within the British government over the desire to maintain Britain's global standing and the reestablishment of a liberal-trade order, and the costs of funding such endeavours.¹³¹ Barnett (1995) comments that in Britain there was "habit of mind that involved thinking in terms of the management of the whole global system".¹³² Britain thus found itself trying to balance three very different and complex relationships: the North Atlantic alliance with America, post-war Europe, and playing the central node in the British Empire and Commonwealth.¹³³

The British economy had been pivoted to meet the needs of total war, leaving a large majority of economic activity under government control. Imports, capital investment, and prices were all centrally managed during the war by the government. The year of 1941 saw what was referred to as the first 'Keynesian budget', authored by Sir Kingsley Wood, and a white paper titled 'Employment Policy' represented the first time the government accepts 'as one of their primary aims and responsibilities the maintenance of a high and stable level of employment after the war', followed up by Beveridge's 'Full Employment in a Free Society' in 1944, which set a goal for unemployment of 3%.¹³⁴ Many felt that central planning, which was the wartime *modus operandi*, would also be the most effective approach for quickly rebuilding. As noted by Cairncross:

"The war had been planned and planned successfully, so it appeared. Why then, it was asked, should planning prove any less successful in peace? What was carried over

¹²⁹ (Cairncross, 1985, pp. 7, 10) Fforde (1992) states that gold and dollar reserves at end of war were 14% of total external liabilities versus a pre-war level of 125%.

¹³⁰ (Burgess, 1999, p. 216)

¹³¹ (George & Institute of Contemporary British History., 1991, p. 34)

¹³² (Barnett, 1995; Cairncross, 1985, p. 11; Geiger, 2004; Leffler & Westad, 2010) Britain, no longer the world's dominant industrial and political power, was still arguably second only to the United States amongst capitalist nation states.

¹³³ See (Owen, 1999) for a discussion of Britain's post-war trade relations and priorities with the empire, continental Europe, and the north Atlantic.

¹³⁴ (Crafts, Woodward, & Duckham, 1991, p. 66)

from wartime was fundamentally the practice of drawing up programmes of various kinds. In the war it was through programmes that administrative decisions were expressed.”¹³⁵

Thus, a political climate that was highly supportive of government planning played a factor behind the ensuing financial repression.¹³⁶

As Labour took power in 1945 the British financial situation was precarious. Pre-war external liabilities of £0.5 billion ballooned by 572% to £3.36 billion as of June 1945. Of this amount £3 billion were ‘quick’ (short-term) liabilities, which in theory creditors could draw upon at short notice.¹³⁷ Britain faced a substantial external deficit even if the hoped-for economic “miracle” occurred, which called for exports growing to 150% of their 1938 volume, no net capital outflows, and no substantial build-up of stocks.¹³⁸ Instead of a miracle, Britain’s 1946-47 projected fiscal deficit came to £1.7 billion, double what had been estimated during the prior year. Further, the 1946 trade deficit was projected to be £500-700 million. During summer 1945 Keynes calculated that the foreign aid needed would total £1.5 billion. In sum, the dual legacies of vast war debts and significant government control over the economy created a fertile environment for policies associated with financial repression to take root in post-war Britain.

The first several years following the end of the war were particularly challenging for Britain’s economy. British GDP fell in the first two years after the war and government spending declined by 20%.¹³⁹ Britain’s public debt-to-GDP ratio would peak in 1946 at 270% (Table 5).¹⁴⁰ At the end of 1945 over 80% of the £3.6 billion in Britain’s foreign held debt,

¹³⁵ (Cairncross, 1985, pp. 299, 311)

¹³⁶ For more historical background and a discussion of planning in Britain in the 1930s see (Ritschel, 1997) and (Toye, 2003)

¹³⁷ (Pressnell, 1986, p. 417, Appendix 21)

¹³⁸ (Fforde, 1992, p. 52)

¹³⁹ (Booth, 1989, p. 129; Cairncross, 1985, p. 18) GDP went on to grow by 3% on avg. per year from 1948-1951; industrial production grew by 33%.

¹⁴⁰ (Abbas, Belhocine, ElGanainy, & Horton, 2010) As footnoted earlier, the IMF figure is higher than Reinhart and Rogoff (2010), which records 248% for 1946. In correspondence both Abbas and Sbrancia stated that this difference may be explained by the IMF’s use of factor costs in calculating nominal GDP.

referred to as the 'Sterling Balances', were held by Sterling Area countries. This debt consisted primarily of low-yielding T-bills and other short-term maturities, and nearly half of the balances were held by just two countries: India and Egypt (Table 6).¹⁴¹

Table 6: UK Gross External Sterling Liabilities ('Sterling Balances'), 31 December, 1945

(£s Millions)

	Official	Other	Total	% Total
<i>Overseas Sterling Area</i>				
Australia, New Zealand and South Africa	£265	£40	£305	8.5%
India, Pakistan and Ceylon	1,313	45	1,358	37.7%
Middle East*	443	147	590	16.4%
East, West and Central Africa	128	77	205	5.7%
Other	213	264	477	13.3%
Subtotal	£2,362	£573	£2,935	81.6%
<i>Non-Sterling Area</i>				
Western Europe	£183	£152	£335	9.3%
Latin America	159	7	166	4.6%
North America	14	19	33	0.9%
Other	44	86	130	3.6%
Subtotal	£400	£264	£664	18.4%
Total	£2,762	£837	£3,599	100.0%

*Note: includes Egypt and Sudan, Palestine and Transjordan, and Iraq. The breakdown between 'Official' and 'Other' is approximate, as it is for No-Sterling Area - Other.

Source: Fforde (1992, p. 91)

The composition of the UK's national debt had undergone a transformation (Table 7). Floating debt had increased significantly, and dated stocks were dramatically lower than in 1919. The average maturity had also declined, with 60% of the debt maturing within 15 years

¹⁴¹ (Cairncross & Eichengreen, 1983, p. 24)

versus 50% in 1919.¹⁴² Financial repression can be employed to reduce the value of shorter duration debts, so this feature of the British debt portfolio was perhaps not as important as it may first appear in contemplating the ability to utilize other debt sustainability methods, such as inflation surprise.¹⁴³

Table 7: Composition of UK National Debt: 1919, 1939 and 1945

Debt Type as a percentage (%) of Total Debt

	1919	1939	1945*
Floating Debt	23%	13%	29%
Dated Stocks	68%	35%	37%
Funded Debt	5%	46%	16%
Other Debt**	4%	6%	19%

*Note: Worswick and Ady's 1945 totals to 101%, presumably due to a rounding error.

**Note: Savings certificates, Defence Bonds, Tax Reserve Certificates, Terminable Annuities.

Source: Worswick and Ady (1952, p. 192), taken from *Abstract of Statistics*

The question of how to handle the Sterling Balances was debated at length. Keynes, like Harry Dexter White of the U.S. Treasury, was always in favour of “conducting major surgery”, meaning repudiation of Sterling Balances.¹⁴⁴ Archival documents indicate that Sterling Balances were not just seen as a problem for Britain and the country’s creditors; a New York Federal Reserve Bank (NYFRB) memorandum comments how:

“the existence of this huge dead-weight debt constitutes, as American negotiators realized, one of the most formidable threats to their realization of a multilateral world trading system”.¹⁴⁵

¹⁴² (Worswick & Ady, 1952, p. 191)

¹⁴³ (Calvo, 1989) “Debt liquidation is possible even though prices are sticky and government bonds are short-term. A policy implication is that short bond maturities are no safeguard against surprise devaluations intended to lower the burden of the debt.”

¹⁴⁴ (Skidelsky, 2000, p. 462)

¹⁴⁵ C261D pp. 16-17, NYFRB Research Memorandum titled ‘Notes on the Nationalization of the Bank of England’, New York Federal Reserve Bank Archive, 19 October, 1952

Any material reduction in Sterling Balances would need to involve India and Egypt. However, Fforde (1992) notes that “the ethical case for cancellation of war debts to India and Egypt was not accepted by local opinion”.¹⁴⁶ Sterling Area countries were encouraged to accumulate sterling under the assurance that it would be made immediately convertible at war’s end. However, this promise was ultimately not kept by the British.¹⁴⁷ Here we can see how financial repression, which is typically a domestic in terms of its orientation and impact, had a somewhat unusual international dimension in Britain’s case.

On 10 December, 1945 a report issued by the Bank of England rejected as ‘impracticable’ the idea that private balances should be expropriated, but that official balances might be ‘adjusted’ (repudiation) by 20%.¹⁴⁸ In January 1946 Keynes wrote about the use of ‘compound discounting’ and unilaterally blocking all Sterling Balances to trigger a crisis leading to a 33% currency devaluation for all Sterling Area countries, a suggestion that was rejected.¹⁴⁹ Further pressure was placed on Britain by America to “induce the various creditors to scale down the size of these balances substantially”.¹⁵⁰ However, Britain was able to keep the Anglo-American loan language sufficiently flexible to allow the Siepmann Committee to pursue bilateral negotiations with individual countries on loan forgiveness.

In the spring of 1946 the Bank of England and Treasury calculated that a very small fraction of the Sterling Balances, representing under 2% of the total (less than £60 million of the roughly £3 billion in total Sterling Balances), could be safely released per year over the next five years without triggering a crisis.¹⁵¹ As one Bank of England official stated:

¹⁴⁶ (Fforde 1992, pp. 89-91)

¹⁴⁷ (Cairncross & Eichengreen, 1983, p. 24)

¹⁴⁸ The Report pointed out that a number of Colonial Governments had made interest-free loans to the UK during the war, which could be written down as part of a post-war settlement.

¹⁴⁹ (Fforde, 1992, pp. 92-94)

¹⁵⁰ C261D p. 17, NYFRB Research Memorandum titled ‘Notes on the Nationalization of the Bank of England’, New York Federal Reserve Bank Archive, 19 October, 1952

¹⁵¹ (Fforde, 1992)

“our strongest argument is that it is in the interest of all countries which hold sterling that the position of sterling should be maintained. Our weapon is that we can completely block the existing Balances, but it is a weapon which it would greatly damage us to use, and the other countries will know this quite well.”¹⁵²

Foreshadowing the following year’s convertibility crisis, the Bank’s Sir David Waley stated in July 1946 that “there is no disguising the fact that the next twelve months will be a very stormy time”.¹⁵³

One particularly contentious bilateral Sterling Balance negotiation was the 1947 spring-summer discussions with Egypt. These negotiations culminated in the ‘Dalton ultimatum’, which was a threat to block all of Egypt’s Sterling Balances. Egypt, however, proceeded to leave the Sterling Area and play its ‘ace’, which was to insist on U.S. dollar payments of almost \$80 million in 1948 from Britain’s Egyptian-Suez Canal based military forces, causing Britain to relent.¹⁵⁴ While efforts in Egypt came up short, forbearance came from New Zealand, which forgave £10 million in March 1947, and Australia, which forgave first £20 million in March 1947 and another £8 million in August 1948.¹⁵⁵ In September 1946 a deal was also struck with Argentina where 0.5% interest was negotiated on Argentina’s loan to Britain, and only £5 million per year of sterling allowed to be released per year.¹⁵⁶

Exchange control on foreign balances represents a perhaps novel form of financial repression, which typically consists of domestic controls. Unlimited use of sterling was permitted inside the Sterling Area. However, prior Bank of England approval was required for transfers to non-sterling countries, and settlement in gold was provided when indebtedness exceeded specified amounts. In 1949 a multilateral formula designed to limit dollar

¹⁵² (Fforde, 1992, p. 108)

¹⁵³ (Fforde, 1992, p. 108)

¹⁵⁴ (Fforde, 1992, p. 117)

¹⁵⁵ (Pressnell 1986, p. 366)

¹⁵⁶ (Fforde, 1992, p. 117)

expenditure replaced these bilateral agreements and it wasn't until 1961 that full current account convertibility was established.¹⁵⁷

¹⁵⁷ (Cairncross & Eichengreen, 2003, pp. 24-26)

3.3 Classifying Sovereign Credit Events

Classification of sovereign credit events can vary. For example, economists and credit rating agencies employ different sovereign credit event definitions. Further confusion arises over the inconsistent use of terms to describe credit events. During a sovereign credit crisis and event many different terms other than the word ‘default’ are often employed, including ‘restructuring’, ‘reprofiling’, ‘soft restructuring’, and ‘rescheduling’, to characterize sovereign credit events.¹⁵⁸ The precise definition of ‘reprofiling’ vis-à-vis default is also often unclear.

Rather than being a simple matter of style, semantic differences can have significant implications. Grossman and Vay Huyck (1988) note that “window dressing” is often employed to avoid legally classifying debts as in default for regulatory purposes.¹⁵⁹ Financial stability is another justification given for the often elaborate effort made by policymakers and creditors to avoid using the term ‘default’ in conjunction with credit events. For example, in 2010-2012 it was feared a Greek default would trigger costly credit default swaps and further threaten a vulnerable European banking system to contagion risk, prompting significant efforts to avoid a technical Greek default (and referring to events as such).¹⁶⁰

Economists will also classify sovereign credit events differently. For economic analysis, Grossman and Vay Huyck conceptually define default as “the failure to meet contractually agreed upon obligations in full”, such as the repudiation of debt or the failure to repay the loan on time.¹⁶¹ However, Reinhart and Rogoff (2009, 2002) also suggest that annual inflation of 40% is significant enough to warrant designating a country as in default, though they acknowledge the 40% threshold as arbitrary. Reinhart and Rogoff (2010) further

¹⁵⁸ These terms were all used at various times during Greece’s sovereign debt crisis from 2010-15 (Times, 2011)

¹⁵⁹ (Grossman & Van Huyck, 1988, p. 1088)

¹⁶⁰ (Bernanke, 2012; Evans-Pritchard, 2012) Federal Reserve Chairman Ben Bernanke, commenting on Europe’s fragile banking system, stated that as of March 2012 European banks had a loan-to-deposit ratio of 1.3, which is a level similar to Japanese banks following the late-1980s Japanese Nikkei bubble collapse, whereas the level for U.S. banks was 0.7, in line with the historical average.

¹⁶¹ (Grossman & Van Huyck, 1988, p. 1088)

distinguish between *external* and *domestic* sovereign default, the former of which they define as "the failure to meet a principal or interest payment on the due date (or within the specified grace period). The episodes also include instances where rescheduled debt is ultimately extinguished on terms less favourable than the original obligation".¹⁶² They go on to state that domestic default also includes the "freezing of bank deposits and or forcible conversions of such depositors from dollars to local currency".¹⁶³

The definition used by economists can also differ from market facing institutions, such as credit rating agencies, as the recent Greek illustrates. Standard and Poor's determined that the February 2012 Greek debt restructuring constituted a 'selective default' because Greece forced debt holders who were 'holding out' from joining in a revised agreement to join alongside 'voluntary' creditors in a Greek debt write-down.¹⁶⁴ The International Swaps and Derivatives Association, which ultimately determines whether a credit event has occurred for the purpose of determining payment on financial instruments such as credit default swaps, concurred with Standard and Poor's. In other words, had Greece not instituted a retroactive collective action clause on a relatively small number of private sector hold-outs then Greece would not have been judged to have defaulted on its sovereign debt even though the Greek-Troika program called for a write-down of approximately 75% of value of Greece's debt.

The Greek case highlights the often complex nature and lack of a generally agreed upon framework for determining sovereign credit events. In other words, a very significant sovereign credit event for Greece would go unrecorded if economic historians were to follow the lead of the credit rating agencies. In short, it can be difficult to characterize some sovereign defaults in a simple, binary fashion.

¹⁶² (Reinhart & Rogoff, 2010)

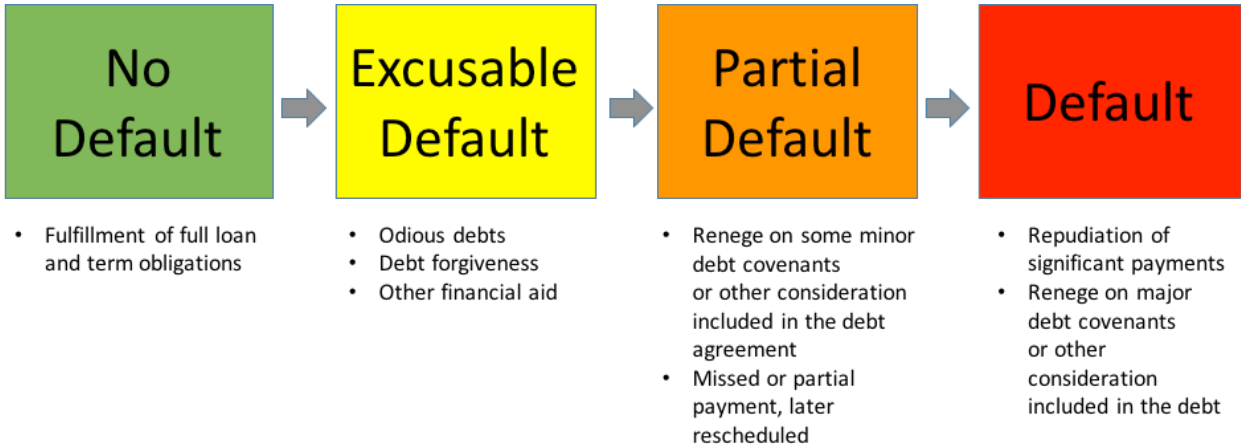
¹⁶³ (Reinhart & Rogoff, 2010)

¹⁶⁴ (BBC, 2012)

This paper argues that two enhancements to how we determine and measure sovereign credit events would be useful and provide a more accurate, nuanced, and ultimately complete record of sovereign credit history. First, judgments on default should also take non-financial factors into consideration, such as whether there has been a failure to meet any of the other debt covenants or other forms of consideration included in the debt agreements. Second, it would also be useful to go beyond a binary yes-no determination of whether a country has defaulted to distinguish between different types of default. In other words, recognizing that a ‘default spectrum’ exists would provide a more accurate and useful historical record of different sovereign credit events.

This paper suggests a default classification framework that would distinguish between four different sovereign credit event scenarios: no default, excusable default, partial default, and default (Figure 7).

Figure 7: The Sovereign Default Spectrum



The first scenario, *no default*, is when full terms of the original loan agreement have been fulfilled. The second scenario, *excusable default*, could mean that some form of financial aid (e.g., bridge financing) or debt forgiveness has been voluntarily granted by the creditor(s) and agreed to by the debtor(s). One justification for debt forgiveness could be a determination that the debts are 'odious', meaning that either a legal or moral justification is

provided for expunging the debt. A country that has successfully found agreement with its creditors but has still made significant adjustments to the originally agreed upon terms and or debt payments can therefore be classified as an excusable default. Some might take issue with the use of a judgment-laden term like 'default' given the mutually agreed upon nature and or moral circumstances surrounding the extinguishment of odious debts. However, it is important to note that the original obligation has not been met and a loss has been incurred. In other words, mutually agreement does not alter the fact that a creditor loss has been sustained, and it is therefore useful still to record the extinguishment of odious or similar debt.

With regards to the definitions for *partial default* and *default*, there is value in adding a 'partial default' designation so that previously overlooked credit events can be identified and recorded. Specifically, a country that fails to meet all of the original terms of its debt agreement and has not successfully renegotiated with creditors has in effect repudiated some obligations, and this event should be recorded as a form of default.

How is a partial default different from default? Here is an example of a partial default: a country that delays an interest or principal payment but then subsequently makes that payment and future payments. A second example: a country that fail to adhere to the full terms of the loan agreement but still makes good on all interest and principal payments. These are lesser sovereign credit events than a full repudiation. Other scenarios that could trigger a partial default could include cases where a significant currency devaluation occurs where debt is denominated in the depreciated currency. Suggesting precise guidelines for determining when all sovereign credit events would be classified as either a full or partial default is beyond the scope of this paper. What can be said here is that determination would depend upon a number of factors. In the case of a currency devaluation, these factors could include the causes behind the devaluation (e.g., was it deliberate), how much debt remained to be paid, and the size of the devaluation.

The question of default often has important tangible and intangible implications that reach beyond the realms of finance and economics. Negative financial consequences of default, such as losses to creditors and higher borrowing costs for the country that defaults, are generally well understood. However, less clear is why creditor and debtor countries alike have often gone to such great lengths to avoid the consequences and stigma associated with being labelled as a 'defaulter'. One example from history that illustrates these points is the case of post-Second World War Britain and the Anglo-American loan.

3.4 Britain's Default on the 1946 Anglo-American Loan

“The financial problems of the war have been surmounted so easily and so silently that the average man sees no reason to suppose that the financial problems of the peace will be any more difficult.”

-John Maynard Keynes, 1945¹⁶⁵

Before examining the evidence of a British default it is useful to review what Britain and the United States hoped to accomplish during their financial aid negotiations, which began in September 1945 in Washington D.C. Sovereign credit event determinations involves judgment, and a fuller understanding of both the ‘letter and the spirit’ of a credit agreement informs judgment. For the Americans, the two initial primary post-war economic aims with regard to Britain were covered during the aforementioned ‘Consideration’ negotiations: non-discriminatory (free) trade and sterling convertibility. Britain hoped to obtain either grant-aid from the U.S. or negotiate a loan at zero percent to meet its immediate post-war financing needs.¹⁶⁶

Prior to successfully negotiating the Anglo-American Financial Agreement other financing options were considered. For example, discussions took place inside the Federal Reserve and externally of alternative ways of financing the “Anglo-American Problem”, as it was characterized. A NYFRB memorandum dated 30 October, 1945 describes a ‘monetary approach’ to the problem of British liquidity, which was favoured by NYFRB head Allan Sproul.¹⁶⁷ Sproul described his proposal as a “monetary arrangement between the two countries which does not involve a loan contract, a rate of interest, or a repayment date or dates”. The details of the proposal would have the Bank of England entering into an agreement with the NYFRB and other branches of the Federal Reserve, whereby:

¹⁶⁵ (Cairncross, 1985, p. 10)

¹⁶⁶ (Skidelsky, 2000, p. 338) Keynes and Whitehall felt that Britain had made the much larger sacrifice for the common good than the U.S. and that this should be accounted for.

¹⁶⁷ C261, ‘Monetary Approach to the Anglo-American Problem, W. Knoke to R. Sproul, New York Federal Reserve Bank Archive, 30 October, 1945

“the latter would accumulate pounds sterling the next 3 to 5 years in an amount sufficient to cover the British balance of payments deficit. Presumably this proposal is not meant to cover the lend lease financing so that the sum involved according to our present thinking would be sterling equivalent to \$3.5 billion dollars. This accumulation of sterling funds, and release of corresponding amount of dollars to the British, would proceed without any firm agreement as to how the operation should be liquidated”.¹⁶⁸

This monetary approach, which would provide Britain with credit and the ability to defend sterling’s exchange rate, had the advantage of being “a great deal more flexible than the present loan scheme” by allowing for adjustments as necessary “with greater ease away from the glare of publicity”. Ultimately, this alternative funding proposal was scrapped as “the magnitude of England’s needs today (\$4 billion to \$6 billion) might make the transaction too enormous even for the Federal Reserve System to handle”. In addition, there was concern over the Federal Reserve showing favouritism towards the UK:

“Not an obstacle exactly, but a possible source of future embarrassment that we might well wish to avoid, would be a situation where the System after making an arrangement with the British declines to make similar arrangements with the French or Russians, for instance, thus inviting the reproach of discrimination, or political pressure aiming at pushing us into more and more such arrangements”.¹⁶⁹

In light of subsequent events, specifically the incredible financial pressure Britain came under following the loss of reserves, the above monetary approach presents an intriguing counterfactual. First, the lack of market confidence in Britain’s financial wherewithal and the maintenance of sterling’s exchange rate played at least some role in the subsequent 1947 convertibility and 1949 devaluation crises. How much would Britain have benefitted by having access to billions in U.S. dollar funding via the NYFRB? Would such a program have stemmed the collapse in confidence that occurred in the lead-up to the dual sterling crises? Further, New York was a major centre for discounted ‘free’ sterling trade, and the very visible discounted rate at which free sterling traded played a considerable role in

¹⁶⁸ C261, Office Correspondence, Mr. Knapp to Chairman Eccles, p. 1, New York Federal Reserve Bank Archive, 29 October, 1945

¹⁶⁹ C261, ‘Monetary Approach to the Anglo-American Problem, W. Knoke to R. Sproul, p. 3, New York Federal Reserve Bank Archive, 30 October, 1945

exacerbating the pressure on the official sterling rate. Archival evidence indicates that NYFRB authorities did not condone the trade of free sterling in New York and may have even sought to tamp it down. Nevertheless, New York free sterling trade continued. Further it is reasonable to presume that the NYFRB would have moved to prohibit free sterling trade more aggressively if the Federal Reserve System was holding billions in sterling at risk of devaluation.

In Washington the British delegation to negotiate an American loan was famously led by John Maynard Keynes.¹⁷⁰ For the past several years Keynes had played a central role in British economic policy and relations with the United States. When Keynes would passed away on 21 April, 1946 his colleague, Otto Clarke, said it:

“leaves the Treasury in a terrible hole. Keynes has been The Treasury over the last few years; he has determined policy, spurred on the other officials by criticism and help, conducted the major negotiations. This dependence has been good in some respects; it has been bad in others for it has prevented the officials from developing an individual technique of thought. He has been the brains and conscience. Now at the beginning of a period of far-reaching negotiations, the controller of the basic strategy (and of 75% of the tactics) has gone. A frightful gap is left in Bretton Woods; another in the Sterling Balances.”¹⁷¹

Given the country’s financial position the British negotiating position was relatively weak. There was also the matter of securing financing in the face of a less than enthusiastic American public and U.S. Congress. In contrast to other recent negotiating delegations, no Bank of England officials accompanied Keynes. In fact, the Bank of England had clashed with Keynes over his plans.¹⁷² Describing the negotiations, Skidelsky (2000) emphasizes “the intensity and often bitterness of the struggle between Britain and America for post-war position which went on under the facade of the Grand Alliance”.¹⁷³ As noted in a NYFRB memo from Mr. Knapp to Chairman Eccles:

¹⁷⁰ (Mackenzie, 1996)

¹⁷¹ (Skidelsky, 2000, p. 472)

¹⁷² (Fforde 1992, pp. 32-34) The Bank had become a centre for alternatives ideas the ones proposed by Keynes.

¹⁷³ (Skidelsky, 2000, p. xx) For more on Anglo-American relations see (G. Kolko, 1969; J. Kolko & Kolko, 1972), (Thorne, 1979) and (Woods, 1990).

“Any proposal, however well meant, which would in effect make them [Britain] entirely dependent on American good graces, will leave them cold. They know the present American attitude, which does not give much encouragement; and they have to reckon with American attitudes for the next fifty years”.¹⁷⁴

In December 1945 the Anglo-American Financial Agreement (commonly referred to as the ‘American Loan’) was finalized at terms of 2% for \$3.7 billion, plus \$650 million in Lend Lease balances.¹⁷⁵ The loan was to be paid over 50 years, with an initial delay of five years, making the first payment due in 1951.¹⁷⁶ Keynes ultimately fell short of meeting his hoped for negotiating goals for Britain, protesting that:

“On the matter of interest, I shall never so long as I live cease to regret this is not an interest-free loan. The charging of interest is out of tune with the underlying realities.”¹⁷⁷

Scholars such as Dobson (1990) report widespread “resentment” over the terms insisted upon by the Americans.¹⁷⁸ Cairncross (1985) reports how British government officials viewed the loan terms as “commercial” even though on actuarial basis the effective interest rate on the loan worked out to 1.6%.¹⁷⁹

An NYFRB document titled ‘Benefits of the British Loan Agreement’ highlights some of the intended benefits of the loan for both parties. One of the key elements of the loan was that “Britain was not permitted to use any part of the American line of credit specifically to pay off existing external debts”, although “the line of credit will indirectly make possible the early repayment of some of this debt by releasing dollars for this purpose which would

¹⁷⁴ C261, Office Correspondence, Mr. Knapp to Chairman Eccles, New York Federal Reserve Bank Archive, 29 October, 1945. From p.2

¹⁷⁵ See (Skidelsky, 2000, p. 446) and (Dobson, 1990). Cairncross (1985) reports how British government officials viewed the loan terms as “commercial”, or too high, even though on actuarial basis the effective interest rate on the loan worked out to 1.6% (Cairncross, 1985, p. 105).

¹⁷⁶ (Cairncross, 1985, p. 105; Rosenson, 1947) The text of the Financial Agreement is presented in (Skidelsky, 2000, pp. 453-458)

¹⁷⁷ (Skidelsky, 2000, p. 446)

¹⁷⁸ (Dobson, 1990)

¹⁷⁹ (Cairncross, 1985, p. 105)

otherwise have to be used in Britain's current account deficit".¹⁸⁰ The document claims that Americans stood to benefit from an economically healthier Britain in a number of ways, including greater importation of American goods and Britain's support of multilateral trade policies. However, many of the benefits the Americans were expecting would not come to fruition.

3.4.1 The 1947 Convertibility Crisis

Clause 10 of the Financial Agreement stated that pound sterling would be made convertible for current but not capital account transactions by 15 July, 1947.¹⁸¹ Convertibility was insisted upon to eliminate discrimination against U.S. exports into the Sterling Area via 'dollar pooling' arrangements.¹⁸² Dollar pooling reduced dollars available throughout Sterling Area countries to pay for U.S. goods. Another advertised benefit of the Agreement for the Americans was that "any sterling acquired by Americans as a result of their current transactions with Britain will be freely convertible into any currency once the Agreement goes into effect".¹⁸³

The convertibility clause was controversial. First, in practice it was difficult to distinguish between current and capital conversions. There were also some in Britain who objected at the time of the negotiation to the provision of sterling convertibility.¹⁸⁴ However, Keynes' responded:

"The way to remain an international banker is to allow cheques to be drawn upon you; the way to destroy the Sterling Area is to prey on it and try to live

¹⁸⁰ C261, Attachment from letter from R. Sproul to W. Knoke p. 1, New York Federal Reserve Bank Archive, 10 May, 1946

¹⁸¹ (Newton, 1984, p. 398, note 27) It took until 15 July, 1946, over six months from the completion of negotiations, for the U.S. Congress to ratify the Financial Agreement.

¹⁸² C261, Attachment from letter from R. Sproul to W. Knoke p. 3, New York Federal Reserve Bank Archive, 10 May, 1946

¹⁸³ C261, Attachment from letter from R. Sproul to W. Knoke p. 3, New York Federal Reserve Bank Archive, 10 May, 1946

¹⁸⁴ The Treasury's Sir Hugh Ellis Rees unpublished memo (1962) states that there was never any chance of successfully making sterling convertible within the agreed timeframe.

on it. The alternative (to the loan) is to build up a separate economic block which excludes Canada and consists of countries to which we already owe more money than we can pay, on the basis of their agreeing to lend us money they have not got and buy from us...goods we are unable to supply.”¹⁸⁵

While the loan was intended to last for three years, over half of the loan had been drawn down in twelve months.¹⁸⁶ Large capital transfers were given as the reason, although as Gardner (1956) notes “the available evidence on this latter point is only circumstantial”.¹⁸⁷ Cairncross’s (1985) analysis pointed out that even with the introduction of the Exchange Control Act there was a capital outflow £643 million, or a staggering 8% of GDP, in the same year as the 1947 convertibility crisis. As Cairncross states this “was certainly not the purpose for which the American and Canadian loans were produced”.¹⁸⁸ Indeed, in a briefing document prepared for answering U.S. Congressional questions such as “What will England do with the credit?”, the prepared response states “The purpose of the line of credit is...to help the United Kingdom to maintain adequate reserves of gold and dollars”.¹⁸⁹

On 18 August, 1947, Britain announced the suspension of convertibility due to the deterioration in Britain’s reserves. There is some disagreement in the literature as to the exact timing and speed by which Britain’s reserves declined.¹⁹⁰ However, Britain's reserves do appear to have precipitously declined in the months prior to August 1947 and through the end of the year (Table 8).

¹⁸⁵ (Skidelsky, 2000, pp. 446-447)

¹⁸⁶ (Pressnell, 1986)

¹⁸⁷ (Richard N. Gardner, 1956, p. 317)

¹⁸⁸ (Cairncross, 1985, pp. 153-154) This episode also illustrates the challenge of obtaining accurate statistical information during this period: the 1947 capital drain was originally calculated in 1948 at £349 million, or nearly half of the actual figure of £643 million.

¹⁸⁹ C261, ‘Questions and Answers o the Financial Agreement’ p. 3, New York Federal Reserve Bank Archive, 14 February, 1946

¹⁹⁰ (Cairncross, 1985, p. 162; Kennedy, 2011; Peden, 2000, p. 389; Schenk, 2010, p. 63)

Table 8: UK Gold and Dollar Reserves, Selected Dates 1938 – 1947*(\$s millions)*

Date	Current Value*	Value	% of 1938 Reserves	Change from Previous Date
31 August, 1938	\$4,190	\$4,190	100%	
31 December, 1946	\$2,696	\$1,409	34%	-\$1,494
31 March, 1947	\$2,380	\$1,259	30%	-\$316
30 June, 1947	\$2,410	\$1,223	29%	\$30
30 September, 1947	\$2,383	\$1,192	28%	-\$27
31 December, 1947	\$2,079	\$985	23%	-\$304

Note: official estimates of gold and U.S. and Canadian dollars, as expressed in U.S. dollars at current exchange rates.

Source: Gardner (1956, p. 324), from Table 37, E.C.A. Special Mission to the UK, *The Sterling Area*, 1951, p. 135

3.4.2 Evidence of a British default on the Anglo-American Financial Agreement

Scholars who have examined mid-20th century British economic history, or the history of sovereign defaults, including Gardner, Newton, Reinhart & Rogoff, et al have either overlooked or not interpreted Britain’s suspension of convertibility in 1947 or subsequent events as constituting default.¹⁹¹ However, the evidence from archival sources, and a careful reading of the Financial Agreement, show that this view is difficult to defend.

The initial response from U.S. Treasury Secretary Snyder to the suspension of sterling convertibility was that this constituted a default.¹⁹² Snyder requested that Britain acknowledge in writing its intention to unilaterally suspend convertibility, which would be followed by the U.S. halting the balance of the loan. Snyder’s interpretation was also shared

¹⁹¹ (Richard N. Gardner, 1956; Richard Newton Gardner, 1969; Richard N. Gardner, 1980; Newton, 1984; C. M. Reinhart, 2010; Carmen M. Reinhart & Rogoff, 2009)

¹⁹² (Richard N. Gardner, 1956, p. 322)

by British negotiators in Washington. According to a cable dated 18 August, 1947 to Mr. Bridges in the Foreign Office, Mr. Eady states:

“We made no bones of the fact that although this was not a repudiation of the principles of the loan agreement, it would be regarded in substance as a breach of the agreement, but we argued that it was a breach forced upon us by circumstances which were beyond our control”.¹⁹³

The unilateral declaration by Britain that sterling convertibility would be suspended was messaged from the Prime Minister to Eady in Washington at 8:55pm on 19 August, 1947, stating:

“You will realize how reluctant we are to take this action in view of our financial agreement with you...we have been forced to act without the consultation with you which we should have wished. The course of events leaves us no option.”¹⁹⁴

In sum, the decision to suspend convertibility was clearly taken alone by Britain without the approval of the United States government and it was in violation of the Financial Agreement. This was the first instance of Britain breaking the terms of the Financial Agreement.

Convertibility was halted on 20 August.¹⁹⁵ Two days of non-stop negotiations, described by some as “a search for legal loop-holes in the Agreement”,¹⁹⁶ led to a joint statement that the suspension was “of an emergency and temporary nature” without defining an exact date at which convertibility would be re-established.¹⁹⁷ However, there was an expectation that should Britain be unable to restore convertibility in the near term then a revised Agreement would be submitted for Congressional approval, or the remaining \$400 million would not be disbursed.

¹⁹³ OV31/101 No. 4528, Eady, Bank of England Archive, 18 August, 1947

¹⁹⁴ OV31/101 No. 8436, Prime Minister's Office, Bank of England Archive, 19 August, 1947

¹⁹⁵ (Richard N. Gardner, 1956, p. 323)

¹⁹⁶ OV31/101 No. 4570, Lovett, Bank of England Archive, 20 August, 1947

¹⁹⁷ OV31/101 Cmd. 7210, Bank of England Archive, 20 August, 1947

There was significant trepidation amongst British officials over the thought of again going before Congress to renegotiate the American loan. Chancellor of the Exchequer Hugh Dalton:

“Of Congressional debate on our affairs we had had enough in 1946 when the Loan Agreement was under discussion...Many congressmen had deployed lengthy, ill-informed, unfriendly and even spiteful criticism of Britain. We did not want a repetition of this, which would have been damaging to our credibility and to Anglo-American co-operation generally.”¹⁹⁸

However, the view from inside the U.S. Treasury differed from Dalton’s. As expressed by U.S. Treasury officials Frank Southard and Lowell Pumphrey, the feeling was that Article XII of the Financial Agreement, which requires that the U.S. Congress be presented with any proposed modifications, should be invoked. In a candid report from his dinner with Pumphrey of the U.S. Treasury, the Bank of England’s Grafftey-Smith stated:

“He (Pumphrey) showed me a personal letter from Southard indicating that, after much discussion within the U.S. Treasury, it was decided that the most honest method of presentation would be for H.M.G to invoke Article XII”.¹⁹⁹

The relevant section of Article XII states: “Either Government shall be entitled to approach the other for a reconsideration of any of the provisions of this Agreement, if in its opinion the prevailing conditions of international exchange justify such a reconsideration with a view to agreeing upon modifications for presentation to their respective Legislatures”.²⁰⁰ However, the U.S. Congress was never officially asked to approve an updated Financial Agreement, and the ‘temporary’ suspension of sterling convertibility was maintained for over a decade, until 1958.²⁰¹ Meanwhile, the remaining loan funds were disbursed.²⁰² In sum, even if the

¹⁹⁸ (Dalton, 1962p. 255)

¹⁹⁹ OV31/102 No. 1, Grafftey-Smith, Bank of England Archive, 2 October, 1947

²⁰⁰ OV31/102 No. 1, Grafftey-Smith, Bank of England Archive, 2 October, 1947

²⁰¹ (Graves, 1971)

²⁰² (Richard N. Gardner, 1956, pp. 323-325) From correspondence of August 20, 1947, Relating to Modification of the System of Transferable Accounts, Appendix C of U.S. National Advisory Council, *Report on Activities*, April 1, 1947 to Sept. 30, 1947.

suspension fell within the terms of the original Agreement, the revised understanding negotiated at the time of the suspension of sterling's convertibility was not fulfilled.

Official minutes from a meeting on 1 October, 1948 in Washington D.C. between the new Chancellor, Sir Stafford Cripps, and Snyder confirm Britain's default. During the meeting the subject of convertibility was revisited, and Cripps stated that should another effort to make pound sterling convertible be undertaken "we (the UK) might have to face the choice between a *second default* on our obligation".²⁰³

While the suspension of sterling convertibility and the aftermath provide clear evidence that Britain defaulted, this was not the lone instance of default. A second default occurred in December 1947 when Britain, which was still suffering from a decline in reserves, sought the remaining \$400 million U.S. credit even though convertibility had not been re-established. As Gardner (1956) remarks, "but how, under the original exchange of notes...could the United States permit withdrawal of the \$400 million if convertibility were not resumed?"²⁰⁴ By this time, however, the administration and Congress were absorbed in Marshall Aid planning amid the backdrop of Soviet aggression. A second set of notes between Britain and the U.S. were exchanged and Britain was allowed to access the \$400 million without reinstating convertibility.

There is evidence of a further two additional instances of British default. With respect to the Sterling Balances, the Agreement called for Britain to make 'every endeavour' to negotiate down or block a large portion of the balances; the U.S. government was led to believe that 33%, or approximately £1 billion, would be written off.²⁰⁵ Newton (1984) states "Britain had committed herself under Clause 10 of the Financial Agreement to "adjusting" (downward) the Sterling Balances".²⁰⁶ However, for a variety of reasons, the 'major surgery' Keynes envisioned for the Sterling Balances never occurred. The Bank of England and, to a

²⁰³ OV31/102 No. 117, Wilson-Smith, Bank of England Archive, 1 October, 1948

²⁰⁴ (Richard N. Gardner, 1956, pp. 324-325)

²⁰⁵ (Gardner 1956, p. 326)

²⁰⁶ (Newton, 1984, p. 399)

lesser extent the Treasury, considered the Sterling Balances to be “solemn obligations”. There was also a view that the Balances could be helpful to British foreign trade and that a drastic reduction could negatively impact Indian independence.²⁰⁷ Newton states: “the increase of (Sterling Balances) gave Britain, banker to the Sterling Area, advantages of importing without having to pay in the now”.²⁰⁸ Regardless of the rationale, very little downward adjustment of the Sterling Balances took place by 15 July, 1947. If not an outright violation, the lack of adjustment certainly violated the spirit of the Agreement.

The fourth instance of default relates to Article 9 of the Financial Agreement, the non-discrimination of trade clause, which Britain violated by paying more for non-U.S. goods to conserve U.S. dollars. Treasury Secretary Snyder publicly denied this practice, but he privately accommodated Britain by supporting discrimination against U.S. goods. British trade discrimination, however, is a clear violation of Article 9.²⁰⁹ The decision to overlook Imperial trade preference, made by Snyder without seeking Congressional approval to amend the terms of the Financial Agreement, was within British policymaking circles referred to as the ‘Snyder let-out’.²¹⁰ Some historians have viewed Britain’s trade discrimination as having been officially “sanctioned by the United States”.²¹¹ However, British officials appear to have been well aware of Snyder violating both the spirit and the letter of the agreement by not taking this before Congress. A confidential UK Board of Trade memo dated 15 October, 1948 states:

“It was impossible...for the administration formally to interpret Article 9. The agreement (Anglo-American Loan) was approved by Congress and only an Act by Congress could be effective for our (British) purposes. If the administration did issue a statement there would certainly be counter-statements by members of Congress that it had no force, with the result that the administration have put itself into an untenable position without doing us any good. Worse still, we should have excited congressional opposition to the

²⁰⁷ (Richard N. Gardner, 1956, p. 326)

²⁰⁸ (Newton, 1984, p. 399)

²⁰⁹ (Richard N. Gardner, 1956, p. 335)

²¹⁰ OV31/102, Board of Trade Memo, Bank of England Archive, 18 September, 1948

²¹¹ (Krozewski, 2001, p. 81) “The international context, sanctioned by the United States, defined the feasibility of Britain’s discriminatory management.”

matter itself by the unconstitutional way in which it had been presented. A new administration would almost certainly inform us that the joint statement had no validity.”²¹²

While there is ample evidence that Britain did not adhere to the full terms of the Financial Agreement, often with the encouragement of parts of the U.S. executive branch, what about the repayment of the loan’s interest and principal? While the existing literature makes no mention of missed payments, archival sources suggest this may have happened. For example, there is a reference to Britain having trouble beginning payments in 1951.²¹³ Suggestions for addressing this problem include renegotiating the terms of the agreement to delay repayment of principal by five years (the 1951 payment would be \$52 million, rising annually thereafter), reduce interest expense, or, as Christelow suggests, “transition of the Loan into a free gift”.²¹⁴ The Anglo-American loan was later renegotiated in 1956-57 to allow for the UK to ‘take a bisque’, meaning suspend payments of principal and interest in any year, up to seven times, during the remaining life of the loan.²¹⁵ This modification to the loan agreement certainly reduced the real value of the debt. However, it was mutually agreed and approved by the U.S. Congress. In sum, a review of the archives has not revealed an obvious 'smoking gun' missed or skipped payment.

The two final events that could be considered defaults are the two sterling devaluations, in 1949 and 1967. Because the Anglo-American Financial Agreement's principal and interest payments were denominated in dollars it was not possible for Britain 'print' dollars to help pay off the loan. However, as shown previously, much of Britain's other sovereign debt, such as the Sterling Balances, was denominated in sterling. Further, not all of this debt could be easily exchanged by Britain's creditors. Britain's 1949 and 1967 sterling

²¹² OV31/102 No. 119, Franks, Bank of England Archive, 15 October, 1948. The memo was written at a time when it was unclear who would win the 1948 U.S. Presidential electoral contest between Democratic incumbent Harry S. Truman and Republican challenger Thomas E. Dewey (Truman prevailed by a close margin).

²¹³ OV31/102 No. 6, Christelow, Bank of England Archive, 15 October, 1947; OV31/102 No. 61, Thompson-McCausland, Bank of England Archive, 26 April, 1948

²¹⁴ OV31/102 No. 6, Christelow, Bank of England Archive, 15 October, 1947; OV31/102 No. 61, Thompson-McCausland, Bank of England Archive, 26 April, 1948

²¹⁵ (Cosío-Pascal & Bankruptcy, 2006, p. 7)

devaluations, which reduced the real value of sovereign debt denominated in sterling, could also therefore be viewed as a partial default.

3.5 Conclusion

“We are reluctant to put on record, if we can avoid it, what amounts to a public confession that we have not fulfilled our obligation.”

-Draft letter from H.M. Treasury to U.S. Treasury, December, 1951²¹⁶

The above quotation is from a letter prepared at the end of 1951 at the request of U.S. Secretary of the Treasury Snyder, drafted on behalf of the new Conservative Chancellor of the Exchequer, R.A. Butler, by Sir Herbert Britain of Treasury. Great reluctance was expressed inside the British Treasury to sending such a letter, and it was never formally delivered to the Americans.²¹⁷ However, from these and other statements it is clear that contemporary actors judged that Britain had defaulted on Anglo-American Financial Agreement. But how should economic historians ultimately judge British debt sustainability during this period?

Gardner (1956) concludes his own assessment of the convertibility clause and the Financial Agreement as follows:

“Thus did the letter of an unwise provision give way before the obvious interest of Britain and the United States. The convertibility provision had been tightly drafted to ensure that an important step toward multilateralism would be achieved. In fact, the provision advanced multilateralism not at all.”²¹⁸

Gardner’s interpretation is supported by Cairncross, and perhaps is correct in terms of judging the broader global significance of the economic and trade picture during this time.²¹⁹ However, the fact that the original Financial Agreement may have been poorly designed does not mean Britain avoided default.²²⁰ Nowhere in either Gardner's or Cairncross's assessment

²¹⁶ OV31/103 No. 177, Brittain, Bank of England Archive, 10 December, 1951

²¹⁷ OV31/103 No. 182, Butler, Bank of England Archive, 19 December, 1951

²¹⁸ (Richard N. Gardner, 1956, p. 325)

²¹⁹ (Cairncross, 1985, pp. 100-101)

²²⁰ Gardner also either missed or overlooks some factual elements of the story, such as the failure of the British to adhere to subsequent arrangements, first negotiated in August 1947 and then again in December 1947.

is the word 'default' used in conjunction with Britain and the Anglo-American Financial Agreement. This may be in part due to the fact that the concept of an 'excusable default' had not yet been developed. The term excusable default is defined by Grossman and Van Huyck (1988) as a credit event that is "justifiably associated with implicitly understood contingences", and should implicitly be considered as a lesser or non-offense by the debtor as compared to outright debt repudiation.²²¹ Gardner and Cairncross argue in essence that Britain's failure to meet the full terms of the Financial Agreement can be characterized as an excusable default, even though neither use this term. However, U.S. Treasury Secretary Snyder made several legal and constitutional violations by not seeking U.S. Congressional approval for the so-called 'Snyder let-out' on Clause 9 of the Financial Agreement. In other words, Britain was only 'partially excused' by one branch of the U.S. government from fulfilling its obligations. Further, it would not be accurate to describe the Anglo-American Financial Agreement as odious debt, which as discussed earlier also falls under the heading of 'excusable default'. In sum, Britain's default on the Anglo-American Financial Agreement resides somewhere between the 'excusable' and 'partial' end of the sovereign default spectrum.

Whether or not there was an attempt to downplay or even cover-up Britain's default on loan terms to mitigate damage to Britain's reputation, both within the Sterling Area and abroad, is also unclear. A very public British default would certainly have resulted in reduced confidence in Britain's financial fortitude and further weakened sterling, a still important international reserve currency. Starting in the late-1940s U.S. policy shifted, and financial and economic priorities gave way to concerns over the spread of communism. In other words, there were significant incentives for both Britain and the U.S. to disguise Britain's failure to fully complete the terms of the Anglo-American loan, and checking communist expansion appears to have been more important to the U.S. (at least within the executive branch) than seeing certain elements of the Anglo-American loan agreement fulfilled. The British case

²²¹ (Grossman & Van Huyck, 1988)

illustrates the considerable lengths policymakers on both sides of a credit agreement are often willing to travel to avoid branding a country as in default.

Ultimately, sovereign-to-sovereign lending is rarely just about the money. The Anglo-American loan illustrates how non-financial and non-economic priorities, such as geopolitics, can affect sovereign debt sustainability. The public record and archival correspondence make clear the many political aspects of the loan, including Britain's support for the International Trade Organization, Britain's "adherence to Bretton Woods organizations", and "enabling [Britain] to assume the obligations of the UNO [United Nations Organization], and thereby to contribute to the maintenance of world peace".²²² The British case also suggests that partial or excusable sovereign defaults are far from unimportant economic events and are worthy of further scholarship.

²²² C261, 'Benefits of British Loan Agreement' p. 3, New York Federal Reserve Bank Archive, 14 February, 1946

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4 Origins and Measurement of Financial Repression: The British Case, mid-20th Century

Abstract: A disagreement has emerged over whether advanced countries such as Britain engaged in financial repression following the Second World War. A review of the historical literature and archival evidence show that financial repression played an important role in sustaining Britain's record-setting levels of public debt. In Britain, eleven pieces of legislation and sixteen policies/directives are identified that supported financial repression during this period. An examination of two leading quantitative methods for measuring financial repression highlights the need for alternative approaches, such as a proposed composite indicator. Using free market bond yield data, British government savings attributable to financial repression are calculated at over 8% of GDP in 1948. The paper discusses various aspects of British financial repression, such as interest rate policy, capital controls, directed lending, and the conscription of the British banking system.

JEL: H63, E58, E61, E62, H12, H27, P24

Keywords: financial repression, capital controls, sovereign debt, debt sustainability, inflation, British economic history, British banking system, interest rates, financial regulation, macroprudential regulation

4.1 Introduction

Financial repression has received renewed academic and public attention in recent years as part of the ongoing economic and policy debate over how best to achieve economic growth while sustaining public debts. The renewed interest in financial repression has been prompted in part by the highest levels of public and private sector debts in advanced economies since the Second World War, the period which some scholars argue was the last time advanced countries practiced financial repression on a wide scale.

Until recently problems posed by unsustainable levels of sovereign debt were nearly exclusive to developing economies. Over the last four decades, much of the sovereign debt research and policy focus has therefore been directed towards emerging markets. However, debt sustainability measures that are typically employed by developing countries, such as repudiation and inflation, are viewed as impractical, undesirable, or even impossible for many advanced economies to implement. At the same time, outstanding debts and deficits are large enough that other traditional mechanisms for achieving fiscal balance, such as reductions in government expenditures or asset sales, are viewed by many as insufficient to make a material impact on sovereign debt sustainability. If advanced economies are ultimately unable to achieve sufficient economic growth to make their debts sustainable then financial repression may be the most compelling policy option.

A disagreement exists between Reinhart and Sbrancia (2011) and Taylor (2011) over the evidence of widespread financial repression in the post-Second World War period.²²³ The disagreement is explored in more depth later in the paper but can be summarized as follows: Reinhart and Sbrancia state that the decline in the real value of public debt is *prima facie* evidence of financial repression, while Taylor counters that the specific reasons for why the real yields on government debt may turn negative are not always clear.

²²³ (C. M. Reinhart & Sbrancia, 2011; Taylor, 2011)

This paper makes three contributions to the current discussion: first, existing methods for measuring the effects of financial repression are critically examined, revealing a number of methodological issues and limitations that can be addressed in part through by a proposed composite indicator (composite index) of financial repression. Second, the disagreement over the existence of financial repression in post-Second World War period is explored by examining the British case in-depth, and a wide range of financial repression policies employed by Britain are identified. Last, an alternative measure of British financial repression is presented using free market bond yield data; British financial repression 'savings' are calculated at over 8% of GDP in 1948, which is significantly greater than savings estimates for other countries during the post-Second World War period.

The remainder of the paper is structured as follows: section 4.2 covers the definition and history of financial repression. Section 4.3 compares two leading methods for measuring financial repression. Section 4.4 explores the case of British post-Second War financial repression. Section 4.5 concludes.

4.2 Literature survey

Before any study can be undertaken it is useful to have a precise definition of the topic to be studied. However, arriving at both a clear and generally agreed upon definition of the term *financial repression* is problematic; a wide range of policies and practices can be, and often are, placed under its banner. The term financial repression is frequently employed as a pejorative to criticize particular policies, evoking strong reactions in academic and policy discussions. Adding further trouble is the interchangeable use by some scholars of terms like *fiscal repression* with financial repression, sometimes in the same paper.²²⁴ Overlap can also be found between policies associated with financial repression and the policies that fall under the more agreeably termed *macroprudential regulation*.²²⁵ For example, increased reserve requirements and holding more 'safe' government debt in lieu of other capital is considered both prudent orthodoxy for achieving financial stability as well as a core component of financial repression.

Financial repression can be defined as any measure taken by central authorities that directs lendable funds towards the sovereign's publicly issued debt, often on attractive terms (below market). In other words, in the absence of financial repression the government would have to pay a higher rate of interest to entice lenders; otherwise the government would risk losing significant investor funds to other free market investments that generate higher rates of return. Here we see one of the difficulties in identifying financial repression, which is the reliance on the counterfactual that economic actors would behave differently if certain policies were not in place.

The core policy elements of financial repression can perhaps be best grouped into two categories²²⁶ – capital controls and domestic financial regulation:

²²⁴ (Drelichman & Voth, 2008)

²²⁵ For further discussion see (C. Reinhart, Kirkegaard, & Sbrancia, 2011)

²²⁶ Framework adapted from (C. M. Reinhart & Sbrancia, 2011, p. 6)

1. **Captive domestic credit providers**, which typically include the banking system, pension funds, insurance companies and other institutions (e.g., government agencies). Such entities can be owned or directly operated by the government under a regime of financial repression. Alternatively, firms can also be regulated or nudged through moral suasion. Public debt financing from these entities is often directed by the government via the following mechanisms:
 - a. Reserve requirements that govern both the percentage and type of capital (e.g., government debt) and must be retained by the banking system in reserve against deposits.
 - b. Exchange and capital controls that restrict both institutions and individuals to domestic savings and investment vehicles, thereby preventing them from taking advantage of potentially more attractive offshore returns.
 - c. Preferential tax treatment for government debt over other competing financial instruments, such as equities.²²⁷
 - d. Restrictions on holding certain assets (i.e., foreign currency, gold), including prohibiting the ownership of gold, or limitations on the sale or transfer of gold within or beyond the domestic market.

2. **Interest rate caps** in the form of rate ceilings, or other indirect measures that help maintain low interest rates. Low rates can both reduce government debt expense and influence the demand for government debt. For example, savings deposits that are regulated to pay a lower rate of interest than government debt will incentivize the migration of capital into government debt.

The above definition of financial repression is by no means comprehensive. Indeed, a myriad of measures are often suggested as a form financial repression. For example, government restrictions on the actions of credit ratings agencies has been characterized as financial repression.²²⁸ In sum, while the broad concept of financial repression is generally

²²⁷ For more on this specific area see (Campbell & Froot, 1994)

²²⁸ (Evans-Pritchard, 7 July, 2011)

well established, there is room for debate over precisely which policies or actions should and should not be considered financial repression.

4.2.1 Historical overview of financial repression

To more clearly define and understand financial repression it is helpful to examine its origins. Some policies associated with what came to be called financial repression in the latter-half of the 20th century have existed long before the term was invented. Restrictions on interest and usury date back to at least 1800 B.C. and the Babylonian Code of Hammurabi.²²⁹ Lending with interest, or interest rates considered usurious, have often been framed in moral and religious terms and are chastised in both the *Koran* and *Old Testament*. For example, Jews, like Christians, were in general not supposed to lend money at usurious rates of interest, but the Old Testament book of Deuteronomy contained a 'get-out clause' for Jews lending to gentiles.²³⁰

More recently a system of compulsory government finance called *prestiti* was in operation in 14th and 15th century Venice and Florence.²³¹ Restrictions on the free movement of capital, such as the export of specie, are seen as early as 16th century Spain and the Napoleonic period.²³² However, exchange controls, as they are commonly understood and practiced today, arguably first came into wider existence during the First World War when Germany introduced exchange regulations shortly after hostilities commenced.²³³ On 3 April, 1918 France followed suit and enacted exchange controls to limit capital flight. Britain, under the guidance of a then young employee of the Exchequer named John Maynard Keynes, practiced a lighter version of capital controls, which included licensing imports and placing restrictions on the way in which war loans could be spent.²³⁴ Later, in his 1936

²²⁹ (Lane, 1937)

²³⁰ (Ferguson, 2008, pp. 35-36) 'Unto a stranger thou mayest lend upon usury; but unto thy brother thou shalt not lend upon usury'

²³¹ (Blitz & Long, 1965)

²³² (Cooper, Tarullo, & Williamson, 1999, pp. 6-7)

²³³ (Dulles, 1929, p. 223; Moulton & Mcguire, 1923, p. 166)

²³⁴ (R. F. Harrod, 1951, pp. 204-205)

General Theory, Keynes expressed himself to be at least a sometime proponent of interest rate caps, stating:

“...the rate of interest is not self-adjusting at a level best suited to the social advantage but constantly tends to rise too high, so that a wise government is concerned to curb it by statute and custom and even by invoking the sanctions of moral law.”²³⁵

While caps on interest can prevent monopolist or oligopolistic lenders from abusing their pricing power, caps also bring down the cost of borrowing for government.

Gurley and Shaw (1955, 1960) were the first to articulate the broader economic system of financial repression.²³⁶ In 1973 Shaw and McKinnon simultaneously coined the term ‘financial repression’ in their respective books on the role of the financial sector in economic development.²³⁷ McKinnon and Shaw focused on two channels for transmitting financial repression: first, the reduction in the efficiency of the banking sector in allocating savings, meaning bankers operating in a financially repressed environment are unable to manage credit according to market rates and prices. Second, maintaining artificially low interest rates reduces the savings level, which in turn can reduce capital accumulation.²³⁸

The term financial repression became somewhat of a catch-all description for excessive financial regulation in developing economies by promoters of the ‘Washington consensus’, which was a set of policies associated with the push for market liberalization in the 1970s-1980s. McKinnon, Shaw and subsequent scholars focused their research on the economic development barriers created by financial repression for less developed economies.

²³⁵ (Keynes, 1936, p. 351)

²³⁶ (J. G. Gurley & Shaw, 1955; John G. Gurley, Shaw, Enthoven, & Brookings Institution., 1960)

²³⁷ (McKinnon, 1973; Shaw, 1973)

²³⁸ (Shaw, 1973, Ch. 2 and 3)

4.2.2 Economic impact of financial repression

Since Gurley and Shaw's ground breaking work in the mid-1950s, a number of research studies have found that financial repression has a negative impact on economic growth.²³⁹ A more specific criticism of financial repression is the negative impact it has on the marginal productivity of capital; controls suppressing interest rates below their equilibrium level cause projects with otherwise positive returns on investment to go unfinanced.²⁴⁰ Financial development is likely to suffer under such conditions as the low return on financial assets reduces the incentive for savings to be allocated to the financial system for intermediation.²⁴¹ The resulting drag on capital accumulation undercuts entrepreneurship and economic development.

Capital mobility, which is restricted by financial repression, helps channel resources to their most productive uses both locally and worldwide. Capie and Wood (2002) studied the effects of British capital controls and found that they result in 'deadweight losses', meaning higher prices, reduced production, and increased bureaucratic and administrative costs.²⁴² Capital controls can also be difficult to abandon once they are in place, and they can negatively impact a country's attractiveness as a destination for foreign capital by reducing the 'free market' credibility of the nations that implement capital controls. Exchange controls can also create what amounts to a quota on imports, thus triggering an increase in relative domestic prices.²⁴³ Foreign exchange rationing has also been shown to have a negative impact on output and employment.²⁴⁴

Both the empirical and theoretical literature clearly support the case that financial repression can negatively impact economic growth. However, it must be noted that robust

²³⁹ See for example (Easterly, 1993; Galindo, Micco, Ordoñez, Bris, & Repetto, 2002; Lanyi & Saracoglu, 1983; Roubini & Salaimartin, 1992; World Bank, 1989)

²⁴⁰ (Goldsmith, 1969)

²⁴¹ (De la Torre, Gozzi, & Schmukler, 2007)

²⁴² (Capie & Wood, 2002)

²⁴³ (Agénor, 1992, p. 11; Bhagwati, 1978; Greenwood & Kimbrough, 1987)

²⁴⁴ (Austin, 1989)

economic growth and financial repression may not be mutually exclusive. For example, many of the countries that Reinhart and Sbrancia argue as having actively engaged in financial repression following the Second World War also managed to generate outsized economic growth. From 1948 to 1973 the real GDP of Western Europe grew twice as fast as during any other period of comparable length, before or since.²⁴⁵ In other words, if Reinhart and Sbrancia are correct in their assessment, the ‘era of financial repression’ following the Second World War coincided with the ‘golden age of economic growth’.

Also of note is the fact that from 1945 through 1980 there was not a single major systemic international banking crisis. This fact stands in stark contrast with repeated banking crises that occurred both before and following the ‘era of financial repression’.²⁴⁶ One possible explanation for this phenomenon is that, in contrast to the growing international trade integration following the Second World War, financial integration across borders was prevented through a number of restrictions.²⁴⁷ As noted earlier, financial repression policies share some common features with prudential measures, such as bank reserve requirements that mandate an increase in government debt holdings. Research has shown that banking crises often foreshadow sovereign debt defaults.²⁴⁸

Arguably one of the most important elements of financial repression is its impact on public debt. Governments are often forced to pay a higher rate of debt interest, or in extreme cases can be entirely shutout of debt markets, as the ratio of public debt-to-national income (debt-to-GDP) climbs. Inflation, which often accompanies financial repression, is captured in nominal GDP and can help reduce the debt-to-GDP ratio. However, significant inflation, or negative real interest rates, need not accompany financial repression to have a positive debt sustainability effect; any below-market interest rate reduces the servicing cost of government debt. However, like inflation, financial repression is only effective against government debts that are denominated in the domestic currency.

²⁴⁵ (B. Eichengreen, 1996)

²⁴⁶ (Bordo & Landon-Lane, 2010; Carmen M. Reinhart & Rogoff, 2009)

²⁴⁷ (Obstfeld & Taylor, 2004)

²⁴⁸ (C. M. Reinhart & Rogoff, 2011)

4.3 Measurement of financial repression

Giovannini and de Melo (1993) and Reinhart and Sbrancia (2011) developed methods for quantifying and measuring the impact of financial repression. This section contains a discussion of these methods, their results, and suggested alternative approaches.

4.3.1 Giovannini and de Melo

Giovannini's and de Melo assemble data for a sample of twenty-four emerging market countries for the period of 1972 through 1987.²⁴⁹ Giovannini and de Melo calculate government revenue from financial repression as the difference between the government's foreign and domestic cost of funds, multiplied by the public debt of the central government:

$$FR = (i_f - i_d) * PD$$

where government revenue from financial repression (FR) is calculated by subtracting the artificially low domestic interest rate (i_d) from the foreign market interest rate (i_f), and then multiplying by government public debt (PD).

Their results estimate the 'government revenue' from financial repression ranged as high as 5.8% of GDP in Mexico, or 40% of the Mexican government's tax levies. To determine their 'market' rate the authors utilize data from the *World Bank Debtor Reporting System*, which is based on foreign 'commercial' debt interest from financial institutions that have floated LIBOR-based borrowings on international markets, such as New York and London.

One problem with this method, which the authors do not discuss, is that commercial rates of interest are nearly always higher than government rates, often by a significant margin. Accordingly, commercial rates may not be representative of foreign sovereign rates,

²⁴⁹ (Giovannini & Demelo, 1993, p. 957) Some data is missing for some years, and the authors acknowledge the debatable decision of including Greece and Portugal in their sample, both of which are generally considered as 'advanced' countries.

leading to an upward bias in their financial repression calculations. A second issue with their method is that rates of interest can significantly vary by type of financial institution. Many different types of financial operating entities besides depositories, such as insurance companies, investment banks, specialty finance lenders, and auto finance companies, can be classified as a 'financial institution'. In defence of the authors, it was a not uncommon practice during the period studied for governments to own, or exercise some degree of control, over domestic financial institutions. It could therefore be reasonable to argue that financial institutions serves are a reasonable proxy for the market interest rate that foreign investors would require to hold government's debt. However, the authors fail to make this case.

A perhaps significant conceptual problem with representing an interest rate from the period under study as a 'market' rate is the pervasiveness of financial repression during the period.²⁵⁰ The loosening of capital controls and financial deregulation took place over the course of the sample period, not before the period of study.²⁵¹ One possible way of addressing this issue would be to segment and compare data between different sub periods. However, such an approach was not undertaken or discussed by the authors.

The authors exclude debt held by the central bank in their final calculation, as the interest is returned to the government. However, the debt holdings of monetary authorities are included in their effective domestic interest rate calculations "because the treasury normally remunerates the central bank for its holdings of interest-bearing treasury debt".²⁵² While the explanation for excluding central bank holdings in the first instance seems reasonable, the inconsistent treatment of central bank holdings is not sufficiently justified by the authors.

²⁵⁰ (C. M. Reinhart & Sbrancia, 2011)

²⁵¹ (Obstfeld & Taylor, 2004; D. Quinn, 1997)

²⁵² (Giovannini & Demelo, 1993, pp. 956-957)

Last, the authors use of the term ‘government revenue’ to describe the effects of financial repression is problematic. The government does not in fact collect any tax revenue from financial repression. The benefits government’s realize from financial repression, such as reduced interest expense, are in fact more akin to ‘savings’ than revenue.

4.3.2 Reinhart and Sbrancia

Reinhart and Sbrancia reference Giovannini's and de Melo's methods and take a similar ‘bottom line’ approach to calculate the ‘liquidation effect’, which they also refer to as ‘financial repression tax’, through an examination of real interest rates of government debt.²⁵³ They assemble data for a ten-country sample of advanced and developing economies, including the United Kingdom for 1945-1980. Their results show that negative real interest rates had a significant impact on reducing the real cost of public debt. Reinhart and Sbrancia acknowledge the similarity between theirs and Giovannini and de Melo’s method. They do not, however, consider the Giovannini and de Melo method appropriate for the post-Bretton Woods era because many countries did not have much if any external debt denominated in a foreign currency.

Reinhart and Sbrancia construct a ‘synthetic’ debt portfolio for each sample country to determine the appropriate domestic interest rate. Next, they calculate the real interest rate (r_t) for each country as follows:

$$r_t = \frac{i_{t-1} - \pi_t}{1 + \pi_t}$$

Where π and i are CPI inflation and nominal interest rates, respectively. Savings to government occur any year in which the real interest rate (r_t) is negative. The ‘liquidation

²⁵³ (Sbrancia, 2011, p. 35) The authors also state they have also chosen to remain “silent about the optimality or desirability of relying on this mechanism to reduce debts”.

effect', or 'financial repression tax' in any given year, is simply calculated by multiplying the negative real interest rate (r_t) by the outstanding public debt.

Reinhart and Sbrancia also propose a "supplementary" method for calculating debt liquidation that takes into account capital losses, or declines in bond prices, on government debt. This method could be important for governments (or central banks) that purchase their country's debt in significant quantity when it is advantageous to do so. Reinhart and Sbrancia calculate a holding period return (HPR) for each debt instrument as follows:

$$HPR_t = \frac{(P_t - P_{t-1}) + C_t}{P_{t-1}}$$

Where P_t and P_{t-1} are bond prices at time t and $t-1$, respectively, and C_t is the yearly interest payment. Similar to their previous method presented above, a government debt liquidation year is determined as any year in which the real return of the debt portfolio is negative. The authors do note several problems with this second approach, such as how to factor in non-marketable debt (for which there is no price data), as well as the general difficulty of obtaining historical bond price data for some countries.

With the first method, Reinhart's and Sbrancia's findings for the United Kingdom suggest that nearly one-half of the years from 1945-1980 (including 1948-1953) were debt liquidation years, with an average negative real interest rate of 3.8%.²⁵⁴ Their results for the UK using the second measure were slightly lower than their first, with liquidation as a percentage of GDP of 2.4% versus 3.2%, respectively. However, they only utilize bond price data for the UK from the 1960 onwards.

One of the first questions to emerge from Reinhart's and Sbrancia's work is why the years 1945-1947 were found to be non-debt liquidation years for the United Kingdom? As

²⁵⁴ At the time of writing their full database has not yet been made available for a more detailed review of methods and results (i.e., individual years or isolated periods).

shown later, significant inflation continued after the end of the war. Further, while debt levels peaked in 1946, the UK's overall debt position was roughly similar in 1948 as it was in 1945, the first post-war year that authors identify as a debt liquidation year. Part of the explanation is that their methodology may be overly conservative. They consider a debt liquidation year as one in which real interest rates are *negative* as opposed to when real interest rates are simply *below market rates*. The authors justify their higher threshold due to the difficulty and conceptual challenges associated with determining a true 'market' rate during a period of widespread financial repression. True, negative real returns on deposits and bonds were a near universal phenomenon during much of the post-war period. Further, even if there were no restrictions on interest rates in a relatively free market like Switzerland, it is reasonable to believe that global rates had some downward influence on Swiss rates.

While it is unclear how to best to adjust for the effect of 'world interest rates' in any use of market rates in calculating the effects of financial repression, acknowledgement of this problem is insufficient justification for altogether disregarding market rates.²⁵⁵ During and after the Second World War sophisticated free markets developed in lightly regulated venues.²⁵⁶ In Switzerland, for example, foreign securities and currencies were traded at significant discounts to their official rates.²⁵⁷ The Bank of England "obsessed" with overseas trading of 'free' sterling, and approximately \$300 million of free sterling was traded during one year year in New York alone.²⁵⁸ Further, currency black markets undermine the efficacy of capital controls, which typically play a crucial role in financial repression. The existence of sizable currency black markets could conceivably negate the effectiveness of financial repression, particularly for economic actors that have access to such markets. These free markets are not mentioned by the authors.

²⁵⁵ For further discussion of a 'world interest rate' see (Barro & Sala-i-Martin, 1990; Blanchard & Summers, 1984; Chinn & Frankel, 2005; Koedijk, Kool, & Kroe, 1994; Lucas, 1990; Yi, Blankenau, & Kose, 2001)

²⁵⁶ See for example (Frey & Waldenström, 2004)

²⁵⁷ (The Economist, 22 May, 1948)

²⁵⁸ (Cairncross, 1985, pp. 258, 263)

A second way in which the author's calculations may prove conservative relates to their use of official inflation data sources.²⁵⁹ For example, the inflation statistics reflected in Richards (2002) show consistently lower levels of inflation than other estimates for the same period that are shown later in this paper. The authors do make note of this issue, but for reasons that are unclear they do not utilize arguably more realistic inflation figures.

There is, however, a perhaps more fundamental issue in Reinhart's and Sbrancia's second method that is not discussed by the authors.²⁶⁰ It is true that a government, following a decline in the prices of its bonds, can retire debt at an advantageous cost to the government. However, the interest expense incurred by that government on subsequent debt issuance may increase as the price investors are willing to pay on any newly issued debt is determined by the current yield on already issued bonds. Bond yields are inversely related to bond prices:

$$\text{current yield} = \frac{\text{annual coupon}}{\text{market price}}$$

In other words, for fixed coupon government bonds, as bond prices decline yields increase, and higher yields equate to higher nominal interest expense born by the issuing government on any newly issued government debt. In sum, any economic gain a government realizes by retiring any of its bonds that have declined in value may be offset or exceeded by higher interest costs associated with new debt issuance. A simple hypothetical illustration of the above point is presented in Table 9, which shows the impact of debt retirement and new sovereign bond issuance on a government balance sheet.

²⁵⁹ (C. M. Reinhart & Sbrancia, 2011, p. 28)

²⁶⁰ (C. M. Reinhart & Sbrancia, 2011, pp. 30-31)

Table 9: Illustration of Intertemporal Changes in Public Debt Interest Expense Due to Capital Gains (Losses)

Hypothetical Treasury Bond Issuance and Treasury Balance Sheet

Treasury Bond Issuance	1950	1951	1952	1953	1954
Bond(1) principal	£100				
Coupon payment (fixed)	£2.50	£2.50	£2.50		
Coupon yield (fixed)	2.50%				
Market price of Bond(1)	£100	£100	£75.00		
Current Yield	2.50%	2.50%	3.33%		
Bond(2) - principal				£100	
Coupon payment (fixed)				£3.33	£3.33
Coupon yield (fixed)				3.33%	
Market price of Bond(2)				£100	£100
Current Yield				3.33%	3.33%
Treasury Balance Sheet	1950	1951	1952	1953	1954
Beginning of Year Cash	£0.00	£100.00	£97.50	£10.00	£10.00
Annual Surplus / Deficit	£0.00	£0.00	-£10.00	-£100.00	£0.00
Interest expense	£0.00	£2.50	£2.50		£3.33
Debt Issued - Deficit - Interest = Cash	£100.00	£97.50	£85.00	£10.00	£6.67
Bond Repurchases			£75.00	£0.00	£0.00
Gain (Loss) on Bond Repurchase (one time)			£25.00		
Gain (Loss) on interest refinancing (reoccurring)					-£0.83
Cash - Bond Repurchases	£100.00	£97.50	£10.00	£10.00	£6.67

The above illustration demonstrates how a beneficial one-time capital gain realized by a government through a decline in the market value of its bonds can be partially, if not wholly, offset by modestly higher reoccurring interest expense the government will incur on subsequent debt issuance. The reason for this is that a decline in bond prices results in

higher yields on outstanding debt, and it is these *ex post* yields that guide the pricing of newly issued debt.

Last, the authors acknowledge that in the reduction of post-Second World War debts that “other factors, such as real growth, may have been relevant as well.”²⁶¹ As noted in Chapter 2, popular narratives as well as academic analysis by Buiters (1985) and others on how post-Second World War debts were reduced through economic growth are incomplete at best, and possibly misleading. However, Reinhart and Sbrancia do not attempt to compare or quantify the relative contribution of real growth and financial repression. Such a comparison could be helpful for understanding the relative impact of each on post-Second World War debt reduction.

4.3.3 Alternatives measures of financial repression

This section presents an alternative calculation of government savings from financial repression for Britain during the post-Second World War period. This alternative calculation can be characterized as a hybrid of the previously described methods developed by Giovannini and de Melo and Reinhart and Sbrancia and addresses some of the issues identified earlier. Specifically, the alternative calculation presented below does away with the commercial rate of interest used by Giovannini and de Melo and instead utilizes a free market rate.²⁶²

In addition to ‘free’ sterling, there is evidence of a market for ‘free’ British sovereign debt. In America, New York-traded UK bearer bonds were yielding 7%, which was more than

²⁶¹ (Sbrancia, 2011, p. 35)

²⁶² Another supplementary approach to the Reinhart and Sbrancia method not performed here that could be useful would be to allow for a lower threshold of what constitutes a debt liquidation year, such as whenever real interest rates are below market rates.

double the approximately 3% yield that British 2.5% coupon Consols were paying in London during this time (Table 10).²⁶³

Table 10: Prices and Yields of Long-Term British Government Securities, 1935-1961

							Yield Range of All Issues 30-years or Longer		
Annual							Low	High	Max Current Yield of Premium Issues
Year	Avg.	Yield %	High	Yield	Low	Yield			
1935	86.500	2.89%	94.3750	2.65%	80.000	3.13%	2.88%	3.13%	3.48%
1936	85.000	2.94%	87.2400	2.87%	82.250	3.04%	2.96%	3.17%	3.54%
1937	76.250	2.28%	84.8125	2.95%	73.125	3.42%	3.37%	3.43%	3.64%
1938	74.000	3.38%	79.3750	3.16%	64.000	3.91%	3.56%	3.62%	3.87%
1939	67.250	3.72%	71.1250	3.51%	61.000	4.10%	3.65%	3.77%	3.62%
1940	73.500	3.40%	77.0000	3.25%	68.125	3.67%	3.25%	3.44%	3.58%
1941	79.875	3.13%	82.8750	3.02%	76.750	3.26%	3.03%	3.19%	3.62%
1942	82.500	3.03%	83.6250	2.99%	81.000	3.09%	3.03%	3.18%	3.62%
1943	80.625	3.10%	83.2500	3.00%	78.250	3.19%	3.14%	3.23%	3.62%
1944	79.625	3.14%	82.2500	3.04%	78.688	3.18%	3.07%	3.18%	3.62%
1945	85.625	2.92%	92.8125	2.69%	91.563	3.06%	2.74%	2.91%	3.44%
1946	96.188	2.60%	99.6250	2.51%	81.125	3.08%	2.53%	2.67%	3.69%
1947	90.500	2.76%	99.1250	2.52%	80.000	3.12%	3.00%	3.05%	3.65%
1948	77.875	3.21%	83.3750	3.01%	74.500	3.36%	3.13%	3.19%	3.94%
1949	75.750	3.30%	81.9375	3.05%	65.128	3.84%	3.56%	3.81%	3.90%
1950	70.375	3.55%	74.6875	3.35%	68.125	3.67%	3.53%	3.73%	
1951	66.000	3.79%	71.5000	3.50%	60.125	4.16%	4.06%	4.44%	
1952	59.125	4.23%	62.0000	4.03%	55.000	4.55%	4.27%	4.61%	
1953	61.240	4.08%	65.2500	3.83%	58.375	4.28%	3.89%	4.27%	
1954	66.500	3.76%	69.7500	3.58%	58.375	4.28%	3.81%	4.15%	
1955	60.000	4.17%	66.5000	3.76%	54.875	4.56%	4.39%	4.50%	
1956	52.750	4.74%	56.7500	4.41%	49.875	5.01%	4.90%	5.08%	
1957	50.250	4.98%	55.6875	4.49%	45.000	5.56%	5.41%	5.62%	
1958	50.250	4.98%	52.8125	4.73%	46.750	5.35%	4.89%	5.20%	
1959	51.875	4.82%	53.6250	4.66%	48.625	5.14%	4.99%	5.40%	
1960	46.375	5.40%	49.7500	5.02%	43.875	5.71%	5.68%	6.07%	
1961	40.375	6.20%	44.0000	5.70%	36.250	6.90%	6.45%	6.85%	

Source: Homer (1963)²⁶⁴

²⁶³ ('Free Sterling in Europe', The Economist, 22 May, 1948) At present only a single free yield data point has been located.

The New York 'free' yield can be employed to calculate government savings from financial repression through a slightly modified version of Giovannini and de Melo's method:

$$(1) \quad FRS = (i_m - i_d) * PD$$

where government savings from financial repression (FRS) is calculated by subtracting the artificially low domestic interest rate (i_d) from the free market interest rate (i_m), and then multiplying by government public debt (PD). The results of such a calculation for the years 1945-1951 are presented in Table 11.

²⁶⁴ (Homer, 1963, p. 16)

Table 11: UK Financial Repression Savings Estimate, Constant Free Market Interest Rate, 1946-60

Year	UK Net Public Debt (£bs)	Free market interest rate*	Avg. Yield of Long-Term UK Debt	Financial Repression Savings (£bs)	Financial Repression Savings % of GDP
1946	23.64	7.00%	2.60%	1.04	10.9%
1947	25.63	7.00%	2.76%	1.09	10.1%
1948	25.62	7.00%	3.21%	0.97	8.1%
1949	25.17	7.00%	3.30%	0.93	7.3%
1950	25.80	7.00%	3.55%	0.89	6.7%
1951	25.92	7.00%	3.79%	0.83	5.6%
1952	25.89	7.00%	4.23%	0.72	4.5%
1953	26.05	7.00%	4.08%	0.76	4.4%
1954	26.58	7.00%	3.76%	0.86	4.8%
1955	26.93	7.00%	4.17%	0.76	3.9%
1956	27.04	7.00%	4.74%	0.61	2.9%
1957	27.01	7.00%	4.98%	0.55	2.5%
1958	27.23	7.00%	4.98%	0.55	2.4%
1959	27.38	7.00%	4.82%	0.60	2.5%
1960	27.73	7.00%	5.40%	0.44	1.7%

*Note: At present only a single free yield data point has been sourced ('Free Sterling in Europe', *The Economist* 22 May, 1948)

Sources: HM Treasury, *The Economist*, Homer (1963), IMF, UK ONS

The results indicate that the effects of UK financial repression were likely largest (as a percentage of GDP) in the years immediately following the Second World War, but then steadily diminished. In 1948, savings attributable to financial repression were over 8% of GDP, or significantly larger than Giovannini and de Melo's largest finding of 5.8% of GDP for Mexico. However, as time progresses the average yield of long-term UK debt nearly doubles while the net public debt only increases from £23.6 billion in 1946 to £27.7 billion in 1960, or by 17%. However, the above estimation assumes no change over time in the 7% free market yield on UK debt sourced from the 1948 *The Economist* article. The results from adjusting the

free market yield proportionally to the adjustment in official market yields are found in Table 12.

Table 12: UK Financial Repression Savings Estimate, Adjusted Free Market Interest Rate, 1946-60

Year	UK Net Public Debt (£bs)	Free market interest rate*	Avg. Yield of Long-Term UK Debt	Financial Repression Savings (£bs)	Financial Repression Savings % of GDP
1946	23.64	5.50%	2.60%	0.69	7.2%
1947	25.63	5.86%	2.76%	0.79	7.4%
1948	25.62	7.00%	3.21%	0.97	8.1%
1949	25.17	7.20%	3.30%	0.98	7.7%
1950	25.80	7.74%	3.55%	1.08	8.1%
1951	25.92	8.26%	3.79%	1.16	7.8%
1952	25.89	9.22%	4.23%	1.29	8.1%
1953	26.05	8.90%	4.08%	1.25	7.3%
1954	26.58	8.20%	3.76%	1.18	6.5%
1955	26.93	9.09%	4.17%	1.33	6.8%
1956	27.04	10.34%	4.74%	1.51	7.2%
1957	27.01	10.86%	4.98%	1.59	7.2%
1958	27.23	10.86%	4.98%	1.60	6.9%
1959	27.38	10.51%	4.82%	1.56	6.4%
1960	27.73	11.78%	5.40%	1.77	6.8%

*Note: Adjusted proportionally based on changes in the yield of long-term British government debt. At present only a single free yield data point has been sourced ('Free Sterling in Europe', The Economist 22 May, 1948)

Sources: HM Treasury, *The Economist*, Homer (1963), IMF, UK ONS

One untested method for calculating financial repression savings that is beyond the scope of this paper involves the creation of synthetic market yield. As noted earlier, the lack of a market interest rate would address one of the most significant issues with the Giovannini and de Melo method, which is the determination of a suitable free market rate of interest (i_f) to compare with the financially repressed rate of interest (i_d). 'Free' currency exchange rate data could be used to construct a synthetic market yield for bonds by employing a modified version of the uncovered interest rate parity equation:

$$(2) \quad (1 + i_E) = \frac{F_t}{S_t} (1 + i_f)$$

where F_t is the current 'free' exchange rate (which substitutes in the classic version of the equation for the expected future spot exchange rate, given that free currency was often trading at a devalued free rate that anticipated future official devaluations), S_t is the current fixed official exchange rate at time t , i_E is the interest rate in the the free currency issuing country, and i_f is the synthetic market yield.

Further study is necessary to determine the feasibility of the above approach, but research suggests a statistically significant, negatively lagged influence of currencies on debt.²⁶⁵ Further, Flandreau & Oosterlinck (2011) imputed currency values from government debt yields, and it could be worth exploring whether such a transformation can be reversed to calculate a synthetic market yield.²⁶⁶

4.3.4 The Financial Repression Index

Both Giovannini and de Melo and Reinhart and Sbrancia use the results from their quantitative methods to compare the degree of financial repression across different countries. However, with regards to the Reinhart and Sbrancia method, Taylor (2011) notes that the actual reason(s) behind negative real yields on government debt are not always clear. For example, in May 2012 the German government successfully floated two-year bonds with a zero coupon, and in 2015 the Swiss government issued new debt with a negative nominal yield. These events occurred in spite of the fact that positive inflation existed in both Germany and Switzerland at the time of debt issuance, and future expectations of inflation were also positive. Investors appear to be paying the German and Swiss government in real and nominal terms, respectively, for the opportunity to lend money to the government. If the Reinhart and Sbrancia method were employed in these cases the

²⁶⁵ (Dreher, Herz, & Karb, 2006)

²⁶⁶ (Flandreau & Oosterlinck, 2011)

results would suggest that both Germany and Switzerland were engaged in financial repression. However, the notion that financial repression in either country is responsible for the observed negative yields is dubious. Instead, a flight to higher credit quality in response to the European sovereign debt crises is the likely explanation behind the German and Swiss rates.

In sum, ‘bottom’s-up’ approaches to identifying financial repression can produce incomplete or misleading results. Further insights can be gained by comparing countries across qualitative measures of financial repression such as a composite indicator (composite index), which allows for cross-country comparisons of financial repression over a series of standardized measures and different time periods. Sample variables that could be utilized for the construction of an index taken from existing data sources such as the IMF, BIS, World Bank, and OECD are summarized in Appendix 1.²⁶⁷

²⁶⁷ Unfortunately, for the time period under study in this thesis much of the data required to create a financial repression composite index was either never collected or has not yet been located.

4.4 British financial repression

This section of the paper addresses the disagreement in the literature over what role financial repression may have played in sustaining Britain's record-setting levels of public debt following the Second World War. Largely missing is a detailed historical account of the policies and practices that may or may not have facilitated financial repression in countries such as Britain. In other words, does the historical record support or contradict Reinhart and Sbrancia's quantitative argument of financial repression? The short answer to the above question is that yes, Britain did in fact enact numerous policies and legislation that can be characterized as financial repression. Further, these policies played a useful role in sustaining British sovereign debt. However, it is far too simplistic to refer to financial repression in a simple binary, yes or no, fashion. Different degrees and types of financial repression exist.

The remainder of this paper describes the nuanced, multi-faceted nature of British financial repression by first exploring the origins of British financial repression, then examining the various aspects of British financial repression, and concludes with the impact financial repression had on select areas of the British economy.

4.4.1 The origins of British financial repression

The growing threat posed by an ever more assertive Nazi Germany led the British to rearm in the latter-half of the 1930s. While this brought full employment it also triggered concerns over inflation and imbalances in Britain's national accounts.²⁶⁸ It was during this time that John Maynard Keynes' theories on wartime and post-war finance, which would prove highly influential to British financial repression, took shape. In April and July 1939 Keynes wrote several articles in the *Times* outlining a dual policy of low interest rates and capital controls, which went on to be partially adopted in April 1941.²⁶⁹ Keynes also

²⁶⁸ (Skidelsky, 2000, p. 20)

²⁶⁹ Keynes' ideas were first publicized via two editorials in the *Times* on the 14th and 15th November 1939. A booklet version titled *How to Pay for the War* followed on 27 February in 1940. However, an earlier lecture on this topic was given by Keynes at Cambridge's Marshall Society on 20 October, 1939 titled 'War Potential and

advocated for deferred deposits, which were to be blocked and have an open-ended release date to be determined at the discretion of the Treasury.²⁷⁰ Originally called ‘compulsory savings’, the program was later rebranded as ‘deferred pay’ for marketing purposes.²⁷¹ The plan called for the government to set long-term interest rates at 2.5%, which represented a 17% reduction on the approximately 3% yields of longer-term British debt instruments at that time.²⁷²

Lord Keynes professed himself to be a proponent of interest rate caps in his *General Theory*²⁷³, and in a 12 January, 1937 *Times* editorial Keynes stated “we must avoid [dear money]...as we would hell-fire”.²⁷⁴ The doctrine of ‘permanently cheap money’ would go on to reign over British monetary policy until 1951. Keynes advocated that the British Chancellor of the Exchequer should announce that he would borrow at no more than 2.5% so creditors have zero doubt that these are the best terms available for long-dated British debt. Keynes had ‘an appreciation that the social and political climate would not permit a repeat of the *rentier*-friendly policy of First World War’, although Keynes later revised upwards his suggested interest rate to 3%.²⁷⁵ To be effective Keynes felt the Chancellor’s statement would need to be buttressed by control over domestic capital issues and an embargo on foreign lending, meaning capital controls would need to be instituted.²⁷⁶ Low interest rates, one of the hallmarks of financial repression, were facilitated by the Bank of England (where Keynes was a Court member), which kept the short-term Treasury bill rate at 1% from 1939-1945.

It is here with these late-1930s proposals that we see Keynes laying some, but not all, of the theoretical and policy foundations for post-war British financial repression. However,

War Finance’ (Skidelsky, 2000, p. 43). Coincidentally, the Labour party also published at this time an identically titled book on war finance (Durbin, 1939). The reason Keynes’ ideas ultimately won out was because, as Skidelsky put it, he had the “only theory on offer which promised both guns, butter and low interest rates” (Skidelsky, 2000, p. 20).

²⁷⁰ (Keynes, 1940, p. 47)

²⁷¹ (Skidelsky, 2000, p. 59)

²⁷² (Keynes, 1940, p. 44)

²⁷³ (Keynes, 1936, p. 351)

²⁷⁴ (Skidelsky, 2000, p.22)

²⁷⁵ (Kynaston, 1999, p. 464)

²⁷⁶ (Skidelsky, 2000, pp. 24-25)

Keynes' crucial contributions to British financial repression go entirely unacknowledged by Keynes' biographers and other economic historians.²⁷⁷

Evidence of British financial repression prior to the 1940s also exists. After Britain abandoned the gold standard for a second and final time in 1931, a prohibition on loans to overseas borrowers was imposed. In 1933 the purchase of foreign securities was also prohibited, although direct investments abroad were treated more leniently.²⁷⁸ It is unclear what role if any Keynes had on shaping these policies. One difference between this period and with the following decade appears to be the reliance of the Bank of England and Whitehall on the use of moral suasion, as opposed to regulations or law, to execute 1930s policy changes. This approach may have also played at least some role in the relatively speedy reversal of some policies, such as the relaxation of loan restrictions to Commonwealth borrowers in 1933. These examples illustrate how financial repression can take both explicit and implicit form.

As early as September 1941 British officials were contemplating the post-war financial and economic order.²⁷⁹ In December 1941, on the other side of the Atlantic, Treasury Secretary Morgenthau asked Harry Dexter White to begin work on what was to become the Bretton Woods agreement.²⁸⁰ It was during this time that groundwork was laid in both Britain and the U.S. for the post-war international framework that would prove so conducive to financial repression. Stringent capital controls, imposed at the beginning of the Second World War in September 1939, provided the necessary condition for the creation of the Sterling Area, which would play a supporting role in enforcing international financial repression.²⁸¹ Under the new rules all purchases of foreign exchange required prior approval of British officials, and countries that did not participate in the war ceased to be a part of the Sterling Bloc (e.g., Sweden). The outbreak of war led Britain to impose exchange control on

²⁷⁷ (R. F. Harrod, 1951; Skidelsky, 2000)

²⁷⁸ (Cairncross and Eichengreen, 1983, p. 22)

²⁷⁹ (Fforde, 1992, p. 36)

²⁸⁰ (Skidelsky, 2000, pp. 256-263)

²⁸¹ (Capie, 2010, p. 146)

payments outside the Sterling Bloc, while relatively free movement of capital, coordinated by the Bank of England, was permitted within.²⁸² The regulations and rules governing the Sterling Area were complex; varying degrees of freedom existed on the transferability of currency, dependent upon location and purpose. Import restrictions also existed so that “while there might be freedom to make a payment, there was not always freedom to make a purchase”.²⁸³ During the war a ‘Dollar Pool’ was established among Sterling Area countries that would remain in place after hostilities ended. Its purpose was to conserve U.S. dollars amongst Sterling Area members by imposing licensing restrictions on dollar imports, and members were required to deposit excess dollars and gold at the Bank of England.²⁸⁴

Keynes, in addition to providing the intellectual foundations for much of British financial repression, would also go on to play a leading role in implementing financial repression policies during and after the war from inside Treasury. However, it is important to note that not all facets of post-war British financial repression were prescribed by Keynes. Further, Keynes was not alone in advocating for British financial repression. For example, the Bank of England was at least willing to go along with, if not play the role of accomplice, in the maintenance of low interest rates.

While other economic historians have indirectly covered various aspects of British financial repression without labelling it as such, Reinhart and Sbrancia (2011) are the first to explicitly make the case that financial repression was practiced in post-Second World War Britain and other advanced countries. One of the first questions which emerges after reviewing Reinhart’s and Sbrancia’s research that prompted Taylor’s critique is what policies and outcomes should constitute sufficient evidence, or proof, of financial repression? In other words, is financial repression akin to the U.S. Supreme Court’s definition of pornography, which basically amounts to ‘we know it when we see it’? Or can the ‘financial repression’ label be assigned in a more rigorous, systematic fashion? Debt liquidation does

²⁸² (Cairncross & Eichengreen, 1983, p. 24).

²⁸³ (Capie, 2010, p. 146; Catherine Ruth Schenk, 1994)

²⁸⁴ (Cairncross & Eichengreen, 1983, p. 25)

not require financial repression as it can be due solely to the effects of inflation in excess of nominal interest rates. In other words, demonstrating that debt liquidation occurred in any given year, or over an extended period due to negative real interest rates, is insufficient proof of financial repression.²⁸⁵

Reinhart and Sbrancia support their quantitative evidence by identifying several financial repression measures in each sample country.²⁸⁶ For the UK, they highlight the following three Domestic Financial Regulations measures:

1. The Gold market closed in early Second World War, reopened only in 1954.²⁸⁷
2. The Bank of England stopped publishing the Minimum Lending Rate in 1981.
3. In 1986, the government withdrew its guidance on mortgage lending.

The following two measures are listed for Capital Account-Exchange Restrictions in the UK:

1. All restrictions on outward Foreign Direct Investment abolished, and outward portfolio investment liberalized.
2. Exchange Control Act of 1947 suspended in October 1979; all remaining barriers to inward and outward flows of capital removed.

The above measures are perhaps some of the more significant financial repression policies in Britain following the Second World War. However, the authors do not make any reference to the relative importance of these policies, or explain why these were highlighted over other policies that could constitute financial repression. Further, they overlook a number of other British financial repression policies. For example, Chancellor Dalton directed

²⁸⁵ Sbrancia (2011) develops a conceptual framework utilizing inflation expectation estimates to distinguish between debt liquidation related to unanticipated inflation and financial repression.

²⁸⁶ (C. M. Reinhart & Sbrancia, 2011, p. 17)

²⁸⁷ (Bank for International Settlements., 1941)

government departments to support Treasury debt auctions by making purchases that helped finance government debt at low rates of interest.²⁸⁸

British financial repression during this period, in the form of legislation and directives/policies, are summarized in Table 13 and Table 14, respectively. In total, eleven pieces of legislation and sixteen policies/directives that supported British financial repression were found either in archival evidence or the literature. These legislative and policy acts highlight the intricate and comprehensive nature of British financial repression during this period.

²⁸⁸ (Cairncross, 1985, pp. 432-433; Worswick & Ady, 1952, pp. 196-198).

Table 13: UK Financial Repression Legislation, 1936 – 1998

Legislation	Date Enacted	Repealed/ Reduced	Description
Tripartite Agreement	1936	1973	Beginning with the 1936 Tripartite agreement between the U.K., France and the U.S. and subsequent bilateral and multilateral agreements though Second World War and the 1944 Bretton Woods agreement, exchange rates were managed so that foreign exchange could only be legally converted at official exchange
Capital Issues Committee	1936	Late-1950s	Formal government application process for controlling capital flows to foreign and domestic applicants; only £31 million exported annually from 1932-36 ²⁸⁹ ; also reviewed all domestic issues over £50,000, and the Bank of England reviewed anything over £100,000 ²⁹⁰
Deferred Pay	April 1941	post- WWII	Originally called ‘compulsory savings’, deposits were to be blocked and have an open-ended release date, to be determined at the whim of the Treasury. An interest rate of only 2.5% a year, which was 17% cut on the roughly 3% yielded by longer-term instruments at that time.
Capital Controls	Sept. 1939	post-WWII	Permission from authorities required prior to making any forex purchases; restrictions on foreign exchange on payments made outside the Sterling Area. Limits on sterling banknotes travellers can take out of the UK of £20 and £10, respectively, and “no sterling can be sent out of the United Kingdom without permission”. ²⁹¹
Treasury Deposit Receipt (TDRs)	WWII	post-WWII	New security which allowed the Treasury to bypass the London money market and borrow directly from banks through the issuance of non-marketable TDRs
Closure of London Gold Market	WWII	1945	Closure of London gold market, trading and ownership of gold, and restrictions on imports/exports of gold

²⁸⁹ (Ingham, 1984, pp. 195-197; Wilson, 1995, p. 183)

²⁹⁰ (Morgan & Thomas, 1962, p. 210; Wilson, 1995, p. 189)

²⁹¹ C261, Letter from Bank of England to Manager of the Federal Reserve Bank of New York, New York Federal Reserve Bank Archive, 17 October, 1946

Legislation	Date Enacted	Repealed/ Reduced	Description
Bank of England Act	Aug. 1946	1998	Bank of England nationalized by the UK government; clause 4(3) gave the Bank, with Treasury approval, explicit power to govern the proportion of commercial bank assets
Exchange Control Act	1947	Oct. 1979	Restricted some external loans as well as inward capital flows; repeal in 1979 led to the removal of all remaining barriers on inward and outward capital flows
Minimum Lending Rate	post- WWII	1981	Published by the Bank of England
Tax Increase on Dividends	post- WWII	N/A	Increase in the dividends tax from 5% to 12.5% made Britain's sovereign debt a more attractive investment vis-à-vis equities
Mortgage Lending Guidance	post- WWII	1986	Government guidance on UK mortgage lending

Table 14: UK Financial Repression Policies and Directives, 1931 – 1973

Policy	Date Enacted	Repealed/ Reduced	Description
Low Interest Rates ('Cheap Money')	1931	1951	Except for a brief fluctuation at the beginning of the war, Bank Rate was maintained at 2%; short-term Treasury bill rate at 1% from 1939-1945
Foreign loan embargo	1932	1934 for Sterling bloc	The ban on foreign loans partially removed for other countries in Feb. 1938 but then reinstated in Dec. 1938 ²⁹²
Withdrawal of large sterling notes	1943	post- WWII	Retirement of all notes of £10 and up to "provide an additional handicap for those who may contemplate breaches of Exchange Control" ²⁹³
Bank Advances Restrictions	1945, 1947, 1949	post- WWII	Restrictions on bank advances were issued three times by the Capital Issues Committee (CIC) ²⁹⁴
Issuing Houses Association	1945	post- WWII	Organization of 52 British merchant banks which facilitated the monitoring and control of lending ²⁹⁵
Bank Lending Restrictions	Mid-1950s	post- WWII	Enactment of the first quantitative limits on loans from banks. ²⁹⁶
Special Deposits	Mid-1950s	post- WWII	"a (relatively small) call for 'special deposits' made by CIC" ²⁹⁷

²⁹² C261, 'British and Canadian Conversion Policies. Appendix: British Treasury Control over the Price of Gilt-Edged Securities, 1932-39', Correspondence between L. M. Pumphrey to Mr. House, New York Federal Reserve Bank Archive, 23 October, 1941

²⁹³ From C261 p. 1, 'Withdrawal of Large Bank Notes: The British Experience', New York Federal Reserve Bank Archive, 4 December, 1944: "The real purposes were to make more difficult the illegal operation of note smugglers desirous of evading exchange control regulations, of black market operators, and of tax evaders—all of whom predominantly use large denomination notes in order to cover up their tracks". Bank of England notes in circulation during this time consisted of £1, £5, £10, £20, £50, £100, £200, £500 and £1000.

²⁹⁴ (Capie, Collins, & Institute of Economic Affairs., 1992, p. 68)

²⁹⁵ (Wilson, 1995, p. 189)

²⁹⁶ (Capie et al., 1992, p. 68)

²⁹⁷ (Capie et al., 1992, p. 68)

Policy	Date Enacted	Repealed/ Reduced	Description
Export Lending	1964	post-Second World War	Bank of England established loan priorities which gave preference to exports and discouraged speculation ²⁹⁸
Stamp Duty on Transfers of Financial Securities	post- WWII	1963	Cut securities transfer tax from 2% to 1% to encourage international financial activity in the City of London ²⁹⁹
Restrictions on Lending in Foreign Currency	post- WWII	Oct. 1963	Chancellor announces that foreign currency loans 'allowed almost without restriction' ³⁰⁰
Taxes on Bearer Securities	post-WWII	1963	Reduced from 6% of nominal value to 3% and 2% of the market value for residents and non-residents, respectively ³⁰¹
Registered Securities Tax	post- WWII	1963	Rate reduced from 2% to 1% ³⁰²
Dollar Pool	WWII	post- WWII	Required that members deposit their excess U.S. dollars and gold at Bank of England
Bank advances-to-government debt ratio	WWII	post- WWII	Reduction in bank advances-to-government debt ratio so that banks could hold more government debt
Restrictions on forward exchange (forex options)	WWII	post- WWII	Restrictions on UK Banks dealing in forward exchange included: i) a "genuine commercial contract is in existence"; ii) "it is not a swap" but an "outright purchase or sale of exchange"; iii) "the maturity date must not be more than four months ahead". Some exceptions were allowed by the Bank of England "when such a practice is a normal and necessary facility of the trade in question". ³⁰³

²⁹⁸ (Capie et al., 1992, p. 68)

²⁹⁹ (Quennouëlle-Corre & Cassis, 2011, p. 225)

³⁰⁰ (Quennouëlle-Corre & Cassis, 2011, p. 225)

³⁰¹ (Quennouëlle-Corre & Cassis, 2011, p. 226)

³⁰² (Quennouëlle-Corre & Cassis, 2011, p. 226)

³⁰³ C260.3 p. 1, New York Federal Reserve Bank Archive, 9 October, 1945

Policy	Date Enacted	Repealed/ Reduced	Description
Fixed Exchange Rates	1936	1973	Beginning with the 1936 Tripartite agreement between the U.K., France and the U.S. and subsequent bilateral and multilateral agreements though Second World War and the 1944 Bretton Woods agreement, exchange rates were managed so that foreign exchange could only be legally converted at official exchange.

Regarding the efficacy of the policies highlighted by Reinhart and Sbrancia, even with exchange restrictions Britain experienced significant capital outflows to the Sterling Area, which calls into question just how effective capital restrictions were during this time. Dow (1964) claims that 20% of capital outflows were due to the looseness of controls.³⁰⁴ There are also frequent reports in archival documents of gold trade occurring despite of restrictions in the London market. For example, in a letter dated 30 January, 1947 from Mr. Werner Knoke at the New York Federal Reserve Bank (NYFRB) to his counterpart and frequent correspondent at the Bank of England, Mr. George Bolton, Knoke inquires about the London gold transactions that are:

“carried on a very substantial scale we are told, for instance by Samuel Montagu, who purchases the gold all over the world, shipping it directly or via London for sale in markets like China, the Near East, etc.”³⁰⁵

Samuel Montagu was the proprietor for Samuel Montagu & Co, which was one of the six ‘Authorised Dealers’ in gold other than the Bank of England.³⁰⁶ In a reply dated 13 February, 1947, Bolton informs Knoke that “before the war London was an international centre for gold arbitrage and we are therefore under great pressure to allow London firms to

³⁰⁴ (Dow & National Institute of Economic and Social Research., 1964, p. 24; Catherine R. Schenk, 2010) For further discussion on the effects and effectiveness of capital controls see (Dulles, 1929, pp. 226-227; Edwards, 1999; B. J. Eichengreen, 1998; Montiel & Reinhart, 1999)

³⁰⁵ C261, New York Federal Reserve Bank Archive, 30 January, 1947

³⁰⁶ The other authorized London bullion banks at this time were Johnson Matthey & Co. Ltd, Mocatta & Goldsmid, Pixley & Abbell, N.M. Rothschild & Sons, and Sharps & Wilkins. C261 p. 2, New York Federal Reserve Bank Archive, 10 February, 1947

participate in the business”.³⁰⁷ He goes on to say that there are exceptions to the UK rules against gold ownership, including:

“any person not resident in the United Kingdom or those parts of the Sterling Area which prohibit the holding of gold by residents, may own gold in the United Kingdom” and claim that any trade in the various “free markets” of gold at premium to the official “does not necessarily damage the major currencies”.³⁰⁸

While the UK officially posed restrictions on the export of gold, importation was encouraged as it served to enhance London’s status as a financial capital and increased the likelihood that it may be offered for sale (or otherwise made available) to a gold-strapped Bank of England. Bolton also speaks of the “handsome profit” that can be earned in the gold arbitrage trade, where gold is purchased at \$43 per ounce, claiming that:

“no irreparable harm results from the sale of the relatively small gold production of Latin America in the various ‘free markets’ at a substantial premium. It feeds a hoarding demand causes a minor wave of disturbance and many consequential reactions but, while it underlies the weakness of certain paper currencies.”³⁰⁹

However, this trade may have also increased the opportunity for speculation and profiteering at black market rates. In a memo dated 2 July, 1947, the NYFRB confronted the Bank of England about how “Franck of Samuel Montagu and Goldsmid of Mocatta & Goldsmid seemed the most active factors in the premium gold market”. Bolton, in his reply to Knoke, said he “would try to keep them in line”.³¹⁰

This above exchange between Bolton and Knoke on the subject of free market gold trade is one of several found in both the NYFRB and Bank of England archival records on this subject. While the correspondence generally implies a close relationship between officials, differences of both opinion and facts frequently emerge. For example, Knoke takes issue

³⁰⁷ C261 p. 2, New York Federal Reserve Bank Archive, 10 February, 1947

³⁰⁸ C261 p. 1, New York Federal Reserve Bank Archive, 10 February, 1947

³⁰⁹ C261 p. 2, New York Federal Reserve Bank Archive, 10 February, 1947

³¹⁰ C261 p. 2, Peter Lang record of telephone conversation with Mr. Bolton, Bank of England, New York Federal Reserve Bank Archive, 2 July, 1947

with Bolton's claim that gold is selling in New York at \$43 an ounce, stating "we have not sunk so low as to have (black) market at this country at \$43!!!"³¹¹ Per a NYFRB memo, a claim made by Lord Catto of the Bank of England that Britain "disapproves of the sales of gold on the black markets in Greece" is doubted inside the Federal Reserve. NYFRB head Sproul conveys to Knoke that "it has always been my understanding that in Greece the British had been the ones anxious to make sovereigns available for sale there".³¹²

At other times, typically on the eve of a crisis, a palpable tension emerges between the Bank of England and NYFRB. For example, on 17 June, 1947, shortly before the sterling convertibility crisis, Knoke spoke with an "audibly disturbed" Bolton who complained that the NYFRB was being "unnecessarily legalistic" on a "question concerning the whole constitutional position between the British Treasury and Bank of England" with regard to a request by the Bank of England for an uncollateralized loan. The prior custom at the NYFRB had been to secure loans with gold on hand in the basement safe, and the British government had previously informed the NYFRB that all gold on hand was the property of the government, not the Bank of England.³¹³

Knoke also emphasizes the "serious monetary consequences if dealings in gold at unofficial and varying prices should become widespread".³¹⁴ Free markets in gold and currencies were a serious concern on both sides of the North Atlantic, and there appears to be a *quid pro quo*, where Mr. Bolton of the Bank of England would "appreciate keeping him informed of any unusual developments in the sterling market here (New York)", and vice versa on the Federal Reserve's interest in London free gold activity. Overall, ample archival evidence indicates that significant gold trade was occurring in London, and that this trade would have undercut the impact of British financial repression. London played a critical role in managing the global gold market, through locally-headquartered South African mining interests, as well through the relationship with the South African government that purchased

³¹¹ C261 p. 2, New York Federal Reserve Bank Archive, 18 February, 1947

³¹² C261 p. 1, Letter from Sproul to Knoke, New York Federal Reserve Bank Archive, 6 March, 1947

³¹³ C261 p. 1, New York Federal Reserve Bank Archive, 17 June, 1947

³¹⁴ C261 p. 2, New York Federal Reserve Bank Archive, 18 February, 1947

all locally mined gold at parity.³¹⁵ However, in contrast to Britain's focus on free sterling trade in New York, the Americans were the ones who were primarily concerned about free trade in gold. The NYFRB wanted Britain's help to "smash the premium between free market transactions between gold and the dollar", but the Fed also recognized that "it might be much more difficult to smash the premium in transactions between gold and the pound sterling".³¹⁶ Per the Bretton Woods agreements, the U.S. dollar was the one currency tied at a fixed rate to the value of gold. Bolton and the Bank of England's partial assurances notwithstanding, any trade in gold at a premium over \$35 per ounce official parity was clearly of significant concern to the U.S. government as it suggested that the U.S. dollar was overvalued, fanning unwanted speculation of official devaluation.

As noted by Cairncross (1985), capital exports to the Sterling Area were not fully blocked until 1972.³¹⁷ As Cairncross' analysis highlights, even with the introduction of the 1947 Exchange Control Act there were capital outflows of £643 million, or a staggering 8% of GDP.³¹⁸ Reinhart and Sbrancia are silent on the actual effect of such controls.

Financial repression is comprised of many interrelated components and cannot be fully appreciated or understood through just the measurement of debt liquidation and the listing of a handful of policies of uncertain effect. In sum, while Reinhart and Sbrancia are the only authors to date to attempt to quantify the effects on debt of British financial repression in the post-Second World War period, their argument that Britain engaged in financial repression is not sufficiently supported. Questions remain over whether financial repression was a conscious policy choice, and what if any alternatives to financial repression did countries such as Britain possess. And with respect to the role of British banks, was moral suasion sufficient to enlist firms into aiding government? Or with the changing political climate and the departure after twenty-four years of the powerful central bank personality

³¹⁵ C261 p. 4, New York Federal Reserve Bank Archive, 10 February, 1947

³¹⁶ C261 p. 2, Letter from J. Burk Knapp of the Fed Board of Governors to Werner Knoke, New York Federal Reserve Bank Archive, 4 March, 1947

³¹⁷ (Cairncross, 1985, p. 119)

³¹⁸ (Cairncross, 1985, pp. 153-154)

of Montagu Norman, did corralling the City now require the imposition of new formalized edicts?

The remainder of the paper is structured around several of the core areas of the economy which play a role in debt sustainability and financial repression, including interest rates, capital controls, and institutions such as the Bank of England and the British banking system.

4.4.2 Interest rates

Low nominal and negative real interest rates are generally considered to be a hallmark of financial repression. However, the question of what precisely constitute a 'low' interest rate is unclear.³¹⁹ While there is considerable room for argument over what is and is not an artificially low interest rate there is less debate on the policies and forces that might contribute to low rates of interest paid by governments on public debt.

In the 1940s the UK government sought and secured what it at least considered to be low rates of interest on public debt. Known as 'cheap money', low interest rates had been advocated by Keynes as early as 1937 and was adopted as a cornerstone of wartime credit policy.³²⁰ Britain's funding strategy during and after the war has been characterized as 'heavy government borrowing at a fixed rate of interest'.³²¹ Except for a brief fluctuation at the beginning of the war, the Bank of England's Bank Rate was maintained at 2% through 1951.³²² The long end of the yield curve was managed towards the goal of running 'a 3 percent war'.³²³

³¹⁹ For a discussion of the 'world interest rate' concept see (Barro & Sala-i-Martin, 1990; Blanchard & Summers, 1984; Chinn & Frankel, 2005; Koedijk et al., 1994; Lucas, 1990; Yi et al., 2001)

³²⁰ (Skidelsky, 2000, pp. 22, 88) Keynes pushed for "permanently cheap money", saying "we must avoid (dear money)...as we would hell-fire" *The Times*, 12 January, 1937

³²¹ (Cairncross, 1985)

³²² (Fforde, 1992, p. 92; R.S. Sayers, 1981) Bank Rate had been lowered to the 2% level in 1931.

³²³ (R. S. Sayers, 1956)

The First and Second World Wars were financed at five and three percent rates of interest, respectively, and the Second World War's lower rate "prevented a threefold increase in the internal National Debt" from First World War levels while leaving the interest burden in 1945 comparable to what it was in 1919.³²⁴ Worswick and Ady (1952) explain this low rate of interest in financial repression terms by stating "so long as the expenditure of the private sector was limited by rationing and other controls, income recipients would have little else to do with a large part of their earnings but to lend it to the Government".³²⁵ Debt service expense-to-GDP was roughly 8% and 6% following First and Second World Wars, respectively.³²⁶

Forces that caused "the 'natural' rate of interest to be relatively high" in Britain included inflationary pressures, a low natural savings rate, and the need for capital expenditures.³²⁷ Internal documents from the Bank of England support the view of scholars on the goal of low interest rates. For example, a Bank of England survey marked confidential and titled 'Developments in the Control of Credit in the United Kingdom' shared with the NYFRB on 25 September, 1952 describes how:

"low and stable levels of short-term interest rates, with consequently easy credit conditions, had its origin in the needs of war finance and was continued, and even increased, in the post-war period with the dual object of keeping down the cost of that national debt and of maintaining full employment by facilitating borrowing by industry *and public bodies alike.*" (*italics denote emphasis added*)³²⁸

Post-war Chancellor of the Exchequer Hugh Dalton, who has been characterized simultaneously as the enemy of *rentier* and the friend of the speculator, was not content with the already historically low rates of interest.³²⁹ Dalton sought a policy of even cheaper money from late-1945 through 1947, openly stating his objective to "bring down the long-

³²⁴ (Worswick & Ady, 1952, pp. 191-192)

³²⁵ (Worswick & Ady, 1952, pp. 191-192)

³²⁶ (Buiter 1985, p. 17 Figure 2)

³²⁷ CV61 p.2, Mr. Klopstock to Mr. Sproul, 'The Cheaper –Money Policy in Britain – A Lesson for the United States"', New York Federal Reserve Bank Archive, 7 September, 1948

³²⁸ C261A p. 1, New York Federal Reserve Bank Archive, 25 September, 1952

³²⁹ (Paish, 1947, 1950)

term rate of interest".³³⁰ In July 1947 Dalton told the House of Commons that "cheap money is to continue".³³¹ One financial instrument that played a key role in Dalton's effort to deliver lower interest rates was the Treasury Deposit Receipt (TDRs), a new wartime invention that allowed the Treasury to bypass the London money market and borrow directly from banks.³³² TDRs were very unpopular with bankers as they were non-marketable instruments, meaning they could not be sold on the open market but instead only exchanged for a loss with the Bank of England's discount window. As noted by Worswick and Ady, "bankers would have welcomed a reduction in the volume of government indebtedness, especially of TDRs."³³³

Rates on TDRs were originally 1-1/8 percent, a rate that Dalton in September 1945 slashed down by nearly in half to just 5/8 of a percent.³³⁴ At the same time Dalton also cut the rate on T-Bills by a similar amount to 1/2 a percent. These two changes reduced the nominal interest burden on floating debt by approximately half. Dalton then moved to cut longer-term rates through a number of conversions and the floatation of several issues at a rate of 2.5%, including the Treasury Stock 1975 securities, which thereafter came to be non-affectionately referred to in banking circles as 'Daltons'.³³⁵

The intellectual inspiration behind the Daltons, including the original suggestion of the 2.5% rate, appears to be Keynes. In his *General Theory* Keynes stated that that a government could achieve its interest rate targets if it let the market determine the term structure.³³⁶ Keynes originally advocated that the Chancellor should announce that in no circumstance will he borrow at more than 2.5% so lenders have zero doubts that these are

³³⁰ C261D p.2, NYFRB Research Memorandum titled 'Notes on the Nationalization of the Bank of England', New York Federal Reserve Bank Archive, 19 October, 1952

³³¹ CV61 p. 6, Mr. Klopstock to Mr. Sproul, 'The Cheaper –Money Policy in Britain – A Lesson for the United States"', New York Federal Reserve Bank Archive, 7 September, 1948

³³² (Howson, 1988; Worswick & Ady, 1952, pp. 212-213)

³³³ Worswick and Ady (1952, p.198, 214)

³³⁴ (Worswick & Ady, 1952) The authors provide two different rates for TDRs on pp. 198 and 214 of 5/8 and 7/8, respectively

³³⁵ (Worswick & Ady, 1952, p. 199)

³³⁶ (Booth, 1989, p. 157) In *The General Theory* Keynes also states "The remedy for the boom is not a higher rate of interest but a lower rate of interest! For that may enable the so-called boom to last. The right remedy for the so-called trade cycle is not to be found in abolishing booms and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keeping us in a permanent boom." (Keynes, 1936, p. 322)

the best terms available for long-dated bonds. Skidelsky summarizes Keynes' position on how to achieve this interest rate as follows:

“In order to enforce this rate the market should be given ‘an increased amount of liquidity’ to prevent the ‘congestion of credit’, which Keynes had warned in 1938. To be effective these techniques would need to be buttressed by the following three elements: 1) Control of domestic capital issues, 2) Prioritizing the use of physical resources (rationing), and 3) an embargo on foreign lending (capital controls).”³³⁷

Keynes, however, later expressed that 3% was the appropriate rate at which the government should borrow to ensure demand and he personally opposed the issuance of Daltons.³³⁸ As the Daltons were floated on the market the value of longer-dated gilt issues began to soften. By the time Cripps replaced Dalton in November 1947 yields on Consols had climbed back up to 3%, and would climb further to 3.5% during 1949.³³⁹ Archival documents state that this climb in yields was “permitted” by the UK Treasury, which had “rigged” the Treasury bond market through the use of public departments to purchase UK public debt.³⁴⁰

The use of interest rate policy, through changes in the Bank of England's Bank Rate, was almost non-existent during the twenty years preceding the Tories return to power in 1951. Previously, Bank Rate had been raised at times when Britain's reserves were declining. Upon the mentioning of this idea as a possible means of addressing the 1949 devaluation crisis, Dalton stated “I say Montagu Norman walks again. I thought we had buried all this stuff about Bank Rate”.³⁴¹ Keynes agreed with Dalton, adding that the “social and political climate would not permit a repeat of the *rentier*-friendly policy of the First World War”.³⁴² Skidelsky describes Keynes' “hatred of the *rentier*”, which “was proof against economic arguments, because at bottom it was theological, not scientific. The bondholder is his mind

³³⁷ (Skidelsky, 2000, pp. 24-25)

³³⁸ (Booth, 1989, p. 157)

³³⁹ (Worswick & Ady, 1952, p. 202) An increase in bond yields reflects a decline the market value of the bonds.

³⁴⁰ CV61 p.1, Mr. Klopstock to Mr. Sproul, ‘The Cheaper –Money Policy in Britain – A Lesson for the United States’”, New York Federal Reserve Bank Archive, 7 September, 1948

³⁴¹ (Cairncross, 1985, p. 176) Douglas Jay, Economic Secretary to the Treasury, is also quoted to the same effect. Dalton couldn't see the point of higher interest rates because capital expenses “is not now determined by what people want but by what the government permits”.

³⁴² (Skidelsky, 2000, p. 69)

was nothing but the medieval usurer, or Shylock, someone who sought to make a profit out of lending money.”³⁴³

November 1951 saw the first sustained increase in the Bank Rate, which was increased from 2% to 2-1/2%. What followed was a fairly dramatic increase in yields across UK government debt, particularly short-dated issues, as well as private sector securities (Table 15). The effects of the increase on Bank Rate were seen most dramatically on the short-end of the government yield curve, with yields on UK short-dated debt more than doubling from 1.70% to 3.48% from October 1951 to July 1952. Yields on medium-term and the longer-term war loan did not see nearly as large a jump, increasing by 21% and 18%, respectively, which was approximately in-line with the rise seen in private sector securities.

³⁴³ (Skidelsky, 2000, p. 69)

Table 15: Average Yield of UK Securities, 1950-52

	Government Debt Securities			Industrial Securities	
	Short dated	Medium dated	3-1/2% War Loan	Debentures	Ordinary Shares
1950 Avg.	2.03%	2.99%	3.77%	4.07%	5.48%
1951 YTD Avg.	1.84	3.59	3.98	4.28	5.35
Oct. 1951	1.70	3.66	4.06	4.33	5.26
Nov.	1.97	3.78	4.18	4.50	5.76
Dec.	2.29	4.08	4.35	4.70	5.90
Jan. 1952	2.36	4.14	4.37	4.71	6.35
Feb.	2.41	4.17	4.42	4.77	6.43
Mar.	2.92	4.31	4.54	4.92	6.64
April	3.15	4.24	4.50	4.84	6.37
May	3.26	4.27	4.56	4.85	6.95
June	3.51	4.45	4.75	4.94	7.28
July	3.48	4.42	4.78	4.96	6.78
1952 YTD Avg.	3.01%	4.29%	4.56%	4.86%	6.69%
% Δ Oct 1951 to July 1952	105%	21%	18%	15%	29%

Source: CV261A p. 4, New York Federal Reserve Bank Archive, 25 September 1952

The ‘Daltons’ episode and other evidence appears to have demonstrated, to at least some degree, the existence of a ‘market floor’. In other words, if the British government offered debt at a nominal interest rate deemed too low by market participants, then the market was free to sell-off British debt in sufficient quantities to compel authorities to offer a higher yield on new bond issues. For example, the archival records go on to state that:

“Soon after the decline of gilt-edged prices early in 1947, the market became thin, nervous, and anemic. Any large offering that in previous years could have been easily absorbed caused digestive troubles and jumpy reactions”.³⁴⁴

³⁴⁴ CV61 p. 4, Mr. Klopstock to Mr. Sproul, ‘The Cheaper – Money Policy in Britain – A Lesson for the United States’, New York Federal Reserve Bank Archive, 7 September, 1948

In October 1947 Dalton remarked that “the establishment of an effective 3 per cent gilt-edge yield is no more than a temporary lapse from the 2 ½ per cent objective”. However, Dalton would be proven wrong.³⁴⁵

The effects of market forces on public debt markets also existed in the 1960s. A NYFRB study highlights how “the margin between (UK) Treasury Bill rates and other short-term rates is greater here than in the United States” (Table 16). This fact suggests that if financial repression was impacting interest rates in both countries the impact was less dramatic in the UK by the early 1960s.³⁴⁶

Table 16: Comparison of UK and U.S. Interest Rates, September 1964

Instrument	United Kingdom	United States
Treasury Bills	5.50%	4.00%
Local Authority Deposits (UK) / Finance Paper (U.S.)	6.50%	4.25%
Finance House Deposits (UK) / CDs (U.S.)	7.00%	4.38%

Source: CV61A p. 8, New York Federal Reserve Bank Archive, 18 October 1965

The NYFRB study goes on to comment that in the UK the “market in local authority temporary money has provided foreigners, as well as domestic holders, with an attractive alternative to the Treasury bill”, and that “the local authorities are competing for institutional and private funds not only against the Government (with its higher credit rating), but also against the finance houses and each other”.³⁴⁷ Those looking to put cash to work earning interest in London had “many more attractive outlets” than in the U.S.³⁴⁸ By the late-1950s the London Eurodollar market generally offered banks the ability to earn interest at 4%.³⁴⁹ The fact that rates in the UK private sector remained competitive and above public sector rates of interest on offer, and the lack of compression between the different UK

³⁴⁵ CV61 p. 6, Mr. Klopstock to Mr. Sproul, ‘The Cheaper –Money Policy in Britain – A Lesson for the United States’, New York Federal Reserve Bank Archive, 7 September, 1948

³⁴⁶ CV61A p. 8, New York Federal Reserve Bank Archive, 18 October 1965

³⁴⁷ CV61A pp. 11, 8. New York Federal Reserve Bank Archive, 18 October 1965

³⁴⁸ CV61A p. 16, New York Federal Reserve Bank Archive, 18 October 1965

³⁴⁹ CV61A p. 17, New York Federal Reserve Bank Archive, 18 October 1965

instruments compared to the U.S. marketplace, undermines claims that the UK interest rates operated under a regime of strict financial repression.

In sum, these findings are somewhat at odds with the portrayal of post-war British financial repression as a regime with absolute control over interest rates, or an era where investors had few investment options. Indeed, there was a significant spread in yields across a variety of different debt securities available for investment purposes. This evidence highlights the importance of distinguishing between different types and degrees of financial repression. In other words, while moral suasion and qualitative techniques may have encouraged banks to hold longer-term British debt, other economic actors in the UK had a variety of investment options outside low-yielding government securities.

4.4.3 Capital and exchange controls

Alongside low interest rates, capital controls are typically considered a cornerstone of financial repression.³⁵⁰ As noted by internal archival discussions between the Bank of England and Federal Reserve, “the war has diminished confidence in paper currencies” and controls were seen as one means to “avoid the real danger of a breakdown or collapse of social institutions and political structure”.³⁵¹ The stringent controls imposed at the beginning of Second World War laid the groundwork for the Sterling Area.³⁵²

An example of one policy designed to control the movement of capital was the requirement that permission from authorities be obtained prior to making any forex purchases.³⁵³ Keynes argued against closing down the stock exchange stating that, with

³⁵⁰ See (Aizenman, Gavin, & Hausmann; Alesina, Grilli, & Milesi-Ferrett, 1993; Alexander, Enoch, Baliño, & International Monetary Fund., 1995; Wyplosz, 1986, 2001) In recent times it has been suggested that low interest rates are the only requirement of financial repression as other mechanisms, such as *quantitative easing*, have replaced the need for stringent capital controls.

³⁵¹ C261 p. 1, Letter from Sproul to Knoke, New York Federal Reserve Bank Archive, 6 March, 1947

³⁵² (Capie, 2010, p. 146; De Vegh & Scudder Stevens & Clark., 1939) For a further description of the Sterling Area see (R. Harrod & Princeton University. Department of Economics and Sociology. International Finance Section., 1952)

³⁵³ (Cairncross & Eichengreen, 1983, p. 24)

foreign exchange controls and a prohibition on new securities issuance, all savings would be accessible by the Treasury, thereby “making cheap borrowing easy” for the government.³⁵⁴ Indeed, in 1913 domestic industry only comprised 8% of issues quoted on the London Stock Exchange. However, the figure would rise to and remain over 90% from the late 1940s onward as capital exports “remain(ed) in the doldrums”.³⁵⁵ Another element of British capital controls were the restrictions on foreign exchange on payments made outside the Sterling Area, which were imposed at the outbreak of war and maintained well into peacetime.

Following the conclusion of the war Keynes felt that “nothing is more certain than that the movement of capital funds must be regulated”.³⁵⁶ The Bank of England initially sought to trace how so much sterling had wound up in foreign markets such as New York, and complex rules were established on how and by whom sterling could be exchanged for dollars.³⁵⁷ The Exchange Control Act was passed in 1947, which had the effect of restricting some external loans as well as inward capital flows.³⁵⁸ This act was not repealed until October 1979.³⁵⁹ However, persistent capital leakages were an ongoing concern for policymakers in spite of controls. By April 1940 Keynes estimated leakages of £100M since the start of the war. U.S. dollars, which the Treasury was seeking to raise, were leaking through London’s allowance for non-residents to sell British securities for dollars. This caused Keynes to ‘go on the warpath’ to enforce capital controls; others in the Treasury were not in favour of action due to concern about the losses of foreign balances held in London.³⁶⁰

As noted earlier in the paper during the discussion of the free gold market, there is some question as to the overall effectiveness of capital controls. Further, in certain areas the export of capital was not prohibited at all. For example, Sophisticated markets for ‘free’ sterling blossomed in New York and Switzerland. In addition, capital exports were allowed

³⁵⁴ (Skidelsky, 2000, p. 79)

³⁵⁵ (Wilson, 1995, p. 188)

³⁵⁶ (Skidelsky, 2000, p. 205) The Bank of England also favoured capital controls (p. 210)

³⁵⁷ C261 p. 1, Bank of England letter to NYFRB’s Mr. Knoke, New York Federal Reserve Bank Archive, 7 December, 1945

³⁵⁸ (Cairncross & Eichengreen, 1983, p. 22)

³⁵⁹ (C. M. Reinhart & Sbrancia, 2011, p. 17)

³⁶⁰ (Skidelsky, 2000, pp. 75-76)

within the Sterling Area up until 1972 at which point exchange control was applied.³⁶¹ Dow (1964) estimates that 20% of capital outflows were due to the ‘looseness’ of controls (leakages).³⁶² The regulations and rules governing the Sterling Area and the movement of capital were, put simply, complex. Varying degrees of transferability of currency and different forms of sterling, many of which had unique exchange rates and separate rules about how the currency could be used, made for a confusing regulatory environment.³⁶³ As noted by the Federal Reserve Board of Governors, sterling’s status varied from place to place, serving “as a hard currency for the Belgians but a soft currency for the Indians”.³⁶⁴

The British gold market was closed in the early stages of Second World War and did not officially reopen until 1954.³⁶⁵ Regulation governed the export of gold, and British citizens residing permanently in Britain were prohibited from owning gold not made into jewellery. However, British citizens residing permanently in a country which does permit personal gold ownership (e.g., France) could own gold. During this period several London gold dealers established subsidiaries in Canada, Beirut, Hong Kong and South Africa while the London market was closed.³⁶⁶ What is not entirely clear from a review of the literature and archival materials is what effect in practice the closure of the London gold market actually had on flows. In other words, if the British bullion banks – Rothschild, Mocatta and Goldsmid, et al – were still largely able to operate, as the NYFRB claimed, did the closure of the London gold market help achieve the British objective of minimizing the drain of gold reserves? These and related questions may warrant further research.³⁶⁷

³⁶¹ (Cairncross, 1985, p. 119)

³⁶² (Dow & National Institute of Economic and Social Research., 1964, p. 24)

³⁶³ (Pick, 1953) Some of the many names given to the different versions of sterling include: cheap, free, overseas, external, black market, Handpayments, etc.

³⁶⁴ C261 p. 2, Letter from J. Burk Knapp of the Fed Board of Governors to Werner Knoke, New York Federal Reserve Bank Archive, 4 March, 1947

³⁶⁵ (C. M. Reinhart & Sbrancia, 2011)

³⁶⁶ (Green, 1968, p. 115) See also (Green, 1973, 1981)

³⁶⁷ Unfortunately, a warehouse fire destroyed much of the archival material that was held by Rothschild about the London gold market during this period, so it is not clear what archival materials may exist.

Britain was not alone in establishing greater control over capital and foreign exchange. Following the Second World War an elaborate set of financial restrictions, interest rate caps, and capital controls remained in effect in advanced economies until the 1970s-1980s, at which point widespread financial liberalization was pursued across much of the non-communist world. The UK had a higher degree of controls in place on its current account from 1950-1980 (Figure 8). Britain's degree of capital account openness fluctuated both above and below the sample average during this time (Figure 9).³⁶⁸

³⁶⁸ (Obstfeld & Taylor, 2004, pp. 160-171; D. Quinn, 1997; D. P. Quinn & Toyoda, 2008)

Figure 8: Current-account openness, 1950-2004

(100 = more open)

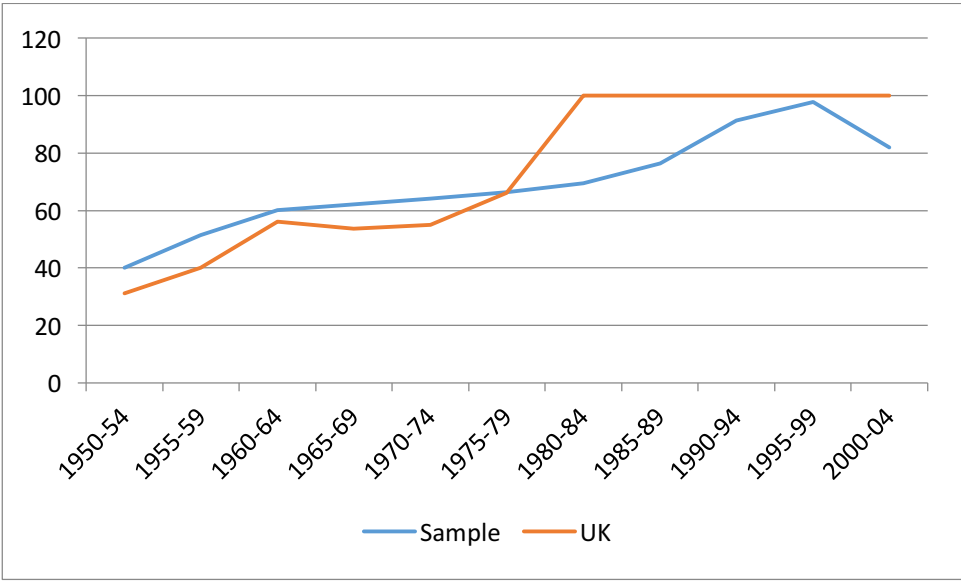
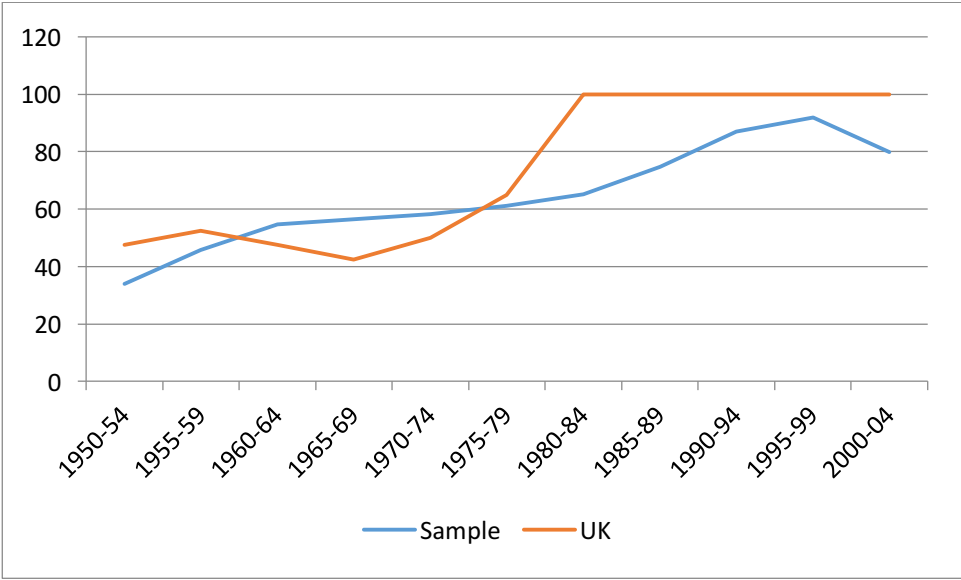


Figure 9: Capital-account openness, 1950-2004

(100 = more open)



Note: sample countries includes: Australia, Austria, Belgium, Denmark, Ireland, Italy, Finland, Germany, Greece, France, Japan, New Zealand, Netherlands, Portugal, Spain, Sweden, and Switzerland.

Sources: Quinn (1997), Quinn and Toyoda (2008)

4.4.4 Banking system

“The commercial banking system is to be fitted, as an integral part, into what promises to be a greater degree of central organization of the British economy than has ever existed in the past”.

-Anonymous, New York Federal Reserve Bank Archive³⁶⁹

Before exploring the particulars of the role played by British banking in post-Second World War financial repression it useful to discuss the history and structure of the British financial system. On the whole, the British banking and financial system has proven comparatively stable.³⁷⁰ While not immune from problems (e.g., the 1890 Baring’s crisis) the buoyancy of British banks compares favourably with other countries during periods of economic distress. For examples, in the 1930s U.S. banks failed *en masse* (thousands) while far fewer British banks failed (both in absolute total number and as a percentage of the number of banks in existence at the time).³⁷¹

Since the Barings crisis, the Bank of England had accepted financial responsibility for the principal merchant banks. The Bank was willing to buy merchant bank acceptances in the market without formal limit. Principal merchant banks held accounts at the Bank and were members of the Accepting Houses Committee (AHC), formed in 1914. All AHC members were a liability of the Bank of England, which assisted merchant banks in 1939 (as in 1931 and 1914) when standstills occurred. One further reason for the relative stability of British banks during this period was due to the structure of the British financial system, particularly the clear lines of demarcation between institutions that could engage in different financial functions. Restrictions kept discount, merchant and clearing banks out of each other’s lines of business.³⁷² It took the 1933 U.S. Glass-Steagall Act, which required that separate companies perform the function of managing deposits, investment banking, and insurance, to create what already informally existed in Britain.

³⁶⁹ CV61A p. 3, New York Federal Reserve Bank Archive, 1946

³⁷⁰ (Fforde, 1992, p. 749)

³⁷¹ (Bemanke & James, 1991, pp. 51-55; Grossman, 1994; Wicker, 2001)

³⁷² (Capie & City University. Centre for Banking and International Finance . Centre for the Study of Monetary History., 1987; D. T. Llewellyn, 1985; David T. Llewellyn, 1985, p. 10) See also (Fforde 1992, p. 758)

Did the greater relative financial stability enjoyed by the British banking system go hand-in-hand with having an oligopolistic banking industry? The British banking ‘cartel’, as it has been sometimes referred, formed in the late 19th century and has further consolidated through the present day.³⁷³ While the Bank of England stepped in to arrange mergers (e.g., Governor Norman’s coordination of the merger between the Royal Bank of Scotland and Williams Deacons Bank), mergers and further industry consolidation by London’s Big Five clearing banks was eschewed by the Bank of England given the oligopolistic nature of British banking.³⁷⁴ The Bank of England certainly took the view that low competition, while reducing efficiency, led to higher stability.

The Bank of England also found it easier to deal with a relatively small number of banks, which may have played an important role in the state’s ability to influence the composition of bank balance sheets. Indeed, an archival document from an NYFRB study shows how a much greater share of UK Treasury Bills are held by the UK banking system as compared to the United States banking system.³⁷⁵ The study goes on to discuss how by this time UK Treasury bills “now fulfil the function once performed by commercial bills” as a means for British banks to convert liquid assets into cash, underscoring the importance in the shift from private instruments of credit to public credit in bank operations and the London bill market. However, there was arguably a trade-off between stability and lower efficiency, which can be seen in the relatively high cash/deposit and liquidity ratios of 8% and 28-30%, respectively.³⁷⁶

³⁷³ (Strange & Royal Institute of International Affairs., 1971, p. 162)

³⁷⁴ (Capie, 2010, p. 327) The Big Five London Clearing banks during this time were: Midlands, Barclays, Lloyds, National Provincial and Westminster.

³⁷⁵ This was true in spite of the fact that the UK and U.S. Treasury bills “fundamentally alike” in structure CV61A p. 1, 18 October 1965, New York Federal Reserve Bank Archive

³⁷⁶ (Capie et al., 1992, p. 69)

The 'special relationship' between the Bank of England and London's clearing banks allowed their profits and losses to be kept from the public (as well as the Bank of England).³⁷⁷

As noted by Fforde (1992):

"The special relationship with the bank was far more than that of supervisor and supervised. It is unlikely that those words were ever used. It was more like a relationship between partners, each possessing some degree of control over the other. It was all very informal."³⁷⁸

British banks were given a special degree of latitude by their regulator, the Bank of England, in the form of practices such as the maintenance of hidden reserves.³⁷⁹ The hidden reserves of British banks cloud the question of what precisely were bank profits during this period, and some questionable claims are found in the literature regarding British bank profitability. For example, Worswick and Ady (1952) describe bond dealings for banks as "highly profitable".³⁸⁰ However, they do not provide sufficient details on how the effects of inflation may have eroded the real value the bonds held by British banks.

Flexible arrangements on disclosure and liquidity, along with restrictions on competition and somewhat guaranteed market share, could help explain why banks acquiesced to the substantial reduction seen in the value of their public debt holdings. For example, in the post-war period the deposit reserve ratio for UK banks was relaxed from 10% of deposits required to be kept in notes and coin in reserve to just 8%.³⁸¹ British banks did not closely adhere to the defined minimum requirement that 30% of British bank liabilities be held in 'liquid' assets such as Treasury bills, commercial bills, and Treasury deposit receipts.³⁸² Further examination of rates on deposits at British banks could be useful. As noted by Reinhart and Reinhart (1999), "banks pass the reserve requirements component of the financial repression tax on to depositors via lower deposit rates and/or non-government

³⁷⁷ (R. S. Sayers, 1976, pp. 552-560)

³⁷⁸ (Fforde 1992)

³⁷⁹ (Capie, 2010, pp. 445, 591; Capie et al., 1992, pp. 68-69)

³⁸⁰ (Worswick & Ady, 1952, p. 215)

³⁸¹ C261A p. 1, New York Federal Reserve Bank Archive, 25 September, 1952

³⁸² C261A p. 1, New York Federal Reserve Bank Archive, 25 September, 1952

borrowers via higher lending rates. This mix between the two depends upon which has access to more alternatives".³⁸³

Significant change came to the Bank of England in the mid-1940s. First, in 1944, after serving for 24 years, Governor Montagu Norman stepped down at age 72. Then in August 1946, the era of bank regulation referred to as the "the world of the 'Governor's eyebrows", came to an end when the 'Old Lady of Threadneedle Street' was nationalized under the Bank of England Act.³⁸⁴ As noted by Fforde (1992), the Bank's:

"relations with Whitehall and the City were clear enough in broad outline, but often informal, unmodified, and uncertain on the margins. Maintenance of the authority of the Bank, together with control over the direction in which it moved, therefore depended unusually on the supremacy of the Governor."³⁸⁵

This informal arrangement changed when controversial clauses 4(3) and 4(4) of the nationalization act were adopted, which formalized the Bank's relationship with Treasury. Where previously the Bank had employed moral suasion, clause 4(3) gave the Bank, with the approval of the Treasury, explicit power to govern the proportion of commercial bank assets.³⁸⁶ The formalization of this power and the addition of the Treasury in the decision making framework on the mix of assets banks would hold can be viewed as a significant advancement of financial repression. One of the core elements of financial repression is the ability for government to mandate the composition of firm balance sheets to ensure the government debt is held, and clause 4(3) and 4(4) formalized the government's authority in this regard. These sections allowed the Treasury to:

"request information from and make recommendations to bankers, and may, if so authorized by the Treasury, issue directions to any banker for the purpose of securing that effect is given to any such request or recommendation."³⁸⁷

³⁸³ (C. Reinhart & Reinhart, 1999)

³⁸⁴ (Capie, 2010, p. 590)

³⁸⁵ (Fforde, 1992)

³⁸⁶ (Fforde, 1992, p. 7)

³⁸⁷ C261D pp. 19, NYFRB Research Memorandum titled 'Notes on the Nationalization of the Bank of England', New York Federal Reserve Bank Archive, 19 October, 1952

Indeed, statements from both the Midlands and Westminster bank chairmen condemned the adoption of clause 4(3) and represent one of the only instances found in the literature of an objection to British financial repression policies by bankers.³⁸⁸ However, it was stated that “certain safeguards to bankers and customers are provided for”, such as the “right of bankers to make prior representations with the Bank of England and the Treasury before the ‘directions’ are issued to them”.³⁸⁹ A note in the New York Federal Reserve archives records a quote summarizing Dalton’s view on the new power hierarchy between British banks and the government: “in the last resort...as a matter of principle, if there be a serious case of conflict or challenge, the Bank of England must be master and the leader of the clearing banks”.³⁹⁰ As noted by Worswick and Ady, “thus the banking system was a useful instrument in the hands of a determined Chancellor.”³⁹¹

What ultimately was the impact of the new Bank of England control clauses and nationalization? There are references to the government’s share of the overall business handled by banks increasing significantly following the war.³⁹² It is unclear how much the establishment of this clause impacted bank assets.³⁹³ The literature only addresses the process which led to the Act’s passage, and Worswick and Ady state “no instance of its use has been publicized”.³⁹⁴ In contrast, archival evidence points to significant influence by the UK Treasury on bank balance sheets. For example, the previously cited 1952 Bank of England study on credit control states that the banks:

“made every effort to comply with the requests of successive Chancellors of the Exchequer that credit should, as in war-time, be granted only for essential purposes, which in the post-war period, were to be judged in the light of the criteria laid down from time to time for the guidance of the Capital Issues Committee. Thus, though the

³⁸⁸ (Fforde, 1992, p. 7)

³⁸⁹ C261D pp. 19, NYFRB Research Memorandum titled ‘Notes on the Nationalization of the Bank of England’, New York Federal Reserve Bank Archive, 19 October, 1952

³⁹⁰ CV61A p. 3, New York Federal Reserve Bank Archive, 1946

³⁹¹ (Worswick & Ady, 1952, p. 217)

³⁹² (Institute of Bankers., 1949)

³⁹³ (Fforde, 1992) See Ch. 1 (pp. 1-30)

³⁹⁴ (Worswick & Ady, 1952, p. 218)

weapons of quantitative control of bank credit could not be used, a broad qualitative control was maintained.”³⁹⁵

This qualitative control on bank lending was supplemented with the reintroduction of quantitative measures in November 1951, namely the first sustained increase in Bank Rate in nearly 20 years (from 2% to 2-1/2%).³⁹⁶ The return to quantitative measures was in part driven by the fact that the “efficacy” of qualitative means of controlling bank balance sheets “was limited, in spite of the cooperative attitudes of the banks”.³⁹⁷

From the literature there is also a discussion of pressure on banks to support government bonds. For example, new discount houses appear to have been forced to take on a new role of holding government debt.³⁹⁸ The aforementioned Treasury Deposit Receipts (TDRs) were also unpopular among bankers.³⁹⁹ UK banks were required to maintain a certain ratio of liquid assets that included Treasury bills, which contrasted with U.S. banks that only had to keep cash and deposits (but not government debt) with the Federal Reserve.⁴⁰⁰

How much of this represented a change from the past is not entirely clear. For some time prior to nationalization the Bank of England was described by some as “little more than a handmaiden of the Treasury”.⁴⁰¹ During the Second World War British banks took on all government debt not purchased by the public. British banks’ advance ratio (the % of assets allotted to loans and overdrafts) dropped from the peacetime level of 50% to 15%, indicating a large shift away from private sector loans in favour of government debt. The advance ratio did not return to the peacetime level as quickly as it had after First World War, taking until

³⁹⁵ C261A p. 2, New York Federal Reserve Bank Archive, 25 September, 1952

³⁹⁶ C261A p. 2, New York Federal Reserve Bank Archive, 25 September, 1952

³⁹⁷ C261A p. 2, New York Federal Reserve Bank Archive, 25 September, 1952. The memorandum goes on to note that “the generous compensation to be given to private owners of present (Bank of England) stock, have also done much to dampen opposition of the Bill”.

³⁹⁸ (Worswick & Ady, 1952, p. 215) “It was made clear that as long as they were prepared to act as genuine jobbers - that is, to buy to capacity on falling markets - the authorities would support their liquidity.”

³⁹⁹ (R. S. Sayers, 1953)

⁴⁰⁰ Source: CV61A p. 20, New York Federal Reserve Bank Archive, 18 October 1965

⁴⁰¹ Source: CV61 p. 1, Research Memorandum on the ‘Pros and Cons of Bank of England Nationalization’, New York Federal Reserve Bank Archive, 22 December 1945

the 1960s for the ratio to return to 40%.⁴⁰² A shift by banks away from private sector loans in favour of government debt is a common feature financial repression policy. The banks could discount their T-bills with the Bank of England for any cash that was needed, and by war's end Britain's money supply had doubled.⁴⁰³

After the war British banks were swimming in liquidity with large deposit bases and liquid assets, and the comparatively high level of liquidity possessed by the banks persisted well into the 1950s.⁴⁰⁴ The Dalton policy of 'cheap money' initially led to a rise in the value of stocks and gilts.⁴⁰⁵ However, bond prices did decline later by a significant margin following the introduction of the 2.5% 'Daltons'. The clearing banks in particular were required to keep on their balance sheets a large percentage of government securities due to the "subjugation of bank behaviour to the perceived greater needs of government finance".⁴⁰⁶ After the war, banks were trying to rebuild their advances-government debt ratio. At the same time authorities were trying to sell more debt and cap and or slow growth in bank advances.⁴⁰⁷ For example, archival documents describe a UK government "funding operation" in November 1951, supported by the banks and "important overseas holders of Treasury Bills", whereby £1 billion in UK Treasury Bills were exchanged for 1-3/4% Serial Funding Stock maturing in 1952, 1953, and 1954.⁴⁰⁸ The effect of this funding operation was to "sharply" reduce the liquid assets of the clearing banks so that "should the need arise" the banks clearing banks "would be relatively susceptible to pressure" by the Bank of England on the composition of their balance sheet.

There is a large academic literature on London's banks. However, there is very little to no discussion of the policies or sentiments often associated with financial repression in the banking literature covering this period. For example, Burk's (1989) history of Morgan

⁴⁰² (Capie et al., 1992, p. 64) Ratio of advances to total assets at commercial banks in the late 19th century were 60%, 50% in the interwar period, and 16% in 1944.

⁴⁰³ (Fforde, 1992, p. 7)

⁴⁰⁴ (Capie et al., 1992, p. 64)

⁴⁰⁵ (Worswick & Ady, 1952, p. 194)

⁴⁰⁶ (Capie et al., 1992, pp. 67-68)

⁴⁰⁷ (Capie, 2010, pp. 80-81)

⁴⁰⁸ C261A p. 5, New York Federal Reserve Bank Archive, 25 September, 1952

Grenfell, a leading Anglo-American merchant bank, focuses on personalities and transactions, but does not reference financial repression.⁴⁰⁹ The same is true of Sayers' (1968) study of Gillets, which includes the years 1945-51.⁴¹⁰ While this absence of financial repression from the literature may in part be due to the fact that many of the histories on British banks were 'official', the private diaries of British merchant banker Siegmund Warburg also do not mention financial repression.⁴¹¹ One notable exception to the silence from bankers occurred in January 1947, when the chairmen of the Big Five clearing banks urged in their annual letters an end to Dalton's policy of 'cheap money'.⁴¹² However, the general absence of discord raises questions. British banks would hold large quantities of British bonds well into the post-war period (Table 17), and in the UK "a much higher proportion of the total outstanding [Treasury bills] is in the hands of the banking system (including discount houses) than it is in the United States".⁴¹³

Table 17: Institutional Comparison of UK and U.S. Treasury Bill Holdings, 30 September 1964

Sector	United Kingdom	United States
Commercial banks and discount houses	50%	27%
Foreign holders	42%	19%
Other holders	8%	54%
Total	100%	100%

Source: CV61A p. 10, New York Federal Reserve Bank Archive, 18 October 1965

As noted earlier, the real value of British bonds experienced a steady and substantial decline following Second World War. One would expect that the post-Second World War liquidation of the value of British debt of perhaps unprecedented proportions to generate at least a mention in passing from bankers, which in turn would be picked up in the historical

⁴⁰⁹ (Burk, 1989)

⁴¹⁰ (R. S. Sayers, 1968)

⁴¹¹ (Ferguson, 2010)

⁴¹² (Worswick & Ady, 1952, p. 201) Another example of protest was the earlier noted comments by the chairmen of Midlands and Westminster condemning clause 4(3) in the Bank of England Act (Fforde, 1992, p. 27).

⁴¹³ CV61A p. 10, New York Federal Reserve Bank Archive, 18 October 1965

literature. How can this apparent paradox be explained? It is hard to imagine that British banks were not aware of the fact that the real value of their British debt holdings was being eroded.

There are at least four possibilities that could explain the paradox behind the existence of British financial repression and the absence of mention in the literature and by financiers: a) historical research to date has simply overlooked this aspect of British financial history; b) British banks found a way to mitigate the effects of financial repression; c) a financial repression bargain, so to speak, existed between the banks and the authorities; d) financial repression's effects were small enough, and stretched out over sufficient time, to escape protest. It is tempting to speculate that the latter two explanations are correct based what later happened to British banking. The merchant banks were considered to be the *crème de la crème* of the London banks. However, once London's financial deregulatory 'Big Bang' occurred most of London's merchant banks ceased to exist as independent going concerns over the next several years. Of the original merchants banks only Rothschild has remained an independent entity.⁴¹⁴ Merchant banks had been sheltered and simply found they were no longer competitive in a globalized financial market.

4.4.5 Directed lending

Directed lending is a common feature of financial repression, and British government departments such as the National Debt Commissioners and the Post Office Savings Bank were directed to support Treasury bond auctions and the overall government bond market. Other agencies that supported government debt markets included the trustee savings banks, the social insurance funds, the Exchange Equalization Account and the Issues Department of the Bank of England.⁴¹⁵ These departments were often used to support conversions through

⁴¹⁴ Kleinwort was bought by Dresdner. S.G. Warburg was purchased by Swiss Bank Corp. (now Credit Suisse). Morgan Grenfell was bought by Deutsche Bank. Schroeder's was purchased by Citibank. Hambros was sold to Société Générale in 1998. Barings failed in 1995.

⁴¹⁵ (Worswick & Ady, 1952, p. 197)

advance buying of the security to be converted, thereby helping to ensure a successful conversion.

Dalton orchestrated directed lending operations with the goal of managing interest rates. Low interest rates were effected by swapping higher interest rate long-term term debt with lower interest rate short-term debt, as well by underwriting new lower-interest rate issues.⁴¹⁶ Both Worswick and Ady (1952) and Cairncross (1985) briefly discuss these operations. However, Cairncross described them as “rumour”, while Worswick and Ady refer to the departments as the “Treasury’s creatures” that were “taking up the slack on those issues which the public would not take”.⁴¹⁷ While these operations were originally concealed from the public archival documents reveal the extent of these operations.⁴¹⁸ A New York Federal Reserve report cites another report by a Mr. Bloomfield titled “Interest Rate Policy in Great Britain- 1945-48” that describes the effects of British directed lending as follows:

*“2 ½ per cent Consols under the impact of vigorous buying by the public departments had risen by November 1946 to within a point of parity, the highest level in 44 years, and the market had been sufficiently ‘rigged’ to permit the issue at part of a 2 ½ per cent Treasury stock redeemable after 1975 at the Treasury’s discretion” (the ‘Daltons’).*⁴¹⁹

Comparing non-bank private sector institutions in the U.S. and UK, we see that in 1963 that U.S. non-bank private sector institutions held a much larger portion of their short-term assets in Treasury Bills than in the UK (

⁴¹⁶ (Worswick & Ady, 1952, p. 197)

⁴¹⁷ (Cairncross, 1985, pp. 432-433; Worswick & Ady, 1952, pp. 196-198, 215)

⁴¹⁸ (Worswick & Ady, 1952, pp. 197, 202) Worswick and Ady also stated that it is possible to make a back-door calculation by monitoring credit creation, particularly the increase of deposits. They also note that the activities of the departments declined under the Cripps Chancellorship.

⁴¹⁹ CV61 p.1, Mr. Klopstock to Mr. Sproul, ‘The Cheaper –Money Policy in Britain – A Lesson for the United States’”, New York Federal Reserve Bank Archive, 7 September, 1948

Table 18).

Table 18: Private Sector Institutional Comparison of UK and U.S. Treasury Bill Holdings, % of Total Short-term Assets held in Treasury Bills, 1963

Sector	United Kingdom	United States
Insurance companies	2%	10%
Corporate pension funds	1%	40%
Mutual banks	0%	18%
Savings banks	0%	12%

Source: CV61A p. 8, New York Federal Reserve Bank Archive, 18 October 1965

U.S. companies were generally considered to be much more ‘liquid’ than their UK counterparts, with current assets of 40% and 22%, respectively. UK private sectors insurance companies, when asked by the Radcliffe Committee to explain this preference for longer-term securities, stated:

“We do not want to have securities that turn over too rapidly or too frequently, such as bills or short-dated investments; we would rather have something which is going to be there for a reasonable period of time, for purely administrative reasons”.⁴²⁰

How should we interpret the preference on the part of British insurance and pension organizations for not holding UK Treasury bills, even though as the NYFRB study puts it “it might have paid them to do so”? The NYFRB ascribes a partial explanation to “habit” on the part of British insurance and pension schemes. Perhaps this and the previous explanation evidenced in the above quote from the insurance sector do explain in part the peculiar preference for preferring to earn a lower yield. However, given the active role of government in the management of UK economic affairs in the post-war period, questions abound over whether some degree of moral suasion on the part of the authorities could play a role in these preferences.

Other significant differences can be seen between the UK and U.S. Treasury bill holdings in other sectors of the economy (Table 19 and Table 20). UK non-financial

⁴²⁰ Committee on the Working of the Monetary System (Radcliffe Committee), Question 7092. UK National Archives, 1957-59

corporations held just 8% of the UK Treasury bill market compared to the 18% held by equivalent U.S. firms. However, UK local authorities held just 0.1% of the UK Treasury bill market and so would not appear, at least as of 1964, to have been a party to directed lending schemes.

Table 19: UK % of Total Treasury Bill Market Held by Sector, 30 September 1964

Sector	£s millions	% of T-bill market
Local authorities	£3	0.1%
Insurance	3	-
Trustee savings	2	-
Private sector pension funds	-	0.1%
Other non-bank financial institutions	3	0.2%
Non-corporate bodies (Public Trustee)	5	0.1%
Non-financial corporations	4	7.7%
Total	£229	8.3%

Source: CV61A p. 12, New York Federal Reserve Bank Archive, 18 October 1965

Table 20: U.S. % of Total Treasury Bill Market Held by Sector, 30 September 1964

Sector	£s millions	% of T-bill market
State and local governments	£1,940	12%
Insurance	200	1%
Mutual savings banks	120	1%
Savings & loans	240	1%
Corporate pension trust funds	290	2%
Non-financial corporations	2,830	18%
Misc. (including non-bank security dealers)	3,017	19%
Total	£229	54%

Source: CV61A p. 12, New York Federal Reserve Bank Archive, 18 October 1965

The 1964 NYFRB study remarks on how the institutional holdings of UK (and U.S.) Treasury bills has remained consistent “over the last four years, even though there has been an increase in alternative outlets (for earning interest) outside the public sector”, particularly the time certificate of deposit.⁴²¹

⁴²¹ CV61A p. 17, New York Federal Reserve Bank Archive, 18 October 1965

4.4.6 Inflation

Financial repression can be effective without inflation by simply reducing the level of nominal interest expense on public debt.⁴²² However, inflation often accompanies financial repression, and it need not be significant to have a material impact on debt sustainability over an extended period of time. Further, small differences in the rate of inflation can have a significant impact over time on the value of public debt, as well as determining the number of years or periods which can be labelled as periods of ‘debt liquidation’.

Other than the World Wars and their immediate aftermath, the first half of the 20th century in Britain was marked by very little inflation.⁴²³ As the Second World War commenced Keynes argued against what he called the ‘old-fashioned laissez-faire solution of inflation’ as a means of paying for the war.⁴²⁴ In a section of *How to Pay for the War* covering inflation during the period surrounding first great conflict of the 20th century, Keynes wrote:

“But what a ridiculous system with wages and prices chasing one another upwards in this manner! No one benefited except the *profiteer*. The seeds of much subsequent trouble were sown. And we ended up with a National Debt vastly greater in terms of money than was necessary and very ill distributed through the community.”⁴²⁵

Much of Keynes’ pre- and early-war policy efforts were spent advocating against the government’s use of inflation as a means of financing the war.⁴²⁶ Whether or not Keynes intended to remain staunchly anti-inflationary after the war is unclear as he was often criticized during this period for ‘making up theory on the hoof’.⁴²⁷

⁴²² (C. M. Reinhart & Sbrancia, 2011)

⁴²³ (Capie et al., 1992, p. 63) In fact much of the interwar period was marked by deflation.

⁴²⁴ (Keynes, 1940, p. 70; Skidelsky, 2000, p. 63) Keynes: “An individual by saving more cannot protect himself from the consequences of inflation if others do not follow his example.”

⁴²⁵ (Keynes, 1940, p. 73) Also, in the chapter titled ‘Can the Rich Pay for the War?’, Keynes argues that the rich would be the relative beneficiaries of inflation. (p. 21)

⁴²⁶ (Skidelsky, 2000, p. 55)

⁴²⁷ (Skidelsky, 2000, p. 23)

Somewhat surprisingly, deflation was reported by some to be as great a concern as inflation both during the war and the post-war period.⁴²⁸ However, as with many other wars inflation climbed during the Second World War, with retail prices increasing on average by 6.3% annually.⁴²⁹ There is some dispute in the literature on the level of inflation during the war (and afterward) with Cairncross' estimating 50% inflation during the Second World War.⁴³⁰ Inflation in the Second World War was approximately half that of the First, with Woodward (1991) claiming that this "relative success" was achieved through "much less dependence on borrowing and more concerted effort to reduce consumption through increased taxation".⁴³¹ Rationing was deemed crucial to making price controls effective.⁴³² A variety of measures were employed to manage demand, prices, costs, and overall inflation pressure, including price controls, subsidies, standardization schemes, and quality controls. Such measures could perhaps be considered as elements that supported financial repression, but they generally fall outside of the definition of financial repression.

Another hallmark of financial repression is a relatively high savings rate in spite of low interest rates and or inflation due to few (if any) investment or spending alternatives.⁴³³ Average weekly wages from 1940-1945 increased by a rate of 5% per year, lagging slightly behind price increases. Woodward (1991) speculates that trade unions, which had a strong wage bargaining position due to low unemployment, exercised wage restraint due to both sympathies for the war effort and their inclusion in war administration. Paradoxically, the savings rate also grew during this inflationary period of declining real wages to 15%.⁴³⁴ However, this is revealed to be less surprising given rationing and other restrictions on purchases both during and after the war.⁴³⁵

⁴²⁸ (Dow & National Institute of Economic and Social Research., 1964, p. 10) The White Paper on Employment Policy (Cmd. 6527, 1944) warned of deflation.

⁴²⁹ (Cairncross, 1985; Crafts, Woodward, & Duckham, 1991, p. 189; Mitchell, 1975) Wholesale prices during this period rose by 8.8% annually.

⁴³⁰ (Cairncross, 1985, pp. 14-15)

⁴³¹ (Crafts et al., 1991, p. 190)

⁴³² (Capie, Pradhan, Wood, & City University. Centre for the Study of Monetary, 1986; Capie & Wood, 2002)

⁴³³ (McKinnon, 1973; Shaw, 1973)

⁴³⁴ (Cairncross, 1985, pp. 13-14)

⁴³⁵ (Zweiniger-Bargielowska, 2000)

Woodward (1991) claims that post-Second World War (1945-1950) inflation averaged 4.3% per year, ranging between 3-7% annually.⁴³⁶ Real wages were unchanged through 1951 but real earnings increased by 10%.⁴³⁷ In 1948, 30% of consumption was rationed; by 1950 only 11%. In 1947 83% of UK raw materials were under some degree of official control; by 1950 the figure had declined to 47%.⁴³⁸ Woodward also states that for this period “at no time was there a return to the excess of 1919-20”, when annual inflation ran at 21.5% and 24.8%, respectively.⁴³⁹ However, other research suggests that actual post-war inflation was significantly higher than nationally reported figures used by Woodward and Richard (2002), particularly if one adds the early 1950s into the analysis when inflation approached post-First World War levels.⁴⁴⁰

Cairncross (1985) notes that the official Cost-of-Living index, based on pre-First World War estimates, was “far from being a true measure of the change in the value of money”.⁴⁴¹ Woodward also stated “in the early post-war years controls were deliberately used to contain demand pressures and to prevent the prices of a number of key commodities from rising rapidly. However, from 1947 onwards the controls were gradually relaxed, and had more or less disappeared with the change in government in 1951”.⁴⁴² While it is true that price and demand controls were largely removed by the early 1950s, Woodward says nothing of financial controls, such as those on foreign exchange conversion and other restrictions, which may have played a significant role in suppressing inflation during this time.⁴⁴³ The growing conflict on the Korean peninsula in 1950-51 is largely credited with the spike in inflation during this period. The cost of rubber tripled, wool and cotton doubled, and

⁴³⁶ These figures are in-line with Richards (2002) more recent numbers.

⁴³⁷ (Cairncross, 1985, p. 18)

⁴³⁸ (Cairncross, 1985, p. 23)

⁴³⁹ (Richards, 2002, p. 15)

⁴⁴⁰ (Díaz, Lüders, & Wagner, 2003; Feinstein, 1972; Friedman & Schwartz, 1982; Price, 1988; Wiles, 1952)

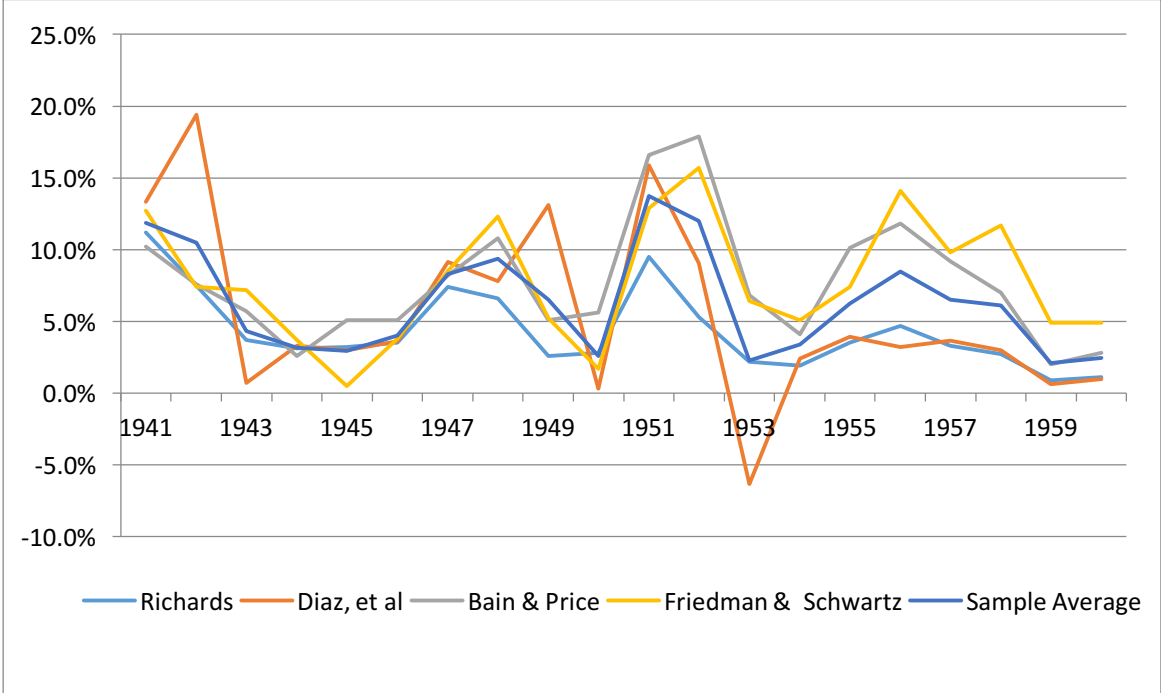
⁴⁴¹ (Cairncross, 1985, p. 39)

⁴⁴² (Crafts et al., 1991, p. 191)

⁴⁴³ (Crafts et al., 1991, p. 191) Woodward argues the post war Labour Government used its close relationship with the trade union movement to exercise wage restraint; 1948 was the year of the first voluntary income policy, which insured wage increases were kept well below inflation.

numerous other commodities went up in price by 50%.⁴⁴⁴ The various inflation series found in the literature are presented in Figure 10 and Table 21.

Figure 10: UK Inflation (Retail Prices), Annual Percentage Change, 1941-1960



Sources: Diaz, Luders and Wagner (2005) Richards (2002), Friedman and Schwartz (1982), Price and Bain (1988)

The smallest and largest variance in the range of values for any given year during this period are 1.6% and 10.5% for the years 1946 and 1949, respectively. Overall, given the wide variation in inflation estimates for this period it may be more accurate to utilize a range of inflation estimates for calculating debt liquidation.

⁴⁴⁴ (Dow & National Institute of Economic and Social Research., 1964, p. 55)

Table 21: UK Inflation (Retail Prices), Annual Percentage Change, 1945-1951

Year	Richards	Diaz	Bain & Price	Friedman & Schwartz	Sample Average	Range High-Low*
1945	3.2%	3.0%	5.1%	0.5%	2.9%	4.6%
1946	3.5%	3.6%	5.1%	3.8%	4.0%	1.6%
1947	7.4%	9.1%	8.2%	8.5%	8.3%	1.7%
1948	6.6%	7.8%	10.8%	12.3%	9.4%	5.7%
1949	2.6%	13.1%	5.1%	5.2%	6.5%	10.5%
1950	2.8%	0.3%	5.6%	1.7%	2.6%	5.3%
1951	9.5%	15.9%	16.6%	12.9%	13.7%	7.1%
Annual Average	5.1%	7.5%	8.1%	6.4%	6.8%	5.2%

*Note: the difference between the highest and lowest estimate each year.

Sources: Diaz, Luders and Wagner (2005) Richards (2002), Friedman and Schwartz (1982), Price and Bain (1988)

4.5 Conclusion

This paper has shown that opportunities exist for improving both our quantitative and qualitative understanding of financial repression through an in-depth examination of British mid-20th century financial repression. Further research is necessary on who were the winners and losers of low interest rates. Worswick and Ady (1952) state that low interest rates in the UK may have caused a "redistribution from the smaller to the larger *rentier*".⁴⁴⁵ However, little to no quantitative evidence is presented to support this claim. There is also the question of the knock-on effects of low interest rates on the British economy and financial system. During the post-war years "an unduly large proportion of world trade had come to be financed in London in order to take advantage of the low interest rates".⁴⁴⁶ But how much did this inflow of funds for trade finance further destabilize the fragile balance in Britain, with its high-debt and overvalued currency?

Further research is also necessary to understand the trade-offs between the negative consequences of financial repression, such as its impact on economic growth, and its potentially positive features, such as buttressing the financial system. In addition to promoting financial stability, financial repression can help achieve debt sustainability. Contrary to what its name implies, financial repression may on occasion be an appropriate policy. It may therefore be appropriate to determine a more neutral name for financial repression, which is often used as pejorative for scoring rhetorical points in policy debates.

⁴⁴⁵ (Worswick & Ady, 1952, pp. 204-205)

⁴⁴⁶ C261A p. 5, New York Federal Reserve Bank Archive, 25 September, 1952

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Appendix 1 Financial Repression Composite Indicator Variables and Data Sources

Variables	Description	Source
Capital movement	Outflows (and inflows)	IMF AREAER
Exchange control	Restrictions on foreign exchange movements, including adjustments in the rate	BIS
Financial soundness indicators	Various measures of financial soundness for countries, such as reserves	IMF
Public Pension Reserve Funds' Asset allocation	Institutional investors' asset allocation	OECD
Funded Pensions Indicators: Asset allocation	Bills and bonds issued by public and private sector	OECD
Cross-border lending and borrowing	Lending and borrowing of internationally active banks in key financial centres, including offshore centres	BIS
Deposit interest rate (%)	Interest rate paid on bank deposits	World Bank
Interest rate spread (%)	Lending rate minus deposit rate	World Bank
Real interest rate (%)	Real rate of interest when taking into account inflation	World Bank
Risk premium on lending (prime rate minus treasury bill rate, %)	Risk premium on lending is the interest rate charged by banks on loans to prime private sector customers minus the "risk free" treasury bill interest rate at which short-term government securities are issued or traded in the market. In some countries this spread may be negative, indicating that the market considers its best corporate clients to be lower risk than the government	World Bank

Variables	Description	Source
Portfolio equity, net inflows (BoP, current US\$)	Portfolio equity includes net inflows from equity securities other than those recorded as direct investment and including shares, stocks, depository receipts (American or global), and direct purchases of shares in local stock markets by foreign investors. Data are in current U.S. dollars	World Bank
Private credit bureau coverage (% of adults)	Private credit bureau coverage reports the number of individuals or firms listed by a private credit bureau with current information on repayment history, unpaid debts, or credit outstanding. The number is expressed as a percentage of the adult population	World Bank
Public credit registry coverage (% of adults)	Public credit registry coverage reports the number of individuals and firms listed in a public credit registry with current information on repayment history, unpaid debts, or credit outstanding	World Bank
Domestic credit provided by banking sector (% of GDP)	Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net	World Bank

5 Currency Black Markets and Historical Turning Points: 'Free' Sterling in New York and Switzerland in the 1940s

Abstract: During and after the Second World War, a period of fixed exchange rates, sophisticated markets for currencies trading at free-market rates developed in a number of financial centres. This paper presents new daily time series data from currency black markets in Switzerland and New York for British pound sterling (or 'free' sterling, as it was often referred), the U.S. dollar, and Swiss franc. Archival evidence shows that during the 1940s many of the largest and most sophisticated financial firms were active in these markets, and that these markets saw significant trading volume. A narrative account of the substantial communication about free currency markets between Bank of England and New York Federal Reserve Bank officials is presented. Statistical breakdate tests on the new data give a market perspective on key turning points during and after the Second World War. Contrary to the existing literature, free sterling's exchange rate appears to have reflected the currency's fundamental market value around the time of the 1949 devaluation. The data also suggest that British officials used recent free market quotes to fix sterling's new official exchange rate at \$2.80.

JEL: F31, N24, N44

Keywords: currency black markets, black markets, sterling, dollar, Swiss franc, free sterling, Second World War, exchange rates, New York, Zurich

5.1 Introduction

Black markets, also sometimes referred to as ‘informal’ or ‘free’ markets, can provide insights into financial and economic preferences during times of significant regulation, such as periods of war or financial repression. One period where black markets can make such a contribution is the 1940s. During this decade many currencies could only be legally exchanged at official rates or in limited quantities. In response, sophisticated markets for ‘free’ currencies blossomed in financial centres in Switzerland and in New York, and these markets facilitated the exchange of currencies at a discount (or premium) to their ‘official’, meaning policymaker-established, exchange rates with other currencies.

This paper presents the first study of currency black markets in advanced economies. In this paper a currency black market is defined as any prohibited currency exchange, meaning an exchange operating outside legal or regulated parameters. This paper also represents the first currency black market study to utilize high-frequency exchange rate data. New daily time series data is presented for several currencies, including British pound sterling (often referred to as ‘free’ or ‘cheap’ sterling), the U.S. dollar, and the Swiss franc. Archival material from the Bank of England and New York Federal Reserve Bank is used to present a policy narrative on these markets and to compliment the data analysis.

The remainder of the paper is structured as follows: Section 5.2 present an overview of the currency black market literature; Section 5.3 presents a historical overview of the 1940s currency black markets in New York and Switzerland; Section 5.4 describe the data set and presents descriptive statistics; Section 5.5 presents a structural break analysis of the Swiss franc-free sterling and U.S. dollar-free sterling exchange rates during and after the Second World War, respectively, to show how currency black markets responded to 1940s events; Section 5.6 concludes and outlines possible future research questions.

5.2 Literature Review

Described by some as the inevitable consequence of state intervention, black markets typically develop when some service or item of value that is regulated experiences excess (or insufficient) demand.⁴⁴⁷ Scholars have long been interested in black markets given the often unique market information and insights they can provide, and a number of research studies have examined the operational mechanics and structure of specific types of black markets, such as those for currencies.⁴⁴⁸ There are a wide number of possible explanations behind the emergence of individual foreign exchange black markets, some of which are summarized in Table 22.

Table 22: Summary of Forces that give Rise to Currency Black Markets

1	Government restrictions on trading in goods and or services
2	Illegal trade (e.g., drugs) can lead to demand or supply of illegal currency
3	Tourism or migration
4	Imposition of exchange controls
5	Capital flight
6	A hedge against political uncertainty
7	Inflation tax avoidance
8	Financial repression tax avoidance

Sources: Agenor (1992), Bhagwati (1978)

The structure of currency black markets depends on a number of factors including the degree of tolerance shown by officials towards illegal markets, the degree of awareness of such markets, and transaction costs and other frictions (e.g., perceived risk or penalties for participation).⁴⁴⁹ The public sector, when confronted with a prominent black market, will often expend considerable effort combating its existence given the perceived deleterious economic effects (Table 23).

⁴⁴⁷ (Von Mises, 1929, p. 83) see also (Agénor, 1992, pp. 5-6)

⁴⁴⁸ See for example (Bevan, Collier, & Willem Gunning, 1989; Browning & Culbertson Jr, 1974; Davidson, Martin, & Wilson, 2007; Gutmann, 1977; McLaren, 1996, 1998; Stahl II & Alexeev, 1985; Thomadakis, 1981) The question of how economic actors first become aware of black markets is a subject of network theory.

⁴⁴⁹ (Jones & Roemer, 1987; Pitt, 1984)

Table 23: Negative Public Sector Externalities Created by Currency Black Markets

1	Enforcement costs associated with deterring illegal activity and punishment
2	Loss of tariff and tax income
3	Reductions in the flow of foreign exchange to the central bank
4	Black markets encourage rent seeking activities (e.g., corruption)
5	Reduction in government seigniorage

Source: Agenor (1992)

Black markets can prove a challenging research topic due to difficulties in obtaining both reliable and complete data. By definition, a black market is a non-state sanctioned activity, and any participation may carry some form of punishment. This creates disincentives for participants to record or preserve detailed and or accurate records. Scholars who have studied black markets have noted concerns over both the availability and reliability of black market data.⁴⁵⁰

Previous research on foreign exchange black markets can be broadly grouped into two categories: general-theoretical and empirical. General-theoretical research, which comprises the majority of the research published on currency black markets to date, has emphasized the applicability of different economic frameworks and models across space and time as a means to better understand the fundamental dynamics and forces that motivate black markets.⁴⁵¹ Less common are empirical studies,⁴⁵² which focus on individual currencies or foreign exchange markets over a given period of time.⁴⁵² This paper, which focuses primarily on the operation of currency black markets in two countries, the United States and Switzerland, and for three currencies (British pound sterling, U.S. dollar, Swiss franc), most closely resembles the latter empirical body of work. However, one difference between this

⁴⁵⁰ (Agénor, 1992, p. 2)

⁴⁵¹ See for example (Agénor, 1991, 1992; Bhagwati & Hansen, 1973; Culbertson, 1975; Gupta, 1981; Kamin, 1993; Koveos & Seifert, 1985; Lehmann, 1980; Luintel, 2000; McDermott, 1989; Nowak, 1985; Phylaktis, 1996; Pinto, 1991; Reinhart & Rogoff, 2004; Roberts, 1989; Sarwar, 1997; Shachmurove, 1999; Sheikh, 1976)

⁴⁵² See for example (Baghestani, 1997; Bahmani-Oskooee, 1996; Dornbusch, Dantas, Pechman, de Rezende Rocha, & Simões, 1983; Goldberg, 1992; Kamin, 1991; Kharas & Pinto, 1989; Phillips, 1988; Thomas, 1989)

paper and prior empirical research is that this is the first paper to study currency black markets in advanced economies. In contrast to the daily data employed in this paper, previous currency black market research has also been limited to employing low frequency data that is either annual⁴⁵³, quarterly⁴⁵⁴, monthly⁴⁵⁵, or bi-weekly⁴⁵⁶. Further, currency data from prior studies is often an average over some period of time, or end of period data (e.g., last day of the month). Using such data may hinder the ability to observe how currency black markets responded during fast moving or discrete events, such as an official currency devaluation or the outcome of a wartime battle.⁴⁵⁷

For understanding market views on a nation's overall macroeconomic and political prospects, freely traded national currencies can provide several advantages over other asset prices. For example, currencies are free from company or industry-specific idiosyncrasies found in an individual company's stock price.⁴⁵⁸ However, a perfectly independent price measure of a nation's overall macroeconomic and political prospects does not exist, and currency exchange rates contain their own idiosyncrasies. For example, the value of any particular national currency is always relative; exchange rates are influenced by the economic circumstances of the two countries whose currencies are being exchanged, or the peculiarities of the service or good (e.g., gold) that is being exchanged for a national currency. Exchange rates from an individual market may also be influenced by regulations or other factors specific to that particular market.

While a full discussion of the myriad of influences on national currency exchange rates is beyond the scope of this paper, some causes behind the rise and fall of exchange rates are generally understood. For example, a national currency will often decrease in value in response to a negative real or perceived change in national factors, including lower

⁴⁵³ (Bahmani-Oskooee, 1996; Thomas, 1989)

⁴⁵⁴ (Baghestani, 1997)

⁴⁵⁵ (Agénor, 1992; Dornbusch et al., 1983; Kharas & Pinto, 1989; Reinhart & Rogoff, 2004; Roberts, 1989; Thomas, 1989). Reinhart (2004), Roberts (1989) utilize monthly figures from the IMF and Franz Pick's *World Currency Yearbook* (formerly titled *Pick's Currency Yearbook*)

⁴⁵⁶ (Goldberg, 1992)

⁴⁵⁷ For a discussion of these limitations see (Weidenmier, 2002)

⁴⁵⁸ (Willard, Guinnane, & Rosen, 1996, p. 3)

economic growth rates, declining international trade, inflation, lower interest rates, military outcomes, an increase in sovereign default risk, political regime stability, financial system instability; a national currency may increase in value vice-versa. Often a combination of factors may explain the rise and fall of a currency's value. However, these cause and effect relationships do not always hold, and the timing of any change in exchange rates for the above reasons can vary significantly. In sum, caution should be exercised in any discussion of the timing and causes behind the rise and fall in the value of freely traded national currencies.

5.3 Historical Overview of 1940s Currency Black Markets

“People here are very grim and determined. It is going to be a terrible business but I think we shall pull through. We are fully prepared to be bombed to smithereens in London but it won’t make any difference.”

–Comment by Mr. M. Bolton, Bank of England, as recorded by Mr. W. Knoke, New York Federal Reserve Bank, 24 May, 1940⁴⁵⁹

As noted by Aldcroft and Oliver (1998), British sterling was the anchor currency in one several ‘currency blocs’ that emerged in the 1930s following Britain's suspension of the gold standard in 1931, the devaluation of sterling, and the move to a floating exchange rate regime.⁴⁶⁰ In the case of the Sterling Bloc, as it was referred, various efforts were made to reduce exchange rate volatility, including the introduction of the Exchange Equalisation Fund in 1932 and the September 1936 exchange stabilisation agreement reached between the UK, France and the United States.⁴⁶¹ However, these measures achieved mixed results as currencies continued to fluctuate in value, particularly in response to pre-wartime events such as Germany’s 1938 annexation of Austria.⁴⁶²

A New York Federal Reserve Bank (NYFRB) memorandum prepared by Charles P. Kindleberger dated 30 September, 1937 titled ‘Economic Position and Prospects of Great Britain’, laid out the Britain’s desire to knowingly maintain an artificially high value for sterling:

“there seems to be little doubt that sterling is too high in relation to the dollar at present quotations (\$4.95) as a long-run proposition, yet it is likely that a high sterling rate will suit Great Britain for the duration of her armament boom. High sterling enables the British to buy desired raw materials from outside the Sterling Area more cheaply, and to prevent certain of their resources from being diverted to production for export markets”.⁴⁶³

⁴⁵⁹ C261 p. 1, New York Federal Reserve Bank Archive, 24 May, 1940

⁴⁶⁰ (Aldcroft & Oliver, 1998)

⁴⁶¹ (Aldcroft & Oliver, 1998, p. 83)

⁴⁶² (Kanago & McCormick, 2013)

⁴⁶³ C261, p. 3, New York Federal Reserve Bank Archive, 30 September, 1937

Volatility in sterling's exchange rate was an issue in the lead-up to the Second World War, with Kindleberger noting on 13 November, 1937 that:

“the lack of stability of the foreign exchange market...calls into question the perfection of the technical arrangements made under the Tripartite Agreement. Fluctuations of more than 2 cents a day in the sterling rate, and similar or even greater variations in other European currencies seem to require an explanation on the part of the Stabilization Fund authorities presumably charged with the elimination of day-to-day changes of this magnitude. The sterling rate may be taken as the basis of discussion since the variations in other exchange rates were in large part due to the fluctuations of this currency.”⁴⁶⁴

Despite significant efforts by Britain's Exchange Equalisation Fund to enforce the Tripartite Agreement, sterling fell over 7% from its February 1938 value of \$5.04 to \$4.68 in late-August 1939, a little over a year following the Anschluss.⁴⁶⁵

As discussed by Kanago and McCormick (2013), at the onset of the Second World War a large free market for sterling operated in New York until the introduction of significantly enhanced exchange controls in June 1940. However, as the Second World War progressed, currency black markets (or 'free' markets as they were often referred to by contemporaries) developed in a variety of locations, including the Swiss cities of Berne and Zurich.⁴⁶⁶ As noted by Frey and Waldenstrom (2004), neutral Switzerland and Sweden were host to the only two financial markets in Europe where the domestic government did not heavily intervene during the vast majority of the war.⁴⁶⁷

Kanago and McCormick's study daily free sterling in the New York market for a 14-month period, from May 1939 until July 1940. Starting on 5 September, 1939, British sterling

⁴⁶⁴ C261, p. 1, Letter from C. P. Kindleberger to W. Knoke titled 'British Stabilization Fund Technique', New York Federal Reserve Bank Archive, 13 November, 1937

⁴⁶⁵ (Kanago & McCormick, 2013)

⁴⁶⁶ (Kanago & McCormick, 2013, p. 389) In the post war period other important markets for "free" sterling included Paris, Milan, Hong Kong, Beirut, Bombay, Macao, Casablanca, Tangier and Alexandria 28-Oct. 1951 (463) *NY Times* article.

⁴⁶⁷ (Frey & Waldenström, 2004, p. 56)

had an official (fixed) exchange rate against other currencies such as the U.S. dollar and Swiss franc.⁴⁶⁸ However, Kanago and McCormick state that after the 5 September, 1939, that:

“there was substantial trading of free sterling in New York and Switzerland. It wasn’t until June 1940 that the British government took decisive steps to limit the free exchange of dollars and pounds”.

Fixed rates had come to be seen by many policymakers as preferable to floating rates and the accompanying currency speculation, which during the interwar period in Keynes’ words had “caused so much trouble”.⁴⁶⁹ During the Second World War and beyond, policymakers simultaneously viewed black markets as both an important source of information as well as a threat to state goals.

Despite the British crackdown, data found in the Swiss National Bank archives indicate that free sterling trade continued through at least September 1944 in Switzerland. As late as 1943 black market currency smugglers were still a significant concern to British policymakers. On 22 April, 1943, the Chancellor announced that the Bank of England would cease issuance of all £10 notes and withdraw large denominations of sterling to:

“provide an additional handicap for those who may contemplate breaches of Exchange Control. The real purposes were to make more difficult the illegal operation of note smugglers desirous of evading exchange control regulations, of black market operators, and of tax evaders—all of whom predominantly use large denomination notes in order to cover up their tracks. Bank of England notes in circulation during this time consisted of £1, £5, £10, £20, £50, £100, £200, £500 and £1000.”⁴⁷⁰

Later, on 24 January, 1945, a confidential memo was sent from the Bank of England to the NYFRB stating that “it has now been decided to seek powers whereby the Bank of England

⁴⁶⁸ (Kanago & McCormick, 2013, p. 392)

⁴⁶⁹ (Skidelsky, 2000, p. 250)

⁴⁷⁰ C261, p. 1, ‘Withdrawal of Large Bank Notes: The British Experience’, New York Federal Reserve Bank Archive, 4 December, 1944

notes of £5 and upwards may be called in” with only one month’s notice, after which these notes would cease to be legal tender.⁴⁷¹

During the war the Bank of England was concerned about sterling’s exchange rate in not just free but also official markets. Maintaining confidence in sterling was deemed important to maintaining confidence in Britain’s war prospects, and according to archival documents there was at least one instance where the Bank of England orchestrated an intervention in an official currency market to protect sterling. On 13 June, 1941, the Bank of England’s Montagu Norman wrote to his counterpart at the Bank of Canada, Graham Towers, requesting that that the Bank of Canada intervene on the Bank of England’s behalf in the New York market to support sterling’s official exchange rate range of \$4.025-4.035.⁴⁷²

Norman to Towers:

“Would you be willing to arrange to intervene on our behalf through third parties at any time the free market rate tends to move beyond the limits of our official rates. I should much appreciate your comments particularly as to whether you think origin of operations could be disguised.”⁴⁷³

Towers, in a cable sent the next day, agreed to act through the Royal Bank of Canada, a Canadian commercial bank, which he felt would help disguise the origin of the transaction.

Towers to Norman:

“It might well be thought that their operations were conducted for private clients. However, if they had occasion to be frequently in the market on both sides, it might be suspected that the transactions had an official flavor.”⁴⁷⁴

Some movement in sterling’s exchange rate against the dollar was allowed in the official (regulated) New York foreign exchange market. However, very little movement in sterling’s value against the dollar occurred in the official New York market. For the nine-year

⁴⁷¹ C261, p. 1, New York Federal Reserve Bank Archive, 24 January, 1945

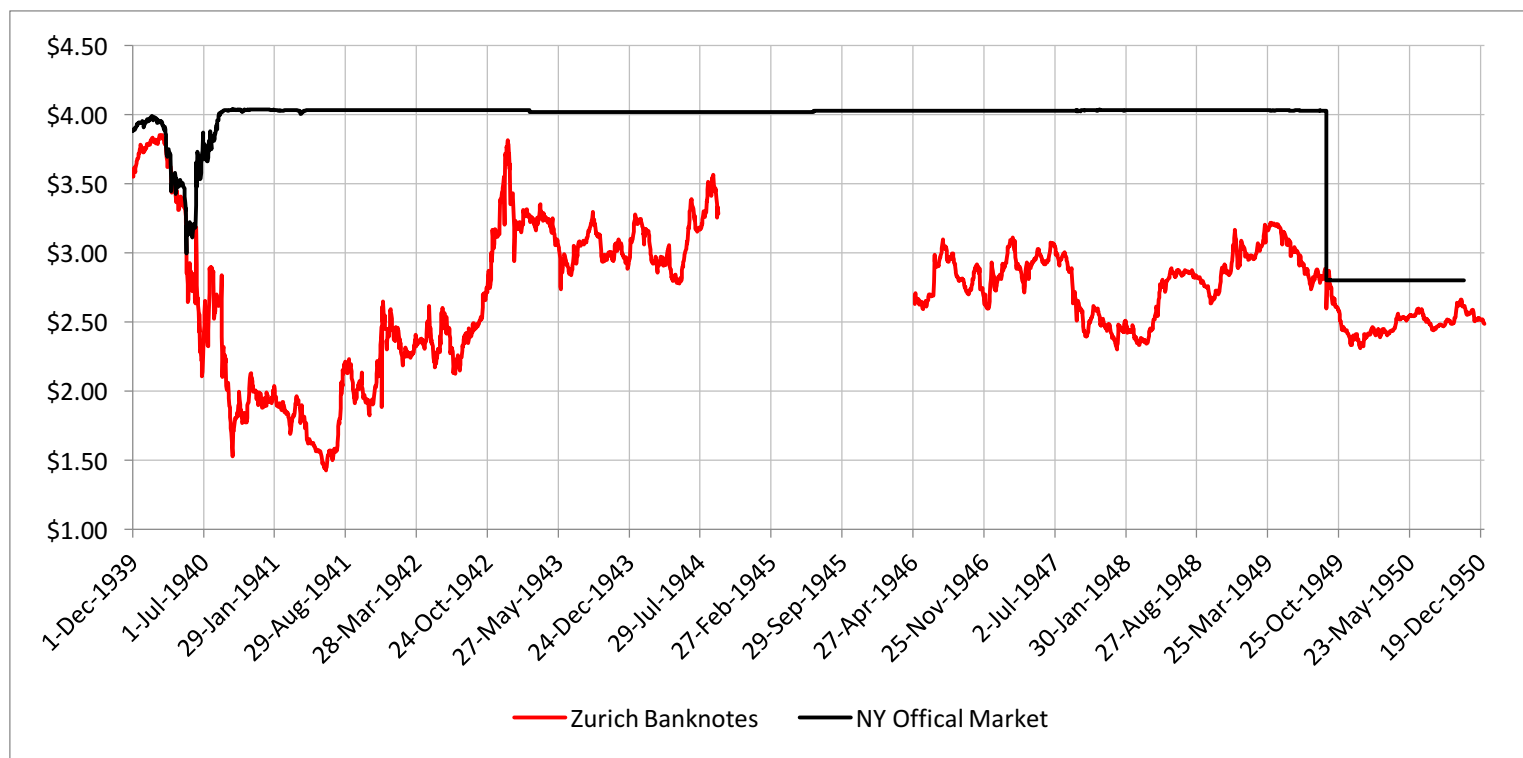
⁴⁷² EC4/168, Bank of England Archive, 13 June, 1941

⁴⁷³ EC4/168, Bank of England Archive, 13 June, 1941

⁴⁷⁴ EC4/168, Bank of England Archive, 13 June, 1941

period from August 1940 up until sterling's devaluation on 19 September, 1949, trading in the official sterling market was range-bound between a high \$4.04 and a low of just above \$4 per pound, or just \$0.04 (1%) in range during almost the entire 1940s (Figure 11). Further, for the vast majority of this period, sterling traded within \$0.01 of its official rate of exchange of \$4.03.

Figure 11: Official U.S. \$/£ Exchange Rate vs. 'Free' Rate, Dec. 1939 – Dec. 1950



Note: No data was found for the 18-month period from 19 September, 1944 through 3 May, 1946, which was likely due to the enactment of a resolution by the Swiss Bankers Association on 18 September, 1944 banning trade in British sterling and US dollar notes.

Source: Swiss National Bank Archive

As of July 1940, Bank of England officials were still proclaiming confidence in their ability to maintain sterling's official rate. For example, when Knoke asked Bolton whether two American banks, Guaranty Trust and National City Bank, could buy and sell sterling with each other, Bolton dared the banks to trade outside sterling's official range, stating that "if somebody wanted to take a loss by selling lower or buying higher (than the official rate) that was his funeral".⁴⁷⁵ In contrast to sterling's stability against the dollar in the official market, free markets in New York, Zurich, Stockholm and Lisbon were quoting British sterling as low as \$1.60 – less than half the sterling's official value – during the height of the Battle of Britain.⁴⁷⁶ In a telephone conversation between the Bank of England's Mr. Bolton and the New York Federal Reserve Bank's Mr. Knoke, Bolton remarked that, with regards to the New York sterling quotations reaching London, "all press reports seem to refer to the free market rate as though that were the only rate".⁴⁷⁷ The Bank of England made arrangements with "the London branches of the American banks to ensure a quotation of sterling at the official rate in New York", although noting that "it will be difficult to prevent some abuse of the facilities of this nature".⁴⁷⁸

In the post-war period free sterling often traded at a discount of 30% or more to its official exchange rate. Both the Bank of England and NYFRB archives contain a voluminous correspondence on the problem of 'free' sterling, or 'cheap' sterling as it was often referred. During and after the war the Bank of England received detailed updates from the NYFRB on the price and market action for sterling in the New York market, as well as the names of financial houses actively dealing in sterling (Table 24).

⁴⁷⁵ C261, p. 4 New York Federal Reserve Bank Archive, 1 July, 1940

⁴⁷⁶ No. 75 28-Oct. 1951 (463) From a *New York Times* article quoting Franz Pick.

⁴⁷⁷ C261, p. 2 New York Federal Reserve Bank Archive, 9 August, 1940

⁴⁷⁸ C261, p. 3, Incoming Cablegram Serial No. 3899 from Mr. Bolton of the Bank of England, New York Federal Reserve Bank Archive, 7 June, 1940

Table 24: Quarterly Sterling Volume, New York-Based Financial Firms, Sept.-Dec. 1941

Name	Qtr. Ending Dec. 1941
Royal Bank of Canada	£26,500
Bank of London & South America	25,000
Guaranty Trust Company	16,000
National City Bank	15,500
Manufacturers Trust Company	10,500
First National Bank of Boston	10,200
Barclays Bank (D.C. & O.)	9,000
Philadelphia National Bank	8,000
Corn Exchange Bank	6,500
Central Hanover	6,100
Bank of the Manhattan Company	5,000
Chemical Bank & Trust Company	4,500
American Trust Company, San Francisco	4,000
Security First National, Los Angeles	3,900
Public National Bank	3,400
Irving Trust Company	2,000
American Metal Company	750
J.P. Morgan Bank	500
Lazard Frères	200
Bank of Nova Scotia	100
Total	£157,650

Source: Bank of England Archive

As noted from a July 1940 recorded phone conversation between Bolton and Knoke, the volume in the New York free sterling market “did not tell the whole story”:

“What the total was of uncovered commercial commitments of the nature which we discussed at the beginning nobody knew. Rubber wasn’t the only commodity bought on a sterling basis. There were many others such as wool from South American, leather, bristles, essential oils, cocoa beans, coffee, etc. With regard to all of them our importers had claimed that their business was legitimate, they acted in good faith and were now asking that they be allowed to cover at the free sterling rate” .⁴⁷⁹

During and particularly after the Second World War the number of different currency regulations employed by many nations began to multiply, with unique rules, legalities and exchange rates based on the trading partner and use case. Here Britain was

⁴⁷⁹ C261, p. 3 New York Federal Reserve Bank Archive, 1 July, 1940

perhaps the leader with by one count over 60 different 'varietals' of sterling.⁴⁸⁰ Many of the different forms of sterling arose out of bilaterally negotiated foreign trade and exchange agreements with different countries, and they were consequently named after that particular country. Selected examples of these different accounts, and their end of month rates for the period of December 1948 through August 1949, can be found in Table 25.

⁴⁸⁰ (Pick, 1951)

Table 25: Monthly Exchange Rates for Selected British Sterling Accounts, 1948-49

\$/£ Account Variety	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.
Handpayments London	N/A	£2.98	£3.06	£3.09	£3.06	£3.04	£2.70	£2.80	£2.83
Scheduled Territory	£3.05	£2.95	£3.03	£3.10	£3.03	£2.65	£2.60	£2.66	£2.87
Dutch Accounts	£3.25	£3.18	£3.32	£3.30	£3.28	£3.28	£3.20	£3.14	£3.26
Egyptian Accounts	£3.30	£3.25	£3.10	£3.15	£3.18	£3.20	£3.00	£2.85	£2.90
Italian Accounts	£3.85	£3.45	£3.40	£3.45	£3.40	£3.45	£3.28	£3.18	£3.16
French Accounts No. 1	£3.55	£3.25	£3.25	£3.30	£3.30	£3.35	£3.18	£3.20	£3.18

Source: Pick's Monthly Currency Report, 1948-49

In addition to the country specific forms of sterling, other legal and illegal varieties of sterling in existence are summarized in Table 26.

Table 26: Legal and Black Market Forms of British Pound Sterling as of 1951

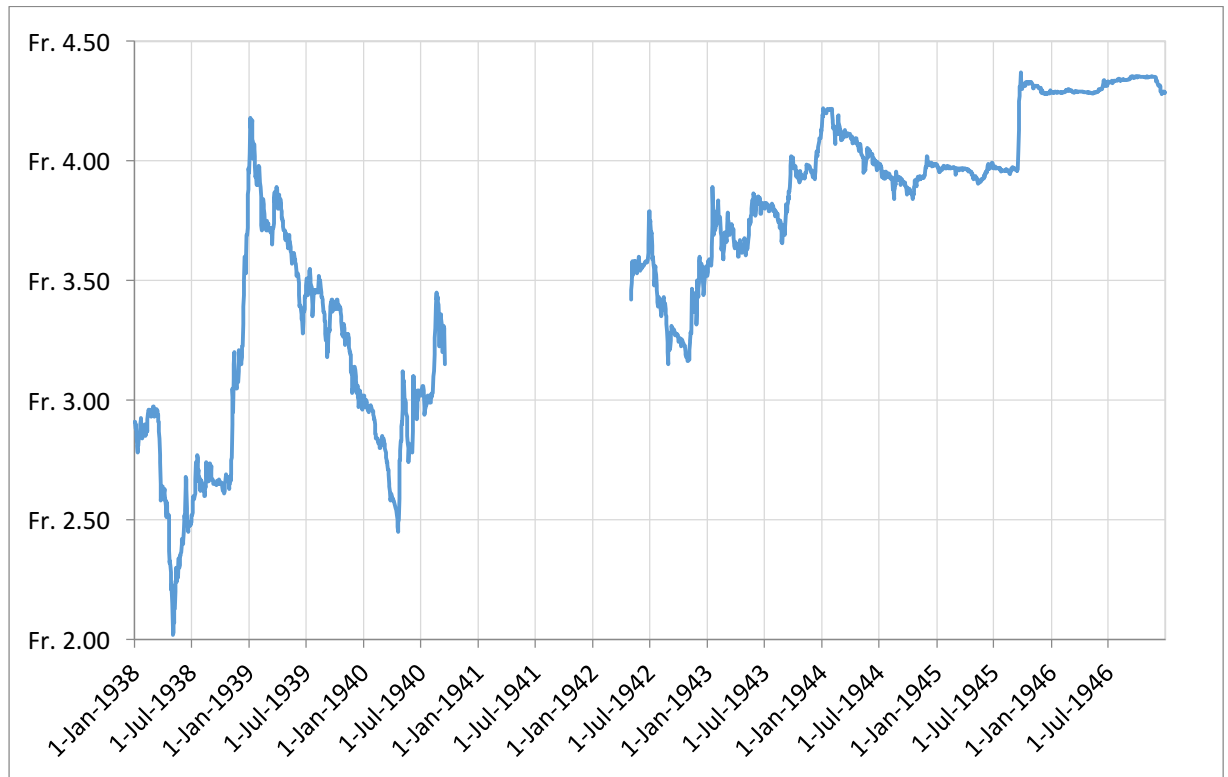
Type	Legality	1951 Daily Volume	Markets Traded	Description
'Free' ('Cheap') Sterling	Illegal	(See Table 31)	New York, Zurich, Hong Kong, Beirut, Paris, Johannesburg, Cairo, etc.	Loosely used term for sterling exchanged for the U.S. dollar, and other currencies, at less than the official exchange rate
Security sterling (or Switch pound)	Legal	£30,000 - 50,000	New York	Used for the acquisition of securities by foreigners
Transferable accounts (Commercial sterling)	Legal	£200,000 - 400,000	New York	Legal variety of sterling arising from trade balances with the UK
Residential sterling	Grey	£500,000 - 1,000,000	New York, Hong Kong, Johannesburg, Beirut, Kuwait	Blocked sterling balances belonging to British citizens
Handpayments London (Diamond sterling)	Illegal	£15,000 - 25,000	London, New York	Sterling and dollar bank accounts which were exchanged in London and New York, and were purported to pay for illegal diamond and fur imports from Britain, purported to represent the "biggest part of the black market"; transfers between New York to London could take anywhere from 3-8 days.
Sterling banknotes	Illegal	£10,000 for New York	Asia, Near Orient, North Africa, lesser extent in New York	Sterling notes traded to meet tourism and other demand

Sources: Pick's Monthly Currency Report, 1951, 1955, 1953

Like British sterling, the currencies of other countries also traded at free exchange rates, including the U.S. dollar and Swiss franc. There was an active market for U.S. dollars in Switzerland both during and after the Second World War (Figure 12). In terms of the

size of the free U.S. dollar market, no volume data has been located to date. However, a NYFRB archival memorandum dated 10 May, 1950 references the “billions of dollars in United States currency hoarded abroad”.⁴⁸¹

Figure 12: Swiss Fr./‘Free’ U.S. Dollar, Jan. 1942 - Dec. 1950, Switzerland



Note: No data exists for the 18-month period from 19 September, 1944 through 3 May, 1946, which was likely due to the enactment of a resolution by the Swiss Bankers Association on 18 September, 1944 banning trade in British sterling and US dollar notes.

Source: Swiss National Bank Archive

Trading of Swiss francs was split into both an official market and a market for what was called ‘finanzdollars’. The market for ‘finanzdollars’ was initially restricted to New York, then later expanded to Switzerland. Finanzdollar Swiss francs were typically convertible into U.S. dollars at a higher exchange rate than the official rate.

⁴⁸¹ C261, p. 1, Conversation between Jay E. Crane and W. Knoke, New York Federal Reserve Bank Archive, 10 May, 1950

Concern over the trading of free sterling continued to be expressed by officials throughout the post-war period. Bank officials deemed these markets, and the heavily discounted price at which sterling could be exchanged, as having a negative impact on confidence in both Britain's war prospects and its ability to meet its financial obligations in the post-war period. For example, alarms sounded inside the Bank of England when public advertisements were placed to sell blocks of sterling, such one posted in the *New York Herald Tribune* on 20 June, 1947 by a Mr. C. Y. Wang to "sell £67,500 at a discount of 10 percent or more from the official rate".⁴⁸² However, as reported in media publications such as *The Economist* (Table 27), the state of Britain's post-Second World War finances and other issues raised concerns over whether sterling would maintain its value. Britain's debt-to-GDP ratio in the 1940s peaked in 1946 at 270%, or over twice the level of the U.S.'s debt-to-GDP ratio.⁴⁸³ Overall, diminished confidence in sterling was perceived by contemporaries as an existential threat to the City's status as a global financial and banking centre.

⁴⁸² C261, p. 1, New York Federal Reserve Bank Archive, 20 June, 1947

⁴⁸³ (Abbas, Belhocine, ElGanainy, & Horton, 2010)

Table 27: Article References in *The Economist* to 'Free' Sterling, 1946-49

Article Title	Date	Summary
Swiss Sterling Control	23-Mar-46	Describes on-demand Swiss convertibility of sterling and desire to prevent too much sterling accumulation in Switzerland
Switzerland's Sterling	16-Nov-46	Mention of currency arbitrage and Swiss banks 'illegal' public advertisements offering to purchase sterling
Banking with Inconvertible Sterling	15-Nov-47	Convertibility crisis hits demand for London banking services
Strength of Sterling	29-Nov-47	Reference to 'free sterling rates' in New York; price of 4.03 and 1/8-1/4, which is butting up against official band of 4.02 3/4 and 4.03 and 1/4. References short sales in July-August and subsequent covering due to sterling being 'oversold'.
Sterling in New York (letter to the editor)	14-Feb-48	Reference to recent front page stories about large sterling banknote transactions in New York; only £10-20K per week representing 90% of the activity; reference to heavy trading from Switzerland and Tangier with a bottom reached of \$2.45. Reference made to sterling appreciating following the war.
Sterling Devaluation	22-May-48	First mention in <i>The Economist</i> of the subsequent sterling devaluation; describes New York rate for sterling as "low" and based solely on the "prohibition of importing pound notes into Great Britain"
Free Sterling in Europe	22-May-48	Reference to growing trade priced in sterling at below official rate of £4.03; quotes price of 10.55 Swiss Francs to the pound vs. official rate of 17.34, a 38.5% discount. Mentions that Portugal, in addition to Switzerland and U.S., places no restrictions on pound note movement. Most of this "considerable" offshore pound note trade occurring not with Britain but other countries. Bearer bonds now purchasable for \$1.80 to the pound vs. \$2.50 a few months ago, which "reflects a growing disinclination in the U.S. to invest in British securities". Gilts can be purchased at a 7% yield.
Sterling for Export	22-May-48	Sterling balances held in London on Italian, French, Belgian and Dutch accounts may be purchased at \$3.35 and sold for \$3.25. Transfers between foreign accounts prohibited by Bank of England. Describes import/re-export arbitrage scheme ('shunting' through triangular and more complex commodity ops). Also describes 'so-called Swiss controlled pound'; Swiss cross-rate for the pound is \$3.52-3.60
Switching in Sterling Securities	24-Jul-48	Financial repression: prohibition on non-residents taking money out by BoE into 13 different account classifications. Expectation of a large decline in American trading on the London Stock Exchange; pound recently trading at \$2 in New York and immediately fell upon this announcement to \$1.85.
No Black Sterling for Vatican	11-Dec-48	Reference to sterling black market in Vatican City and Italy
Harder Sterling	18-Dec-48	Notes sterling's overseas appreciation in the past year, in the U.S. from \$3.20-\$3.50; in Zurich from 9.50-12.25 Swiss francs; Honk Kong free market rate of \$2.80-\$3.10; Paris from 876-1500 francs (vs. official rate of 1062). Notes the creation of technical strength for sterling after the large sterling short position pre-convertibility crisis which needed to be covered.

Article Title	Date	Summary
Free Sterling Hardens	16-Apr-49	Free sterling rates from around the world quoted, from \$3.35 in France to \$3.80 in Argentina; in Switzerland 'B' account sterling goes for \$3.90. "This maze of official and free rates is an international cobweb in which the most noisome spiders lurk and fatten. How long will it be before a breath of fresh air sweeps it all away."
Sterling since Devaluation	26-Nov-49	Post devaluation sterling trading at a discount in NY, Zurich, etc. Shunting becomes profitable when sterling trades at a discount of 5%, accelerates at 10%. Tax free rewards offered to exchange control informers.

Source: *The Economist*

Just how 'black', meaning illegal, were the New York and Swiss free currency markets? During the 1940s, policy sentiment regarding the prohibition, or minimization, of black markets varied. For example, many in British policymaking circles, particularly at the Bank of England, were deeply concerned about the advent and growth of free sterling markets. Contrasting with the Bank's view was the opinion of arguably the most influential economic policy figure in Britain of the time, John Maynard Keynes, who at the outset of the Second World War wrote in favour of allowing currency black markets to exist because they could prove a useful source of information during times of significant regulation.⁴⁸⁴ In a memo to Treasury dated 24 September, 1939, Keynes argued:

"...there is much to be said against blocking up all the loopholes and crevices. Not all the money which slips through is 'lost'. There is a good deal business which does us no harm and is better allowed, which, nevertheless, one cannot make into a precedent by giving it official approval."⁴⁸⁵

Matters on free currency exchange rates were made somewhat clearer following Bretton Woods with the introduction of IMF Clause IV-4-(b), which provided that "each member undertakes to outlaw exchange dealings in its market at rates outside those established by the Fund."⁴⁸⁶ A NYFRB policy document addresses the challenges presented by free sterling trade vis-à-vis Clause IV-4-(b):

⁴⁸⁴ (Skidelsky, 2000, pp. 47-48)

⁴⁸⁵ (Keynes & Moggridge, 1983, pp. 12-13) How important Keynes' views were to the formation of the 1940s markets is unclear.

⁴⁸⁶ The language from the IMF Article states "Each member undertakes, through appropriate measure consistent with this Agreement, to permit within its territories exchange transactions between its currency

“it was up to the United States to prevent such dealings, which could be done either by supporting sterling at our own expense at the legal rate or by rigid exchange control. The former is obviously out of the question, the second would be a tremendous nuisance quite out of proportion to the advantages to be gained.”⁴⁸⁷

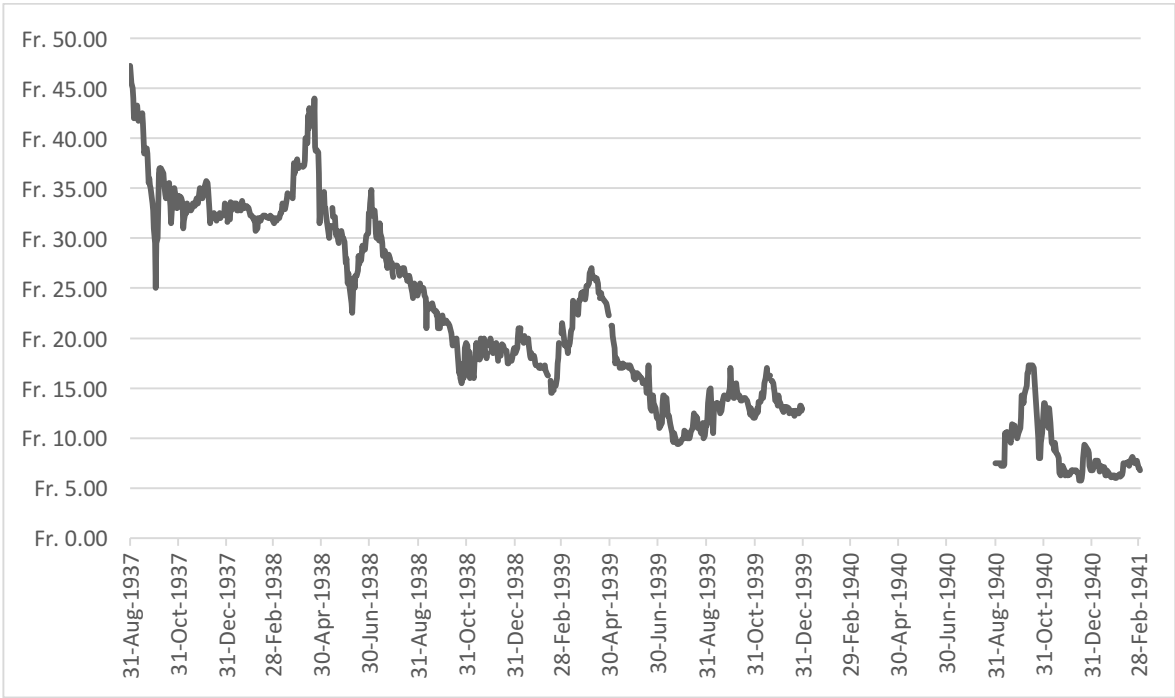
With regards to the legality of Swiss free markets, from the British perspective these markets were certainly thought to be illegal as their currency was traded at a rate other than the official rate. However, from the Swiss perspective, these markets appear to have been legal under Swiss law during most (if not all) of the 1940s, and Switzerland did not join the IMF until 1992. While a resolution enacted by the Swiss Bankers Association on 18 September, 1944 banned trading in sterling and dollar notes for an 18-month period, the trading of banknotes of other currencies, including those of France, Germany, Italy, Belgium, the Netherlands, and Spain, continued in Switzerland for approximately another seven months through 3 March, 1945 (Figure 13).⁴⁸⁸ It is unclear whether the 18 September, 1944 resolution enacted by the Swiss Bankers Association was precipitated by a Swiss regulatory or a legal change. Pressure from Allied countries may have led to the change, or it could have been a response to Nazi economic warfare efforts under the codename ‘Operation Bernhard’ to devalue the U.S. dollar and British sterling by flooding the market with massive quantities of counterfeit banknotes, or altogether other reasons.

and the currency of other members only within the limits prescribed in Section 3 of this Article” and continues “exchange contracts which involve the currency of any member and which are contrary to the exchange control regulations of that member maintained or imposed consistently with this Agreement shall be unenforceable in the territories of any member.” C261, p. 1, New York Federal Reserve Bank Archive, 1945

⁴⁸⁷ C261, p. 1, New York Federal Reserve Bank Archive, 1945

⁴⁸⁸ Devisen Mittelkurse 9.6/9070, 1939-1950, Swiss National Bank Archive. A note found in the Swiss archives states: “According to the Federal Council decision of 2 March 1945, the imports and exports, as well as the delivery and the receipt of foreign banknotes are prohibited. For the travel demand and the small border traffic will be taken in view of specific provisions”.

Figure 13: Swiss Fr./'Free' German Mark exchange rate, Sep. 1941 - Mar. 1945, Switzerland



Note: exchange rate based on the market for 100er/50er German banknotes

Source: Swiss National Bank Archive

5.4 Data and Sources

5.4.1 Introduction and data accuracy tests

"You only have to cough in Zurich and the echo is heard in New York."

- Anonymous Swiss banker⁴⁸⁹

Prior research that has included free sterling market data have utilized end-of-month data sourced from Franz Pick, publisher of *Pick's Currency Yearbook*.⁴⁹⁰ This paper introduces new archival daily time series data from the New York and Swiss free currency markets. The new daily New York data for the Swiss franc-U.S. dollar exchange rate begins in August 1947 and continues through September 1949. Significantly more new data was found for the Swiss market, and the new data set includes daily Swiss franc-pound sterling and Swiss franc-U.S. Dollar exchange rates for most of the period from 1939 through the end of 1951. No Swiss market data for the Swiss franc-British sterling and Swiss franc-U.S. Dollar exchange rates was found for the 18-month period from 19 September, 1944 through 3 May, 1946, likely due to the enactment of a resolution by the Swiss Bankers Association on 18 September, 1944 banning trade in British sterling and US dollar banknotes.

The exact location of trading within Switzerland was not obtained, but archival evidence and contemporary sources indicate that Zurich and Berne both had active markets for free currency trading during this period. References from other non-archival sources such as Cairncross and Pick reference Zurich as the centre for free market currency trading in Switzerland. Trading typically took place six days per week (Monday through Saturday), and gaps in the series appear to primarily coincide with official holidays. Summary statistics for the Swiss market are presented in Table 28, and all data

⁴⁸⁹ (Green, 1968, p. 112) The banker was commenting on the informational symmetry between these two financial markets during the post-Second World War period.

⁴⁹⁰ (Pick, 1951, 1953, 1955) For example, Pick's data was previously used by (Cairncross & Eichengreen, 1983, 2003)

and sources employed in this chapter are summarized in Table 29 (including both new archival sources as well as existing sources).

Table 28: Summary Statistics of Free Sterling and Free Dollar Exchange Rates, Switzerland, 1939-50

Swiss Fr./British £	Total	Sub-Periods	
	'39-'44 - '46-'50	'39-'44	'46-'50
Observations (<i>n</i>)	2,933	1,486	1,447
Max Rate	Fr. 17.75	Fr. 17.75	Fr. 12.80
Min Rate	Fr. 5.10	Fr. 5.10	Fr. 8.75
Mean	Fr. 10.17	Fr. 9.59	Fr. 10.76
Median	Fr. 10.33	Fr. 8.68	Fr. 10.80
Standard Deviation	Fr. 2.36	Fr. 3.10	Fr. 0.85
U.S. \$/British £*			
Observations (<i>n</i>)	2932	1486	1446
Max Rate	\$3.85	\$3.85	\$3.22
Min Rate	\$1.42	\$1.42	\$2.30
Mean	\$2.69	\$2.67	\$2.72
Median	\$2.74	\$2.77	\$2.73
SD Rate	\$0.48	\$0.63	\$0.23
Correlation of Exchange Rates			
Fr./\$ - Fr./£	0.58	0.58	0.36
Fr./\$ - \$/£	0.10	-0.08	-0.54
Fr./£ - \$/£	0.73	0.76	0.59

*Note: a daily U.S. dollar-pound sterling exchange rate is derived using the U.S. dollar-Swiss franc and pound sterling-Swiss franc exchange rates from the Swiss market.

Source: Swiss National Bank Archive

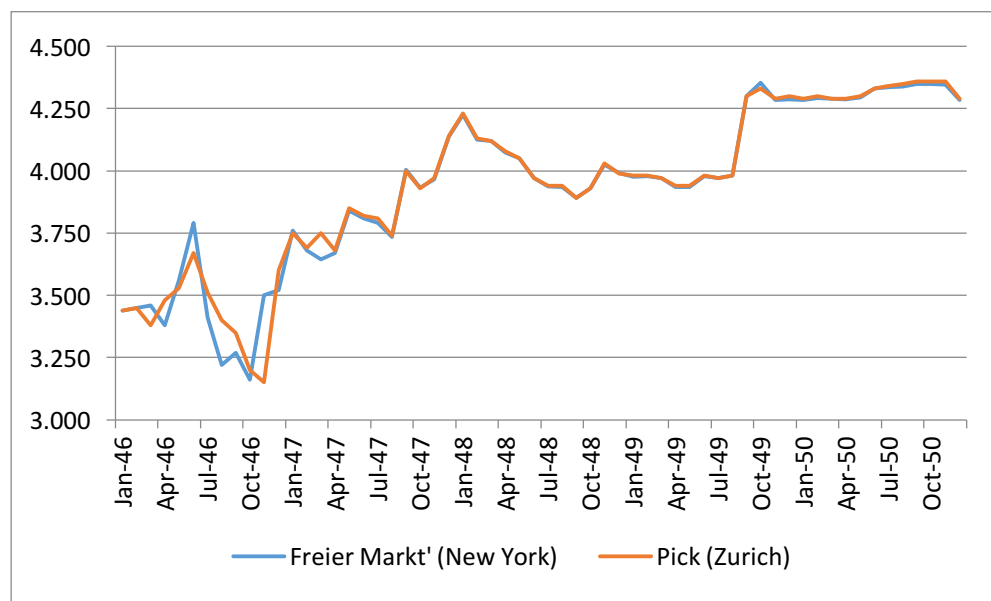
Table 29: Summary of Data Sources - Free Currency Exchange Rates

	Series Name	F/X Cross Rate(s)	Market(s)	Time Period	Frequency	Source Location	Provenance	Reference
1	Banknotenurse	sFr./\$, sFr./E	Switzerland	2 Jan. '42 - 16 Sep. '44; 3 May '46 - 30 Dec. '50	Daily	SNB	SNB	ASNb 9.6/9124
2	Dollarkurse, Freier Markt	sFr./\$	New York	1 Aug. '47 - 26 Sep. '49	Daily	SNB	SNB	ASNb 9.6/9125
3	Finanzdollarkurse Finanzdollar	sFr./\$	New York	6 Jan. '48 - 27 Nov. '48, 3 Jan. '49 - 31 Dec. '49	Daily	SNB	SNB	
4	Kartei OE Geldmarkt und Devisenhandel	sFr./\$	New York	6 Jan. '48 - 31 Dec. '49	Daily	SNB	SNB	ASNb 9.1/9106
5	Devisen Mittelkurse	All rates quoted in sFr: (France) ff-Compte Etranger, (Germany) Freis Konto, Register-Mark, Handelsspermark, Aktien-Sperr-Mark, Reise-Mark Abgabekurs, (UK) E-Free-od Old-Account, E-Registered Account, (Italy) Conto libero, Conto special sv. Conto misto, Reise-Lire Cto. Viaggi, (U.S.) \$-Import-u. Export-Dollar, (Argentina) Pesos-Auszahlung, (Sweden) Auszahlung (Portugal) Auszahlung	Lyon, Berlin, London, New York, Buenos Aires, Stockholm, Lisbon	Dec. '39 - Dec. 1943; Sep. 1944 - Dec. '50	Daily	SNB	Unknown	ASNb 9.6/9070
6	Geldkurse für Sichtdevisen	All rates quoted in sFr.: \$, £, frei RM, Handelsspermark, Lire, Belgas, Gulden, Kr. (Swedish), Kr. (Danish)	London, New York, Paris (1939 -17 June 1940, Mar. 1945-1950), Lyon (22 July 1940- Feb. 1945), Berlin (1939 - 21 April, 1945), Milan, Brussels, Amsterdam, Stockholm, Copenhagen, Oslo (monthly starting Aug. 1944; daily March or April 1946)	1939-1950	Daily & Monthly	SNB	SNB	Monatsbericht der Schweizerischen Nationalbank, Bern/Zürich, 1926-1997.
7	Käch Dissertation (1953)	sFr./\$	New York	Feb. '42 - April '49	Monthly	SNB	Käch	N/A
8	Devisenblätter	sFr./\$	Switzerland	1923-1950	Monthly	UBS/ Basler Kantonalbank	Basler Kantonalbank	N/A
9	NYFRB Cables to BoE	\$/E	New York	1940-1950	Weekly	BOE	NY Fed	N/A
10	Pick's Currency Yearbook (1951)	\$/E, sFr./\$, sFr./E	London, New York, Switzerland	Jan. '46 - Dec. '51	Monthly	UCLA Library	Franz Pick	N/A
11	Pick's Monthly Currency Reports (1947-1949)	\$/E, sFr./\$, sFr./E	London, New York, Switzerland	1947-1949	Monthly	University of Texas Library	Franz Pick	N/A

Some scepticism is in order when working with black market data, whether from professionally published volumes such as the *Pick Currency Yearbook*, or in central bank archival documents. Attribution and provenance are often missing, and some of the archival data that has been collected and used in this chapter is not free from this problem. The Swiss National Bank archivists were unable to verify the provenance of some of archival data used in this chapter, including the handwritten banknote exchange data (e.g., *Banknotenurse*) as well as some exchange rate data found on printed documents (e.g., *Devisen Mittelkurse*).

To address concerns over data accuracy and legitimacy, new archival data presented in this paper was compared against several other sources, including independently published contemporary sources, data presented in the media, and other central bank archival sources (e.g., wire reports), and a high correlation was found when comparing data from different sources and different markets. For example, a correlation of 0.982 for the period of 1946-1950 was found when comparing *Pick's* end-of-month data for the Swiss franc-U.S. dollar rate traded in Switzerland and end-of-month data recorded by the Swiss National Bank's for the Swiss franc-U.S. dollar rate in the New York 'Freier Markt' (Figure 14).

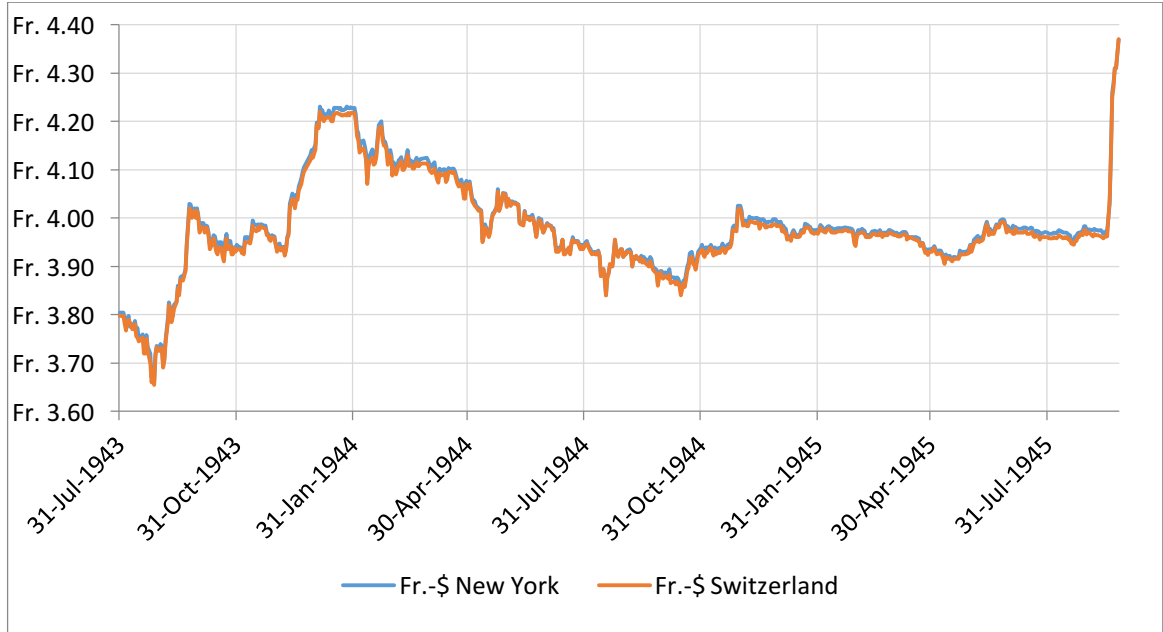
Figure 14: Comparison of Data Sources for Swiss Fr./U.S. Dollar Exchange Rates - New Archival Swiss Data from New York 'Freier Markt' vs. Pick Currency Yearbook Data for Zurich



Source: Pick's Currency Yearbook (1951), Swiss National Bank Archive

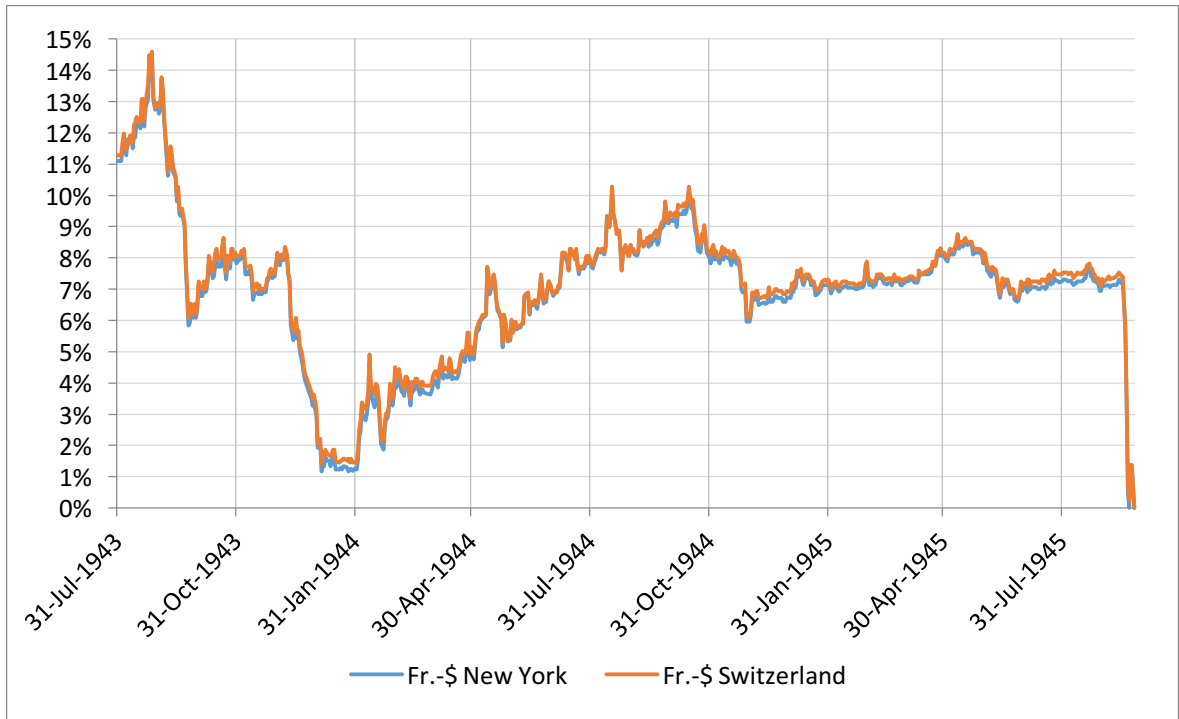
Further, a near perfect identity exists between New York and Swiss markets during August 1947- September 1949 for the free U.S. dollar-Swiss franc exchange rates in both New York and Switzerland (Figure 15 and Figure 16). Overall, comparisons of the new archival data presented in this chapter with others sources across different markets and time periods support the legitimacy of the new data.

Figure 15: Swiss Fr./Free U.S. Dollar Exchange Rate, Switzerland and New York, 1947-49



Source: Swiss National Bank Archive

Figure 16: 'Free' U.S. Dollar Discount Against Swiss Fr., Switzerland and New York, 1947-49



Source: Swiss National Bank Archive

Unlike the daily exchange rate data found for the Swiss free market, a contiguous 1940s daily time series for the U.S. dollar-free sterling market in New York was not located. The absence of such a series during the war is likely explained by the fact that, as *The Economist* noted on 20 July, 1940, “the free market (in New York) has now been virtually closed”.⁴⁹¹ While the New York free sterling market may have been dormant for the remainder of the Second World War, a study of central bank archival evidence indicates that at some point following the end of hostilities the New York free sterling market both reopened and saw significant trading volume. Because a U.S. dollar-pound sterling rate was not located in the Swiss market (perhaps because these two currencies were not actively traded directly for each other in Switzerland), for statistical analysis a daily U.S. dollar-pound sterling exchange rate is derived using the U.S. dollar-Swiss franc and pound sterling-Swiss franc exchange rates from the Swiss market.

⁴⁹¹ (Kanago & McCormick, 2013, p. 403)

5.4.2 Market trading volume and significance

Having established the accuracy and legitimacy of the new data we now turn to the question of the significance of the new data. The analytical utility of accurate, high-frequency free market exchange rate data may suffer if the exchange rates arise from a relatively small number of traders, low trading volumes, or both. An important question that must therefore be addressed before proceeding with any analysis is just how significant were 1940s currency black markets. While a detailed list of all traders and complete trading volume records would be the preferred means of answering this question, these are not the only measure by which market significance can be assessed.

With regard to who was trading in the Swiss and New York free markets, archival records suggest that, in addition to wirehouses and small brokers, many of the largest New York and international banks were actively dealing in free sterling. For example, the list of international firms that are listed or mentioned in archival records as participants in the late-1940s New York free sterling market includes some of the biggest and most sophisticated American, British and Swiss banks of that time, including National City, Chase, Schroders, Guaranty Trust, and Swiss Bank (Table 30). The fact that these banks were active in free markets suggests either that trading volumes were significant or that important bank customers traded free sterling. If neither of these two conditions were met, then it is unlikely that so many of the most prestigious firms would have participated in a market that attracted such regulatory scrutiny.

Table 30: Private Firms Reported to Have Traded in ‘Free’ Sterling

Date	Firm Name	No. of mentions	Firm Type	HQ	Source	Reference	Comments
28/01/1949	Guaranty Trust	1	Commercial Bank	New York	BOE	EC5/1 No. 56	Guaranty's London offices were located on Lombard St.
04-Feb-49	Chase National Bank	1	Commercial Bank	New York	BOE	EC5/1 No. 64	
04-Feb-49	Schroders	1	Merchant Bank	London	BOE	EC5/1 No. 64	New York branch?
04-Feb-49	Guaranty Trust	2	Commercial Bank	New York	BOE	EC5/1 No. 64	Provided the BoE with NY rates, volume, other firm and trend info on 12 Feb. 1949
07-May-49	Albert de Jong & Co.	1	Unknown	New York	BOE	EC5/2 No. 5a	Offices located at 37 Wall St. NY, NY; quoting \$3.25/£ for French account sterling.
17-Jun-49	Swiss Bank	1	Universal Bank?	Switzerland	BOE	EC5/2 No. 23	The New York branch of Swiss Bank named as a dealer of cheap sterling.
17-Jun-49	Chase National Bank	2	Commercial Bank	New York	BOE	EC5/2 No. 23	
17-Jun-49	Guaranty Trust	3	Commercial Bank	New York	BOE	EC5/2 No. 23	
19-Jul-49	Chase National Bank	3	Commercial Bank	New York	BOE	EC5/2 No. 39	
19-Jul-49	Guaranty Trust	4	Commercial Bank	New York	BOE	EC5/2 No. 39	
19-Jul-49	National City Bank	1	Commercial Bank	New York	BOE	EC5/2 No. 39	
19-Jul-49	White	1	Wirehouse	New York	BOE	EC5/2 No. 39	One of the larger wirehouses
19-Jul-49	Weld	1	Wirehouse	New York	BOE	EC5/2 No. 39	One of the larger wirehouses
19-Jul-49	Hayden-Stone	1	Wirehouse	New York	BOE	EC5/2 No. 39	One of the larger wirehouses
19-Jul-49	Sutro	1	Wirehouse	New York	BOE	EC5/2 No. 39	One of the larger wirehouses
14-Nov-49	Hayden, Stone & Co.	1	Broker	New York	BOE	EC5/3 No. 27	The most active NY broker in NY cheap sterling and that it would be useful to get daily quotes from them.

Source: Bank of England Archive

Dealings by such banks at unofficial banknote rates was at one point in time not as great a concern to central bankers as compared to the non-official rate dealings in national sterling accounts (e.g., the Belgian sterling account receives frequent mention for problematic sterling dealings in central bank archives). For example, when Bank of England and NYFRB officials discussed charges raised in Parliament in 1947 that the Chase bank was dealing in the New York sterling black market, the Bank of England’s Mr. Bolton dismissed Parliament’s concerns as he understood Chase’s activities “to be dealings in banknotes and therefore nothing to be excited about”.⁴⁹² However, given the prominent mention later by Mr. Bolton and other officials in the lead-up to the 1949 sterling devaluation of discounted free sterling rates for banknotes in Switzerland and other free markets, and the impact these discounted rates appear to have had on confidence in sterling’s official value, it appears policymakers underestimated the impact of the activities of Chase and other major banks.

⁴⁹² C261, p. 3, Peter Lang record of telephone conversation with Mr. Bolton, Bank of England, New York Federal Reserve Bank Archive, 2 July, 1947

Unlike exchange rate data, no contiguous or high-frequency volume data were found for either the Swiss or New York currency black markets. However, intermittent volume data has been collected from a variety of sources found in the Bank of England Archive, including investment reports, media articles, and various archival sources, and this volume data is summarized in Table 31. From these trading volume figures, and given the considerable attention directed towards these markets on the part of Bank of England and Federal Reserve officials, free sterling trading volumes were often significant both during the war and especially in the latter part of the 1940s in the lead-up to sterling's 19 September, 1949 devaluation. At peak volume in the summer and autumn of 1949 there was approximately £1,000,000 to 1,500,000 in weekly free sterling turnover.

Table 31: Summary of New York 'Free' Sterling Trading Volume Data, 1941-50

Date	Volume	Frequency	Source	BoE Archive Reference	Notes
13-Jun-41	Negligible	N/A		EC4/168	BoE's Norman asks Bank of Canada's Towers to intervene on free market rate in New York. Keep free market rate at \$4.025-4.035.
24-Jul-40	£335,000	Weekly		EC4/168	Peak volume week. See next comment.
29-Sep-41	£15,000-5,000	Weekly	Guaranty Trust	EC4/168	Dropped to £15,000 by March 1941, and weekly range was £5-15K through date of memo.
12-Feb-49	£100,000-£150,000	Daily		EC5/1 No. 69	Memo from Guaranty to BoE: "Subsequent correspondence has indicated that the volume is increasing". "Another things which leads me to believe that the volume is substantial is that even the very reputable firms are inquiring about it."
23-Jun-49	£200,000	Daily		EC5/2 No. 27B	Volume estimate of £200K a day (including note transactions). Hong Kong exchange controlled considered "loose".
06-Jul-49	£1,500,000	Weekly	Ullman & Co.	EC5/2 No. 24	Letter from Isner, H.J. of Ullman & Co of London to Hamilton at BoE: NY "although the biggest, is not the only market for such transactions. I hear it even said – although I am reluctant to believe it – that quite a turnover, almost amounting to a regular market – is taking place in London."
14-Nov-49	£1,000,000	Weekly	Financial Times, New York Times	EC5/3 No. 26	FT reference to a NY Times article of the same day: "The revival of the international market for transferable sterling was causing concern in British Government circles, the newspaper said."
29-Nov-49	£250,000	Weekly		EC5/3 No. 47	Reference to demand driven by meeting invisible payments due to the Sterling Area.
02-Dec-49	£125,000-£140,000	Daily		EC5/3 No. 48	Pre-devaluation daily turnover averaged £250,000 daily. Reference to debt overhang as source of cheap sterling; skepticism about convertibility expressed.
03-Dec-49	£500,000	Weekly	NY Bankers Meeting	EC5/3 No. 40	Cheap Sterling Meeting with NY Bankers

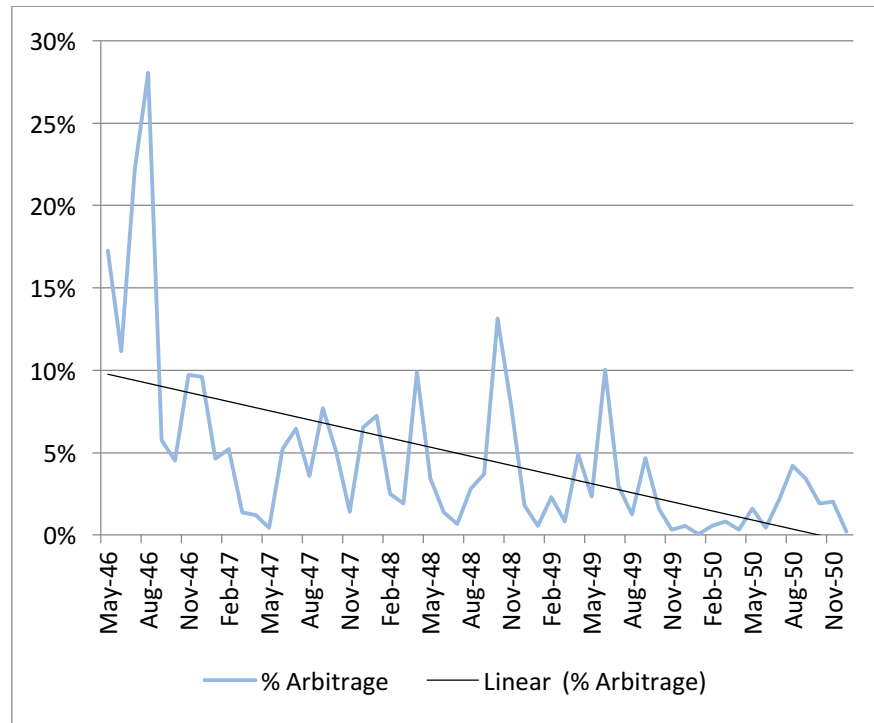
Date	Volume	Frequency	Source	BoE Archive Reference	Notes
08-Dec-49	£125,000- £140,000	Weekly	Financial Times		Article in <i>FT</i> also references pre-devaluation daily turnover averaged £250,000 daily.
12-Jul-50	N/A	N/A	BOE	OV31/109 No. 35	Report (apparently from Australia) about cheap sterling volume returning to pre-devaluation level. Danger of black market for Australian £ developing in NY.
02-Nov-50	£160,000 - £310,000	Weekly	Bank of England	EC5/5 No. 65a	BoE report concludes NY is the "most important" market for cheap sterling as "the U.S.A. is the source of dollars and dollar goods and the destination of most non-dollar commodities sold on a cheap sterling basis"
29-Nov-50	£400,000 - £600,000	Weekly	NY Fed	EC5/5 No. 75a	Also a reference to £190,000/week since Korea.

Source: Bank of England Archive

The evidence of rising free currency trading volume in the latter part of the 1940s is supported by changes in international arbitrage opportunities, which steadily eroded as the decade progressed. *Ceteris paribus*, arbitrage profits should decline as trading volume increases. Increased trading volume is typically accompanied by improved liquidity and market depth, both of which should in theory have a negative impact on arbitrage profits. To test this theory a hypothetical multi-market arbitrage profit calculation is performed across free markets in Switzerland, New York, and London through the following reoccurring, end-of-month series of currency transactions: 1) one pound sterling is converted to free U.S. dollars in London; b) the U.S. dollars are next converted to Swiss francs in New York; 3) the Swiss francs are then converted back into free sterling in Switzerland.⁴⁹³ The percentage gain between the beginning and ending amount of sterling is calculated and depicted in Figure 17.

⁴⁹³ Calculations do not include any estimation of transaction costs or other fees, which are unknown for these markets.

Figure 17: Free Market Arbitrage Profit Opportunity (as % of free F/X rate), 1946-50



Note: end of month data used; calculations do not include any estimation of transaction costs or other fees, which are unknown for these markets.

Sources: Swiss National Bank Archive, Pick Currency Yearbook (1951)

The results of the hypothetical arbitrage profit calculation show that by 1949 the double-digit and even high-single percentage arbitrage returns that were available shortly after the Second World War have effectively vanished. While these hypothetical arbitrage test results agree with the the evidence of rising free market trading volume, it should be noted that rising volumes and improved liquidity may not be the only explanation for the erosion of arbitrage profits as the 1940s progressed. Other explanations may include looser capital controls, fewer information asymmetries across markets and participants, and lower transactions costs.

5.4.3 Denomination exchange rate dispersion and time series construction

Time series data from multiple archival sources have been obtained for some currency pairs. For example, during the period of 2 January, 1942 through 31 December,

1943 three different sources of data exist for the Swiss franc-free sterling exchange rate: the *Devisenmittelkurse 1er* (for the £1 note), the *Devisenmittelkurse 50er/100er* (for £50 and £100 notes), and the *Banknotenkurse* (denomination not stated). Data from these different series are depicted in Figure 18.

Figure 18: Price Dispersion across Different Sources and Denominations, Swiss Fr./Free £ Exchange Rates, Switzerland, 1942-1943



Source: Swiss National Bank Archive

As can be seen in Figure 18 there is a very high correlation across the three time series, and the correlation coefficients for each series pair are all greater than 0.98 (Table 32). It is noteworthy that the highest correlation coefficient (0.9987) exists for data from two different data sources (*Banknotenkurse* and the *Devisenmittelkurse 50er/100er*). This consistency across different sources provides further confidence in the accuracy of the archival data.

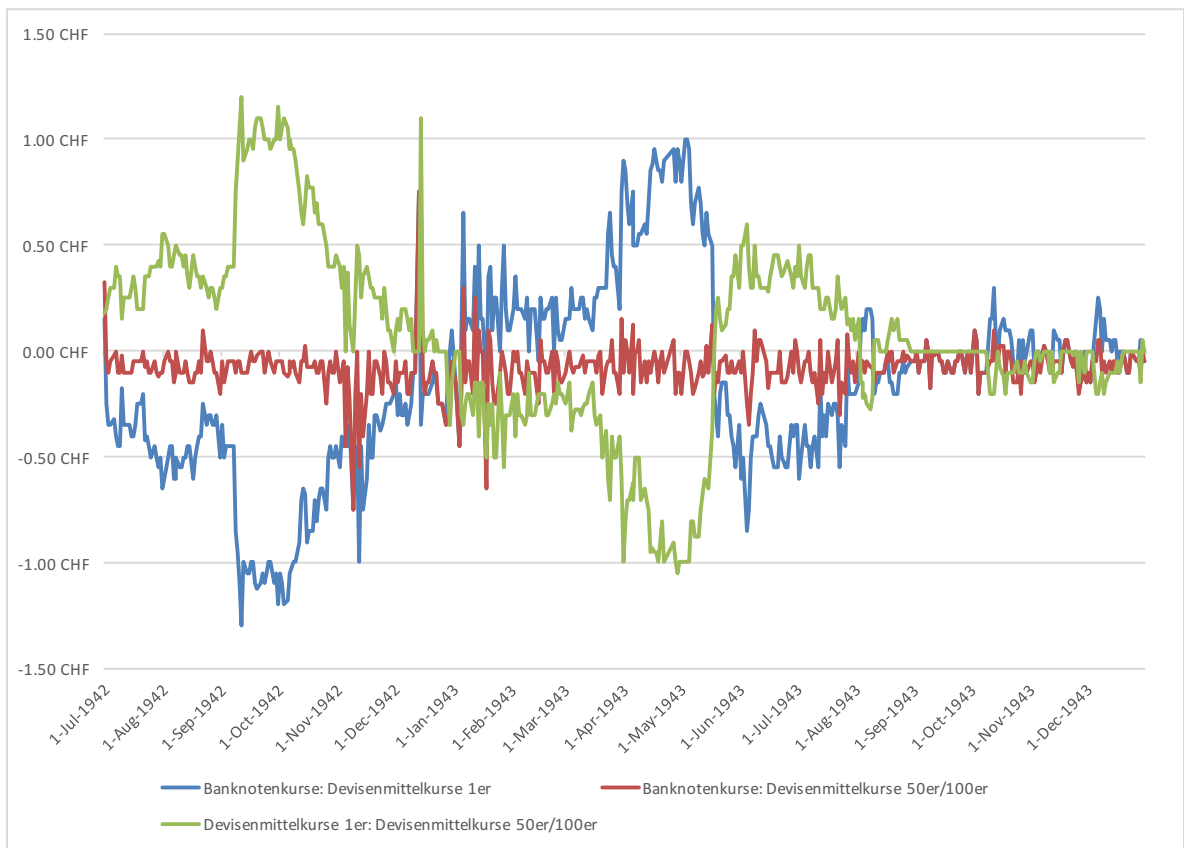
Table 32: Correlations across Different Sources and Denominations, Swiss Fr./Free £ Exchange Rates, Switzerland, 1942-1943

Source	Banknotenkurse: Devisenmittelkurse 1er	Banknotenkurse: Devisenmittelkurse 50er/100er	Devisenmittelkurse 1er: Devisenmittelkurse 50er/100er
Correlation	0.9867	0.9987	0.9880

Source: Swiss National Bank Archive

While there is a high correlation between the different time series, one striking finding from the data is the significant exchange rate dispersion that is often observed across different banknote denominations (Figure 19). Exchange rate dispersion for several periods is also often persistent, meaning the relative premium (or discount) for a particular denomination, lasts for as long as six months before market sentiment reverses. It is unknown whether the *Banknotenkurse* figures represents an exchange rate for a particular denomination of sterling, but there is relatively little dispersion observed between the *Banknotenkurse* series and the *Devisenmittelkurse 50er/100er* series, suggesting that the *Banknotenkurse* series reflects exchange rates for £50 and £100 notes. In contrast, even though the *Devisenmittelkurse 1er* data series is from the same archival document as the *Devisenmittelkurse 50er/100er* series (£50 and £100 notes), significantly greater dispersion is observed between the *Devisenmittelkurse 1er* (£1 note) series and the other two series.

Figure 19: Banknote Denomination Exchange Rate Dispersion, Swiss Fr./Free £, Switzerland, 1942-1943



Source: Swiss National Bank Archive

For the Swiss franc-free sterling exchange rate there are three major periods of exchange rate dispersion: from July 1942-January 1943, January 1943-June 1943, and June 1943-August 1943. An unusually higher degree of preference for £1 notes is observed from 10 September through 7 October, 1942, when as much as a 1.20CHF difference is observed between the exchange rate recorded for £1 notes and £50/£100 notes. To put this 1.20CHF exchange rate difference in perspective, the average Swiss franc-free sterling exchange rate from 10 September through 7 October 1942 for £1 notes and £50/£100 notes was 7.6313 and 6.6063, respectively, making a 1.20CHF difference equal to a 15.7% and 18.2% of each series' respective average for these dates. The fact that nearly 20% more Swiss francs were required to acquire a £1 note over a £50 or £100 note indicates a significant preference for £1 notes during late summer-early Autumn 1942.

The £1 note, however, did not always command a premium over a £50 or £100 note in the Swiss market. For example, starting in March 1943 through May 1943, the £1 note appears to have suffered a reversal of fortune. On 29 April, 1943 as much as 1.05CHF more was required to purchase £50/£100 notes over a £1 note. However, this reversal was short lived. From June 1943 through August 1943 the £1 note again commanded a premium over £50/£100 notes, although this time the premium peaked at just 0.60CHF on 4 June, 1943, or just 5.7% of the average Swiss franc-free sterling exchange rate for £1 notes from June through August, 1943. For the remainder of 1943 relatively little dispersion is observed across different denominations.

What accounts for the observed variation in preferences for one denomination of sterling over another in the Swiss market? Supply shocks for a particular denomination could explain the often sudden and dramatic shifts observed in the preferences of market participants. Another possible explanation for denomination dispersion is found in archival evidence: in 1943 the UK Treasury and Bank of England sought to reduce and even eliminate from circulation large pound sterling denominations, as these notes “were used to feed black market operations, tax evasion, and note smuggling”.⁴⁹⁴ Bank of England notes in circulation during this time consisted of £1, £5, £10, £20, £50, £100, £200, £500 and £1000 notes. A NYFRB memo titled the ‘Withdrawal of Large Bank Notes: The British Experience’ notes that British authorities sought:

“to make more difficult the illegal operation of note smugglers desirous of evading exchange control regulations, of black market operators, and of tax evaders—all of whom predominantly use large denomination notes in order to cover up their tracks”.⁴⁹⁵

There appears to have been a market response to Britain seeking to eliminate large notes from circulation:

⁴⁹⁴ C261, p. 1, ‘Withdrawal of Large Bank Notes: The British Experience’, New York Federal Reserve Bank Archive, 4 December, 1944

⁴⁹⁵ C261, p. 5, ‘Withdrawal of Large Bank Notes: The British Experience’, New York Federal Reserve Bank Archive, 4 December, 1944

“According to newspaper dispatches, the announcement of the new policy temporarily caused a minor “panic” among holders of large notes in general, particularly those engaged in illegal activities, since it was widely believed that the government would follow up its move with stringent measures to track down the holders of large notes and to make the holding of such notes presumptive evidence of illegal operations. As a result of this belief, many holders of large notes hastened to get rid of them through bookmakers or others who were in the position to pay them into banks without arousing suspicion. There were in reports in the London newspapers at the time that large notes were sold at heavy discounts for several weeks after the announcement”⁴⁹⁶.

The observed dispersion could be explained by black market trade flows and the changing supply and demand of larger banknotes, which underpinned this trade. Another factor could be the move by British authorities starting in 1943 to cease issuing and remove from circulation all notes with higher denominations than £10. However, without further supporting evidence, such as comments from market participants in Switzerland, we can only speculate on the exact causes for why particular denominations fell in and out of relative favour.

With regards to the construction of the time series used in the subsequent econometric analysis, given both the variety and quality of the archival data sources, a decision was made to maintain series continuity whenever possible. For example, the earliest time series data for the Swiss franc-free sterling exchange rate exists in the *Devisenmittelkurse 1er* series, which begins on 1 December, 1939. This series continues until 30 August, 1941, at which point the *Devisenmittelkurse 50er/100er* series begins. Therefore, the time series used for analysis incorporates both the *Devisenmittelkurse 1er* series and the *Devisenmittelkurse 50er/100er* until a gap in the *Devisenmittelkurse 50er/100er* series appears on 31 December, 1943, at which point the *Banknotenkurse* series is employed until this series terminates for the remainder of the war on 19 September, 1944. Thus, three separate Swiss franc-free sterling time series are used to construct the exchange rate series covering the period 1 December, 1939 through 19 September, 1944 that is used in the subsequent econometric analysis.

⁴⁹⁶ C261, p. 5, ‘Withdrawal of Large Bank Notes: The British Experience’, New York Federal Reserve Bank Archive, 4 December, 1944

In cases where two separate time series exist for the same period of time, such as the post-war period from May 1946 through December 1949, preference was given to the professionally typeset *Devisenmittelkurse* over the handwritten *Banknotenkurse* document for two reasons. First, while the legibility of the handwritten *Banknotenkurse* documents is generally excellent, there is a greater risk of misinterpreting handwritten figures than typed figures during digitization. Second, while the precise provenance of both sources is unknown, the more professional appearing *Devisenmittelkurse* lends it added credibility as typed data suggests a more significant production investment and wider circulation than a handwritten document. However, other than a few days, the dispersion observed between these two series for the period from May 1946 through December 1949 is quite small, and their correlation is 0.9979.

5.5 Structural Break Model and Results

5.5.1 Literature overview

This section of the chapter presents a structural break analysis of currency black market exchange rates during and after the Second World War. Exchange rates in currency markets can shift during periods of significant political or economic uncertainty to account for changes to perceptions of economic and political prospects, and long lasting shifts may mark important historical turning points.⁴⁹⁷ The two principle methods by which such exchange rate shifts have been previously analysed by economic historians can be characterized as the ‘narrative-descriptive’ and ‘statistical’ approaches.

An example of a narrative-descriptive approach is Mitchell’s (1903) study of the U.S. civil war greenback market, in which the author presents his data in a chart and then proceeds to discuss exchange rate fluctuations in the exchange rate that correspond with news and events. However, there are several limitations created by relying exclusively on such an approach, including the risk of focussing only on well-known historical events, and the risk of misinterpretations based on how data is visualized.⁴⁹⁸ A further issue identified with Mitchell’s particular narrative approach, as noted in a 1996 *American Economic Review* paper by Willard, Guinnane, and Rosen (hereafter referred to as WGR), is the “lack of an *a priori* definition of what constitutes a significant change in prices”.⁴⁹⁹ In other words, an entirely narrative approach runs the risk of not distinguishing in a robust and consistent manner between what WGR describe as ‘blips’, which are smaller or shorter-lived exchange rate changes, and more significant and long-lasting ‘breaks’ in time series data.⁵⁰⁰

⁴⁹⁷ (Agénor, 1992, p. 3)

⁴⁹⁸ (Calomiris, 1988, p. 213, note 21)

⁴⁹⁹ (Willard et al., 1996, p. 1006)

⁵⁰⁰ (Willard et al., 1996, p. 1006) Blips may signify a “wild market reaction to early news that later turned out to be false; or simply market nervousness over an event for which there was little information. Blips of this sort are not uncommon even in contemporary securities markets.”

New statistical methods have been developed in recent decades to identify, in a consistent manner, a long-lasting shift in time series data. A long-lasting shift in the data, or 'structural break', can mark a historical turning point. One of the principal advantages of employing statistical techniques to analyse historical data is the identification of significant historical events free from existing historical bias, thereby introducing the possibility of identifying new historical dates of significance. For example, statistical analysis by WGR identified dates and events that had been previously overlooked or underemphasized.⁵⁰¹ In addition, events previously considered important by historians may have no significant or long-lasting impact on market prices, highlighting possible differences between what was deemed important by contemporary market participants as compared to historians. While modern statistical techniques have enriched historical data analysis they have not entirely replaced the narrative-historical approach. Modern statistical techniques can be complimentary with historical and archival analysis, and they are often employed alongside each other to strengthen the analysis.

WGR analyse daily data from the U.S. Civil War Greenback market to locate structural breaks, which represent a significant change in the intercept, or mean value, over a determined period of time. The Banerjee et al (1992) method employed by WGR includes the selection of a predefined 'window' (a length of time) that is then used to sequentially compute successive multiple, lagged regressions, each time advancing by one point in the series.⁵⁰² Structural breaks are detected by shifts in the mean predicted value over the window. Subsequent techniques developed by Bai and Perron (1998, 2003) (hereafter referred to as Bai-Perron) take a more dynamic approach towards the identification of multiple structural breaks.⁵⁰³ The Bai-Perron method grows windows of different sizes from a minimum width (h) while looking for a partitioning that minimizes the discrepancy between the data and model by measuring a reduction in the residual sum of squared residuals (RSS, also referred as SSR). A number of subsequent economic

⁵⁰¹ (Willard et al., 1996, p. 1006)

⁵⁰² (Banerjee, Lumsdaine, & Stock, 1992)

⁵⁰³ (J. Bai & Perron, 2003; J. S. Bai & Perron, 1998)

history studies have employed both of these methods to examine financial prices during periods of war.⁵⁰⁴

5.5.2 Swiss franc-free sterling breakdates, 1939-44

All exchange rate data used in the following analysis are from Switzerland. In contrast to the warring countries, the Swiss government did not intervene in a significant way in financial markets during the Second World War, so this data reflects market sentiments.⁵⁰⁵ Switzerland also actively traded with both the Allies and Axis powers through nearly the entire duration of the war.⁵⁰⁶ Thus, sterling's exchange rate against the neutral Swiss franc presents an attractive currency pair for isolating how events impacting Britain may have impacted sterling. However, as discussed earlier, it is unrealistic to think that events only related to Britain impacted sterling's value against the Swiss franc during the Second World War. Events in Switzerland, or in Anglo-Swiss relations, may have also played a role in changes to the exchange rate. For example, as will be shown later, one of the breakdates occurs very close to when the Swiss military mobilized. In addition, strains in Anglo-Swiss relations, such as when the British Admiralty held Swiss goods at British ports, may have impacted the exchange rate.⁵⁰⁷ There is also the fact that, in contrast to Britain, Switzerland did not suffer any significant economic debts or damage from the war, which may have had a positive impact on the value of the Swiss franc.

The first analysis period runs from 1 December, 1939 through 19 September, 1944. The series includes 1,486 data points and spans a total of 1,752 days (Figure 20). The time series expresses the number of Swiss francs per pound sterling, with a maximum and minimum values of 17.75 (31 January, 1940) and 5.10 (6 May, 1942), respectively; mean and median values are 9.59 and 8.67, respectively.

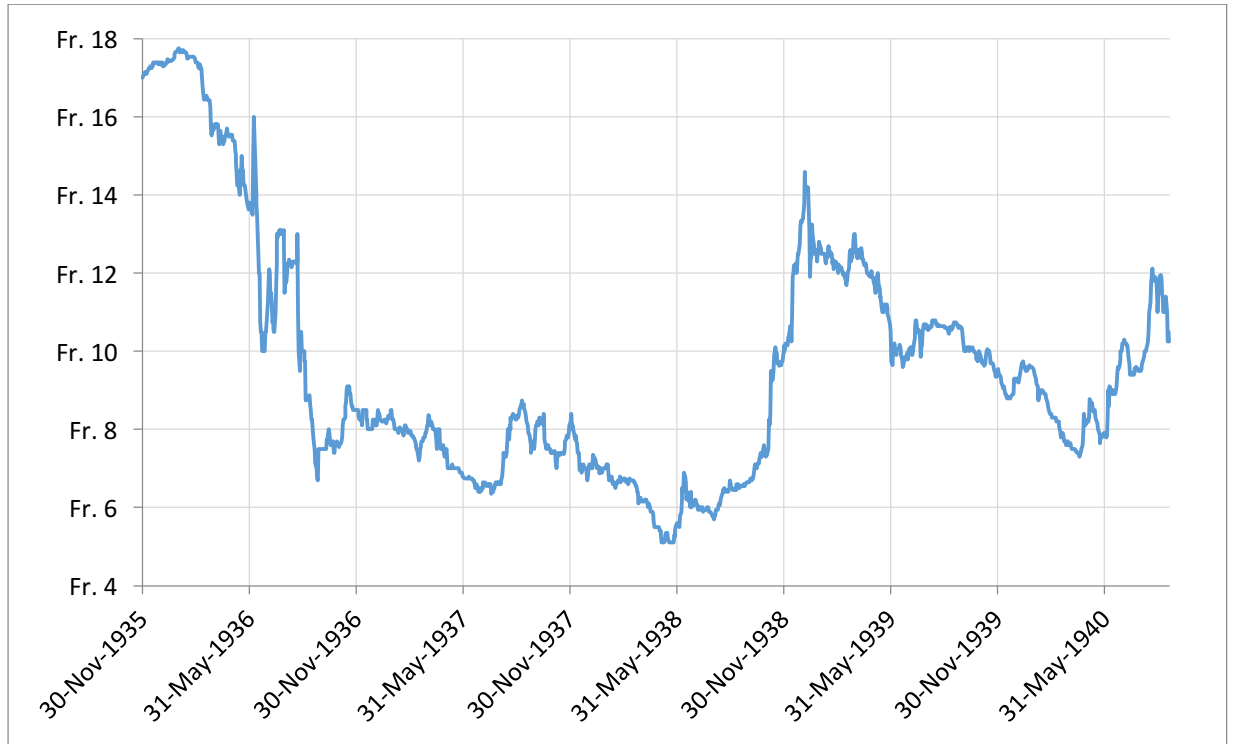
⁵⁰⁴ See for example (Brown & Burdekin, 2000; Frey & Kucher, 2000; Frey & Waldenström, 2004; Oosterlinck, 2003; Smith & Smith, 1997; Weidenmier, 2002)

⁵⁰⁵ (Frey & Kucher, 2000, p. 52)

⁵⁰⁶ (Golson, 2011, pp. 247-251) In response to export bans and agreements with Allied governments, as well as a decline in German exports, Swiss trade with the Axis powers tailed off towards the end of 1944.

⁵⁰⁷ (Golson, 2011, p. 250)

Figure 20: Swiss Fr./Free £ Exchange Rate, Switzerland, 1939-1944



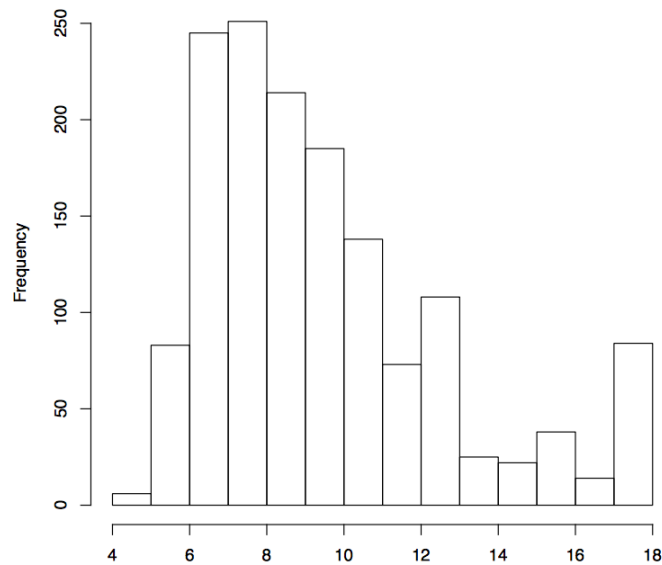
Note: y-axis depicts number of Swiss francs per one unit of pound sterling (£1)

Source: Swiss National Bank Archive

5.5.2a Step 1 – interpolation and data transformation

For days when no trading data is available (typically Sundays and holidays) the previous day's price is utilized, which enables testing for auto correlation. The first two data points are omitted to enable lagged variables. A log transformation of the exchange rate data was applied to reduce skew and heteroscedasticity (Figure 21).

Figure 21: Frequency Distribution of Swiss Fr./Free £ Exchange Rate, Switzerland, 1939-1944



Note: x-axis depicts number of Swiss francs per pound sterling.

5.5.2b Step 2 – test for autocorrelation

To identify structural breaks in the Swiss free sterling market this paper employs methods developed by Bai-Perron that are coded in the R Project statistical package called *strucchange* created by Zeileis et al (2002, 2003).⁵⁰⁸ Bai-Perron employs a standard linear regression model to determine breaks that minimize the sum of squared residuals:

$$(1) \quad \log(y_i) = u + e_i \quad (i = 1, \dots, n),$$

where y_i is the dependent variable (exchange rate) at time i , the independent variable u is the mean exchange rate, and e_i is the error term at time i .

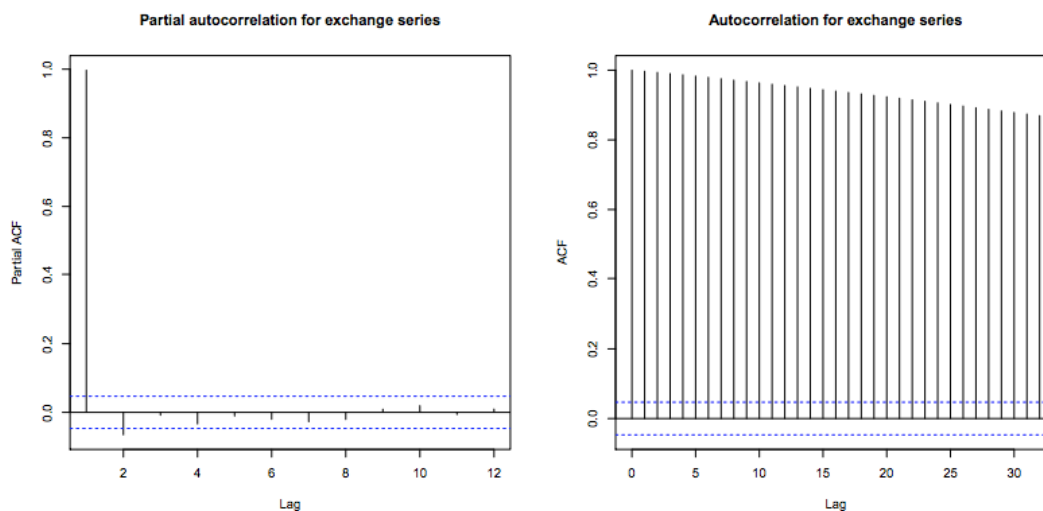
Autocorrelation (serial correlation), which is when observation order is important (e.g., there is a relationship between the error value from one period and another period), is a common issue with time series data and must be tested. Autocorrelation can result in a number of problems i.e., biased coefficients, and error terms and OLS estimators not

⁵⁰⁸ (Zeileis, Kleiber, Krämer, & Hornik, 2003; Zeileis, Leisch, Hornik, & Kleiber, 2001)

achieving the smallest variance.⁵⁰⁹ Standard tests for detection of auto-correlation were performed, including the Durbin-Watson statistic (0.0038, p-value < 2.2e-16), which is very close to zero and therefore suggests the presence of positive autocorrelation. The Ljung-Box test (X-squared = 1484.9, df = 1, p-value < 2.2e-16), and Breusch-Godfrey statistics (LM test = 1474, df = 1, p-value < 2.2e-16) also refute a null hypothesis of no auto-correlation.

To address autocorrelation, the data was examined to determine the appropriate lag variable order. Figure 22 shows partial auto correlation and auto correlation plots for the series. A strong correlation exists for lag 1 (yesterday's exchange rate) and smaller but significant correlation for lag 2 (two-days ago exchange rate). These results were confirmed with the VARselect procedure for vector auto-regressive analysis. Both the Hannan-Quinn and Schwartz criteria tests favoured a model with two lag variables as showing the fewest residuals.

Figure 22: Auto Correlation and Partial Auto Correlation Plots, Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944



The revised linear regression AR(2) model that incorporates two lag variables to minimize the sum of squared residuals in determining structural breaks is:

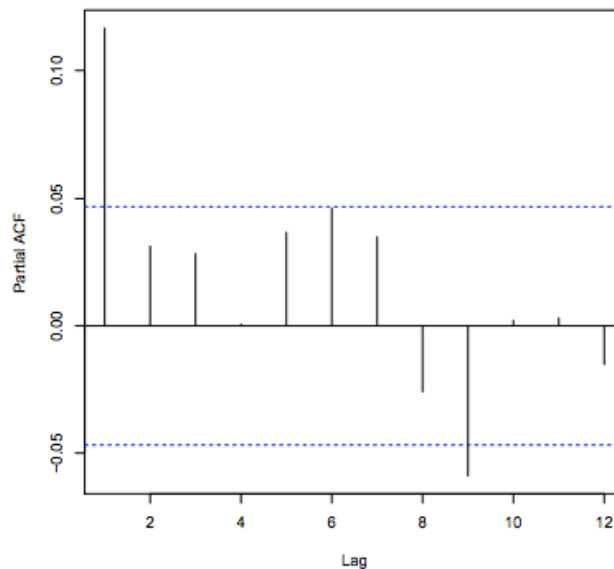
⁵⁰⁹ For further discussion see (Greene, 2008)

$$(2) \quad \log(y_i) = \beta_0 + \beta_1 \log(y_{i-1}) + \beta_2 \log(y_{i-2}) + u_i \quad (i = 1, \dots, n),$$

where y_i is the dependent variable (exchange rate) at time i , and β_0 is the mean exchange rate, β_1 and β_2 are the two lagged variables at time $i - 1$ and $i - 2$ (the two prior days' exchange rates), respectively, and u_i is the error term at time i .

The results of a Breusch-Pagan test for heteroscedasticity was 3.2727 (2 degrees of freedom, p-value of 0.1947), which confirms that the assumption of constant variance is tenable. The Durbin-Watson statistic (2.0033 p-value 0.5141) supports the use of an AR(2) model.

Figure 23: Partial Auto Correlation of Residuals of AR(2) model, Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944

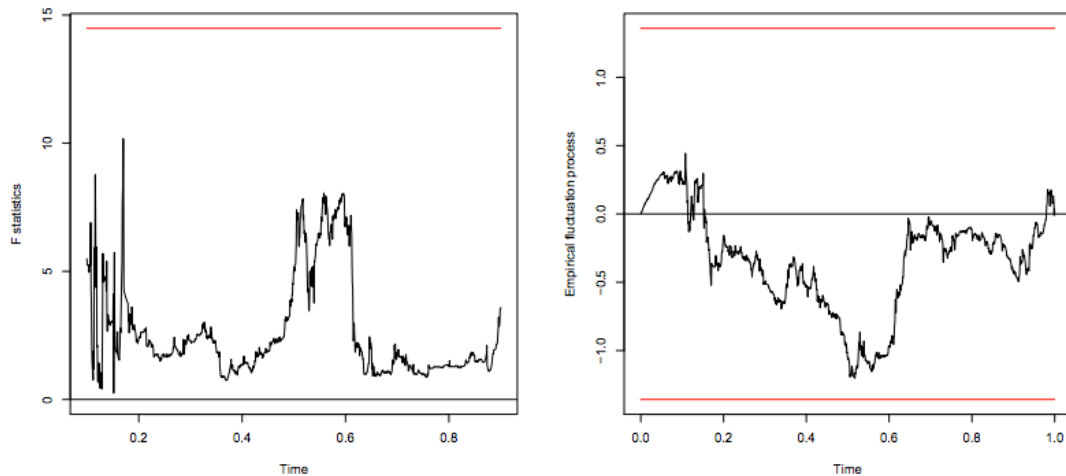


5.5.2c Step 3 – test for evidence of structural breaks

The next step in the process is to determine whether the observed price deviations in the Swiss franc-free sterling exchange rate represent random error or exceed normal variation, thereby indicating the possible presence of structural breaks. Two tests for change point analysis were applied to determine whether the variation observed in the data is consistent with a null hypothesis of constant parameter values. The results of the Chow-Quandt statistical test are shown in Figure 24. A high F-statistic means that the null

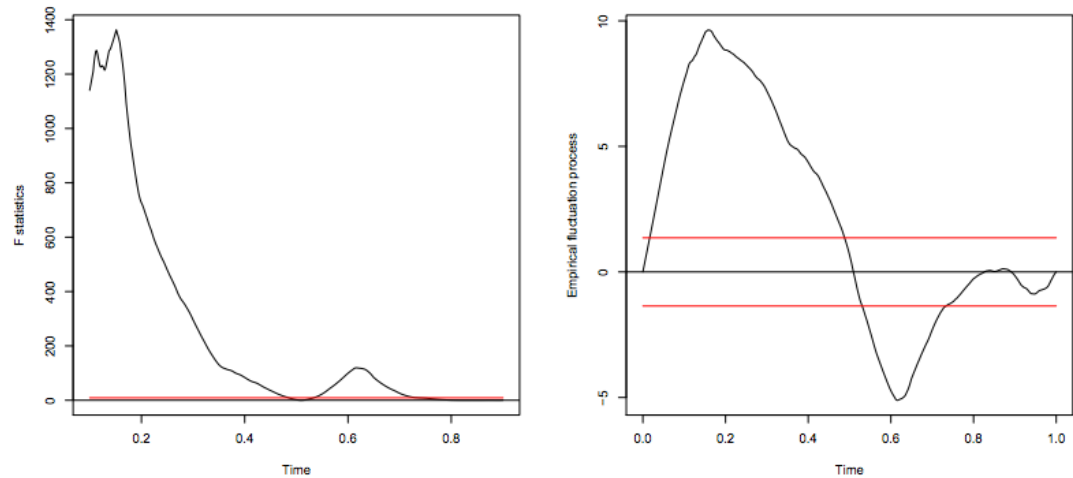
hypothesis of no structural breaks can be rejected. None of the peaks in the F-statistic reach significance, and the empirical fluctuation process (EFP) of an OLS-CUSUM statistic also fails to cross the significance threshold. However, the Nyblom-Hansen test (2.0333, p-value of 0.005) indicates the hypothesis of no structural breaks in the AR(2) model of exchange rate data can be rejected for now.

Figure 24: AR(2) Model SupF and EFP Tests of an OLS-CUSUM statistic for Structural Change, Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944



It is useful to compare changes between the AR(2) model in equation (2) and the model in equation (1). As shown in Figure 25, the variation in the rolling F statistics and the EFP process far exceed the critical values (red horizontal lines). The mean-only model shows auto correlation. However, Bai-Perron suggest that abrupt breaks may be more readily detected by a mean-only approach and so therefore a comparison of mean-only and AR(2) breakpoint dating is performed.

Figure 25: Mean-Only Model SupF and EFP Tests of an OLS-CUSUM statistic for Structural Change, Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944



5.5.2d Step 4 – determine window size

With the prior steps having established the appropriate regression model and the likely presence of structural breaks, the next step is to determine the dates of any potential structural breaks. As outlined by Bai-Perron, a critical decision must now be made about the size of the window (h), or number of data points to be included in each time segment, to calculate a break point. For example, the fit of the structural break test would be perfect and therefore meaningless if h were set to 1. It is useful here to briefly compare the different choices of window sizes in the literature.

Some studies employing later-developed advances in break test methods than those available to WGR, such as Kanago and McCormick (2013), employ relatively short windows for determining breaks. Kanago and McCormick re-run their analysis with progressively narrower windows of as few as five days. During periods where events are moving very quickly, such as the beginning of the Second World War, then perhaps a narrow window is appropriate given the frequency of shifts and high-impact events. However, a narrow window can be expected to yield models with a high number of breaks, as well as blips of doubtful significance. Further, as noted in their 2003 paper, Bai and Perron state that there is a risk that a small h could lead to distorted sizes in F-tests if autocorrelation is present or error distribution varies across segments. As already noted,

the Swiss franc-free sterling exchange rate time series data tested positive for auto correlation, and so this supports creating a longer window than the 5-day window employed by Kanago and McCormick.⁵¹⁰

In contrast to shorter-term events and shifts is the search for historical turning points, which are signalled by a long lasting shift in the mean value of the time series. Turning points can be distinguished from shorter-term ‘blips’, which do not signify any long-lasting changes in the data trend. As WGR and others discuss there is some arbitrariness involved in determining what constitutes a ‘long lasting’ shift in the mean value of time series data. WGR start by looking for “means shifts that last for periods of time that are shorter than the rest of the war”.⁵¹¹ From here the authors note the trade-off between choosing a shorter time period, which makes it easier for shifts to be described as long lasting, and looking at a larger period, which could lead to false negatives or overlooking important events. WGR settle on 100 days as the period for which a directional shift in price must last for it to be considered long lived.⁵¹² The conflict that WGR study, the American Civil War, had a similar duration to the Second World War and therefore serves as useful precedent for guiding window size selection in this study. A trimming value of 6.7% applied against 1,486 observations results in a window size of 100. In addition to utilizing a 100-day window, structural breaks were computed with window sizes of 20, 40, 60, and 80 days, respectively.

5.5.2e Step 5 – determine the number of structural breaks

As noted by Bai and Perron, “selecting the break points using the Bayes Information Criteria (BIC) works well when breaks are present”.⁵¹³ However, the optimal number of breakpoints indicated by the BIC is not definitive, and break dates that surface

⁵¹⁰ Kanago and McCormick do not discuss any tests for auto correlation on their data, nor do they discuss the introduction of any lags into their regression model to account for auto correlation.

⁵¹¹ (Willard et al., 1996, p. 1008)

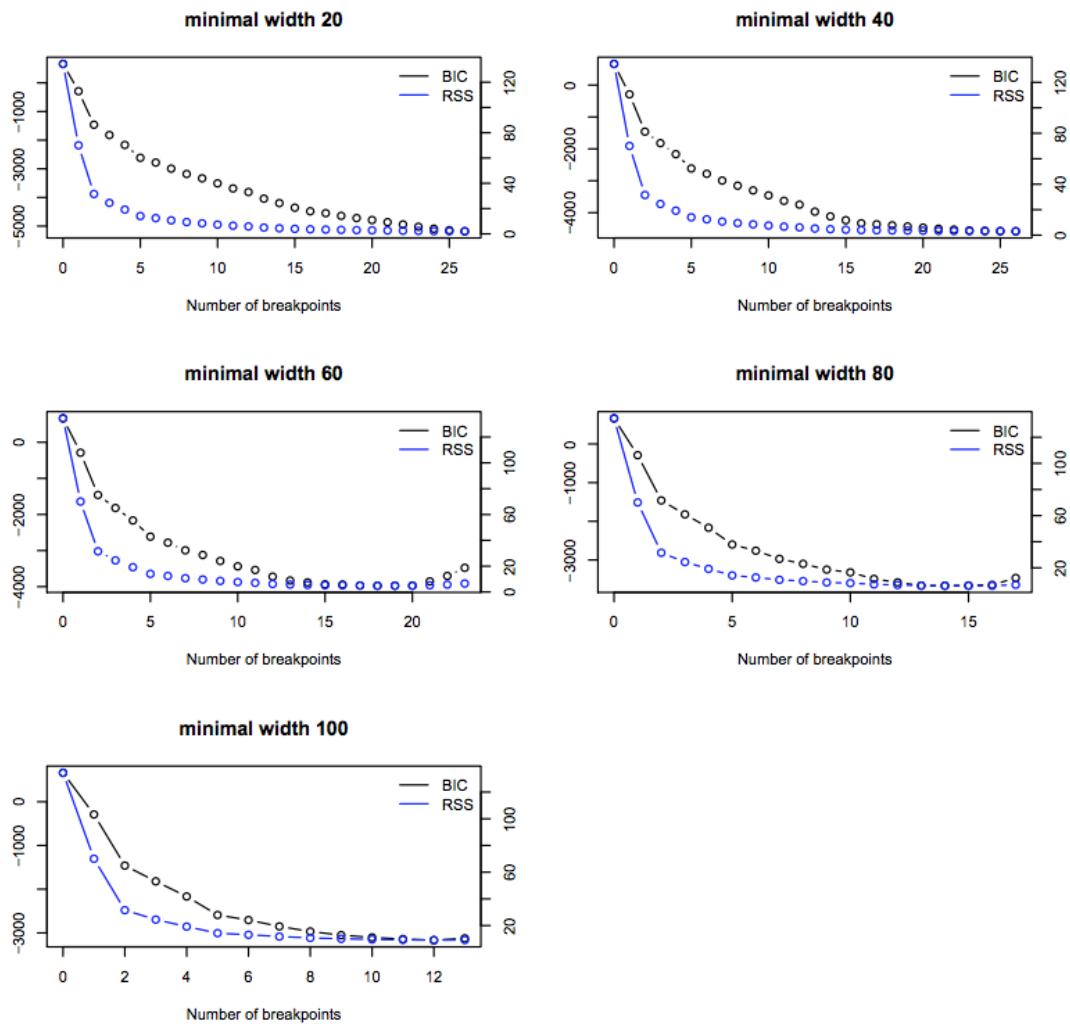
⁵¹² (Willard et al., 1996, p. 1008) WGR also test for an 8-day period and find that this “did not change the basic location of significant break dates” (note 13)

⁵¹³ (J. Bai & Perron, 2003, p. 18)

from more than one test can be considered as more robust.⁵¹⁴ The BIC and RSS reduction results from *strucchange* are shown for the various window sizes in Figure 26. For the shortest window (20-days) up to four breakpoints are identified before a BIC penalty is introduced; wider windows suggest as few as three then two breakpoints. RSS is decreasing linearly at seven breakpoints, which justifies making seven breakpoints an upper bound.

⁵¹⁴ The Zeileis *strucchange* packages does not implement the Liu et al modification of the Schwartz Criteria (LWZ) or the $supF(l/l+1)$ test, that compares l breaks in one model with another model featuring $l+1$ breaks that is included in Bai Perron's Gauss implementation.

Figure 26: Mean-only Model: BIC and RSS Results for Alternate Sized Windows (h), Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944



The BIC and RSS test from the mean-only model show that more breakpoints are required before the BIC shows an upward trend (e.g., 21 breakpoints for a window size of 60). Shorter windows do not show an upturn in BIC prior to the computational limit of 26 structural breaks. The BIC results from windows of 60 and 80 days suggest 13 breakpoints. However, there is a more than two order of magnitude difference between the RSS values in the mean-only model as compared to the AR(2) model (Figure 27).

Figure 27: AR(2) Model: BIC and RSS Results for Alternate Sized Windows (h), Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944

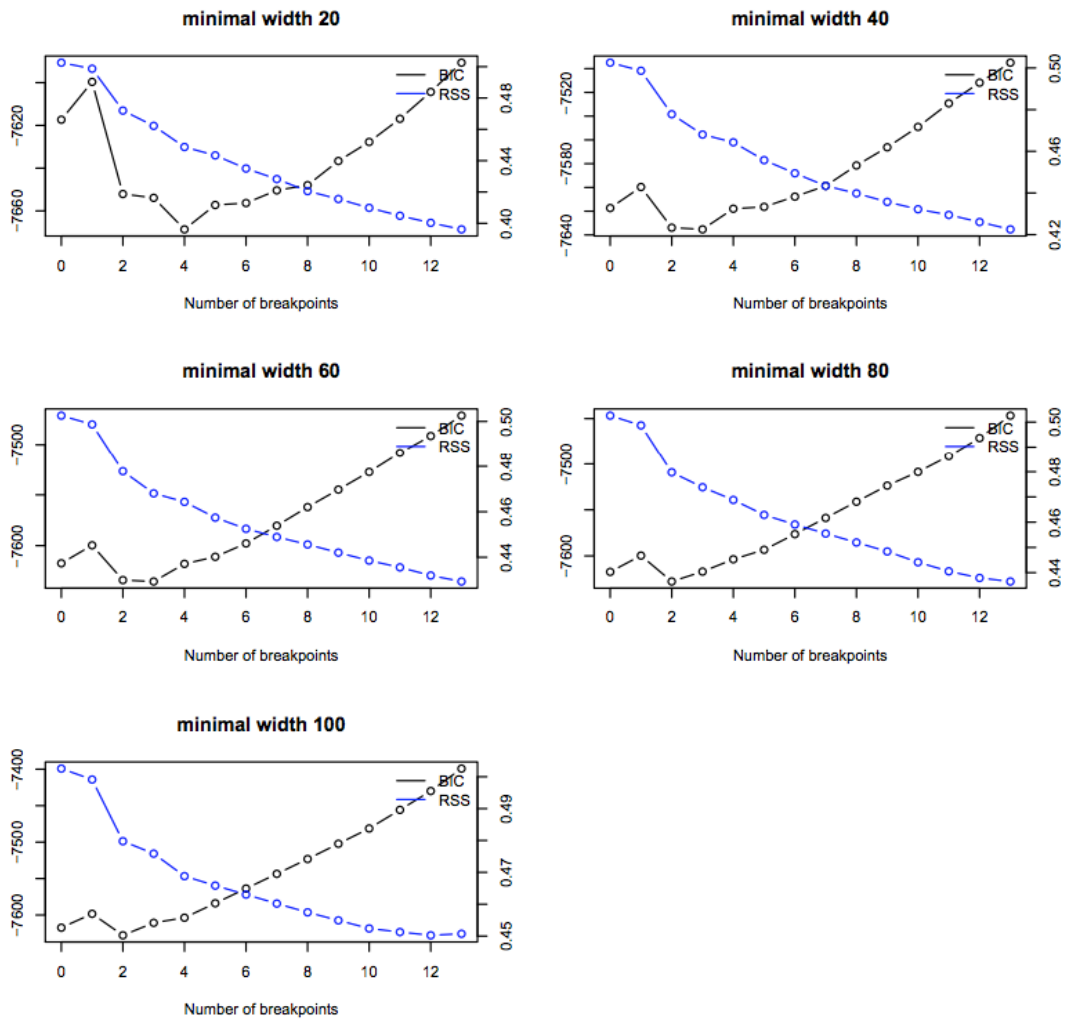


Figure 28 depicts the confidence intervals selected by *strucchange* for between two and seven breakdates at window sizes of 20, 40, 60, 80, and 100 days. Each segment covers the 95% confidence interval for a break date determined by the Bai-Perron algorithm run with the window size and number of breakpoints shown in the left margin. A red segment indicates a decrease in the mean value of sterling against the Swiss franc; a green segment indicates an increase in the mean value of sterling against the Swiss franc. Given freedom to place five breakpoints with a window of 20 days, the optimal partition determined by the algorithm obtains the greatest RSS reduction by dating all of the breaks early in the war, during the Battle of Britain. Three are associated with decreases, emphasizing that

the sharp reduction in exchange rate over that time is the period least well fit by a constant parameter model.

Figure 28: AR(2) Model: Breakpoints and Confidence Bands for Alternate Sized Windows (h), Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944

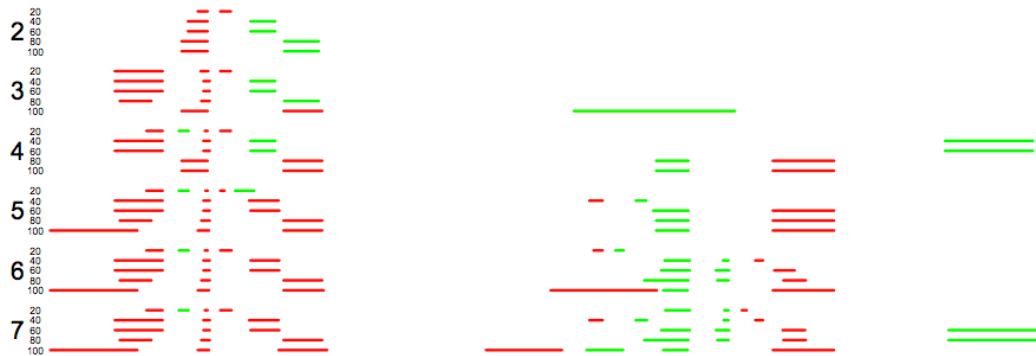
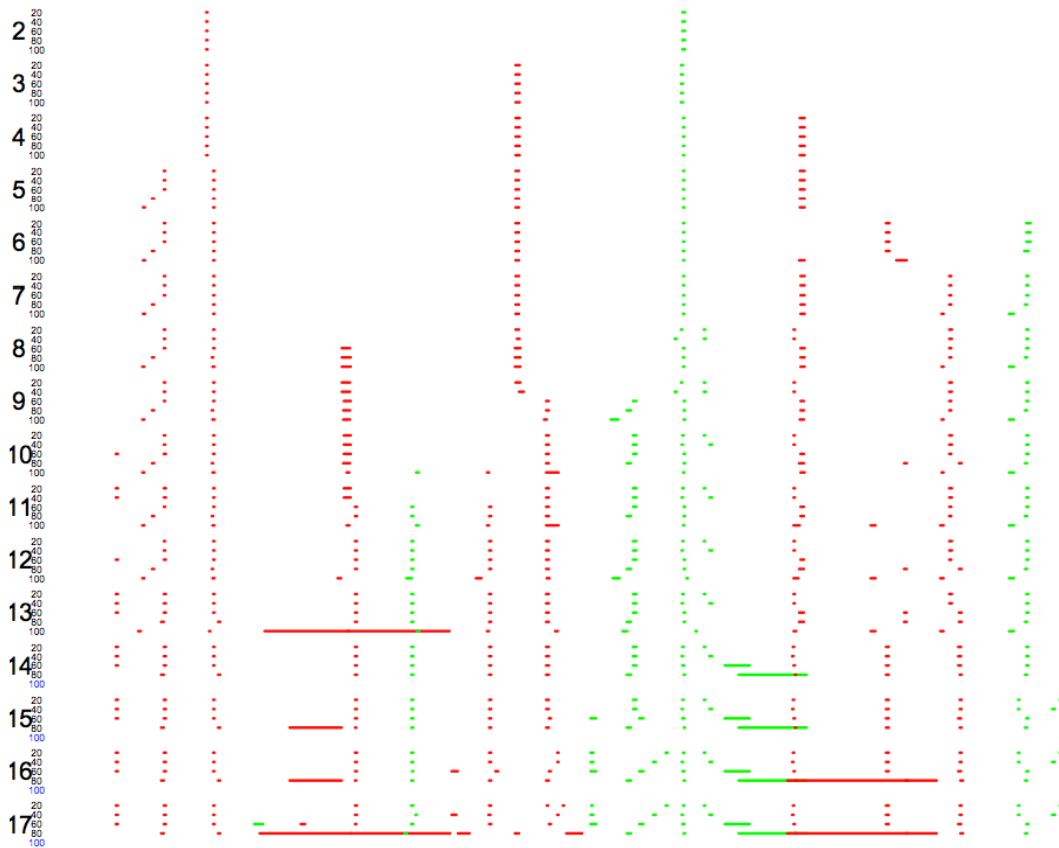


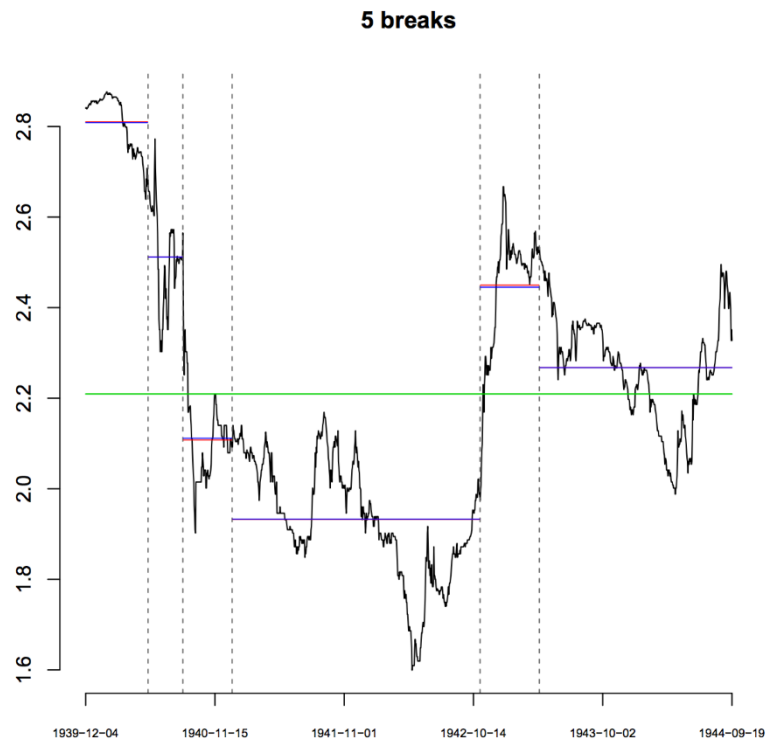
Figure 29 depicts the break dates and segment lengths of the mean-only model. In most cases, break dates persist, albeit with minor shifts, as the number of available breakpoints is increased. The confidence intervals are narrower than for the AR(2) model, though exceptions with broad, and in some cases overlapping, intervals occur in segmentations with wider windows. This result is consistent with Bai-Perron's observation that a segmented model without lagged variables can better account for abrupt shifts in mean value.

Figure 29: Mean-only Model: Breakpoints and Confidence Bands for Alternate Sized Windows (h), Swiss Fr./Free £ Exchange Rates, Switzerland, 1939-1944



Ultimately, the selection of which change point model and the number of breakpoints is somewhat arbitrary. Too many breaks and there is a risk of over-fitting; too few breaks and important turning points are overlooked. For example, the data and analysis support the conclusion that there were at least two structural breaks, with the first during the Battle of Britain and a second around the time of the Battle of Stalingrad. A visual inspection suggests that a plausible model is represented by the AR(2) 80-day window model with five structural breakpoints (Figure 30).

Figure 30: Breakpoints, AR(2) Model 80-day window, Swiss Fr./Free £ Exchange Rates Switzerland, 1939-1944



5.5.2f Discussion of events around breakdates

Decreases in sterling's value against the Swiss Franc are observed during the early part of the war around the time of the Battle of Britain, which ran from summer to autumn in 1940. From 18 May to 6 June free sterling's value against the Swiss franc dropped from 15 to 13.5 francs per pound, a 10% decline.

The first breakdate in the 80-day window AR(2) model is 18 May, 1940, a date around which a number of significant events occur.⁵¹⁵ On 19 May German General Guederian cut-off Allied troops in Belgium, and the order was given for British expeditionary forces to retreat to Dunkirk and other port cities. The British Royal Air Force, which had been suffering heavy losses on the continent, also ordered a recall of squadrons to Britain on 19 May. Several important events also precede the breakdate,

⁵¹⁵ Bryce and Kanago (2013) show two breakdates in the dollar-sterling exchange around this time, on the 2nd and 9th of May, respectively.

including Germany’s invasion of France and the Low Countries and British Prime Minister Neville Chamberlain’s resignation, both of which occurred on 10 May. An example of a Swiss event that may have had some bearing on the Swiss franc side of the exchange rate with sterling occurred on 11 May, the date Switzerland mobilized its military forces.

The occurrence of so many significant events around the 18 May breakdate, combined with the earlier noted need for caution when attempting to link changes in market prices to discrete events, seed doubt over which event (or combination of events) is primarily responsible for the sustained decline in value observed for sterling. Furthermore, the directional impact that some events had on sterling’s value is difficult to assess. For example, did the market view Chamberlain’s resignation as a positive or negative development for sterling? Finally, while breakdates as shown will often cluster for various window sizes, the discretion involved in model selection can also influence the exact breakdate. In sum, a significant negative shift in sterling’s trajectory occurred around 18 May, but the precise event(s) that triggered the change cannot be pinpointed.

Table 33: Breakpoints and confidence intervals, AR(2) Model 80-day window, Swiss Fr./Free £ Exchange Rates Switzerland, 1939-1944

Break	2.5% Confidence	Breakpoint date	97.5% Confidence
1	28-Mar-1940	18-May-1940	20-May-1940
2	10-Aug-1940	20-Aug-1940	24-Aug-1940
3	26-Dec-1940	31-Dec-1940	1-Mar-1941
4	10-Sep-1942	30-Oct-1942	3-Nov-1942
5	25-Mar-1943	9-Apr-1943	9-Jul-1943

There was a sudden but brief reversal in sterling’s trajectory as one pound climbed in value to 15 francs on 7 June and to 16 francs on 8 June, perhaps in response to the successful Dunkirk evacuation that took place between 27 May and 4 June, referred to as a “miracle” by new British Prime Minister Winston Churchill.⁵¹⁶ However, sterling resumed its downward slide on 9 June, and on 18 June Churchill delivered a speech to the House of

⁵¹⁶ (Churchill, 1951, Volume 2, Ch. 12)

Commons stating “the Battle of France is over, I expect the Battle of Britain is about to begin”.⁵¹⁷ Sterling proceeded to hit a new low of 10 francs on 27 June, before swinging to a high of 13.1 francs on 29 July, a 31% increase. These dramatic exchange rate shifts underscore the volatile nature of the free market during a period of fast moving events.

Table 34: Exchange Rate on Structural Break Dates, AR(2) 80-day window, Swiss Fr./Free £ Exchange Rates Switzerland, 1939-1944

Break	Breakpoint date	Fr./£ on break date	Fr./£ next trading date	Nominal change	% Change
1	18-May-1940	15.0000	14.4000	-0.60	-4.00
2	20-Aug-1940	12.2500	12.3000	0.05	0.41
3	31-Dec-1940	8.2500	8.1000	0.15	-1.82
4	30-Oct-1942	7.3000	7.2000	0.10	-1.37
5	9-Apr-1943	12.4500	12.6000	0.15	1.20

The second breakdate is 20 August, 1940, during the heart of the Battle of Britain.⁵¹⁸ On this date Prime Minister Winston Churchill spoke before the House of Commons, stating "never in the field of human conflict was so much owed by so many to so few".⁵¹⁹ Churchill’s comment was a reference to the events of 18 August, “The Hardest Day” of the Battle of Britain, which featured the greatest combined casualties on both sides. Sterling fell from 12.25 Swiss francs on 20 August into single digits for the first time during the war on 26 August. Following a brief turn above 10 francs, the free sterling rate in Switzerland would remain in single digits for over two years until November 1942.

The date of 15 September, known as “Battle of Britain Day”, is generally considered by historians to be a key turning point in the war. On this day German forces made their largest bombing raid, but the Germans suffered significant casualties. However, sterling’s value continued sliding, dropping from 8.25 Swiss francs on 16

⁵¹⁷ (Churchill, 1951, Volume 2, Ch. 12)

⁵¹⁸ Bryce and Kanago (2013) data series ends on 25 July, 1940 and their last breakdate in the dollar-sterling exchange rate is on 12 July, 1940, around the time that the Battle of Britain begins.

⁵¹⁹ (Churchill, 1951, Volume 2, Ch. 16, final paragraph)

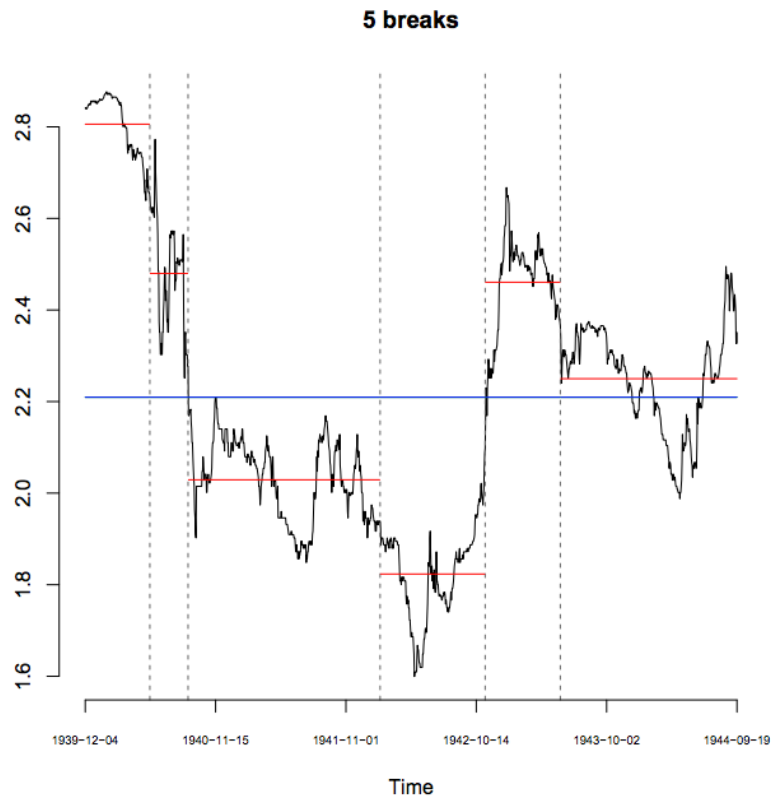
September to 6.70 francs on 25 September. Battle of Britain Day may have marked a turning point in Britain’s favor, but market participants appear to initially have taken a different view. However, following Hitler’s abandonment in late-September of the planned invasion of Britain (Operation Sealion) sterling’s value stabilized and then dramatically climbed, reaching a high during this time of 9.10 Swiss francs on 16 November, a 36% increase from Battle of Britain Day.

The third breakdate occurs on 31 December, 1940. The Battle of Britain is considered to have ended well prior to this date. However, German bombing raids of London continued into 1941, inflicting significant damage. Sterling’s value began trending downwards for the remainder of 1941 and into 1942 before reaching its nadir for the war of 4.95 Swiss francs on 4 May 1942. This third breakdate is the only instance of a breakdate from the AR(2) model that disagrees by over two months with breakdates generated by the mean-only 80-day window model (Table 35 and Figure 31). The gap between the third breakdates for the two models is 395 days, which is substantially greater than the next highest gap of 49 days for the fifth breakdate; the other three breakdates all fall within two weeks of each other.

Table 35: Breakdate Comparison Between AR(2) and Mean-only Models, 80-day window, Swiss Fr./Free £ Exchange Rates Switzerland, 1939-1944

Break	AR(2) Breakpoint date	Mean-only Breakpoint date	Days gap between Mean-only and AR(2)
1	18-May-1940	23-May-1940	5
2	20-Aug-1940	2-Sep-1940	13
3	31-Dec-1940	30-Jan-1942	395
4	30-Oct-1942	5-Nov-1942	6
5	9-Apr-1943	28-May-1943	49

Figure 31: Breakpoints, Mean-only Model 80-day window, Swiss Fr./Free £ Exchange Rates Switzerland, 1939-1944



The mean-only model places its third breakdate, 30 January, 1942, closer to sterling's low point during the war, and well outside of the Battle of Britain. This third break is around the conclusion of the Battle of Moscow, where the Nazis suffered their first significant land defeat, a positive for Britain and the Allies. However, by this time the war had expanded significantly from the European continent to Africa and Asia, and it is in these areas that we find more plausible explanations for sterling's loss in value around this date. For example, German General Irwin Rommel's forces in North Africa made two noteworthy advances against the British when his Afrika Korps captured Agedabia on the 21 January and then Benghazi on 29 January. However, the events unfolding in the Asian and Pacific theatres in January 1942 perhaps weighed heaviest on sterling. During this time the Japanese were making advances on Borneo and Kuala Lumpur, while America and Japan waged the nearby Battle of Bataan. On 19 January a large number of British troops were captured by the Japanese near Singapore, and on 27 January all British troops

in the area retreated into Singapore, the so-called 'Gibraltar of the East'. On 31 January the Japanese captured the port of Moulmein and were threatening Singapore and Rangoon. The British surrender of Singapore on 15 February, 1942 was considered by Churchill to be the "worst disaster" in British military history.⁵²⁰

The fourth breakdate is on 30 October, 1942. In contrast with the three previous breakdates, this fourth breakdate marks the first time during the war where sustained appreciation in free sterling's exchange rate is observed. On 30 October, 1942 sterling was trading at 7.30 Swiss francs; by 5 January, 1943 it would nearly double to 14.40, which would mark free sterling's high water mark for the second-half of the war. On 31 October Britain won a key battle against Rommel in the Second Battle of El Alamein, and Rommel's forces retreated on 3 November. Historians consider the Allied success in the Second Battle of El Alamein as a significant turning point in the Western Desert Campaign.

The fifth and final breakdate is 9 April, 1943. The value of sterling had already begun declining from its high on 5 January, 1943, reaching 12.45 on 9 April, a decline of 14%. The Soviet Army had successfully defeated the German 6th Army in the city of Stalingrad in early February 1943, which is generally considered to be the key turning point in the European Theatre. However, looking at events around 9 April, as well as the fifth breakdate of 28 May determined by the mean-only model, a clear explanation for the decline in sterling during this period is not obvious as events during period appear to have largely favoured the British. For example, German Afrika Korps troops surrendered to the Allies on 13 May. The British had been achieving success in the Atlantic against German U-boats ("Black May"), and April as a whole was considered a positive turning point for Britain in the Battle of the Atlantic. Perhaps during this time market participants shifted their attention from military events to the great cost of the war on Britain and the likely effect this would have on sterling's value in the months and years to come.

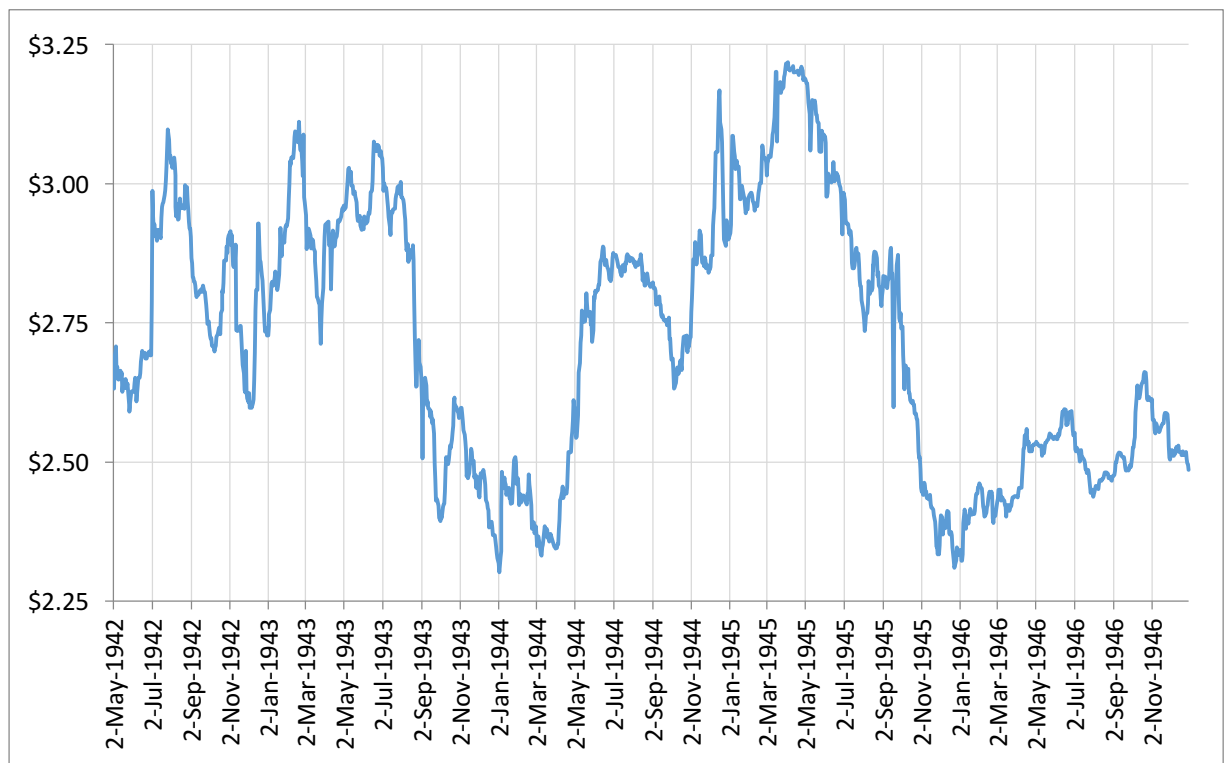
⁵²⁰ (Churchill, 1951, Volume 4, p. 81)

It is important to note that the time series for the Second World War ends on 19 September, 1944, or approximately nine months before the end of hostilities in Europe. Important events, such as D-day in June 1944, are within the time series but may not be reflected in this breakpoint analysis due to insufficient data and the selection of an 80-day window. If a shorter window were selected, and more breakdates considered than the five in the above analysis, then we can see breakdates clustering close to the end of the war around D-Day, as depicted in Figure 28 and Figure 29.

5.5.3 U.S. dollar-free sterling breakdates, 1946-1950

New daily exchange rate data obtained from the Swiss National Bank Archive for the Swiss franc-free pound sterling and Swiss franc-U.S. dollar exchange rates from 1946-50 were used to derive a free U.S. dollar-pound sterling exchange rate (Figure 32). Per the Bretton Woods agreement, the U.S. dollar during served as the world's primary reserve currency, and the exchange rates of other currencies, including pound sterling, were officially fixed against the U.S. dollar. As has been described in earlier chapters, a chronic U.S. dollar shortage afflicted Britain and other countries during this time. For these and other reasons it is useful to test for breakdates in sterling's exchange rate against the U.S. dollar in the latter half of the 1940s.

Figure 32: Free U.S. Dollar/Sterling Exchange Rate, Switzerland, 1946-50



Note: y-axis depicts number of U.S. dollars per one unit of pound sterling (£1)

Source: Swiss National Bank Archive

The period under study in this analysis runs from 3 May, 1946 through 30 December, 1950. The series includes 1,446 data points and spans a total of 1,703 days, or approximately the same number of days as the Second World War break date analysis. The time series expresses the number of U.S. dollars per pound sterling, with a maximum and minimum values of \$3.22 (5 April, 1949) and \$2.30 (3 January, 1948), respectively; mean and median values are \$2.72 and \$2.73, respectively.

Given the similarities in the data and time period many of the steps outlined in the previous sections were repeated, such as a log transformation of the data. The Durbin-Watson statistic (0.0088381 p-value < 2.2e-16) suggests the presence of positive autocorrelation and so an AR(2) regression model (Equation 2) was again used to address autocorrelation (Figure 33).

Figure 33: Auto Correlation and Partial Auto Correlation Plots, Free \$/£ Exchange Rates, Switzerland, 1946-1950

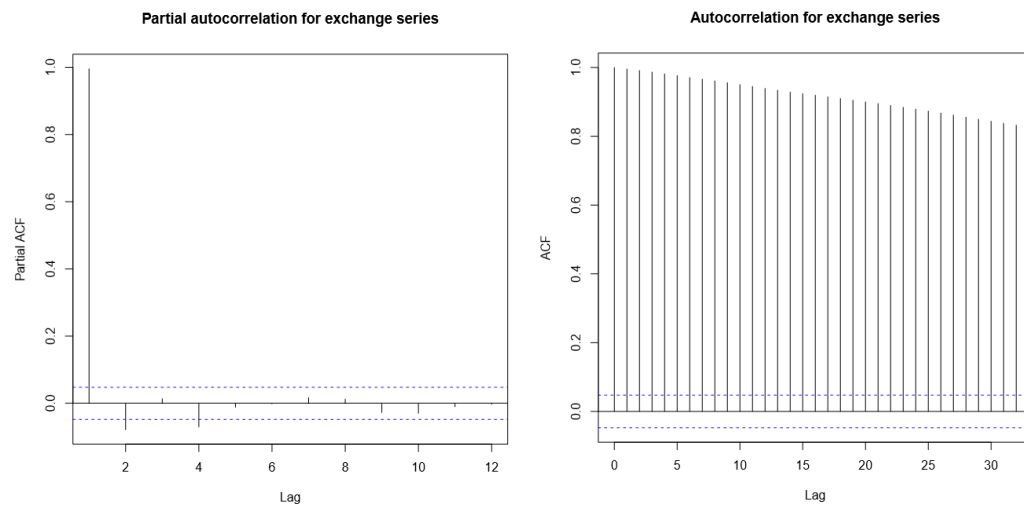
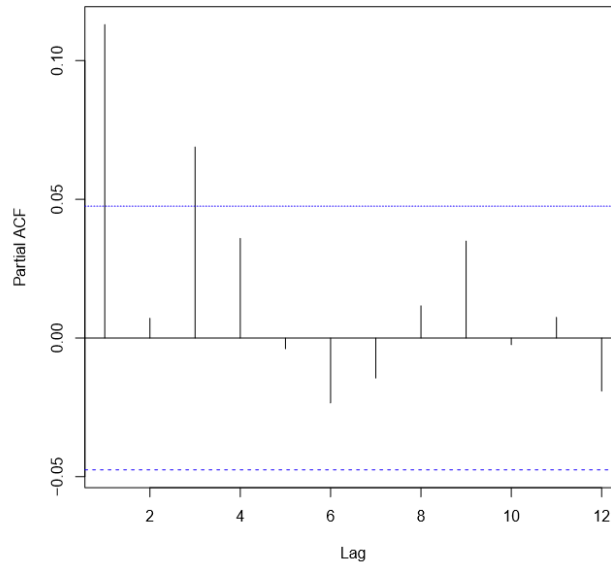


Figure 34: Partial Auto Correlation of Residuals of AR(2) model, Free \$/£ Exchange Rates, Switzerland, 1946-1950



The Durbin-Watson statistic (1.9969 p-value = 0.4762) supports the use of an AR(2) model. Based on the cluster of breakdates shown in Figure 35 we can see breakdates for various window sizes clustering around 1947 and 1949.

Figure 35: AR(2) Model: Breakpoints and Confidence Bands for Alternate Sized Windows (h), Free \$/£ Exchange Rates, Switzerland, 1946-1950

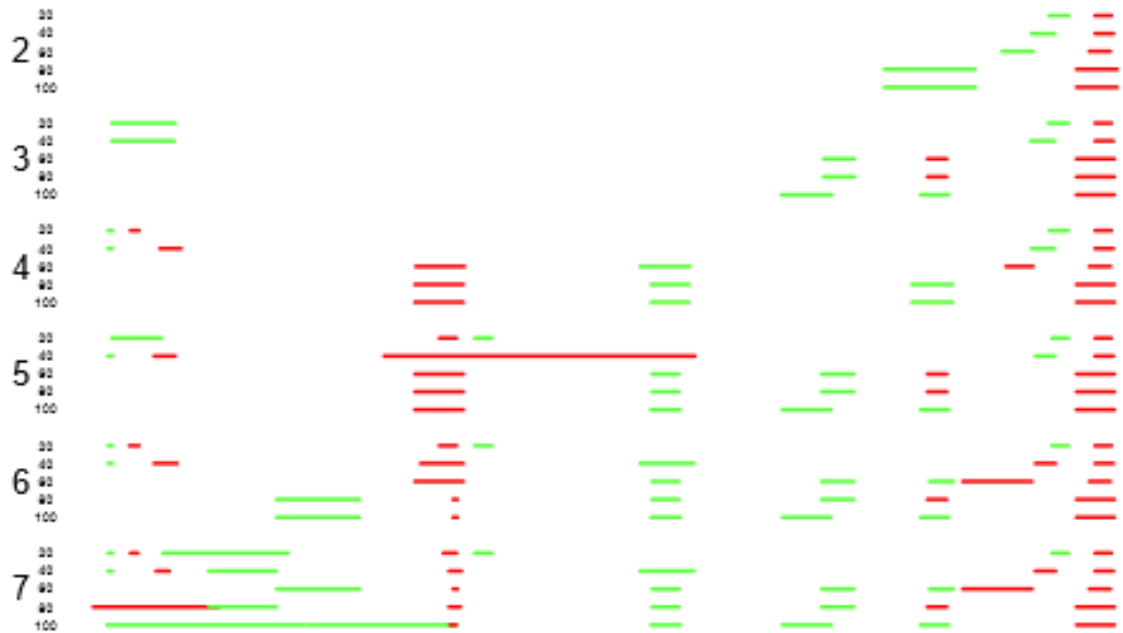
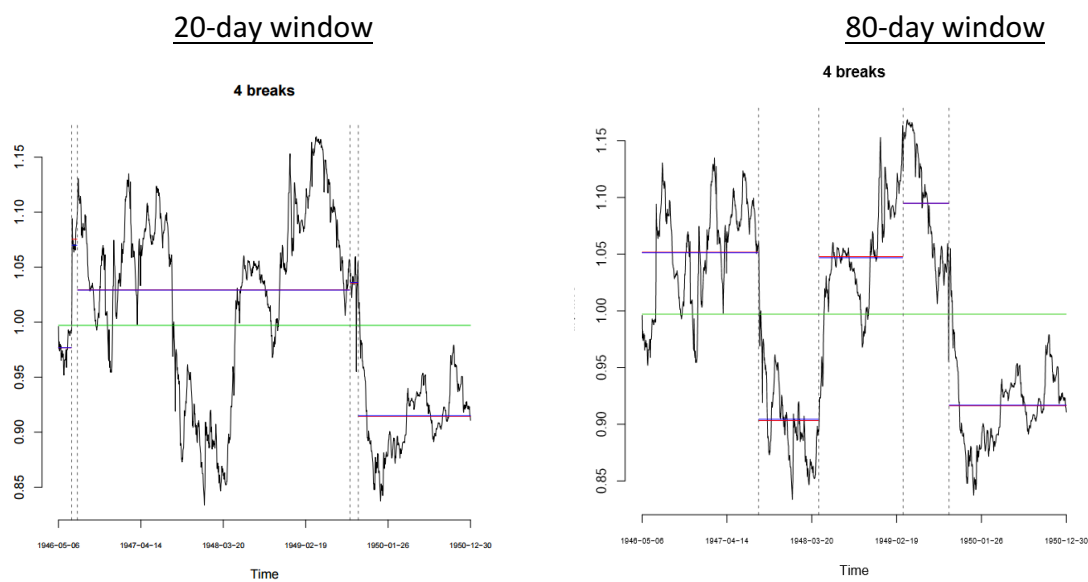


Figure 36 depicts four breakdates selected by Bai-Perron for both a 20-day and 80-day windows. Both windows produce breakdates in 1949, around the time of sterling's official devaluation. The 20-day model misses the 1947 breakdate that is likely associated with the July 1947 convertibility crisis, while this breakdate is captured when the window is set to 80-days (Figure 36). Breakdate results are discussed for an AR(2) with an 80-day window and four structural breaks.

Figure 36: Breakpoints, AR(2) Model 20 & 80-day windows, Free \$/£ Exchange Rates, Switzerland, 1946-1950



The first breakdate in the 80-window model is identified on 19 August, 1947. A key event near the breakdate is the 21 August, 1947 suspension of sterling convertibility. British sterling, per the terms of the Loan Agreement signed with the U.S. one year earlier, was made convertible by the Bank of England into U.S. dollars on 15 July, 1947. The Bank of England was hardly a unanimous supporter of this step, however, as the plan for sterling convertibility was known inside the Bank of England as 'Operation Gearcrash'.⁵²¹ Disaster was correctly predicted by Bank of England officials as Britain quickly burned through its dollar reserves and was forced to abruptly and ignominiously surrender the promise of sterling convertibility. Free sterling's value against the dollar dropped from \$3.02 on 13 May, 1947 to \$2.30 by 3 January, 1948, a 24% decrease.

⁵²¹ (Fforde, pp. 159-160)

Table 36: Breakpoints and confidence intervals, AR(2) Model 80-day window, Free \$/£ Exchange Rates, Switzerland, 1946-1950

Break	2.5% Confidence	Breakpoint date	97.5% Confidence
1	01-Jul-47	19-Aug-47	28-Aug-47
2	10-Apr-48	16-Apr-48	28-May-48
3	14-Feb-49	16-Mar-49	04-Apr-49
4	01-Sep-49	17-Sep-49	17-Oct-49

The second breakdate in the 80-day window model is identified on 16 April, 1948. Free sterling showed buoyancy during this time, appreciating from \$2.44 on 16 April, 1948 to \$3.17 on 17 December, 1948, a gain of 30%. In April 1948 the Organization for European Economic Co-operation was established to coordinate distribution of U.S. money to Europe.⁵²² The Marshall Plan was first proposed at Harvard on 5 June, 1947 and disbursement of these much needed funds to Britain and Europe began in July 1948. An article published 18 December, 1948 in *The Economist* titled 'Harder Sterling' noted sterling's overseas appreciation in the past year and the technical strength for sterling after the large sterling short-position during the pre-convertibility crisis needed to be covered.

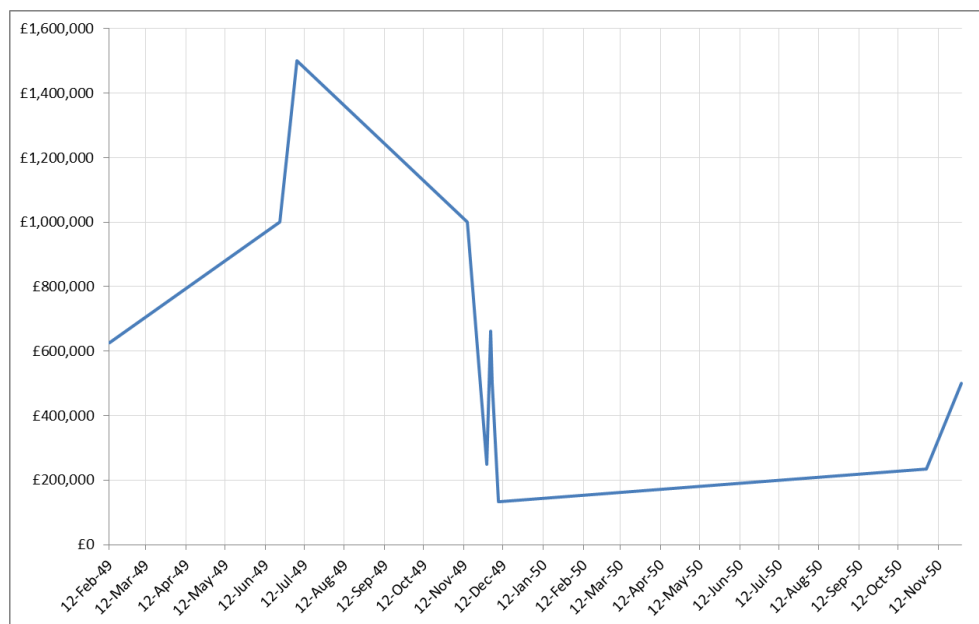
The third and fourth breakdates occur in 1949 on 14 March and 17 September, respectively. During the early months of 1949 there were persistent rumours of sterling's imminent devaluation. On 12 February, 1949 a memo from the Guaranty financial house to the Bank of England commented on the rising volume of free sterling trading, with daily turnover estimated at approximately £100,000-£150,000 (Figure 37). As noted in archival documents:

“Subsequent correspondence has indicated that the volume is increasing. Another thing which leads me to believe that the volume is substantial is that even the very reputable firms are inquiring about it.”⁵²³

⁵²² (George & Institute of Contemporary British History., 1991, p. 4)

⁵²³ EC5/1 No. 69, Bank of England Archive

Figure 37: Summary of Weekly Volume Data for Black Market Exchange Rates, 1949-50



Source: Bank of England Archive

The last of the two 1949 breakdates, 17 September, is likely associated with the 18 September official devaluation by British officials of sterling's exchange rate against the U.S. dollar from \$4.03 to \$2.80. The 1949 devaluation is discussed in more detail in the subsequent section.

5.5.4 Further discussion of sterling's 1949 devaluation

While structural breaks tests have gained wide appeal amongst economic historians in recent years these are not the only means by which new historical insights can be obtained from quantitative data. This section utilizes the new free sterling data set to revisit the case of the 1949 sterling devaluation. Several economic historians that have studied Britain in the immediate post-Second World War period, including Cairncross and Eichengreen (2003), briefly reference the development of what they termed

“sophisticated” markets for ‘free’ sterling in New York and Zurich, and the authors briefly reference Pick (1951) end of month quotations for free sterling in New York (Table 37).⁵²⁴

Table 37: U.S. Dollar-Sterling Exchange Rate, End of Month, London, 1949

Month	\$ / £		
	Market	Official	Discount
March	3.09	4.03	23.3%
April	3.06	4.03	24.1%
May	3.04	4.03	24.6%
June	2.70	4.03	33.0%
July	2.80	4.03	30.5%
August	2.83	4.03	29.8%
Sept.	2.55	2.80	8.9%
Oct.	2.44	2.80	12.9%

Source: Pick’s Currency Yearbook (1951)

UK Chancellor Cripps made a number of ultimately erroneous public pronouncements prior to sterling’s September 1949 devaluation that sterling would not be devalued.⁵²⁵ However, Cairncross and Eichengreen state that the financial community regarded sterling’s significant black market discount as *prima facie* evidence of the need for devaluation.⁵²⁶ This appears to have been also true in North America.⁵²⁷ There is some debate in the literature about whether U.S. policymakers encouraged the UK to devalue sterling.⁵²⁸ Newton (1985) argues that the U.S. Treasury and State departments pushed not just Britain, but a number of European countries to devalue their currencies due to challenges associated with exporting enough goods to pay for needed U.S. imports.⁵²⁹ Congress felt less Marshall aid may be necessary if currencies across Western Europe were devalued. Overall, perceptions in U.S., as expressed in the New York free sterling market and elsewhere, may have played an important role in the 1949 devaluation. Cairncross

⁵²⁴ (Cairncross & Eichengreen, 1983, p. 26; 2003) “the development of a sophisticated sterling market in New York and Zurich which undermined the authorities’ attempts to segregate transactions”. See also (Cairncross 1985, 1992).

⁵²⁵ (Dow & National Institute of Economic and Social Research., 1964, p. 41; Newton, 1985b)

⁵²⁶ (Cairncross & Eichengreen, 1983, p. 115)

⁵²⁷ (Cairncross, 1985, p. 171)

⁵²⁸ (Dow 1962, p. 41, footnote 2)

⁵²⁹ (Newton, 1985a, Ch. 7)

also suggests that free sterling market expectations, as expressed in the exchange rate, played an important role in shaping events and were “used by ministers as an indication of the size of the devaluation required”.⁵³⁰

Cairncross’ provided an eyewitness account of the policy debate of whether to devalue sterling to \$3.00 or \$2.80: Chancellor Cripps asked Foreign Secretary Bevin, who “pursed his cheeks, hesitated and then said \$2.80 and \$2.80 it was”.⁵³¹ But why was sterling devalued to \$2.80 rather than \$3.00? While Cairncross does not say, the new data shows that the average daily exchange rate for free sterling in Switzerland in the nine months before devaluation was precisely \$3.00. Further, in the seven weeks prior to devaluation the exchange rate was \$2.82, or just \$0.02 higher than the \$2.80 value that British policymakers chose. The near perfect alignment of the free market exchange rate data with the debate over whether to devalue sterling to \$3.00 or \$2.80 represents either an extraordinary coincidence, or more likely suggests that British officials looked to the most recent free market exchange rate data rather than the 1949 year-to-date average to set the new official exchange rate for sterling.

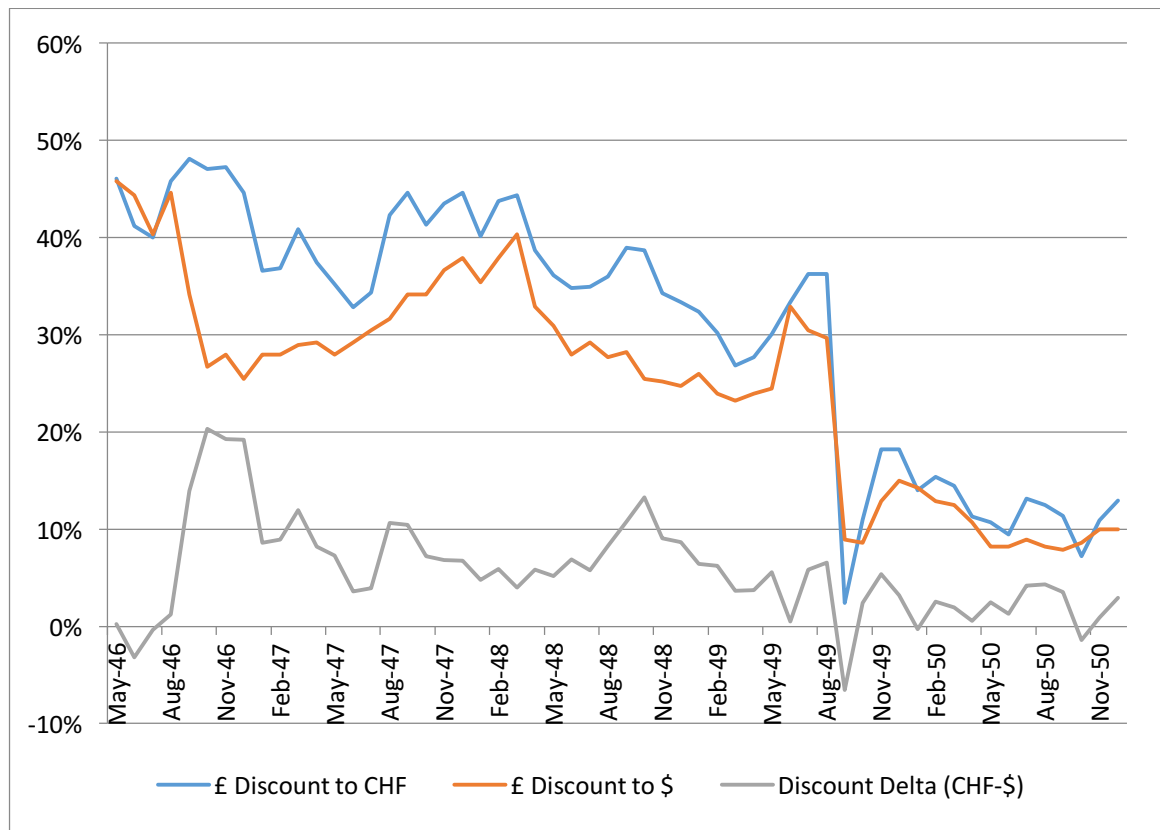
In their analysis of sterling’s 1949 devaluation, Cairncross (1983) and Hawtrey (1954) both state that the discount found on free sterling was a characteristic peculiar to the black market rather than an indication of sterling’s true value. In making this point, Cairncross utilizes Pick’s monthly London ‘hand payments’ data for the value of free sterling before and after devaluation and states that “the discount...had never been less than 23.5 percent before devaluation”.⁵³² However, it is unclear how Cairncross arrived at his view here as the data from Pick (1951) shows that the discount was often significantly greater than 23.5% for the period of May 1946 through devaluation in 1949 (Figure 38).

⁵³⁰ (Cairncross, 1985, p. 169) For example, “there was also a widely held expectation of devaluation in financial circles” (p. 115). With regard to the timing of policymakers’ devaluation decision and the view of financial markets prior to the Sept. 1949 devaluation, Cairncross, citing a story in *The Banker*, states “the almost universal belief in The City was that sterling would be devalued or allowed to float. Similar expectations were entertained on the other side of the Atlantic” (p. 117).

⁵³¹ (Cairncross, 1985, p. 169)

⁵³² (Cairncross & Eichengreen, 1983; 2003, pp. 115-116) They state that “black market rates continued to show a discount on the official rate even after a 30 percent devaluation” of sterling on 19 September, 1949.

Figure 38: Discount on Official Exchange Rates in Swiss Market, 1946-50



Source: Pick's Currency Yearbook, 1951

The inaccuracy by Cairncross here is important for two reasons: first, a change in the *ex post* discount provides some indication of whether the free market was pricing sterling at or close to its true value at the time of devaluation. Second, following devaluation any change in the size of sterling's discount can help answer the black market illegal risk component-true value decomposition question raised by Cairncross and Hawtrey. More specifically, if the illegal risk component represented the entire (or near entire) discount in free sterling, then the discount following devaluation would be roughly in line with the pre-devaluation discount.

The new data from the Swiss market show that free sterling in the weeks following devaluation continued to trade at a discount to the new official exchange rate against the

Swiss franc.⁵³³ However, for three consecutive trading days shortly after devaluation (24th, 26th and 27th of September) free sterling traded in Switzerland at a premium to its new official rate (Table 38). This was the first and only time this occurred during the 1940s. It is unclear whether this negative premia reflects a 'laundering charge' paid by actors who did not possess a legal right to transact, measurement errors, or other short-term market dynamics (e.g., traders caught 'wrong-footed').⁵³⁴ An altogether different possibility is that the free market briefly judged official sterling to now be undervalued.

⁵³³ Sterling's official exchange rate with the Swiss franc was also adjusted downwards from 17.34 to 12.23 CHF-£ (a 29.5 % devaluation)

⁵³⁴ (Dornbusch et al., 1983)

Table 38: 'Free' Sterling Rate and Discount to Official Rate, Switzerland, Sept. 1949

Date	U.S. \$/£			CHF Fr./£		
	Official Rate	U.S. \$/£ Free Rate	Discount	Official Rate	CHF Fr./£ Free Rate	Discount
12-Sep-1949	\$4.030	\$2.8315	29.7%	Fr. 17.34	Fr. 11.220	35.3%
13-Sep-1949	4.030	2.8586	29.1%	17.34	11.320	34.7%
14-Sep-1949	4.030	2.8806	28.5%	17.34	11.400	34.3%
15-Sep-1949	4.030	2.8851	28.4%	17.34	11.425	34.1%
16-Sep-1949	4.030	2.8391	29.6%	17.34	11.250	35.1%
17-Sep-1949	4.030	2.8391	29.6%	17.34	11.250	35.1%
19-Sep 1949*	2.800	2.5990	7.2%	12.19	10.500	13.9%
20-Sep-1949	2.800	2.7482	1.9%	12.19	11.350	6.9%
21-Sep-1949	2.800	2.8000	0.0%	12.19	11.900	2.4%
22-Sep-1949	2.800	2.8103	-0.4%	12.19	12.000	1.6%
23-Sep-1949	2.800	2.8190	-0.7%	12.19	12.150	0.3%
24-Sep-1949	2.800	2.8538	-1.9%	12.19	12.300	-0.9%
26-Sep-1949	2.800	2.8719	-2.6%	12.19	12.550	-3.0%
27-Sep-1949	2.800	2.8046	-0.2%	12.19	12.200	-0.1%
28-Sep-1949	2.800	2.7578	1.5%	12.19	11.900	2.4%
29-Sep-1949	2.800	2.7526	1.7%	12.19	11.850	2.8%
30-Sep-1949	2.800	2.7674	1.2%	12.19	11.900	2.4%

*Note: date of unilateral devaluation of pound sterling against the U.S. dollar from \$4.03 to \$2.80 and the Swiss Franc from Fr. 17.34 to Fr. 12.19.

Source: Swiss National Bank Archive

Perhaps more importantly, the discount on sterling compressed significantly following devaluation and remained comparatively compressed throughout the remainder of 1949 and through 1950 (Figure 39 and Table 39). A cable from the NYFRB dated 28 November, 1949 notes that considerable pressure on sterling in the market in August and September led the NYFRB to not to sell any sterling.⁵³⁵ However, from 19 September onward the downward pressure on sterling in New York abated. In the case of the U.S. dollar-free sterling exchange rate, the size of the discount shrunk dramatically, from a minimum discount of 23.5% in the period prior to devaluation to 8% by 1950.⁵³⁶ For the Swiss franc-free sterling exchange rate (an exchange rate which Hawtrey and Cairncross do not discuss) the discount compressed by a similar amount, 7%, immediately following devaluation.⁵³⁷ The compression observed in free sterling's discount matches the findings

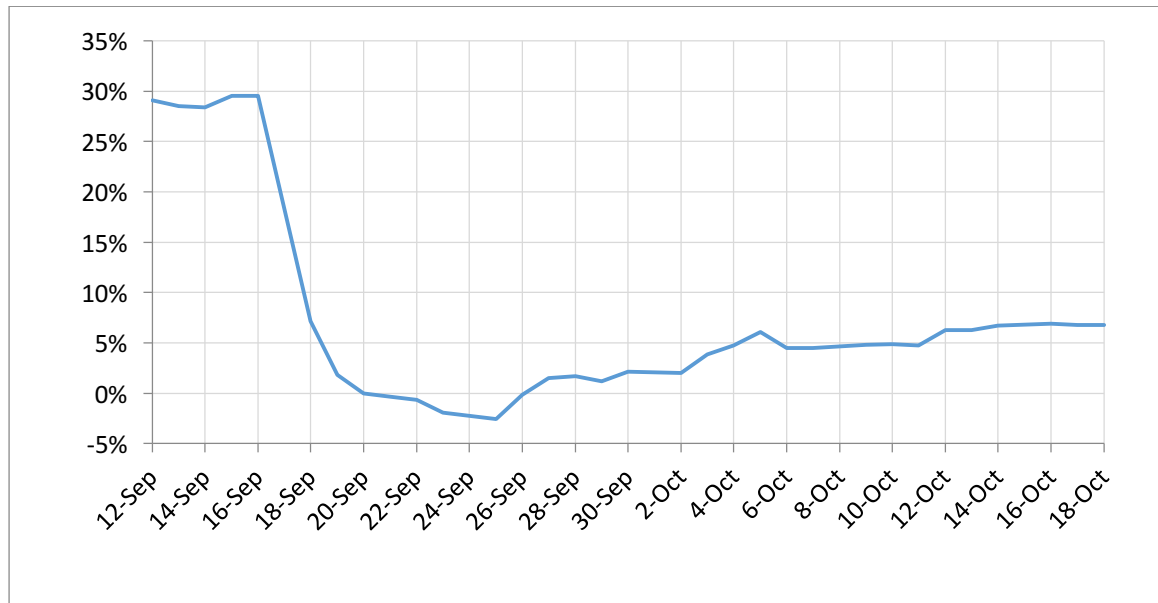
⁵³⁵ OV31/109 10b, Bank of England Archive

⁵³⁶ (Cairncross & Eichengreen, 2003, p. 115, note 12; Pick, 1955)

⁵³⁷ Devisenhefte 9.6/9122, Swiss National Bank Archive, 1942-1950

of more recent studies of developing country black market exchange premia following devaluation.⁵³⁸

Figure 39: Discount (%) on 'Free' Sterling to Official CHF Fr. Rate, Zurich, Sept.-Oct. 1949



Source: Swiss National Bank Archive

Table 39: CHF Fr./Free Sterling £ Exchange Rate, Monthly Average, Zurich Market, 1949

Month	Fr. / £		
	Market	Official	Discount
April	12.66	17.34	27.0%
May	12.25	17.34	29.4%
June	11.94	17.34	31.1%
July	11.46	17.34	33.9%
Aug.	11.13	17.34	35.8%
Sept.	11.50	15.24*	24.5%
Oct.	11.33	12.19	7.1%

*Note: average based on devaluation on 19 September from 17.34 to 12.19

Source: Pick's Currency Yearbook (1951)

⁵³⁸ (Agénor, 1991; 1992, p. 22)

5.6 Conclusion

This paper has introduced new daily time series data and archival evidence on free currency markets in the 1940s. These markets provided a market perspective during a time period characterized by significant regulation of the financial system and economy, and this paper has shown how free currency markets responded to events during the 1940s. The new data clarify several points in the literature, including how much did free sterling's discount reflect its underlying value, and why British policymakers may have chosen \$2.80 instead of \$3.00 for the September 1949 sterling devaluation.

Britain's efforts in the post-Second World War period to maintain sterling's inflated exchange rate against the U.S. dollar and other hard currencies ultimately proved futile. However, what is less clear is whether these efforts were on balance worthwhile. In other words, would Britain have been better or worse off devaluing sterling sooner than September 1949? In addition, given sterling's follow-on devaluation in 1967, should Britain have devalued sterling by an even greater amount in 1949? These and other important research questions about the effects of devaluation on economic growth and financial stability remain for further study.

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Appendix 1 Dates and Descriptions of Key British Historical Events, 1939-50

The following list of events was compiled prior to carrying out statistical tests to compare dates in the 1940s deemed important by historians with the results of the tests. Emphasis here is given to policy and economic/financial events rather than prominent wartime events (e.g., battles), which have generally well known dates (e.g., commencement of the Battle of the Bulge on 16 December, 1945).

Date	Event	Summary
Nov-39	'How to pay for the War' published by Keynes	Described the 'inflationary gap' (aggregate demand exceeding aggregate output at current prices) which would emerge. To ensure war supplies and limit inflation, Keynes argued for taxation to reduce private consumption, encouraging saving, and rationing. In addition to taxation he recommended a system of deferred pay which would be accredited in the form of blocked deposits in friendly societies or other approved savings accounts, to be released post-war when the depression arrived and the budgetary impact ameliorated by a capital levy. 'Thus the system of deferment will be twice blessed; and will do almost as much good hereafter as it does now in preventing inflation and the exhaustion of scarce resources (Crafts & Woodward, 1991 p. 65-66; Keynes 1940, p. 405)
1941	Keynes elected to Bank of England court (Fforde p. 41)	Keynes supranational agenda fit with American elite views (e.g., Hanse-Gulick proposals) but clashed with British concerns (Fforde p. 35) and Congress (p. 49) Cared and put effort into winning over Bank of England that Clearing Union was not inimical to management of Sterling Area (p. 44). Correspondence with Norman, etc. Bank of England's expressed concerns about the practical difficulty of the scale and time span of transitioning to the Keynes' proposal were born out.
1941	First 'Keynesian budget' by Sir Kingsley Wood	(Crafts and Woodward, 1991 p. 66)
14 August, 1941	The Atlantic Charter	Articles IV and V of the Charter declared support for access by all countries 'on equal terms, to the trade and raw materials of the world' and for the fullest collaboration with the 'object of securing for all improved labour standards, economic advancement, and social security'. (Fforde p. 35)
Sep-41	'Export White Paper'	

Date	Event	Summary
Sep-41	Post-war financial planning begins in Britain	Treasury and Bank of England already planning post-war financial questions with papers by Keynes and Hubert Henderson, of which Keynes outlined the policy framework from which he would not deviate 'til his death: a critique of laissez-faire, proposed an International Clearing Union with quotas, overdraft rights, disciplinary procedures for credits and debtors, and an outline for post-war relief and reconstruction financing (Fforde p. 36). Bank of England's proposal for post-war order came to be known as 'key-currency approach' which built on the 1936 Tripartite Agreement vs. Keynes' 'new-institution approach' (Fforde p. 39)
Dec-41	Lend-Lease	
Dec-41	Post-war financial planning begins in U.S.	Treasury Secretary Morgenthau asks Harry Dexter White (Treasury deputy) to begin work on what was to become Bretton Woods
2 February, 1942	White paper 'Employment Policy'	(Cmd. 6527) is the first time the government accepts 'as one of their primary aims and responsibilities the maintenance of a high and stable level of employment after the war' (p. 3) (Crafts and Woodward, 1991 p. 66)
1942	Mutual Aid Agreement, Article 7	Linked wartime aid with peacetime arrangements. In return for aid Britain should render vague but appropriate benefits to the U.S. 'which the President deems satisfactory'. This clause came to be known as 'The Consideration' and related to commercial activity, freeing up trade restrictions, etc. (Pressnel 1985, pp 4-5) (Fforde, p. 35)
Feb-43	Sterling conversion proposal	White plan conveyed idea of converting Sterling Balances to long-term IMF obligations
1943	Sterling Area Dollar Pool established	Was kept in place after the war. Purpose was to conserve dollars by imposing licensing restrictions on dollar imports. Rule required members to deposit excess dollars and gold at Bank of England (Cairncross and Eichengreen 1983, pp 25)
1944	Montagu Norman retires from Bank of England	After an extremely long stewardship Norman steps down at age 72 due to illness. Regular illness throughout his career.

Date	Event	Summary
1944	Beveridge's 'Full Employment in a Free Society' published	In contrast to 'Employment Policy' argued for a specific unemployment rate (a low 3%, deemed unachievable by Keynes).
September 1944	Octagon Meeting in Quebec	Roosevelt & Churchill, to clarify Lend-Lease for final stages of War (details ironed out by 'Combined Committee in WA DC Oct.-Dec. 1944) but no agreement on end of Lend-Lease and its post-war replacement.
Feb-45	Yalta	
Mar-45	Keynes paper on 'Overseas Financial Policy in Stage III'	Use of imaginative characterizations of various options, such as 'Justice', 'Starvation Corner' (making do without American aid), 'Temptation' (accepting U.S. help on onerous terms).
Jul-45	Potsdam	
7 May, 1945	V-E Day	
26 July, 1945	Labour Party wins general election	Surprise result
14 August, 1945	V-J Day	Quick end of Second World War was unexpected (Germany's surrender was forecasted, but not Japan's). Abrupt end of Lend-Lease, and with it two-thirds of the funding for the external deficit, which totalled £10 billion over the war's six years. Industrial reconstruction was deemed in urgent need, and many felt central planning of investment post-war was the most effective way to quickly rebuild.
20 August, 1945	Mutual Aid' from Canada and U.S. ends	Just six days after V-J day (14 August)
20 August, 1945	1946-47 deficit projections	Budget deficit of \$7 billion nearly doubled from the year earlier estimate; trade deficit £500-£700 million (Fforde p. 52)
Sep-45	Anglo-American financial negotiations commence in Washington	British delegation led by Keynes but contrary to other recent delegations no Bank of England official was a part of Keynes' party.
Dec-45	Anglo-American Financial Agreement (U.S. Loan) terms agreed upon	

Date	Event	Summary
10 December 1945	Siepmann's Committee Report	Bank of England reject as impracticable the idea that Colonial Governments should somehow be directed to conscript private balances, but it suggested that a quantity of official balances might be freed, and become available for 'adjustment' by cancellation or funding, through a uniform reduction of note cover to 80%. The Report also pointed out that a number of Colonial Governments had made interest-free loans to the UK during the war, which could be written down as part of a post-war settlement. In short, any material adjustments to the £3 billion in sterling balances would have to come from India's and Egypt's balances, which had been swollen by wartime expenditures in those countries. However, "the ethical case for cancellation of war debts to India and Egypt was not accepted by local opinion". (Fforde, p. 89-91)
15 January, 1946	Keynes note on 'Sterling Area Negotiations'	Calculated a larger sterling balance than Bank of England's. Like Harry Dexter White, was always predisposed to "conducting major surgery" on Sterling Balances. Proposed devaluing Indian and Middle East currencies by 30%.
30 January, 1946	Official Committee on Sterling Area Negotiations meets for the first time	
5 February, 1946	Keynes note on sterling balances	The 'bankers ramp' of 1931 was mostly attributable to 'the reckless accumulation of liabilities in the immediately preceding years which we could not hope to meet when the tide turned. I think we must ration ourselves this time on the extent to which we use the bankers' bluff as a means of supporting (temporarily) the prestige of sterling. I plead that this is not a case where we can muddle through without a drastic solution, grasping no nettles and just hoping it will be all right on the day'.
12 February, 1946	Meeting of the Sterling Area Committee	Keynes proposes a unilateral blocking of all sterling balances to trigger a crisis leading to an across the board devaluation of 33% for all sterling area countries. This idea was rejected as Keynes writ had been impaired by the loan negotiations. (Fforde, p. 94).

Date	Event	Summary
15 July, 1946	Anglo-American Financial Agreement (U.S. Loan) ratified by U.S. Congress	Loan was intended to last for three years; over half the facility was tapped within a year.
1946	Labour Party takes office	
21 April, 1946	Keynes dies	Otto Clarke "His death leaves the Treasury in a terrible hold. Keynes has been the Treasury over the last few years; he has determined policy, spurred on the other officials by criticism and help, conducted the major negotiations. This dependence has been good in some respects; it has been bad in others for it has prevented the officials from developing an individual technique of thought. He has been the brains and conscience." Improved harmony between Bank of England and Treasury (Fforde, p. 95).
Apr-46	Sterling balances projections	Spring 1946 - Bank of England and Treasury calculations determined that < £100-60 million in the £3 billion in sterling balances could be released per year over the next five years. Fforde p. 106
Jul-46	Bank of Canada shares intel with Bank of England	Shared intel with Bank of England on the £150-175 million of freely usable Indian reserves which was used to plan Britain's 'tying up' sterling balances negotiation with India (Fforde, p. 109)
Aug-46	Bank of England nationalized	Act 'formalized' the Bank's relationship with Treasury, although some argued at the time best not to mess with success. "Controversial" Clause 4(3), originally proposed by the Treasury, instituted which gives the Bank power, with the approval of the Treasury, to govern the proportion of commercial bank assets (Fforde, pp 7).

Date	Event	Summary
Sep-46	Argentina bilateral negotiations	Financial repression or good negotiating? Argentina sterling loan terms: .5% interest on Argentina's loan to Britain; only £5 million per year of sterling allowed to be released per year; British owned railroads transferred an Anglo-Argentine entity which would pay a 4% dividend guaranteed by the Argentine government; Britain purchases exportable surplus Argentine meat for two years at 45% above pre-war level. (Fforde, p. 106) Waley: "Our strongest argument is that it is in the interest of all countries which hold sterling that the position of sterling should be maintained. Our weapon is that we can completely block the existing balances, but it is a weapon which it would greatly damage us to use, and the other countries will know this quite well. There is no disguising the fact that the next twelve months will be a very stormy time." (Fforde, p. 108)
10 October, 1946	Newspaper articles	Article by Oscar Hobson on Clause 4(3) pitting bank directors against shareholders and customers. Other articles from the Telegraph, Daily Herald, WSJ (Fforde p. 19, p. 26-27)
Dec-46	European Union of Federalists founded	
Dec-46	Sterling Area held balances reached £3.7 billion	Sterling balances held in 'Sterling Area' were £3.7 billion, or 65% of all externally held balances. (Cairncross and Eichengreen 1983, pp 24,)
16 April, 1946	Anglo-Swiss Monetary Agreement	
Mar-47	New Zealand forgives some £10 million debt, Australia £20 million	
1947	Exchange Control Act	Restricted external loans (Cairncross and Eichengreen 1983, pp 22)
Apr-47	Egypt bilateral negotiations	Import/export trade financing restrictions intimated (Fforde p. 117)

Date	Event	Summary
Jun-47	Dalton Egypt ultimatum	Threatens to block all Egypt sterling balances. Egypt relents and ceases to be a member of the Sterling Area. However, Egyptian 'ace' was to insist on dollar payments from Britain's Egypt/Suez Canal based military which would amount to almost \$80 million for 1948. Britain relented: could no longer compel Egypt through military force, but also couldn't surrender control of the Suez. (Fforde p. 117)
5 June, 1947	Marshall Plan proposed at Harvard, but Congress had not yet approved	invitations sought from European governments for proposals
15 July, 1947	Beginning of the convertibility crisis	Loan Agreement with the U.S. promised convertibility of sterling by mid-1947. Trade was conducted with non-sterling countries largely on a bilateral basis until the introduction of the EPU in 1950." (Cairncross 1995). Was it inevitable? "Disaster" (Fforde p. 35)
21 August, 1947	Sterling convertibility suspended	The plan for convertibility was known as 'Operation Gearcrash' inside the Bank of England. Disaster predicted by Bank officials; marked the end of the Loan Agreement strategy (Fforde, pp. 159-160)
Jan-48	First French devaluation of franc from 119 to 214	Free franc rate was apparently more than 300 francs, and trade could be exchanged half at the official rate and half at the free rate, making the effective exchange rate with the U.S. 264 (Eichengreen, Global Cap, p. 102)
1948	First voluntary income policy	Ensured wage increases were kept well below inflation. Labour Government used its close relationship with trade union movement to exercise wage restraint (Woodward p. 191).
Apr-48	Organization for European Economic Co-operation established	Established to coordinate distribution of U.S. money (George p. 4)
May-48	UEF Congress in The Hague	Churchill speaks in favour of European unity (George, p. 2)
July-48	First tranche of Marshall Aid begins to flow to Britain in 2nd half of year	

Date	Event	Summary
Aug-48	Australia forgives a further £8 million in debt	
Aug-49	The City widely expected devaluation	<i>The Banker</i> , August 1949, p. 71
18 September, 1949	Sterling devaluation	By 31% from \$4.03 to \$2.80. IMF only given 24 hours' notice.
25 September, 1949	23 additional countries devalue within a week	7 more follow the 23 later. Barry says on the franc, yen, \$, and some Latin American countries didn't devalue, but Pick reports the franc was devalued against \$
25 Sept., 1949	Second French devaluation to 264, to unify franc's official and free exchange rate	IMF decree, France humiliated. But stabilized French reserves and allowed for some liberalization such as take notes out of the country (Eichengreen, <i>Global Cap</i> , p. 102, 104)
1950	Sterling balances had fallen to 50% of post-war level	(Cairncross and Eichengreen, p. 26)

6 Alternative Currencies: A Historical Survey and Taxonomy

Abstract: Alternative currencies, which are defined as any non-legal tender medium of exchange, have been a regular and sometime prolific feature of the economic landscape for at least the last half-millennia. Alternative currencies often arise out of similar socio-economic circumstances and then cease to circulate within a relatively short period of time. Regulatory shifts and technology shocks account for some of the challenges that alternative currencies have faced in gaining wider adoption. However, the most commonly observed explanation for why alternative currencies decline is insufficient demand due to relatively high transaction costs, low institutional support, inconsistent social motivation, and other factors. Present-day alternative currencies, such as bitcoin and the Brixton pound, feature similarities and differences as compared to past alternative currencies. Bitcoin in particular possesses several radical new characteristics, including a relatively decentralized structure, efficient cross-border transactions, global brand awareness, support from powerful institutions, and a growing interest in the many non-currency applications of its underlying ledger technology.

JEL: E40, E42, E49, E50, E51, E58, E59

Keywords: money, currency, currencies, black market currencies, national currencies, parallel currencies, alternative currencies, community currencies, crypto-currencies, digital currencies, virtual currencies, Brixton pound, bitcoin, blockchain

6.1 Introduction

In an influential 1974 paper economist Benjamin Klein stated “few areas of economic activity can claim as long and unanimous a record of agreement on the appropriateness of governmental intervention as the supply of money”.⁵³⁹ However, the growth of new types of alternative currencies like bitcoin is leading to a re-examination of this view and prompting questions about the possible use of alternative currencies alongside, or even as a substitute for, national currencies.⁵⁴⁰ While bitcoin, having first been introduced in October 2008, is relatively new, alternative currencies have been a feature of the monetary landscape for the last several centuries (and perhaps much earlier).⁵⁴¹

From preservation work by numismatists, archivists, and others we know that a significant number of alternative currencies have been in circulation throughout the early-modern and modern period.⁵⁴² For example, during the 16th-18th centuries there were hundreds, if not thousands, of unique merchant tokens circulating within London alone. More recently, prior to the introduction of bitcoin it was estimated that there were approximately 4,000 alternative currencies in existence; since bitcoin began circulating in January 2009 more than 600 additional crypto-currencies alone have been created.⁵⁴³

This paper surveys the history of alternative currencies to address three research questions: i) What factors explain the rise of alternative currencies? (e.g., do alternative currencies tend to proliferate under common circumstances, such as similar socio-economic and or political conditions?) ii) Why do alternative currencies tend to decline shortly after their introduction and do exceptions to this pattern exist? iii) How similar or

⁵³⁹ (Klein, 1974, p. 423)

⁵⁴⁰ For example, in a 18 November 2013 statement delivered to a U.S. Senate hearing on Bitcoin, Chairman of the Federal Reserve Ben Bernanke stated that virtual currencies "may hold long-term promise" <http://qz.com/148399/ben-bernanke-bitcoin-may-hold-long-term-promise/>.

⁵⁴¹ There is some evidence of currency token use in Greek and Roman times (Burns, 1927, Ch. 12)

⁵⁴² For example, the British Museum in London possesses one of the foremost collections of historical alternative currencies.

⁵⁴³ The estimate of 4,000 alternative currencies around the globe is from (Lietaer, 2004). According to the website www.conimarketcap.com as of April 2015 there were approximately 600 crypto-currencies, the majority of which had non-negligible market capitalizations.

different are contemporary alternative currencies compared to historic ones, and what does history suggest about the prospects for contemporary alternative currencies such as bitcoin and the Brixton pound?

The remainder of the paper is structured as follows: in section 6.2 a conceptual discussion of money and alternative currencies and a currency taxonomy is presented. In section 6.3 survey of the history of alternative currencies in North America and Europe over the past 500 years is conducted. Section 6.4 concludes. Throughout the paper some of the most common questions around contemporary alternative currencies are addressed, including whether bitcoin should be considered money, and how is bitcoin both different and similar to other alternative currencies.

6.2 Money and currency – a conceptual framework

Today a common yet somewhat bedeviling question is whether alternative currencies such as bitcoin should be thought of as *money*, a *currency*, both, or something entirely different. Bitcoin is also simultaneously referred to as a *crypto-currency*, *digital currency*, *virtual currency*, and *alternative currency*. These questions and differences in terminology have resulted in a great deal of confusion. However, the existing monetary literature lacks an appropriate framework for classifying bitcoin and other types of monetary instruments.⁵⁴⁴ The purpose of this section of the paper is to help clarify what is meant by terms such as money, currency, and alternative currency. Achieving definitional clarity is essential to conduct focused research; the lack of a common, shared taxonomy makes the study of currencies cumbersome and difficult to follow for scholars and non-scholars alike. The taxonomy introduced below will also serve to link the terms and definitions used in this paper to the terminology used in the existing literature, and will also help clearly answer questions such as whether bitcoin should be considered a form of money.

6.2.1 Money – a definition

The effort of scholars to arrive at a precise and shared definition of money has yielded mixed results. Definitional clarity has been achieved in some financial areas, such as the distinguishing between money and *credit*. As noted by Dwyer (1996), “even though a credit card can be used to make purchases, neither a credit card nor its unused balance is money. When someone uses a credit card to buy a dinner, the purchaser is promising to pay later with money”.⁵⁴⁵ However, Mankiw and Taylor (2011), authors of one of the leading economics textbooks, state “in a complex economy, it is in general not easy to draw a line between assets that can be called ‘money’ and assets that cannot”.⁵⁴⁶ This uncertainty over what is and is not money traces back over many centuries. Some have

⁵⁴⁴ See (Dwyer Jr, 1996, p. 3) for further commentary on the confusion surrounding the definition of money.

⁵⁴⁵ (Dwyer Jr, 1996)

⁵⁴⁶ (Mankiw & Taylor, 2011, pp. 619-621)

argued for an *a priori* definition of money.⁵⁴⁷ Others contend that money should simply be considered as an accounting convention and defined on the basis of efficiency and utility.⁵⁴⁸ Arguably one of the more elegant definitions of money was the one offered by Kocherlakota (1998), who long before the existence of bitcoin's blockchain ledger stated that "money is memory".⁵⁴⁹ In other words, if a shared and perfect memory of money existed then there would be no need for notes or ledgers; our collective memory of all transactions and balances would be sufficient.

If one opens any leading contemporary economics textbook they will find that *modern money* is defined as performing the following three functions⁵⁵⁰:

1. *Medium of exchange* – for transacting goods and services, solving 'double coincidence of wants' problem.
2. *Store of value* – retains purchasing power into the future.
3. *Unit of account* – a yardstick; the unit in which goods and services are priced.

Some argue that these three functions of money can be defined hierarchically (Figure 40). According to Ali et al (2014):

"There are many assets that people view as a store of value – houses, for instance – that are not used as media of exchange. By comparison, an asset can only act as a medium of exchange if at least two people (as parties to a transaction) are prepared to treat it as a store of value, at least temporarily. Finally, for an asset to be considered a unit of account, it must be able – in principle, at least, to be used as a medium of exchange across a variety of transactions between several people and as such represents a form of coordination across society. For this reason,

⁵⁴⁷ See for example (Friedman & Schwartz, 1970, Ch. 2-3) and (Schumpeter, 1991)

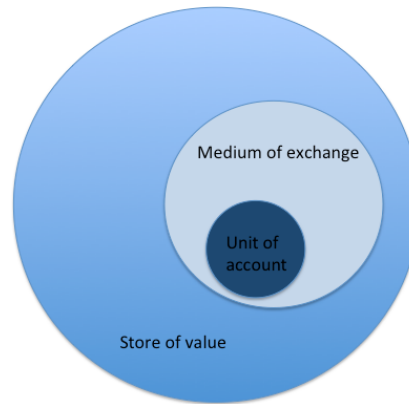
⁵⁴⁸ (Newlyn, 1971, p. 6)

⁵⁴⁹ (Kocherlakota, 1998)

⁵⁵⁰ See for example (Lipsey & Chrystal, 2011, pp. 448-449; Mankiw & Taylor, 2011, p. 618). For a discussion of the differences between modern and some historical forms of money see (Fantacci, 2005, p. 3), who states "in the *ancien régime* there were two different kinds of money: *ideal money*, which was used as a unit of account, and *real money*, used as a medium of exchange".

some economists consider the operation as a unit of account to be the most important characteristic of money.”⁵⁵¹

Figure 40: Hierarchical Depiction of the Three Functions of Money



Source: Ali et al (2014)

The above textbook definition of money, while undeniably useful and generally agreed upon, is too abstract to provide definitive answers to questions such as whether bitcoin should be considered money. For example, should *breadth of use* be weighed in determining whether an instrument such as bitcoin meets the definitional criteria of serving as a medium of exchange? Or instead, as soon as something serves as a media of exchange for the first time we should consider this definitional requirement satisfied? Going further, does the particular instrument in question need to be *dominant* in all three monetary functions within a particular geographical or state boundary to be considered money? Or instead, if a non-dominant level of use across a given geography can still qualify an instrument to be considered money then precisely how much use? Also, how *stable* should the value of the instrument be, and against what should its stability in value be measured, for it to meet the definition of serving as store of value? Or instead, should we say that it meets this definition so long as the instrument maintains at least some value? The existing literature does not attempt to address such questions.

⁵⁵¹ (Ali, Barrdear, Clews, & Southgate, 2014)

It is argued in this paper that the above widely accepted textbook definition of money can be made more useful by introducing reference benchmarks. In other words, comparing two monetary instruments against each other can help us answer questions about how well an instrument meets the generally accepted definition of money. For example, bitcoin today in various ways fulfils all the traditional functions of money, including serving as a unit of account for some organizations and online marketplaces. However, when comparing bitcoin to the U.S. dollar it can be definitively said that the U.S. dollar is the more widely used unit of account, as well as the more widely used medium of exchange, and that therefore the U.S. dollar is superior to bitcoin as a form of money with regard to these two monetary functions. Further, by comparing the two over some period of time against a clearly defined and agreed upon measure of value we could also say which of the two is a better store of value. While the introduction of such comparative reference benchmarks cannot settle the question of whether or not bitcoin is money based on the traditional definition of money, this comparison can make clear which instruments perform the different functions of money in a superior manner.

6.2.1a Differences between money and currency

The primary definitional question of importance for this paper is in what way if any do *alternative currencies* differ from *money*. Relatedly, should we define *currency* as something different from money? When we think of currency we most commonly think of metal coins and paper notes minted by governments. Generally speaking, these *national currencies* retain value from day-to-day (store of value), can be legally exchanged to meet obligations and transact (medium of exchange), and are used to denominate prices for goods and services (unit of account). In such a way national notes and coins meet the traditional definition of money. However, national currencies are not the only type of currency.

As noted earlier the currency literature can be somewhat confusing due to the inconsistent terminology used. For example, economists will sometimes refer to a currency that is used in some illegal manner as a *parallel currency* (or as the 'parallel

market') rather than a *black market currency*.⁵⁵² It is true that such currencies often circulate alongside (or in parallel) to a nation's legal tender. However, there are compelling arguments to instead refer to any illegally used currency operating alongside an official currency as a black market currency rather than a parallel currency. For example, the term parallel currency is commonly used to describe some legal (non-black market) currencies. For example, at the turn of the 21st century European national currencies, such as the Italian lira and Portuguese escudo, were legally operating alongside the newly introduced euro during the phased transition to the euro and were referred to as parallel currencies. Today, many who are advocating for the return of national legal tender currencies to operate alongside the euro in countries struck by crisis, such as Greece, refer to these 'Greek euros' (or 'new drachma') as a parallel currency.⁵⁵³ In sum, while a black market currency may also be functioning alongside another currency, not all such parallel currencies are illegal.

Why do some substitute the term 'parallel' for what can more accurately be described as 'black market' currency? One possibility is for reasons relating to political 'optics'; some researchers and policymakers working closely with countries may favour using the term parallel over black market currency as the use of the latter may attract undesirable scrutiny. For example, black market currencies, while illegal, may often be tolerated for various reasons (e.g., black market exchange rates can often provide useful market-based information). While it may be necessary for policy-related work to continue to use a particular terminology, for academic research purposes it would be useful to arrive at a generally agreed upon classification scheme for different currency types.

6.2.2 Currency taxonomy

This paper presents a currency classification framework that identifies five distinct currency types - national, parallel, adopted, black market, and alternative. These five currency types are organized into two overarching categories – *legal tender* and *non-legal*

⁵⁵² See for example (Agénor, 1992)

⁵⁵³ See for example (Feldstein, 2010)

tender. This framework along with summary definitions and examples is presented in Table 40.

Table 40: Five Different Legal and Non-Legal Tender Currencies

	Type	Description	Examples	
			Historical	Contemporary
Legal Tender	National	Currency minted and or legally designated by a central government for use as legal tender	U.S. National Banks Era (1863-1913)	U.S. dollar, Euro, Pound Sterling, Yen
	Parallel	Multi-currency system; two or more currencies used alongside each other	Bimetallic currency system (gold and silver); Swiss franc split exchange rate markets (late-1940s)	1999-2002 pre-euro national currencies; Panama's use today of U.S. dollar banknotes and national balboa coins
	Adopted	Foreign currency used as the dominant official (or <i>de facto</i>) currency	19th century Maria Theresa Dollar used in Africa	U.S. dollar in Ecuador and Panama; Euro in Montenegro
Non-Legal Tender	Black Market	Illegal (yet often tolerated); also legal tender exchanged at an illegal rate that often differs significantly from the officially set rate	1940s 'Free' British £ in Zurich and NY	U.S. dollar in Argentina ("blue dollar" rate)
	Alternative	Legal (or tolerated); neither minted by a central government nor serves as official (or <i>de facto</i>) legal tender	1932 Austrian Freigeld; 17 th -19 th century British merchant tokens	Bitcoin, Brixton pound

Most countries today have *national* currencies (e.g., U.S. dollar) that serve as legal tender. National currencies are the most common form of legal tender and are also typically the dominant currency, meaning they face very little if any competition from other currencies within the borders they serve as legal tender. In a small number of cases foreign legal tender has been *adopted* as the official domestic currency. For example, Montenegro has adopted the euro, and Ecuador and Panama currently use the U.S. dollar as their official currency. Panama started using the U.S. dollar in 1904 and Ecuador adopted the U.S. dollar in 2000, and both are part of a group of ten countries that have officially adopted the U.S. dollar.⁵⁵⁴ While both Panama and Ecuador have adopted U.S. banknotes as the exclusive paper currency, both countries mint for circulation their own national coins for use alongside, or in *parallel*, to U.S. coinage.⁵⁵⁵ A parallel currency is thus any legal tender currency in use alongside one or more other currencies. Historical examples of parallel currencies include the many gold and silver bimetallic monetary systems; one of the earliest recorded examples of a parallel currency system took place when copper and silver circulated alongside one another in Ptolemaic Egypt in 220 B.C..⁵⁵⁶

Looking at non-legal tender currencies, a *black market* currency exists when a government imposes legal restrictions on the use of a currency but is unable (or unwilling) to enforce those restrictions. Another example of a black market currency is when the government is unable (or unwilling) to enforce an official exchange rate that differs significantly from the market rate. For example, due to the persistent inflation and devaluation of the Argentinian peso, the U.S. dollar is widely used today by Argentinians to store value, transact goods and services, and for setting prices. In response to this development the Argentinian government has placed legal restrictions on the use and transfer of the vast quantity of U.S. dollar banknotes in Argentina.⁵⁵⁷ However, these rules have not prevented U.S. dollars from continuing to circulate

⁵⁵⁴ A number of dependencies also use the U.S. dollar exclusively, including Bonaire, British Indian Ocean Territory, British Virgin Islands, Saba, Sint Eustatius, Turks and Caicos Islands.

⁵⁵⁵ Other countries that circulate their own national coins or notes alongside the U.S. dollar include Zimbabwe, Micronesia, and Palau.

⁵⁵⁶ (Reekmans, 1949)

⁵⁵⁷ (Judson, 2012) It has been estimated that more than \$50 billion in U.S. dollar banknotes circulate inside Argentina's borders. See also <http://www.businessweek.com/articles/2013-05-15/argentina-hold-more-than-50-billion-in-u-dot-s-dot-currency-dot-heres-how-we-know>

widely in Argentina. The U.S. dollar, which is legal to use in many other parts of the world, can therefore be considered a black market currency in Argentina. A historical example of a black market currency similar to Argentina's use of the U.S. dollar was the case of 'free' British sterling banknotes that were traded in London, New York, Zurich, and other financial centres in the 1940s at a substantial discount to the official exchange rate. The British outlawed and actively sought to tamp down the exchange of sterling at anything other than the official rate during the 1940s. However, these efforts were largely unsuccessful until sterling was officially devalued to more closely match the free market rate.⁵⁵⁸

An alternative currency is any instrument that serves as a medium of exchange that is not illegal, or minted or officially designated as legal tender by the central government. For alternative currencies it is important to highlight the distinction drawn here between legal tender minted by a central government and currency minted or sponsored by a regional or other local government (e.g., municipalities). Throughout history regional and local governments have often been involved with the issuance of what are often called *local* currencies.⁵⁵⁹ When evaluating whether such a local currency should be considered an alternative currency a simple definitional test can be conducted: can the local currency be used to pay for goods and services throughout the country, or pay taxes levied by the central government? Local government sponsored alternative currencies typically cannot be used beyond the municipality's geographical boundaries or to pay central government taxes, and they can therefore be considered as an alternative currency.

Not everyone uses the term 'alternative currency' in the same way it is defined in this paper. For example, Amato et al (2003) place 'alternative', 'competing', 'local', and 'community' currencies all under the heading of *complementary currency*.⁵⁶⁰ Practitioners as well as scholars have also used other terms, such as *scrip*.⁵⁶¹ Recently regulators and other officials have simultaneously used terms such as *digital* and

⁵⁵⁸ (Hileman, 2012)

⁵⁵⁹ (Gatch, 2012)

⁵⁶⁰ (Amato et al., 2003, p. 2) Amato et al incorrectly reference Hugh-Jones (1950) as a work on 'loyalty points' as a private currency when in fact Hugh-Jones's paper is on government points used for rationing goods during the 1940s.

⁵⁶¹ See for example (Harper, 1948, p. 13)

virtual to describe new ‘math-based’ currencies or ‘cryptocurrencies’, like bitcoin.⁵⁶² In summary, there is a lack of consensus around the appropriate terms and definitions for alternative currencies

The many different terms employed to describe the various instruments defined in this paper as alternative currencies may have as much if not more to do with the marketing of such instruments than any effort to achieve definitional clarity. For example, terms like ‘complimentary’ may help place a particular currency in a more favourable light with both users and regulators. However, the myriad of competing terms in use can be confusing, or even inaccurate in some instances. For example, the ‘complementary’ term is often meant to connote the idea that a particular currency is not intended as a substitute for national currency, and this connotation would seem appropriate for currencies like the Brixton pound that are fundamentally linked to and dependent upon British sterling.⁵⁶³ However, other alternative currencies, like bitcoin, are not necessarily complimentary or similarly dependent as the Brixton pound upon a national currency.⁵⁶⁴ Other problematic examples include the use of the term ‘digital’ to distinguish bitcoin from other currencies, as digital can also apply to the digital form of national currencies like the U.S. dollar. Further, the term ‘virtual’ may be better reserved for currencies like the Linden dollar that operate in virtual reality environments than applied to bitcoin, which serves as a medium of exchange for non-virtual goods and services. In sum, the term ‘alternative currency’ is suitably general to encompass instruments such as bitcoin and the Brixton pound, whereas terms such as ‘local’, ‘complimentary’, and ‘virtual’ are useful for distinguishing between different types of alternative currencies.

Several currencies are difficult to classify within the currency framework presented in Table 40, such as the case of Cyprus following the March 2013 imposition of capital controls. Did ‘Cypriot euros’, which had legal restrictions limiting their international movement and exchange into other currencies, meet the parallel

⁵⁶² The Bank of England refers to bitcoin as a ‘digital’ currency (Ali et al., 2014) while the New York Department of Financial Services and U.S. Treasury refer to bitcoin as a ‘virtual’ currency.

⁵⁶³ The Brixton pound has a 1:1 exchange rate with British pound sterling, and sterling that has been exchanged for Brixton pounds is held at the Brixton Credit Union (London Mutual Credit Union).

⁵⁶⁴ Indeed, many bitcoin proponents would like to see it substitute for and ultimately supplant national currencies.

currency definition? Cypriot euros, like all other non-Cypriot euros, could be legally used in Cyprus for the purchase of goods and services. However, unlike other euros, most Cypriot euros could not legally be used in other Eurozone countries to purchase goods and services. This limitation made a Cypriot euro, in principle, less valuable than non-Cypriot euros. Based on the framework presented in this paper the Cypriot euro should be considered a parallel currency because non-Cypriot euros could be used alongside Cypriot euros inside Cyprus.

Looking further back into history we find other currencies that present classification challenges, such as the various banknotes that existed during the so-called 'free banking' period in the United States during 1837-1862.⁵⁶⁵ During this period banks issued their own currencies that were redeemable at the issuing bank for specie at par. These banknotes could be exchanged for goods and services as well as for banknotes issued by other banks. However, the exchange rates on banknotes often depreciated the greater the distance they were transacted from the issuing bank.⁵⁶⁶ How should such U.S. free banking notes be classified? In terms of the government's role in the free banking period, banks were required to meet certain legal obligations to issue banknotes, such as purchasing municipal bonds and then depositing those bonds with the state. However, most state governments did not enforce banknote-to-specie convertibility. Klein (1974) provides the following description:

“private bank notes...were all denominated in dollars, where ‘dollar’ denoted a particular weight of gold”; this period could thus be described as “much closer to multiple monies circulating at fixed exchange rates than to multiple monies circulating at flexible exchange rates”.⁵⁶⁷

Of note, the instances of alternative currencies declined dramatically during the ‘U.S. Free Banking’ period.⁵⁶⁸ Whether antebellum banknotes should be classified as a national, parallel, alternative, a combination of the above, or some altogether different currency type is open to debate. Similar classification challenges are confronted when examining Scottish and other free banking systems found during the 17th-19th

⁵⁶⁵ For a discussion of whether the term 'free banking' is appropriate for this period see (White, 2015)

⁵⁶⁶ Bank note exchange rates were published in newspapers and other reports. For more on the price differences see (Calomiris & Schweikart, 1991; Dwyer Jr, 1996, pp. 5-6; Gorton, 1996, p. 348)

⁵⁶⁷ (Klein, 1974, pp. 439-440)

⁵⁶⁸ (Harper, 1948, p. 16).

centuries.⁵⁶⁹ In sum, the classification challenge presented by U.S. Free Banking notes and the Cypriot euro illustrate some limitations with the currency classification framework presented in this paper. However, the vast majority of currencies fit within the Table 40 framework.

6.2.3a Four different alternative currency types

There are at least six different types of alternative currencies, and these six currencies can be grouped into two overarching categories - *tangible* and *digital*.⁵⁷⁰ This alternative currency classification framework is presented in Table 41 and Table 42.

Table 41: Tangible Alternative Currency Classification Framework

	Historical	Contemporary
Intrinsic Utility	Metals; cigarettes during Second World War ⁵⁷¹	SIM airtime minutes ⁵⁷²
Token	17 th -19 th c. British tokens; 1930s Great Depression-era scrip ⁵⁷³	Chiemgau; Brixton pound; BerkShares

The different tangible alternative currency types are presented in Table 41 in the order of their plausible first appearance and use in history. While our records of financial antiquity are incomplete it is reasonable to conjecture that items possessing *intrinsic utility* or value, such as metals, were likely the earliest alternative currencies to be exchanged. Intrinsic utility currencies are also sometimes referred to as *commodity* money. Part of the value of intrinsic utility alternative currencies is derived from their relative physical scarcity. Such intrinsic currencies obviate the need for abstracting a measure of value, which is required with more-conceptual currency systems described below. Another advantage of using an instrument that possesses

⁵⁶⁹ See for example (Rothbard, 1988; Sechrest, 1988; White, 1984)

⁵⁷⁰ It should be noted that some instruments, such as the Brixton pound, have both a digital and physical currency.

⁵⁷¹ (Radford, 1945)

⁵⁷² Unused airtime minutes on SIM cards are a common alternative currency in many African countries (Economist, 2013)

⁵⁷³ (Harper, 1948)

widely agreed upon utility is the avoidance of geographically bounded use; the portability of early currencies made it possible for intrinsic currencies to be used across great distances, which fits with our understanding of the nomadic nature of pre-modern humans.

Circulating alongside or perhaps even prior to the existence of intrinsic currencies were *token* currencies. Token currencies are also physical currencies but with little to no intrinsic utility or value; their value is instead derived from social constructs, such as agreements that they be accepted as a medium of exchange and that their supply be limited. In recent centuries token alternative currencies have often been issued by smaller institutions, such as businesses, for use in day-to-day transactions with different stakeholders. These tokens are often used only within a limited geographic range, such as a borough, town, or region, and are therefore often referred to as ‘local’ or ‘community’ currencies. While efforts have been made to significantly expand the range where token currencies can be used, a link to a particular set of institutions and or location are two of the defining features of tangible token currencies.

Table 42: Digital Alternative Currency Classification Framework

	Closed	Open
Centralized	Linden Dollar, World of Warcraft Gold	Flooz, Beenz
Decentralized	N/A	Bitcoin, Litecoin

While *digital* alternative currencies have received a great deal of public and academic attention of late they have been an active topic in cryptography and technology circles since well before the internet became widespread. A number of crypto or e-money efforts failed prior to bitcoin. Benjamin Wallace writing in Wired (2011) states:

“Cypherpunks, the 1990s movement of libertarian cryptographers, dedicated themselves to the project (of a digital alternative currency). Yet every effort to create virtual cash had foundered. Ecash, an anonymous system launched in the early 1990s by cryptographer David Chaum, failed in part because it depended on the existing infrastructures of government and credit card

companies. Other proposals followed—bit gold, RPOW, b-money—but none got off the ground”.⁵⁷⁴

It is useful to distinguish between *closed* and *open* digital currencies. Closed digital currencies, such as Second Life’s Linden dollar, are largely transacted inside a digital virtual world. Linden dollars were designed for transactions within the Second Life virtual world. However, there is nothing preventing individuals from conducting exchanges with Linden dollars outside of Second Life and then arranging settlement inside Second Life, as has apparently happened through auction sites like eBay. Linden Lab, which created Second Life, retains central control over the issuance and governance of Linden dollars. These two features make the Linden dollar both a closed and *centralized* alternative currency.

Some community currencies, such as the Brixton pound, also have a digital equivalent that can be used to transact with the same goods and services as tangible Brixton pound notes. Because the Brixton pound is operated by a central organization, and because Brixton pounds are largely transacted within a limited geographic range, Brixton pounds can be considered to be both a tangible and a *closed-digital* alternative currency. In contrast, *open-digital* currencies are largely unbounded instruments that can be transacted outside a very limited and clearly demarcated digital environment. Bitcoin is often characterized as the world's first *decentralized* currency. Centralized digital currencies feature a single issuer-operator who maintains control over important currency features, such as supply, use rules, and other important functions. In contrast, decentralized currencies like bitcoin function in a more devolved fashion with open source software development, no single currency issuer, distributed transaction processing, and a transparent public ledger (the ‘blockchain’). However, there is considerable debate over the degree of bitcoin’s decentralization. For example, in March 2013 members of the Bitcoin community corrected a fork in the blockchain through an organized effort. Bitcoin has also come under criticism for its highly concentrated mining, ownership of bitcoins, and other aspects.⁵⁷⁵

⁵⁷⁴ (Wallace, 2011)

⁵⁷⁵ For further discussion see <http://bitcoinmagazine.com/bitcoin-network-shaken-by-blockchain-fork/>

Just as some currencies are difficult to classify within the currency framework presented in Table 40, several alternative currencies are not easy to classify within framework presented in Table 41 and Table 42. For example, should travellers' cheques, which were first issued in 1772 and widely popularized by American Express starting in 1891, be considered an alternative currency? In many ways they resemble community currencies like the Brixton pound, which also has a fixed 1:1 exchange rate with a national currency. While traveller's cheques could historically be used over a much wider geographic range than most community currencies they are also similar to community currencies in that they are only accepted by select merchants and institutions. Because travellers' cheques cannot be used to pay taxes or settle debts, and because they are physical objects, they can be classified as a tangible alternative currency.

Economics textbooks are beginning to give more attention to alternative currencies. For example, Mankiw and Taylor (2011) briefly discuss an alternative currency very similar to the Brixton pound called the Stroud pound. The authors describe how it "can fulfil many of the requirements of national currencies" like the British pound.⁵⁷⁶ Restaurant menus in Brixton can be found with prices in Brixton pounds, and the local Brixton council government through a program called 'Payroll Local' allows Lambeth council employees to receive a portion of their salary in Brixton pounds.⁵⁷⁷ In other words, for a certain set of transactions at participating organizations within a well-defined geography there is little practical difference between the Brixton pound and British pound other than, similar to a merchant loyalty or rewards scheme, you can often receive a discount of 10% on transactions by paying with Brixton pounds. However, Mankiw and Taylor stop short of explicitly stating whether or not currencies like the Brixton or Stroud pounds should be defined as money.

⁵⁷⁶ (Mankiw & Taylor, 2011, p. 620)

⁵⁷⁷ There is no maximum set of the portion of Lambeth Council employees' salaries that can be received in Brixton pounds, but according to Brixton pound organizers most who are participating at present receive about £100 Brixton pounds per month. It is also advised that Lambeth Council employees take no more than 10% of their salary in Brixton pounds as acceptance outside of retailers for items such as housing rent is more limited.

While the terms money and currency are often used synonymously it can be useful to distinguish one from the other.⁵⁷⁸ As noted earlier by Ali et al, some economists argue that money's most decisive function is serving as a unit of account. However, other economists argue that serving as a medium of exchange is money's defining feature.⁵⁷⁹ This paper argues that serving as a medium of exchange may be more usefully defined as the primary function of currency, but only one function of money. Some currencies, like the U.S. dollar, widely perform all three functions of money, while other mediums of exchange may not serve as a widely used unit of account. A precise and generally agreed upon definition of what constitutes a 'store of value' does not exist. For example, some will argue that the significant decline in the U.S. dollar's purchasing power over time due to inflation makes it a poor store of value, and it is certainly true that there are both other currencies (e.g., Swiss franc) and asset classes (e.g., equities) which have over a long period served as a better store of value. However, over the short-run (e.g., less than a month) the U.S. dollar has generally effectively stored value over the last several decades, along with serving as a widely used unit of account and medium of exchange. Similarly, some argue that, given its relatively high volatility, that bitcoin is a poor store of value. However, others argue that bitcoin is a good store of value given its price appreciation against the U.S. dollar and other national currencies over time.

In sum, while all money is currency, not all currency is money. However, if an alternative currency fully embodied all three functions of money then it could also be considered money. In other words, the designation of what is and is not money does not depend on law or a government defining such a currency as legal tender.

⁵⁷⁸ For a detailed discussion of modern money and currency see (Bernstein, 1965, Ch. 4-5)

⁵⁷⁹ (Ali et al., 2014; Lipsey & Chrystal, 2011, pp. 448, 659; Woodford & WALSH, 2005)

6.3 Historical Survey of Alternative Currencies

“It is believed that an examination of the record of scrip experience and a consideration of the conclusions to be drawn from it may be of value if similar conditions should develop in the future.”

-William Joel Canady Harper, 1948⁵⁸⁰

Alternative currencies are nothing new, and as noted earlier their use may date as far back as the early classical period. Numismatic works from the 19th century perhaps comprise some of the earliest published literature on alternative currencies. This section of the paper surveys the alternative currency literature over the past several hundred years, covering the regions where a relatively good historical record of alternative currencies has been maintained, specifically North America and Britain. One aim of this historical survey is to examine whether there are any commonalities between the historical and contemporary alternative currencies, as well as the political and economic contexts in which they arose.

Before proceeding it should be noted that, while extensive and reliable data often exists for present day alternative currencies, the same unfortunately cannot be said for most historical alternative currencies.⁵⁸¹ Data gaps impose some limits on our understanding of the history of alternative currencies and present challenges in some areas in making comparisons between the past with the present.⁵⁸² However, sufficient historical detail and narrative accounts exist to reveal some general themes and patterns about alternative currencies.

6.3.1 Alternative currencies in North America

Prior to the American Revolution there are numerous reports that colonists made significant use of privately produced paper money issued by merchants and

⁵⁸⁰ (Harper, 1948, p. 12)

⁵⁸¹ For a previous unsuccessful effort to collect quantitative data on alternative currencies see (Amato, Fantacci, & Doria, 2003).

⁵⁸² While bitcoin and other present day currencies afford higher quality data sets than historical alternative currencies, it should be noted that some of the data on bitcoin usage is difficult to audit and very likely distorted. For example, bitcoin exchange trading volume is widely believed to be inflated for marketing purposes (Hileman, 2014a).

traders.⁵⁸³ Sylla (1982) summarizes many of the well-known alternative currencies used during this period, such as wampum, which was a shell used as currency by Native Americans, along with other commodity currencies such as corn, pelts, rice, and tobacco.⁵⁸⁴ Further north in Canada, in 1685 a French official created a new 'playing card' currency by cutting a deck of cards into quarters, writing an amounts of livres on the cards, signed his name, and then instructed members of a community to accept them. By 1714 approximately two million livres of depreciated playing card currency were in circulation.⁵⁸⁵ Even after the founding of the Boston mint in 1652 there are reports of merchant issued currency, and complaints of currency 'hoarding' during economic downturns persist well into the 18th century.⁵⁸⁶ Such complaints can be taken as evidence of the continued importance of alternative currencies following the introduction of government supported currency in America.⁵⁸⁷

Given the frequency with which inflation accompanies war it is not surprising that there was a proliferation of alternative currencies during the American Revolution, where lottery tickets, private tokens (shinplasters), and other mediums of exchange circulated.⁵⁸⁸ In post-revolutionary America banks frequently failed, which often led to financial panics and shortages in small denomination currency in particular. In these environments various forms of alternative currency proliferated, including notes issued by cities, states, individuals, merchants, and churches.⁵⁸⁹ This shortage of small denominations of currency is a phenomenon that has been referred to as 'The Big Problem of Small Change', a phrase that was originally introduced by Cipolla (1956) and elaborated on by Sargent and Velde (2002) and others.⁵⁹⁰ According to Sargent and Velde, the problem of not enough small change was rooted in two issues: poor economic theory and inadequate technology.⁵⁹¹ This 'Big Problem' has in fact been the driving force behind the introduction of a number of alternative

⁵⁸³ (McLeod, 1898, pp. 229-230)

⁵⁸⁴ (Sylla, 1982)

⁵⁸⁵ (Chalmers, 1893, p. 118; Del Mar, 1899, p. 118)

⁵⁸⁶ (Sumner, 1874, p. 26)

⁵⁸⁷ (Harper, 1948, p. 10)

⁵⁸⁸ (Del Mar, 1899, p. 116)

⁵⁸⁹ (Harper, 1948, pp. 14-15)

⁵⁹⁰ See for example (Kohn, 2005, Ch. 7)

⁵⁹¹ (Sargent & Velde, 2002, p. XVIII)

currencies.⁵⁹² For example, in 1792 the town of Albany in New York state introduced small notes to address the chronic shortage of smaller denominations.⁵⁹³

In the decades immediately following the adoption of the U.S. Constitution up through the Civil War bank money played a more important role even though various alternative currencies issued by private individuals and merchants, as well as those by local governments, continued to circulate. A noticeable decline in alternative currencies was witnessed during the ‘U.S. Free Banking’ era of 1837-1862 – a period of relative peace from military conflict. However, Harper (1948) notes that “the proportion of local non-bank instruments tended to increase as banks failed with each period of crisis and depression, and to diminish with the revival of business”.⁵⁹⁴

Once criticism of Harper’s study of this earlier period that should be noted is his tendency to conflate credit and money (or currency). For example, he described pre-revolutionary ‘loan bills’, such as due bills and shop notes, which were used by ‘gentlemen of substance’ (individuals and merchants) as local money.⁵⁹⁵ His description states that these provided “evidences of indebtedness” and contains no discussion of whether these bills circulated as currency. These and other debt instruments he describes may more aptly be termed credit rather than currency or money. Harper does, however, highlight a number of alternative currencies before the Great Depression, such as a system during the U.S. Revolutionary War period where merchants discounted each other’s bills.

During the Great Depression various alternative currencies referred to by Harper as ‘scrip’ were widely used throughout the United States and Europe, including commodity notes exchangeable for goods and services as well as municipal notes.⁵⁹⁶ The scrip which Harper focuses on was that issued by chambers of commerce and local governments; self-help groups, merchant groups, and others private actors also issued

⁵⁹² (Cipolla, 1956; Sargent & Velde, 2002)

⁵⁹³ (Carothers, 1967)

⁵⁹⁴ (Harper, 1948, pp. 14-15)

⁵⁹⁵ (Harper, 1948, p. 9)

⁵⁹⁶ (Harper, 1948, p. 7, Figure 1) Harper’s thesis contains a map that plots the different types of scrip used in different parts of the U.S. For European alternative currencies from this period see (Amato et al., 2003, p. 1)

scrip. Similar to today's local complementary currencies like the Brixton pound, one purpose of this Great Depression-era scrip was to limit out-of-town expenditures or purchases at non-local chain stores.⁵⁹⁷ Similar to today's Freicoin, many U.S. scrip currencies and the Austrian Freigeld incorporated *demurrage*, an economic concept of developed by economist Silvio Gesell that is designed to reduce price deflation by encouraging spending.⁵⁹⁸

A number of challenges faced by Great Depression-era scrip are also commonly seen in today's alternative currencies. For example, alternative currencies often struggle to gain wider acceptance. Practical operational issues, such as poor paper quality and not having enough physical space on the scrip note for stamps, are also quite common. The most significant problem confronting 1930s scrip was the need many had to purchase goods and services outside the local community, where the particular scrip was not accepted. Efforts aimed at addressing this problem included establishing local clearinghouses, inter-community barter exchanges, and a national scrip plan, were met with varying degrees of success and failure. Harper states that the national scrip plan proposal was "rejected by Congress in favor of plans by the Secretary of the Treasury and the Federal Reserve Board for an increase in the paper currency issues of the Federal Reserve Banks".⁵⁹⁹

6.3.2 Alternative currencies in Europe

In 16th and 17th century England alternative currencies, commonly referred to as *token* currency in the literature, came into widespread use. The term token appears to have a number of uses. For example, Sargent and Velde define the term token as "a stamped piece of metal, often coin, issued as a medium of exchange by a private person or company who promises to exchange it for its nominal value for goods or legal currency".⁶⁰⁰ However, not all token currency has always been metal. Further, currencies described as tokens were sometimes issued by public entities, such as cities.

⁵⁹⁷ (Harper, 1948, pp. 1-2)

⁵⁹⁸ (Harper, 1948, p. 3) Demurrage incorporates a penalty for holding money. For example, stamps with dates are affixed to scrip at regular intervals to indicate the depreciated value of the instrument. Harper notes that 'transaction' stamps were more common than the 'time' stamp system described by Gesell (Gesell, 1929).

⁵⁹⁹ (Harper, 1948, pp. 5-6)

⁶⁰⁰ (Sargent & Velde, 2002, p. 376)

There is also significant evidence of earlier use in England and throughout other areas of Europe during the medieval period. Evidence of medieval token use has primarily been obtained in the more financially sophisticated regions in Europe during this period of Flanders, northern France and Italy, and Catalonia. In contrast with England, in France and the Low Countries token currency was suppressed through government action.⁶⁰¹ Tokens were issued for two reasons: first, in response to the aforementioned shortage of smaller currency units; second, due to inconveniences associated with using silver, which due to its small weight and size was often lost. In 1594 Queen Elizabeth gave the Mayor of the Corporation of Bristol approval to mint a 'Corporation farthing', which gained a wide circulation and was able to maintain its value.⁶⁰² Tradesmen also issued lead coins up through the early 17th century.

English token currency were in the words of Boyne and Williamson (1889) a "money of necessity". Echoing the tone and language one often finds surrounding today's alternative currency movements, Boyne and Williamson continue:

"they (tokens) would never have been issued but for the indifference of a Government to a public need, and their issue forms a remarkable instance of a people supplying their own needs by an illegal issue of coinage, and in this way forcing a legislature to comply with demands and requests at once just and imperative"⁶⁰³

Boyne and Williamson also state that token currency was illegal, which based on the historical record appears to be true for at least some of this period. However, it does not appear that these alternative currencies were at all times illegal, such as the instance noted in this paper when Bristol was authorized to issue its own local currency in 1594. As noted by Sargent and Velde, "in England, where the mint

⁶⁰¹ (Sargent & Velde, 2002, pp. 216-218)

⁶⁰² (Searle & Cambridge Antiquarian Society., 1871, p. 42) Given the fact that the crown approved the minting of Bristol's 'Corporation farthing' it could be argued that this was not in fact a pure alternative currency. There may also be some confusion or disagreement on the exact date as Sargent and Velde report a similar instance of Queen Elizabeth approving a lead token to be used within 10 miles of Bristol in 1582 (Sargent & Velde, 2002, pp. 217-218)

⁶⁰³ (Boyne & Williamson, 1889, p. b-2)

produced very few small denominations, tokens were tolerated and at times officially authorized".⁶⁰⁴

The year of 1648 is the first in which tokens are reported to have begun appearing in wider circulation.⁶⁰⁵ During the 17th – 19th century the issuance of tokens became widespread throughout England, Wales and Ireland.⁶⁰⁶ A shortage of 'low value copper coinage' in 17th century Great Britain afflicted trade and the government did not address the shortage by minting more 'regal coinage', which was made of gold and silver. Copper, which had been used for money in earlier centuries during feudal times, was considered "unfitting for the head of the monarch".⁶⁰⁷ In 1404 the House of Commons had been petitioned to solve lack of small coins by minting lead tokens. Queen Elizabeth first created a pattern for coins to be minted off of a base metal but perhaps only Bristol issued any, which were used only in a 10-mile radius of the city. The Romans had also used copper coins, and many European countries used copper by 1651.

As a result of the shortage of small change, businesses and local authorities minted their own copper coins 'without authority'.⁶⁰⁸ A wide swath of the British economy minted farthing, halfpenny, penny and tokens in the 17th century as show in Table 43. In addition to commercial establishments a number of somewhat more eclectic organizations and institutions issued tokens, including workhouses, churchyards, colleges and prisons.

⁶⁰⁴ (Sargent & Velde, 2002, p. 217)

⁶⁰⁵ (Searle & Cambridge Antiquarian Society., 1871, p. 43)

⁶⁰⁶ (Boyne & Williamson, 1891; Mathias & Barrington Brown, 1962; Whiting, 1971)

⁶⁰⁷ (Whiting, 1971, pp. 13-14, 16)

⁶⁰⁸ (Searle & Cambridge Antiquarian Society., 1871, p. 43)

Table 43: Issuers of Alternative Currency, 17th Century Britain

Sector	Examples
Shops	grocers, butcher, baker, haberdasher, tobacco sellers, spectacle makers, pewter shops, furrier, bookshop, cap-maker
Vittles*	coffee houses, inns, taverns, pubs
Industry	tallow chandler, weaver, clothier, leatherworker, goldsmiths, oilmen, brushmaker, ironmonger, coal mining,
Services	barber, barber-surgeons, apothecary
Transportation	coachmen, wagoner, canal in 18 th century
Communication	postal service
Institutions	workhouses, colleges (Chelsea College c. 1667), churchyards (Flemish, London), prisons (Newgate c.1669)
Politics	political coins used for “spreading propaganda, subversive agitation or other forms of advertisement”

*Issued over 1,000 tokens, which was more than any industry sector.

Source: Whiting 1971, pp. 34-44, 59, 76-7

These tokens have been described as “ingenious in their style” and generally contained information about the trade of the issuer and their location.⁶⁰⁹ Tradesmen often kept a sorting box so that they could keep track of the various tokens produced by other merchants that they received in exchange. And in cities like London there are parallels with modern alternative currency ecosystem firms, with ‘farthing changers’ operating as market makers and issuing their own tokens.⁶¹⁰ Efforts at regulating the burgeoning token market were introduced as early as 1655 and again in 1669 until a proclamation was made by the King of England in July 1672 that “no person or persons should for the future make, coin, exchange or use any farthings or tokens except such as should be coined in his Majesty’s mint”.⁶¹¹

Tokens continued to be minted for some time despite repeated proclamations from the crown that offenders were to be prosecuted for issuing private tokens. At last, a proclamation in December 1674 appears to have succeeded in halting private

⁶⁰⁹ (Searle & Cambridge Antiquarian Society., 1871, p. 45)

⁶¹⁰ (Searle & Cambridge Antiquarian Society., 1871, p. 46)

⁶¹¹ (Searle & Cambridge Antiquarian Society., 1871, p. 47) Possibly referencing the shortage of money that the tokens were issued to address, the proclamation continues “his Majesty having given directions for the speedy making of a considerable quantity of farthings, to be made current for exchange of monies”.

token issuance for over a century⁶¹², until reports surfaced of widespread counterfeiting of coins from the official mint lead to the reactivation of the private token market in 1784.⁶¹³ In sum, while their circulation was interrupted merchant tokens in Britain appear to be on the more long-lived, and therefore successful, alternative currencies.

6.3.3 Alternative currencies around the World

While there is significant evidence that alternative currencies were not simply a North Atlantic phenomenon, there is not nearly as much historical information on alternative currencies in other regions of the world. For example, in 19th century Japan both Lietaer (2004) and Maruyama (1994, 1999) note that alternative currencies were operational. Japan also played a role in developing alternative currency systems in the post-Second World War period.⁶¹⁴ Today, it is estimated that over 600 active alternative currencies exist in Japan. Lietaer, echoing the sentiment expressed by scholars studying alternative currencies during the Great Depression, references the general economic problems that Japan has suffered since 1990 as an explanatory factor in why alternative currencies have been maintained interest in the country. He does not, however, argue that there is a link between alternative currencies and specific economic factors in Japan, such as deflation or low or negative economic growth. He also suggests that these efforts had previously been largely overlooked due to the fact that women organized them.

Other recent scholarship on 20th century and contemporary alternative currencies includes research by Tibbett (1997), Amato et al (2003), and North (2007).⁶¹⁵ Tibbet's contemporary survey of alternative currencies in existence examined their role as a form of protest against globalization. In recent times alternative currencies have gained traction in British Commonwealth countries, such as New Zealand and Australia.

⁶¹² (Searle & Cambridge Antiquarian Society., 1871, p. 48)

⁶¹³ (Searle & Cambridge Antiquarian Society., 1871, p. 118)

⁶¹⁴ (Lietaer, 2004, pp. 3-4)

⁶¹⁵ (Amato et al., 2003; North, 2007; Tibbett, 1997)

6.3.4 Historical summary

Many similarities can be seen in the conditions that gave rise to history's alternative currencies and today's. Commenting on the use of 'local money' in the U.S. prior to 1932, Harper anticipates the return of alternative currencies in remarks about the relationship between Great Depression-era and earlier alternatives currencies, which:

“resulted from conditions sufficiently like those of the recent depression to suggest the possibility that local money in some form is likely to recur in response to a public demand under substantially similar circumstances”.⁶¹⁶

Throughout history and today there appear to be seven principle socio-economic factors that drive demand for alternative currencies (Table 44).⁶¹⁷ Of note, historical precedent is found for all of these forces except environmentalism.

Table 44: Socio-Economic Forces Driving Demand for Alternative Currencies

Force	Description
Environmentalism	Concerns over environmental impact of globalization, 'peak oil', industrial agriculture
Localism	Protect 'high street' retailers, neighbourly commerce
Technology	Open source software creates low barriers to entry; widespread use of mobile devices
Economic Sentiment	Concerns over inequality, quantitative easing, inflation, 'Too Big to Fail', high unemployment, slow growth, high debt, financial insecurity
Inefficiencies	Slow and expensive financial system (e.g., 2-3% credit card charges)
Financial repression	Growing use of capital controls (e.g., Eurozone, Argentina, China)
Speculation	Currency appreciation due to wider use and acceptance (e.g., bitcoin)

In examining the history of alternative currencies that have either ceased to exist or are in decline, three main causes would appear to dominate - technological

⁶¹⁶ (Harper, 1948, p. 2)

⁶¹⁷ (Hileman, 2014b)

change, government intervention, demand shortage. Advancements in technology have either disrupted or obviated the need for alternative currency. For example, the final decline and cessation of British merchant tokens in the 19th century occurred alongside the development of the standard formula described by Sargent and Velde for determining the proper mix of small change (demand as opposed to supply driven), as well as technological advances in minting which made the production of small coins less expensive. Both the technological advance in economic theory and manufacturing processes combined to eliminate the persistent shortage of small coins.

Throughout the history of alternative currencies governments have periodically intervened to reduce or eliminate the use of such currencies. One example is the Austrian Freigeld currency, which was introduced in 1932 and was outlawed by the Austrian central bank in 1933. What is not entirely clear is whether the Freigeld was shut down due to how similar it appeared to the normal Austrian schilling or because the authorities feared that the upstart currency might gain more widespread adoption. Regardless, lack of sustainable demand appears to be by far the leading cause of alternative currency decline. Early scholarship notes the persistent difficulty that alternative currencies face in gaining wide and sustained adoption. More recently, the UK LETS scheme is illustrative of this difficulty. While LETS is still functioning it has experienced a steady decline, having gone from 350 chapters in 1995, to 303 in 2001, and now 186 in 2005.⁶¹⁸ Overall, LETS simply has not been compelling or convenient enough to sustain its early momentum. However, such difficulties have not stopped the advent of new community currencies, like the Brixton pound, that do away with the LETS barter approach to currency.

⁶¹⁸ (North, 2007)

6.4 Conclusion

What does the persistent pattern of decline observed for many alternative currencies in history suggest about the prospects for contemporary alternative currencies? In comparing bitcoin with the Brixton pound, it is the Brixton pound – which is largely representative of many of today’s local currencies – that most closely resembles past historical alternative currencies. Even with support from local government and the technological advances that the Brixton pound employs it appears to be suffering from many of the same challenges faced by its historical predecessors. In short, very few people live their entire lives inside a geographic area as small as Brixton, and this creates a fundamental limitation and inefficiency with holding Brixton pounds.

Bitcoin is arguably already perhaps the world’s most successful alternative currency in terms of its breadth of use, market value, and mindshare. Bitcoin possesses many new features that distinguish it from historical alternative currencies, including its relatively decentralized structure, efficient cross-border transactions, global brand awareness, and support from powerful institutions. For an alternative currency, the bitcoin currency’s achievements to date are both significant and impressive. However, bitcoin faces many challenges, one of which is the volatility of its exchange rate against national currencies like the U.S. dollar. It is unlikely that many people feel comfortable holding such a volatile store of value for certain uses, such as for monthly rent or other similarly important payments. Unless bitcoin’s volatility stabilizes it is unlikely that it will ever become a widely used unit of account and thereby meet the definition of money.

While bitcoin's decentralized nature perhaps gives the appearance of limiting some of the regulatory risk that has led to the demise of past alternative currencies, regulators still have many ways to slow or curtail the use of a decentralized currency like bitcoin. For example, governments can prevent bitcoin from integrating into the global payment and banking systems, as well as limit access to technology platforms like the Google and Apple application platforms where bitcoin software can be easily obtained by users.

Government interest in bitcoin will in part depend upon bitcoin's level of use. In the short-run governments will be primarily interested in its use for illegal activity, such as in the purchase of illicit goods and tax evasion. Looking ahead, central banks (with a few exceptions) have to date generally taken a rather benign view of bitcoin. However, were bitcoin or another alternative currency to gain wider adoption then governments may grow concerned about the impact it could have on the money supply and the ability of central banks to conduct monetary policy.

Perhaps the most important difference between bitcoin and past alternative currencies is the distributed timestamp ledger on which bitcoin transactions are recorded, called the blockchain. This distributed ledger has the capacity to be used for many non-currency functions, such as for notary services, recording property title changes, election voting, and novel products and service offerings such as smart contracts. Ironically, perhaps the many promising non-currency uses for bitcoin's underlying technology may hold the key to bitcoin's ability to survive and thrive as a currency.

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7 Conclusion

This conclusion summarizes some of the key research findings from this thesis, outlines some of the limitations encountered during research and how they might be addressed in future research, and discusses policy implications.

An effort was made in this thesis to address the following research questions: First, what options are available to a country facing an unsustainable level of sovereign debt? Second, how well do existing economic frameworks account for political and other non-quantitative aspects of sovereign debt sustainability? Third, how comprehensive are existing frameworks for measuring sovereign credit events? Fourth, what role does financial repression play in debt sustainability, and how well do existing methods for measuring financial repression perform? Fifth, what can monetary innovation in the form of currency black markets, which are a sometime by-product of financial repression, say about the effectiveness of financial repression? Sixth, what do free currency markets suggest were the key historical turning points during the 1940s? Seventh, how do other forms of monetary innovation, such as alternative currencies, fit into an overall currency framework, and under what circumstances do alternative currencies rise and decline?

As shown in the literature review, our understanding of the role of financial markets in the 1940s and the effects they had on policy is incomplete at best. One of the main contributions of this thesis is to bring a market-based, financial perspective to mid-20th century economic and historical scholarship. What happens in free currency markets can have an impact on sovereign debt sustainability, as was shown with Britain and the free sterling markets. Currency black markets in New York and Switzerland undermined confidence in Britain's solvency and led to damaging capital flight during the 1947 Convertibility Crisis, as well as the lead-up to sterling's devaluation in 1949. The new archival data presented suggests that these markets may have played an even greater role than previously believed in guiding the choice of a new exchange rate for sterling during the September 1949 devaluation deliberations.

This thesis has also shown that, to address its debt sustainability challenge, Britain partially defaulted on the Anglo-American loan. Britain also engaged in various forms of financial repression, which helped the government pay less interest on its public debt and to ensure a cooperative marketplace for placing new government debt issues. These measures were effective in easing Britain's post-Second World War public debt burden.

An interesting counterfactual question is what would have happened to market confidence had Britain emphasized or employed other sovereign debt sustainability mechanisms outlined in chapter 2? For example, the British Empire in 1945 was still in possession of substantial hard and soft assets. As a crisis mitigation tool, could the Empire have calmed market concerns through more effective bargaining and trading? While the second chapter highlighted some recent examples of debt sustainability-driven asset exchanges, further research is required on how common a practice exchanging assets was for debt assistance, and what the overall impact from such trading has had on debt sustainability and other economic factors.

Similarly, given that Britain's efforts to maintain sterling's exchange rate proved futile, would Britain have been better off devaluing sterling earlier? Further, given sterling's subsequent devaluation in 1967, should Britain have devalued sterling by an even greater amount in 1949? These are complex but important questions. At the time of this writing there is considerable debate and uncertainty over whether, for example, Greece and other Eurozone countries facing economic growth and debt sustainability challenges would thrive or suffer by effecting a devaluation and or leaving the euro. Previous examples of currency union exits, including the Soviet ruble, the Austrian-Hungarian crown, and the Yugoslavian dinar, are inconclusive. Further examination of the economic impact of sterling's devaluation motivates further study and could add something important to the current debate over the future of the Eurozone.

A further contribution made by this thesis is providing an advanced country case study of currency black markets, financial repression, and sovereign debt stability, which are typically studied in the context of a developing economy. Many of today's biggest economic challenges are seated in advanced economies. Previous findings

from studies of emerging market economies, which are often much smaller in size and may owe debts in foreign denominated currencies, may not be entirely applicable for understanding problems in advanced countries. The study of Britain makes a contribution towards our understanding of these economic challenges in advanced economies and may prove useful to policymakers.

As highlighted in the introduction, economic historians have almost entirely overlooked the role of debt in British post-Second World War economic history. Basic measures of debt sustainability, such as debt-to-income, are not included in much of the existing literature on mid-20th century British economic history. While there is no evidence that Britain failed to meet any of its agreed upon interest or principal payments, the evidence is clear that Britain defaulted on the Anglo-American Financial Agreement in the form of failing to meet its contractual obligation of sterling convertibility and open trade. This thesis has also shown how the existing framework used by economic historians for measuring important credit events is too simplistic to capture 'partial defaults', such as Britain's. One important question not explored in the thesis is the impact that Britain's record-setting debt levels may have had on its comparatively poor economic performance in the decades following the Second World War. There is a substantial literature on the question of why Britain underperformed its peer countries following the war, and yet the subject of Britain's dramatically higher debt burden has received almost no prior attention.

Recent claims made by academics and policymakers on financial repression in the post-Second World War period have been scrutinized in Chapter 4 and were found to be, at least in the case of Britain, in need of further examination and clarification. Ample evidence of policies and practices in Britain that are typically associated with financial repression are found in archival documents and the literature. However, quantitative evidence from the bond market and other sources makes clear that British financial repression was not 'absolute', or a case of 'total' financial repression, at least compared to more restrictive and effective financial repression regimes than Britain's. Chapter 4 critiques existing quantitative methods for measuring financial repression and shows that the British government likely generated substantial financial repression 'savings' from below market public debt interest rates. However, as noted in the

chapter, caution is necessary in placing too much weight on this new calculation of British financial repression savings given the paucity of data on free bond yields. More free market real bond yield data, or the calculation of an acceptable synthetic bond yield, could offer a more precise and robust calculation of savings due to British financial repression.

Chapter 4 also highlighted the importance of additional measures of financial repression, such as the use of a compositor index to compare the varying degrees of financial repression across different countries. Much of the data necessary to create such an index for Britain during the mid-20th century either does not exist or has not yet been located. However, such an index could be constructed for present day countries using contemporary sources and will be presented in a forthcoming paper.

The final two chapters explore two forms of monetary innovation: currency black markets and alternative currencies. Periods of financial regulation and economic uncertainty often prompt monetary innovation, as was seen in the 1940s. The new data introduced in this thesis from free currency markets in Switzerland and New York provides one of the few market perspectives during a time of heavy financial regulation. Statistical tests on this data highlight the market's view of key historical turning points during the 1940s. However, there is much we can still learn from further study of these markets. For example, we have limited information about volume and market participants, nor do we possess data on the transactions costs associated with these markets. The significant arbitrage opportunities seen in the years immediately following the Second World War and the subsequent decline in arbitrage profit opportunities present another interesting question for further study. Further, can free currency market data serve as an acceptable proxy for a forward exchange rate market, enabling the calculation of a synthetic 'free' interest rate that could be used for a more refined calculation of financial repression savings?

Perhaps due to the problems alternative currencies faced in gaining wider adoption in the 1930s and their relatively short lifespan, there were fewer 'tokenized' alternative currencies in the 1940s than during the Great Depression. Market participants seeking an alternative to official national currencies instead either

favoured commodity alternative currencies, such as cigarettes in Germany, or black market national currencies. The substantial quantity of British sterling and dollar banknotes purportedly available outside both countries may have also served to tamp down the introduction of new alternative currencies during the 1940s. Sterling and the U.S. dollar were both important global reserve currencies and arguably far superior in terms of their acceptance in various geographies compared to an alternative currency. In short, black market national currencies may have largely obviated the need for alternative currencies in the latter-half of the 1940s.

Finally, what can be said of the applicability of any policy lessons from the British case in the mid-20th century to contemporary events? Does Britain's ultimately futile battle to sustain sterling's exchange rate in the face of market pressures support the current tendency of policymakers to allow exchange rates to freely float when they are under speculative attack? Or did Britain's efforts to delay devaluation on balance serve a useful purpose? The existence of black market currencies and free markets, as was the case during the mid-20th century, shows how difficult a task it can be for policymakers to manage an artificially high or low exchange rate in the medium- to long-run.

The financial repression practiced by Britain in the mid-20th century appears to have yielded mixed results. On the one hand, Britain appears to have been capable of generating substantial financial repression savings relative to GDP. At the same time capital leakages and the steady rise seen in government bond yields over time suggest that Britain was unable or unwilling to engage in the total financial repression that may have been necessary to avoid devaluing sterling and default. After the Second World War Britain was also something of an exception in terms of its track record of financial stability amongst advanced countries. One of the claimed benefits of financial repression policies (sometimes also presented as macroprudential policies) is financial stability. However, Britain's string of significant and lesser financial crises from the 1940s-70s would seem to suggest that Britain did not fully realize this benefit. This fact raises questions over the effectiveness of financial repression at increasing financial stability, or it could also speak to the lesser degree of British financial repression during this period. More comparative analysis between Britain and other advanced

countries on the degree of financial repression practiced by each would be useful for understanding what impact financial repression may have had on both financial stability and economic growth in advanced economies during this period.

With regards to any policy lessons from Britain's post-Second World War battle for debt sustainability, the peculiar features of Britain's circumstances and position during this time must be acknowledged. First, the context surrounding the traumatic events of the Second World War, and particularly the *esprit de corps* with which agreements such as Bretton Woods were negotiated and drafted, was historically unusual. Second, following the war Britain benefitted tremendously from a partnership with a now hegemonic United States, which then represented approximately 50% of the world's total gross domestic product. Britain's relationship with the world's dominant economic superpower opened the door to significant financial aid in the form of the Anglo-American loan, debt forgiveness, Marshall Plan funds, and a myriad of other support that may have been unique to having such a dominant hegemon as an international partner. Further, while sterling's importance was diminished following the Second World War, Britain was still in possession of one of the two global reserve currencies, and London was (and remains) a key global hub for financial capital. While these and other aspects may make the British case unique, one finding from this research is the very significant role that financial aid and support from other nations can play in sovereign debt sustainability, particularly vis-à-vis geopolitical considerations.

In closing, this thesis has sought to contribute toward our understanding of sovereign debt, financial repression and monetary innovation by examining the case of Britain during the mid-20th century. In the wake of the 2008 financial crisis, many questions have arisen over the direction of macroeconomics as a discipline. History, which prior to 2008 had seen a steady decrease in emphasis in economic academic programs, provides a useful empirical perspective on bedeviling questions such as "how much public debt is too much". While caution must always be exercised when comparing history with the present, I hope this work of economic history makes a contribution toward our understanding of contemporary economic and social challenges.