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Schioppa, Claudio A. and Papadia, Andrea

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# Foreign Debt and Secondary Markets: The Case of Interwar Germany\*

Andrea Papadia

London School of Economics  
Department of Economic History  
e-mail: A.Papadia@lse.ac.uk

Claudio A. Schioppa

Université Libre de Bruxelles  
Solvay School of Economics and Management  
e-mail: Claudio.Schioppa@ulb.ac.be

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## Abstract

We offer a new interpretation of the sovereign and commercial debt repatriation to Germany that occurred between 1931 and 1938, involving German bonds held abroad. These bonds exhibited a non-negligible and varying spread between their domestic prices and their respective prices abroad. We analyze nine years of weekly prices of these securities on domestic and foreign stock markets to argue that the crucial factor for the origination, variation and persistence of the spread was the impact of capital controls on the possibility of trading on secondary markets. We also find that German authorities kept the practice of debt repatriation under increasingly strict control in order to enjoy some of its political benefits, while avoiding detrimental macroeconomic effects. Our conclusions differ from previous literature and in addition provide a comprehensive interpretation of different aspects of the episode, consistently with recent macroeconomic literature that links the efficiency of secondary markets to sovereign risk.

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# 1 Introduction

*[...] the Schachtian policy of buying back un-serviced loans below par contributed to crushing Germany's moral standing with the creditors.*<sup>1</sup>

Hermann Josef Abs, 1953. Abs was Head of the German Delegation at the 1952 London Conference on German External Debts.

*He [Hermann Josef Abs] bought back some of the external German debt (Kreuger loan) and made a large arbitrage profit (the difference between the very low price of German debt abroad, and its face value price within Germany) on the deal on his own account.*<sup>2</sup>

The role of secondary markets for sovereign debt has been until recently neglected in macroeconomic theory. In practice, however, secondary markets have played an important role during many sovereign debt crises. Depending on the causes of the crisis and the legal framework, they can either bring about macroeconomic destabilization or function as a mechanism of potential sovereign risk reduction. An example of the former is the South American debt crisis of the 1980s, where secondary markets led to the emergence of a class of small creditors prone to litigation that endangered the results of “the collective negotiation and debt restructuring so crucial to resolving the [...] debt crisis” (Power, 1996). The latter case arises when well-functioning secondary markets allow for debt ownership shifts during a crisis: for instance, during the current European debt crisis a considerable portion of sovereign debt was repatriated by domestic agents in crisis countries<sup>3</sup> (Brutti and Sauré, 2013), presumably contributing to lowering yield spreads vis-a-vis the German Bund.

A repatriation of the kind described above can be explained through the mechanism of the so-called Secondary Market Hypothesis put forward by Broner, Martin, and Ventura (2008, 2010), which claims that well-functioning secondary markets serve as an enforcement mechanism also when default penalties are low. Under the assumption that domestically held debt enjoys considerably higher repayment probability, foreign debt holders under the threat of default can and will sell their claims (public or private) to domestic agents, who do not expect to be defaulted on. The ensuing repatriation of debt by domestic agents will consequently reduce the debtor country's potential net welfare gain from defaulting. Therefore, the existence of complete secondary markets allows foreign asset trade in the first place, and debt repatriation should be expected following a sovereign debt crisis. Conversely, for a given level of default penalties, limiting the working of secondary markets increases sovereign risk.

We revisit the German debt crisis of the 1930s and argue that this mechanism was in action, meaning that the working of secondary markets influenced foreign debt default as

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<sup>1</sup>Klug (1993) page 54, from Schwarz (1982) page 60.

<sup>2</sup>James (2004) page 59. During the 1930s, when these transactions took place, Abs was a director at Deutsche Bank.

<sup>3</sup>Beyond what would be expected based on optimal portfolio allocation considerations.

well as the actions of debtors and creditors. In 1930, foreign holders of German debt saw their chances of repayment damaged by the Young plan, which re-established the seniority of war reparations over commercial debts. Together with the effects of the Great Depression, this caused a sudden stop of capital inflows that endangered the sustainability of German debt (Ritschl, 2012), 46% which in 1931 consisted of short-term debt issued mostly in foreign currency. As a result, sovereign risk increased and foreign debt holders started to sell their claims on Germany finding willing buyers amongst German investors. However, in the summer of 1931 authorities introduced measures to curb capital flights, which also took the form of restrictions of the availability of foreign currency to individuals and firms; ever stricter capital controls were legislated over the years that followed (Ellis, 1940).

The introduction of capital controls meant that it was more difficult for a German citizen to buy German debt traded on foreign markets. The eagerness of foreigners to sell and the difficulties of Germans in buying introduced a wedge between the price at which German debt was traded in foreign exchanges and its price in Berlin. The latter remained high as shown in Figure 1 in reference to a particular class of bonds. German firms and citizens that could access foreign currency continued repatriating German debt to exploit the arbitrage opportunity. Repatriations continued to take place in non-negligible amounts until 1938. At their peak in 1933 they amounted to 2% of German GDP, only to dwindle thereafter due to the specific measures introduced by the authorities aimed at managing repatriations.



Figure 1: The index price of German 6% bonds in Berlin and New York.

Source: Institut für Konjunkturforschung (1933, 1936). In 1931, the Berlin stock exchange was only open between the 1st of January and the 12th of July and from the 3rd to the 18th of August. The trading started again in April 1932. In March 1935, the interest rate of the 6% bonds traded in Berlin was reduced to 4.5%.

This paper offers a comprehensive interpretation of key features of the repatriation episode, which is coherent with German economic policy and its objectives in the 1930s.

We identify three main questions to address: i) why did the repatriations start in earnest in 1931, ii) what are the reasons for the origination, variation and persistence of a price differential between German bonds traded at home and abroad, and iii) why and how did the authorities intervene in the episode.

Previous analyses have often underplayed the fact that repatriations started as a private initiative, instead focusing on explaining the actions of authorities and the impact of capital controls on this practice. On this point many have argued, to a different extent, that authorities encouraged debt repatriation and used the practice as an export subsidy tool, since the foreign currency necessary for the purchases was allotted as a function of export performance (see for example Heuser (1934); Einzig (1934); Harris (1935); Balogh (1938); Bonnel (1940); Ellis (1941); Child (1958)). In a detailed economic analysis of the episode, Klug (1993) partly departs from this interpretation and explains the repatriations as a mixed policy of debt reduction<sup>4</sup> and export promotion, the former point also briefly discussed by James (1985).

The analysis of Klug (1993) raises the question whether Germany was, in fact, in a situation of debt overhang. Following the argument of Bulow and Rogoff (1988, 1991), under debt overhang the marginal value of debt is nil, hence debt repatriation leads to a net transfer of resources to the creditor without affecting the market value of debt, thus invalidating Klug's analysis. We do not touch on whether Germany was actually in a situation of debt overhang, a point already tackled in the literature (Ritschl, 2002). The reason is that we argue, in short, on the validity of the application to this case of the Secondary Market Hypothesis, implying that debt repatriation is rational for individuals of the debtor country, although not collectively rational under debt overhang.

We argue that previous explanations based on export subsidization or debt overhang are not compatible with the macroeconomic objectives of the Nazi regime and the late Weimar governments and support this view with evidence from primary and secondary sources. Instead, we claim that German authorities were aware that debt repatriation was not an effective tool for debt overhang reduction and far from encouraging this activity, they kept it under strict control. Detrimental macroeconomic effects were not the only concern of the authorities, as individuals and firms close to the regime were granted the benefits of this profitable debt repatriation practice.

We also provide quantitative evidence related to the dynamics of the spread between prices of German debt traded abroad and in Berlin by examining weekly data of Dawes and Young bonds prices traded in New York between 1930 and 1940. We choose these bonds due to the particular status they enjoyed, as they were still serviced after the 1932 Lausanne Conference (Piet, 2004). We detect structural breaks of the price series for both bonds and provide confidence intervals around the breaks, to which we associate key political and economic events.

Prices of financial instruments incorporate relevant information, and unforeseen events can cause abrupt changes in the level or dynamics of prices. The structural breaks narrative

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<sup>4</sup>This was a popular argument after the South American debt crisis of the 1980s; for a view of the debate, see for example Bulow and Rogoff (1988, 1991), Krugman (1988), Froot (1989) and Kenen (1991).

strategy has not been uncommon since Guinnane, Rosen, and Willard (1995) analyzed how the unfolding of military events during the American civil war was reflected in Greenback prices; in relation to WWII, among others, Frey and Kucher (2000, 2001) study the impact of the war on the prices of sovereign bonds of different countries traded in Switzerland, Brown and Burdekin (2002) focus on German bonds traded in London, and Oosterlinck (2003) finds that structural breaks in prices of sovereign French bonds in Vichy France were linked to major political news, reflecting varying perceptions of default risk.

In our analysis we find that, together with the beginning of WWII, only events that put sand in the wheels of secondary markets negatively affected the prices of German bonds in New York. Interestingly, other episodes such as unilateral modifications to specific clauses of bond contracts and various reductions in debt service cannot be associated to any of the identified breaks. This suggests that well-functioning secondary markets were regarded as an element of foremost importance by foreign creditors, a finding in line with the implications of the Secondary Market Hypothesis (Broner, Martin, and Ventura, 2008, 2010).

We start our discussion in Section 2 by describing Germany's debt situation in the 1930s, its origins, and the introduction of capital controls. Sections 3 through 6 provide our proposed interpretation. For ease of exposition, each of these sections covers one main feature of the episode, namely how did the repatriation start, the reason for the price spread between Berlin and New York for the bonds under consideration, and what was the reaction of authorities to the repatriations. In Section 7 we summarize previous interpretations of the repatriation episode and comment on their strengths and shortcomings in explaining coherently all main aspects of the repatriation episode. Section 8 summarizes our findings and concludes.

## 2 Historical Context

### 2.1 The debt stockpile: reparations and borrowing in the 1920s

In the aftermath of World War I, the winning powers imposed a heavy reparation payments burden on defeated Germany. The exact amount was not established by the Treaty of Versailles but only in the protocol prepared by the Inter-Allied Reparations Commission (the London Schedule of Payments) in 1921, which formally established Germany's obligations for the first time. Schuker (1988) recounts how reparation payments were divided into three tranches, dubbed A, B and C, but uncertainty remained as to how much Germany would eventually actually pay. While it was fairly clear that the A and B tranches - amounting to 50 million gold Marks - would constitute part of the final reparation burden, the C tranche - amounting to around 82 million gold Marks - was never effectively billed to Germany, but still hovered around in international negotiations for most of the interwar period.

Germany's external debt was further increased by the heavy borrowing of all sectors of the economy on international capital markets throughout the 1920s. Ritschl (2012) argues that the Dawes Plan signed in 1924 was one of the triggers for Germany's heavy borrowing during the course of the decade. The Dawes Plan was intended to provide relief to a country that

was slowly coming out of an economic and political crisis epitomized by the hyperinflation. This international agreement featured the issue of bonds with maturity in 1949, the proceeds of which went to Germany in order to help it keep monetary stability and meet reparation payments (Piet, 2004). More importantly, the Dawes Plan made reparation payments de facto junior with respect to commercial debts. According to Ritschl, this created a moral hazard issue, which incentivized international markets to lend to German companies and public bodies, confident that their claims would be senior to reparations. At the same time, the moral hazard applied to the German counterparts, who found it very convenient to borrow abroad.

Ritschl further argues that this regime was eventually reversed by the Young Plan, drafted and adopted between 1929 and 1930, which re-established the seniority of reparations with respect to commercial debts. This regime switch contributed to plunging Germany in economic chaos by causing a sudden stop as commercial creditors saw their claims endangered. By that time, foreign commercial debts had reached the astronomical level of 32.6 billion Reichsmarks (Table 1). With the inclusion of reparations, Germany's foreign debt amounted to 67.6 billion Reichsmarks, or 81.5% of GDP. Mainly due to a sharp fall in GDP, the foreign debt-to-GDP ratio reached its peak at the end of 1931 exceeding 100% Ritschl (2013).<sup>5</sup>

Table 1 also reports estimates reconstructed by Klug (1993) of the debt repatriation carried out by Germans between 1932 and 1938. Klug believed that the debt repatriation had started in earnest in 1932, but the archival sources we use to estimate the 1931 figure highlight that the practice was already widespread during the previous year.<sup>6</sup>

Data collected from archival sources also gives us a snapshot of the nature and composition of German foreign commercial debts at the end of November 1931. The USA was Germany's principal creditor, with holdings of over 40% of the total foreign commercial debt.<sup>7</sup> England, The Netherlands, Switzerland, France and the Bank for International Settlements also had significant holdings (Table 2).

Germany's industry was the principal debtor in the country, accounting for almost 62% of total foreign debts. The public sector and banks accounted for around 16% and 15% respectively. A large share - around 46% - of German foreign commercial debt was short term (with a maturity of less than a year) with the rest divided between medium term - around 4% - and long term - around 50%. The geographical distribution of this short-term debt was quite different from the long term one, with the USA playing a less important role

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<sup>5</sup>The figure in Table 4 refers to mid-1931, rather than the end of the same year. By that time, the German foreign-debt-to-GDP ratio had not yet reached the 100% mark

<sup>6</sup>Germany Country File, Bank of England Archive; OV34/148: Special advisory Committee Basel 1931 and OV34/179. As the author himself notes, however, some quantitatively negligible debt repatriations also took place in the 1920s.

<sup>7</sup>Although America's lending to Germany has been often highlighted as exceptional and at least partially politically motivated - Schuker called it "American reparations to Germany" - the USA was probably the principal lender of the 1920s for a good number of countries. Accominotti and Eichengreen (2013) have recently shown that around 66% of all European bond issues between 1924 and 1928 took place in New York. This dominant position was then reversed after the 1929 crash with Paris taking over as the principal financial center for new bond issues.



Creditor country	Debt share	Debtor sector	Debt share
USA	27.02%	Industry	53.00%
Netherlands	17.26%	Public bodies	25.97%
Switzerland	16.30%	Banks	8.34%
England	14.04%	Reichsbank and Goldskontbank	7.52%
Bank for International Settlements	7.52%	Private citizens	4.58%
France	5.41%	Insurance companies	0.47%
Italy	0.76%	School, churches etc.	0.12%
Other countries	11.69%		

(a) by creditor country

Debtor sector	Debt share
Industry	53.00%
Public bodies	25.97%
Banks	8.34%
Reichsbank and Goldskontbank	7.52%
Private citizens	4.58%
Insurance companies	0.47%
School, churches etc.	0.12%

(b) by debtor sector

Table 3: German foreign short-term commercial debt, November 1931

Source: Bank of England Archive OV34/69 - Die Auslandsverschuldung Deutschlands nach dem Stande von 30. November 1931.

Currency	Debt share
US Dollar	50.0%
Pound Sterling	11.8%
Reichsmark	10.7%
Swiss Franc	9.7%
Dutch Florint	9.2%
French Franc	3.6%
Other currencies	4.9%

Table 4: German foreign commercial debt by currency of issue, November 1931

Source: Bank of England Archive OV34/69 - Die Auslandsverschuldung Deutschlands nach dem Stande von 30. November 1931.

## 2.2 The many guises of default: German foreign debt in the 1930s

Following the onset and deepening of the severe economic and financial crisis we normally refer to as the Great Depression, the Reichsbank eventually ratified exchange controls in the summer of 1931, in order to curb the massive capital flight the German economy was experiencing (Bonnell, 1940; Child, 1958; James, 1985).<sup>8</sup> The principal feature of this legislation was that the German authorities restricted the availability of foreign exchange for individuals and companies. Moreover, the authorities themselves had to approve the use of the foreign exchange they granted. The allocation of foreign currency was at first established based on

<sup>8</sup>The matter was intricate from the start, and exchange controls regulations were changed countless times. Following their informal adoption in July 1931, they led to “three general exchange-control laws, upwards of 50 separate decrees of amendment and adaptation, and something in the neighborhood of 500 administrative rulings, to say nothing of clearing, compensation, and payment agreements with partner countries,” Ellis (1940), page 9.

the requirements of the previous year.<sup>9</sup> This arrangement lasted until 1934 (James, 1985), when even stricter controls on the use of foreign exchange were established (Klug, 1993).

At the international level, Germany's economic, financial and political chaos was reflected by a series of measures aimed at giving temporary relief to German debtors. On the 21st of June 1931, US president Hoover introduced a one-year moratorium on German intergovernmental debts and reparations. Moreover, the Reichsbank was given a \$100 million emergency loan from the Bank of International Settlements, the Bank of England, the Bank of France and the Federal Reserve Bank of New York. In addition, the first Standstill Agreement - signed in August 1931 - meant that approximately 6.3 billion Reichsmarks of German short-term debts were frozen.<sup>10</sup> Finally, the Lausanne Conference of July 1932 virtually put an end to reparation payments, while maintaining and protecting the service of the Dawes and Young loans (Piet, 2004).

The march towards default accelerated after the rise to power of the NSDAP in January 1933, the reinstatement of Hjalmar Schacht as president of the Reichsbank in March of the same year and his appointment as head of the *Reichswirtschaftsministerium* (Ministry of Economics) in August 1934. Schacht was a prominent figure in German and international economic and financial circles and was generally considered responsible for ending Germany's hyperinflation in the first half of the 1920s. He was also generally seen as a friendly figure by the international community, at least until the start of his second stint as President of the Reichsbank. At the same time, he was a strenuous and tireless opposer of the war reparations imposed on Germany.

James (1985) recounts the steps taken by Schacht, shortly after his reinstatement. A new Law on Payments Abroad was approved in May 1933, which forced all foreign debts not covered by the Standstill Agreements - excluding interest and amortisation payments for the Dawes loan and the interest payments for the Young loans - to be repaid through a *Konversionskasse* (Conversion Bank) and which reduced the service of the debts to 75% of the level of June 1933.<sup>11</sup> By the end of the same year, the amount transferred was reduced to 30%. In January 1934, the Reichsbank declared that scrip would be exchanged with foreign currency for 67% of the nominal value. This meant that 77% of the debt service could be met.

The Germans introduced aggressive measures even with regard to the Dawes and Young loans, which had previously commanded a privileged status. In May 1933, notwithstanding the protests of the Bank for International Settlements who was the guarantor of these loans, Germany unilaterally revoked the Gold Clause (Piet, 2004). This meant that the loans would now be serviced in nominal rather than in the original gold value basis.

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<sup>9</sup>In particular, in November 1931, it was established that 75% of previous year's requirements of foreign exchange would be allocated. In March 1932, the share was lowered to 35% and successively raised to 50% (Klug, 1993).

<sup>10</sup>The agreement was renewed until 1939 with German debtors directly repaying part of the debts every year.

<sup>11</sup>Debtors could pay up to 50% of the debts service, provided that this did not exceed 4% of the principal. The remaining service was to be paid in scrip Reichsmarks (i.e. currency with no legal tender) with a discount of 50%. The Reichsbank, in turn, promised to exchange the scrip with foreign currency.

In the spring of 1934, Germany instituted a complete transfer moratorium - enforced from July - which formalized its default on all foreign obligations (Ellis, 1941). Germany was by no means the only country to follow this pattern of events: external defaults took place in a large number of countries in Latin America and Europe in the early 1930s, but its default was the largest of the interwar era (Reinhart and Rogoff, 2013). Ellis (1940) convincingly argues that the striking aspect of the exchange control system that came to life in Germany during the 1930s was that, while it had all the characteristics of an emergency measure and was so perceived by most contemporaries, it ended up becoming the defining feature of German foreign economic policy during the decade. Holders of German securities abroad followed the unfolding of these events closely and with growing anxiety.<sup>12</sup>

### 3 Our interpretation

A satisfactory account of the German debt repatriations should explain its three key features: 1) why the repatriations started in earnest in 1931; 2) the reason for the appearance and persistence of the price differential between German bonds traded at home and abroad; 3) the behavior of the German authorities. We provide such an account and use a variety of tools to illustrate and substantiate our interpretation.

First, we argue that the incentives for agents to engage in the debt repurchases are best interpreted in the light of simple extensions of a recent theoretical model of sovereign risk, which emphasizes the role of secondary markets. In a companion paper we present these extensions, which are based on the seminal work of Broner, Martin, and Ventura (2010) - BMV hereafter - while below we only provide the intuition. Second, we investigate the centerpiece of the repatriation episode - the price differential between domestically and foreign traded German securities - by quantitatively analyzing a new dataset of German bond prices traded in New York and Berlin. Third, we provide some qualitative evidence for the authorities' tolerance, control and apparent promotion of the repatriations.

In short, we argue that the German governments of the 1930s managed to make the most out of the debt repatriations, an initiative which started spontaneously and was not planned or introduced by the authorities. On the contrary, in order to extract some benefits out of it, the authorities kept it under strict control. The huge price differential between German bonds at home and abroad was a more than sufficient driver for investors to engage in foreign debt repatriations. If unrestricted, however, the practice might have eventually led to the undesirable repayment of a large chunk - if not all - of the German external debt.

Hence, Germany could have lost not only the possibility of repudiating its debt in the future or receiving more debt relief from its creditors, but also accessory "micro" benefits such as export subsidization and windfall profits for specific industries, companies and government supporters. Restricting foreign debt repatriations gave Germany no reason to repudiate its debt, and, in fact, Hitler himself did not consider this the best option (Klug, 1993). As long

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<sup>12</sup>Contemporary commentators such as Einzig (1934), for example, identified the Reichsbank's measures as a severe blow to creditors' hope of ever seeing full repayment.

as the whole debt was not bought back, some in Germany could profit from the situation while the country could maintain some ties with international markets.

## 4 Why did the debt repatriation start in earnest in 1931?

The economic context described in section 2 explains why sovereign risk on German debt increased. Summarizing, between 1929 and 1931 Germany spiraled into political and economic chaos due to the interaction between the Great Depression and Germany's peculiar situation, particularly its massive foreign debt and the large share of short-term liabilities. Additionally, Germany's commercial creditors saw their assets endangered by the Young Plan, which made their claims junior with respect to reparations (Ritschl, 2013). These conditions spurred foreign investors to liquidate their holdings of German debt, not roll over their loans and not extend any further short-term or long-term credit (Ellis, 1940). Foreign investors found German ones ready to purchase these securities, but the introduction of exchange controls (the first, relatively mild ones, already in the summer of 1931) interfered with the workings of secondary markets, leading to a price differential opening up between the quotations of the same bonds in Berlin and financial centers abroad.

The wedge between prices of bonds held in Germany and abroad can be explained by different evaluations of sovereign risk between domestic and foreign investors. For foreign investors the unfolding of the events described above translated into an increase in sovereign risk, while German investors perceived an internal default as politically unlikely (a point that will be further discussed below). A different assessment of sovereign risk between domestic and foreign investors is not uncommon during a crisis, a point in case being the recent European debt crisis, when debt was repatriated by struggling countries (Brutti and Sauré, 2013). The origin of a different evaluation of risk can be complemented by the Eaton, Gersovitz, and Stiglitz (1986) argument that domestic debt holders are in a privileged position to obtain repayment due to, among other things, the ease with which they can interact with the local legal system. In the specific case at hand, the arbitrage profits from repatriating the debt could be realized by domestic agents within a short time frame by selling the securities on the Berlin stock market - at least until exchange controls became more stringent (see Section 2.2) - further attenuating the effects of sovereign risk on domestic agents.

Thus, the debt repatriations unsurprisingly started as an entirely private initiative in 1931<sup>13</sup> as domestic agents needed no further encouragement, given the economic incentives outlined above. Even as the authorities started imposing controls on the practice, private sector initiative remained present and dominant. In fact, before Schacht's New Plan of 1934, debt repatriations became as important as to spur the creation of a private market for the trading of foreign currency eligible to be used for repatriations. This currency sold at large and growing premiums over regular free currency because of the potential for windfall gains

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<sup>13</sup>Some quantitatively negligible repatriations also took place in the 1920s (Klug, 1993).

due to the price differential between German securities held domestically and abroad (Table 5).

1933		1934	
Month	Premium, %	Month	Premium, %
August	122	January	148.5
September	124.8	February	149.5
October	125	March	153
November	120.5	April	158.5
December	129.5	May	156.5
		June	200
		July	215
		August	250

Table 5: The premium of foreign currency eligible for debt repatriations over regular foreign currency.

Source: U.S. Tariff Commission, Foreign Trade and Exchange Control in Germany. Report No. 150, 2d Series. Washington 1942, via Child (1958) page 118-119

The existence of this market led to the practice becoming increasingly concentrated in the hands of a few large banks, “which facilitated control by the authorities on which types of securities could be repatriated” (Child (1958), page 118-19). The market ceased to exist altogether with the provisions of August 1934, which made “free” foreign exchange non-transferable.<sup>14</sup>

The role of secondary markets and the effects of more stringent exchange controls are best understood through the Secondary Market Hypothesis and its formalization in the BMV model. The model posits that when a sovereign crisis ensues and the debtor government cannot credibly commit to enforce payments, creditors will be willing to sell their asset holdings of debt on well-functioning secondary markets at any positive price since, if they hold them, they will eventually have a value of zero. Citizens of the debtor country, instead, will be willing to repurchase them at any price up to face value since any lower price translates into a riskless arbitrage profit, given that the government is expected to enforce payments between domestic citizens. This is the case because, if the debt is held internally in its entirety, an internal default will only lead to an internal redistribution of income, not a net gain resulting from foregone payments to foreigners. Thus, with the repatriations the welfare incentive to default disappears. In the BMV framework, eventually all bonds will be bought back at face value by the citizens of the debtor country since, if they trade even at a fractional discount, there will be untapped arbitrage opportunities.<sup>15</sup> In the absence,

<sup>14</sup>An additional feature of the controls was that before January 1934, bonds repatriated could only be sold to the original issuer (Klug, 1993); while this might have led to some discount compared to stock market prices, the arbitrage operation was still vastly profitable for those who could engage in it.

<sup>15</sup>This equilibrium is inefficient ex post for the debtor country. The efficient solution would be for the citizens of the debtor country to collude and not repurchase the debt on secondary markets. However, each individual can make large capital gains by buying the bonds. Ex ante, however, the presence of complete

or severe malfunctioning, of secondary markets, instead, there will be no international trade in assets in the first place. Without secondary markets, the debtor government will never enforce payments and, knowing this, potential foreign creditors will never lend.

The BMV framework is relevant for the case at hand also when extended to reproduce some important features of the historical period. The qualitative results of the model are in fact robust to: i) relaxing the assumption that redistribution does not matter in case of an internal default by introducing debtor heterogeneity, whereby the government places a greater weight on the welfare of a group of citizens; in the context of the German case, both the Weimar Republic and NSDAP Governments were supported by influential groups; ii) introducing asymmetric information among creditors, where only a fraction of creditors are fully informed about economic and political developments in the debtor country after the lending stage.

To sum up, limiting debt repatriations has two principal effects. On one side, it limits the scope for arbitrage by domestic agents, but also leads to a countrywide welfare gain due to foregone payments abroad. On the other side, it damages foreign creditors who are unable to obtain full repayment of their lending through the indirect channel of secondary market sales. Although foreign bondholders in the interwar period publicly deprecated foreign debt repatriations, their private stance was quite favorable, and interferences in the functioning of secondary markets were seen with hostility.<sup>16</sup> Eichengreen and Portes (1990b) report a statement by the Council of Foreign Bondholders from 1937, which declared that restraints of bond repurchases would be met with “strong and [...] effective criticism on the ground that, by limiting the market in such bonds, it would act detrimentally to the bondholders”. The Creditor Representatives were more open about the benefits of the repatriations declaring in 1934 that “German manufacturers and German debtors are benefited, as also are the foreign creditors, the holders of German dollar bonds, the demand for which at improved prices has been considerably increased as a result of these transactions.”<sup>17</sup>

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secondary markets is beneficial to both countries since they allow the existence of asset trade. Moreover, secondary markets ensure that assets are transferred from those who value them less (creditors) to those who value them more (debtors) and asset holdings are aligned with the preferences of the government who makes the enforcement decision. The main results are robust to the introduction of frictions (e.g. transaction costs), many countries, time periods, shocks, sources of market incompleteness, and sources of heterogeneity within and between regions (BMV, 2010). The model relies on some additional assumptions: there is no (or limited) collusion among debtor country citizens; the government is indifferent to the redistribution following a domestic default; and the government’s enforcement decision happens after the trade in secondary markets is concluded. If it takes place before, the government will not enforce payments and asset trade will be destroyed.

<sup>16</sup>Interestingly, the US government demonstrated its support for the continuation and extension of the exchange controls at the London Conference of 1931. The measure was seen with favour by the Americans presumably because it stopped the liquidation of short-term loans (at this point the Standstill Agreement covered less than half of all short-term debts and the exchange controls were still rather porous), which might have endangered the repayment of long-term debts, which constituted the bulk of American credit in Germany (The Economist, July 25, 1931, p. 160, via Ellis (1940).

<sup>17</sup>Opening Statement of the Creditor Representatives, Berlin May 4 1934, via Klug (1993), page 37.

## 5 What explains the price differential between German bonds traded at home and abroad?

Foreign holders of German debt saw their chances of repayment endangered by the Young plan, negatively affecting prices. Lower prices abroad thus originated, *ceteris paribus*, an arbitrage opportunity for German investors. What accounted for the persistence of the spread between German bonds traded at home and abroad and its variation? Consistently with the Secondary Market Hypothesis, we argue that restrictions on the possibility for German citizens to trade on secondary markets had strongly adverse effects on the price of German bonds traded in New York. The channel through which prices were affected is the strong influence of the possibility of asset trade on secondary markets on foreign creditors' perceived probability of repayment and the impossibility of German investors to fully exploit the arbitrage opportunity represented by the spread. We can't directly test this channel, but we can test if major variations in the spread between domestic and foreign bonds can be associated with events that altered the functioning of secondary markets. The aim is to reasonably recover the information content of bond prices by associating important events to structural breaks in prices, within a coherent economic narrative. This empirical strategy is similar to Brown and Burdekin (2002), who analyze Dawes and Young bonds in London, Oosterlinck (2003), Frey and Kucher (2000, 2001), among others.

More precisely, we look for structural breaks in the weekly price series of Dawes and Young bonds traded on the New York Stock Exchange and in reconstructed series of the spread between German bonds traded in Berlin and Dawes and Young bonds traded in New York between 1930 and 1940. The Young and Dawes bond issues were the direct results of the Dawes and Young Agreements described in section 2 and were essentially German Government debt commanding a somewhat privileged status compared to other bond issues (Piet, 2004). Working with asset price data has attractive features for our analysis: high frequency and reliability. High frequency, in our case, translates into weekly data, while the reliability is due to the fact that stock market data is less prone to direct manipulation.<sup>18</sup>

Figure 2 presents the weekly data for the Dawes and Young bonds traded on the New York Stock Exchange between December 1929 (June 1930 for the Young series) and June 1940, manually collected from the New York Times publication *The Annalist*, as well as quotations of German Mortgage bonds on the Berlin Stock Exchange available from Global Financial Data. Two data issues are immediately apparent: i) the series for Berlin is incomplete, as the Stock Exchange was closed from July 1931 to April 1932; ii) in order to work at the weekly frequency we use German Mortgage bonds as a proxy for our series of interests in Berlin. In dealing with the first issue, we reconstruct the missing data in the bonds traded in

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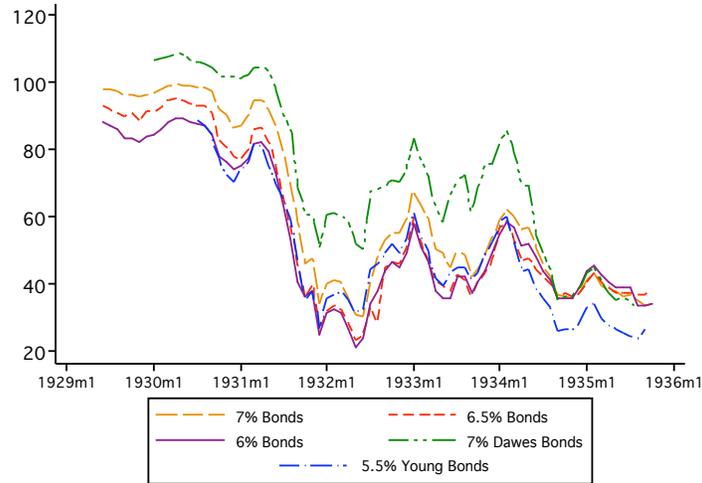
<sup>18</sup>There is substantial literature using different empirical strategies than ours but still relying on bond prices to study historical and economic events, for example Oosterlinck and Landon-Lane (2006); Flandreau, Gaillard, and Panizza (2010). The historical period we are studying does not influence our choice of empirical strategy: Eichengreen and Portes (1990a) have shown that financial markets in the 1930s were equally sophisticated and able to process information as in the 1980s and that sovereign bonds were widely traded in secondary markets, a finding confirmed by Stone (1991).



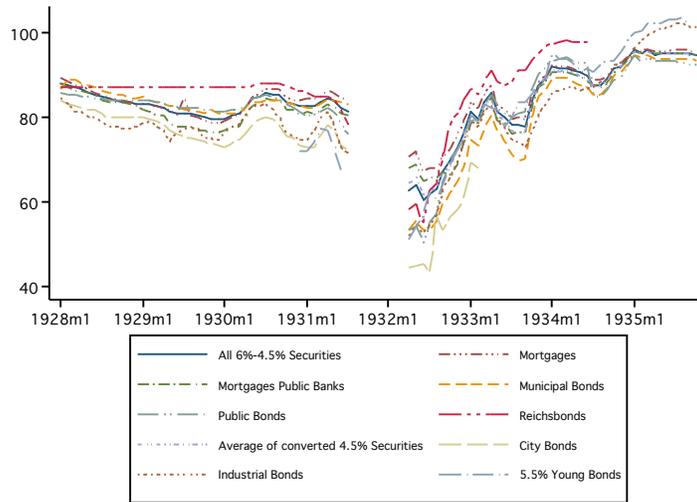
Figure 2: Young and Dawes bonds traded in New York and Mortgage bonds traded in Berlin, weekly frequency. Source: The Annalist.

Berlin assuming four different scenarios, all but one involving an eight-week slump in prices correlated to the dynamics of the US stock market. The scenarios differ in the timing of the slump (ranging from July-August to October-November 1931), whereas one consists in a linear interpolation for the missing subsample. We then use these reconstructed series to get four different spreads series for the Dawes and Young bonds respectively (appendix A).

We justify the use of German Mortgage bonds as close substitutes for our series of interest traded in Berlin based on considerations summarized in figure 3. The lower panel of figure 3 shows that the monthly price of Young bonds traded in Berlin was highly correlated with the prices of other German bonds, private and public, traded on the same exchange. Moreover, the prices of German bonds traded in Berlin reported in Figures 2 and 3 show that, indeed, these followed a very different path from similar bonds traded abroad. First of all, their price recovered much faster after the crash of 1931. Secondly, the apparent correlation between German bonds traded in Germany and in New York breaks down in the first half of 1934, with bonds in Berlin trading at stable price close to face value, whereas in New York prices of German bonds were more volatile and trending downwards. The upper panel of figure 3 shows that public and private German bonds traded in New York were highly correlated. This reassures us on focusing our study only on Dawes and Young bonds. In fact, while the German government was very keen in claiming a difference between “political” and other debts, the treatment of different categories of debtors was not significantly different in practice (Guinnane, 2004). Moreover, the decision to repay foreign debts, whether public or private, eventually rests with a country’s authorities. This was recognized also by the parties involved in the London Debt Agreement of 1953, where both private and public German debts from the interwar period were discussed and repayment was negotiated jointly. In any case, the privileged status of Young and Dawes loans, which gave them a certain degree of seniority



(a) New York



(b) Berlin

Figure 3: German bonds traded in New York and Berlin, monthly frequency. Source: Institut für Konjunkturforschung (1933, 1936).

over other debts (Piet, 2004), means that these bonds were less prone to fluctuation due to temporary shifts in economic conditions, policy and creditor expectations, which serves well the purpose of our analysis.

The empirical analysis, in practice, will consist in the identification of the dates of structural breaks in the time series of the price level of Dawes and Young bonds. We then check the results by performing the same analysis on the reconstructed spread between the price of German mortgage bonds traded in Berlin and the Dawes and Young bonds traded in New York. Ideally we would use the spread data as a the main object of investigation, but the

reliability of this data hinges heavily on the different assumptions made to reconstruct it. We treat both the dates and number of breaks as unknown a priori, to be endogenously determined from the data.<sup>19</sup> We follow the dynamic optimization procedure of Bai and Perron (1998, 2003) and we also check for the robustness of the estimated break dates with the sequential estimation technique based on Bai (1997a,b) and Chong (1995). The dynamic optimization procedure estimates the break dates for a given number of breaks, after having tested for the optimal number of breaks with different statistical tests described in Bai and Perron (1998, 2003). We present results where the number of breaks is identified at the 99% confidence level and provide asymmetric 90% confidence intervals around the break dates, which allows to identify the events we connect with the break within a reasonable time interval rather than a single date. We assume an autoregressive process of the first order for the price level<sup>20</sup>. The constant term and the coefficients of the model are both subject to structural breaks, implying that we allow for breaks both in the level and the persistence of the process. We add a measure of the New York stock exchange market performance as an exogenous regressor, whose parameter is not subject to structural breaks. The dynamic optimization procedure finds the structural breaks dates  $(T_1, \dots, T_m)$  of the resulting partial structural change model such that:

$$(\hat{T}_1, \dots, \hat{T}_m) = \underset{T_1, \dots, T_m}{\operatorname{argmin}} \sum_{j=1}^{m+1} \sum_{t=T_{j-1}+1}^{T_j} [y_t - \hat{\alpha}_{j[T_j]} - \hat{\rho}_{j[T_j]} y_{t-1} - \hat{\beta}_{[T_j]} z_t] \quad (1)$$

where  $y_t$  is our series on interest, either the price level of the Dawes and Young bonds traded in New York or one of the reconstructed series of the spread,  $z_t$  is the exogenous control for market performance and the hat denotes sample estimates. There are  $m + 1$  regimes  $j = 1, \dots, m + 1$  (with  $T_0 = 0$  and  $T_{m+1} = T$ ), where  $m$  is the number of breaks and the subscript  $[T_j]$  represents the dependence of the parameter estimates on the date of the breaks.

The estimated break dates and their confidence intervals are depicted in figures 4 and 5 for Dawes and Young bonds respectively. What emerges from our empirical exercise is that, indeed, restrictions on the possibility for German citizens to trade on secondary markets had strongly adverse effects on the price of German bonds traded in New York. We interpret this as an indication that the perceived probability of default for foreign creditors was strongly

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<sup>19</sup>It is important to note that allowing for more than one break requires different, and more complex, statistical procedures than in the well-known case of a single break. For an overview of the literature, refer to Hansen (2001) and Perron (2005).

<sup>20</sup> The choice of a first-order autoregressive model permits us to use a reasonably flexible, yet easily tractable model. Bond prices are usually modeled in the literature as unit root processes, but other than this there would be no other reason for choosing a unit root process to analyze this set of data. Unit root tests typically found in the literature cannot be applied in this case, as we are considering possible multiple breaks: the appropriate test would be one which tests the null of a unit root with multiple breaks against the alternative of a stationary process with multiple breaks. To our knowledge, such a test exists only for cases with two breaks (Lee and Strazicich, 2003) but not for an arbitrary number of breaks. We therefore assume stationarity of the series under each regime and will use standard methods to identify potential explosive behavior of the series after structural breaks have been accounted for.

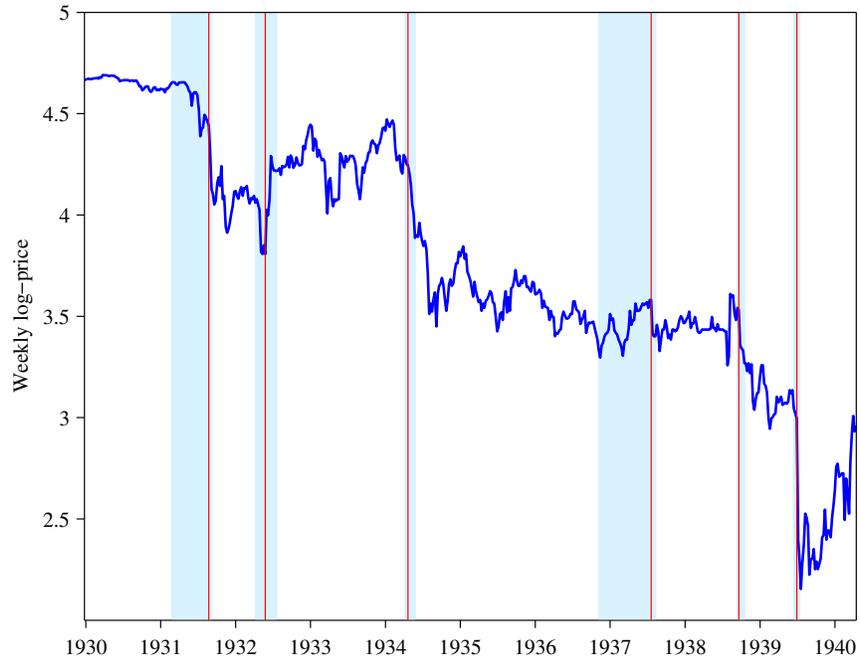


Figure 4: Dawes bond log-price with estimated break dates; shaded areas are 90% confidence intervals

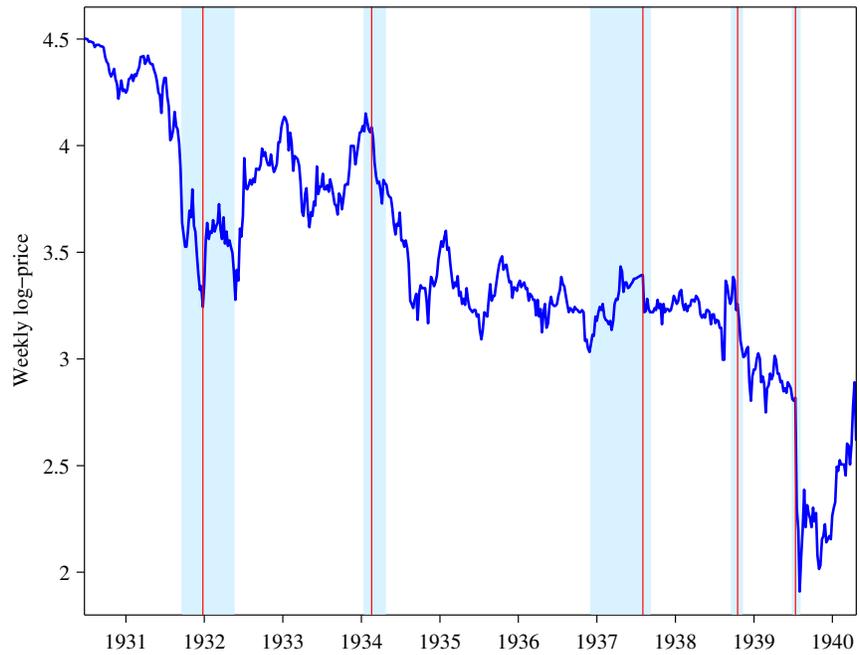


Figure 5: Young bond log-price with estimated break dates; shaded areas are 90% confidence intervals

influenced by the possibility of asset trade on secondary markets. Our results are also peculiar for what they do not find. The service of German foreign debt was modified a number of times - for example, in May 1933 the the German government unilaterally revoked the *Gold Clause*, which meant that the Dawes and Young bonds started being serviced in nominal rather than in the original gold value basis - however, we do not find breaks in correspondence to such events <sup>21</sup>.

Break date	90% confidence interval	Mean	Event
05/9/1931	07/3/1931 - 19/9/1931	51.4	At the end of July 1931 exchange controls were introduced amid political and economic turmoil (Ellis, 1941). August 1931 also saw the signing of the first Standstill Agreement, which froze 6.3bn Reichsmark of German short-term debt (Piet, 2004).
11/6/1932	23/4/1932 - 06/8/1932	67.3	The Lausanne conference was held from June 16 to July 9, 1932 and virtually put an end to reparations payments, while maintaining the service of the Dawes and Young bonds (Piet, 2004).
19/5/1934	05/5/1934 - 23/6/1934	28.1	The transfer crisis started in March 1934, continued with a month-long conference in May and subsequently culminated with the enforcement of a complete transfer moratorium on foreign payments, which established the complete control of the Reichsbank on all foreign exchange operations.
04/9/1937	19/12/1936 - 25/9/1937	23.8	In May and September new capital controls are introduced.
12/11/1938	05/11/1938 - 10/12/1938	19.3	Foreign exchange controls announced and implemented in November and December.
26/8/1939	12/8/1939 - 09/9/1939	10.8	September 1st 1939: Germany invades Poland

Table 6: Break dates with 90% asymmetric confidence bands and corresponding events for the Dawes bond price series. The reported mean is the expected long-run value of the estimated stationary  $AR(1)$  process for the regime *starting* at the respective break date.

<sup>21</sup>We also do not find a break associated to the price slump of Spring 1933, caused by the policy uncertainty surrounding the first “temporary” moratorium on foreign payments. The moratorium did not affect the Dawes bonds but only the amortisation of the Young bonds ((Toniolo, 2005), pages 153-57). Prices recovered from mid-1933 until January 1934, probably due to a group of countries (Netherlands, Switzerland and briefly the UK) offering to raise their import quota of German goods in return for investor protection (Piet, 2004). This would have obviously had a positive impact on German foreign currency reserves and thus on the servicing of its foreign debt.

In Table 6 we associate the estimated break dates and their confidence intervals for the Dawes bonds to key events we believe influenced the market. What sets the events we find apart from other key historical events is that they correspond to instances of German citizens and companies being restricted from accessing secondary markets abroad. The first break and its confidence interval correspond to the introduction of exchange controls in 1931, which was accompanied by a 50% decrease in the expected value of the estimated stationary process of the regime (see the Mean column in the table). Exchange controls made the repurchase of securities abroad very difficult for German investors and companies given that, following the introduction of this measure, foreign exchange availability and its use were tightly controlled by the Reichsbank. Conversely, the second break we identify is connected with an increase in the price of German bonds. This is not surprising since we associate the break to the Lausanne Conference of July 1932, which essentially put an end to reparation payments, thus raising the expected value of the remaining serviced claims, including Dawes and Young bonds. The introduction of a complete transfer moratorium, as well as even tougher exchange controls in 1934, is connected to a further collapse in the price of Dawes bonds. This legislation made debt repurchases extremely difficult due to the complete monopoly of the Reichsbank over foreign exchange operations. This legislation was announced after the so-called Transfer Conference of April-May and enforced as from July 1934. As shown already in Table 1, foreign debt repatriations grew in volumes over time, peaking at over a billion Reichsmarks in 1933, only to dwindle after the policy tightening of 1934, notwithstanding the subsequent enormous increase in the spread and the equally large risk-less arbitrage profits which could be made from this state of things. We are also able to pick up the further tightening of exchange controls in May and September 1937<sup>22</sup>, as well as the announcement and implementation of the foreign exchange law in November and December 1938<sup>23</sup>. The last break we pick up is not an episode of financial repression but the outbreak of World War II, represented by the Molotov-Ribbentrop pact and the German invasion of Poland on September 1st, 1939. The implications of this major event on expectations of repayment are clear and are reflected by a 50% hit to the prices of Dawes bonds in that week.

Table 7 presents the results for the Young bonds. The breaks identified are the same except for the first. In this case, the model picks up an extended period of turbulence between the introduction of the exchange controls in 1931 and the Lausanne Conference of 1932 resulting in a single break instead of two separate ones. The main message remains, however, unchanged.

To sum up, the breaks we find correspond to complex and multifaceted episodes accompanied by partial or total defaults or restructurings. We argue that the financial repression that accompanied them was the key element of these episodes for creditors' expectations of

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<sup>22</sup>More precisely: on May 27th, see Deutsches Reichsgesetzblatt, Jahrgang 1937, Teil I, Nr. 65, p. 600-601; and on September 16th, see Deutsches Reichsgesetzblatt, Jahrgang 1937, Teil I, Nr. 105, p. 1018-19.

<sup>23</sup>November 8th: Anträge auf Zuteilung von Devisen. December 12th: Bekanntmachung des Gesetzes über die Devisenbewirtschaftung. Source: Deutsches Reichsgesetzblatt Jahrgang 1938, Teil I, Nr. 211, p. 1733-48. Exchange banks were also involved in the confiscation of Jewish securities.

Break date	90% confidence interval	Event
26/12/1931	19/9/1931 - 21/5/1932	Dates in between the introduction of capital controls by the end of July 1931 and the Lausanne conference starting in June 1932.
03/3/1934	27/1/1934 - 05/5/1934	The transfer crisis started in March 1934, continued with a month-long conference in May and subsequently culminated with the enforcement of a complete transfer moratorium on foreign payments, which established the complete control of the Reichsbank on all foreign exchange operations.
04/9/1937	02/1/1937 - 09/10/1937	In May and September new capital controls are introduced.
26/11/1938	29/10/1938 - 17/12/1938	Foreign exchange controls announced and implemented in November and December.
26/8/1939	12/8/1939 - 16/9/1939	September 1st 1939: Germany invades Poland

Table 7: Break dates with 90% asymmetric confidence bands and corresponding events for the Young bond price series. Means of the estimated  $AR(1)$  process are not reported as many of the parameters are not found to be significant, but this has no impact on the estimated break dates.

repayment. The exchange controls which limited the access of Germans to secondary markets closed the channel through which the effects of limited debt services to foreigners could be offset. In fact, in the face of a purely external default such as the one we observe, debt repatriation would have represented a natural way for creditors to dismiss unwanted assets and for German citizens to profit on their higher probability of repayment.

For reasons already put forward, we have not relied so far on the analysis of the spreads. When repeating the analysis on the different reconstructed spread series, however, we find most reported breaks and their associated confidence intervals to be present in almost all models and no very different break dates are detected, both for the Dawes and Young bonds.

The comparison of our results with the break dates obtained by Brown and Burdekin (2002)<sup>24</sup> is illustrative of the usefulness of our empirical approach compared to theirs, which is commonly found in the literature (for instance, the previously cited Oosterlinck (2003) and Frey and Kucher (2000, 2001)). One break we share in common is the outbreak of WWII. They also find two breaks in 1935 and two in 1937; however, they are associated with events of political nature, such as the reintroduction of conscription, and not with financial repression events. The importance of providing confidence intervals, not possible with the common approach, is evident when noticing that the two breaks they find in 1937 could in fact correspond, according to our identification, to a single break situated in period

<sup>24</sup>The samples differ, overlapping only for the period 1933-1940, which is the period we compare.

of turbulence due to the introduction of multiple layers of capital controls.

## 6 How is the behavior of the German authorities explained?

The behavior of the German government represents, perhaps, the most puzzling part of the story. If, as we argue, the German government showed awareness that foreign debt repatriations can be detrimental for a highly indebted country, then macro objectives such as systematic export subsidization and large-scale debt reduction were not the ultimate policy goals of this practice. Then why did the German government not completely suppress foreign debt repatriations? Why were some resources put aside for debt repurchases?

We argue that limited and tightly controlled debt repatriations were a useful policy tool. By limiting the availability of foreign exchange and controlling its use, the German authorities were able to extract some microeconomic benefits from the repatriations, without any major detrimental macroeconomic consequence.

First, genuinely additional exports - which would not have taken place without the possibility of debt repatriations (see section 7.1 for an illustration of the role of debt repatriations in trade policy) - were a source of foreign exchange, rather than a leakage. Foreign exchange was of essential importance to Germany to service the debt and to acquire raw materials and capital goods abroad. Second, there is ample evidence that key industries benefited significantly on export markets thanks to these hidden subsidies (James, 1985). Third, the debt repatriations served as a private debt reduction tool and source of risk-less arbitrage profits for specific - and influential - industries, individuals and companies. It is well known that there were strong connections between the Nazi party and groups of industrialists - Ferguson and Voth (2008) have recently documented them and their economic implications - and previous governments had strong connections with interest groups such as the land-owning Junkers. It is not difficult to imagine that granting the possibility of repurchasing foreign debt abroad was a way of favoring supporters and strengthening alliances.

For example, the company *Miag Mühlenbau und Industriegesellschaft* was granted foreign currency in order to buy-back some of its own debt securities from abroad, which bore a particularly heavy interest burden (Klug, 1993). Influential individuals could also engage in sizable repatriations. Hermann Josef Abs - an important figure in post-WWII Germany and in the 1953 London debt agreement in particular, and a Deutsche Bank director in the 1930s - made large personal profits by purchasing German debt abroad and selling it for higher prices in Germany (James, 2004). The finance minister Lutz Graf Schwerin von Krosigk carried out a similar operation in November 1933, but was only granted around half of the foreign exchange he had initially requested (Klug, 1993). Finally, the NSDAP itself, in a period when it was particularly cash-strapped (precisely between Autumn 1933 and Spring 1934), employed some intermediaries to buy large quantities of German debt throughout Europe in order to make profits by selling it at home.

A key feature of our interpretation is that the German government's course of action of

defaulting on foreign creditors, while enforcing domestic payments, was in line with investors' expectations, leading to the price differential we document. Our view could be contested on the basis of the fact that, just a decade earlier, Germany underwent a massive default on its domestic rather than foreign creditors in the form of hyperinflation. How - it could be inquired - can the radical difference in policy response between the two episodes be explained? Apart from the clear political differences between Germany in the early 1920s - a newly established democracy emerging from a traumatic military defeat - and in the early 1930s - a country in deep economic crisis transitioning from an unpopular and dysfunctional democracy to a nationalistic totalitarian regime - we can also identify an economic rationale.

Following Erce (2012), we can frame the selective default decision - that is the decision to default on either internal or external creditors, or both - based on the following elements: 1) the source of the liquidity pressure 2) the health of banking system 3) the sources of financing for the economy. First, as shown in Section 2, almost half of Germany's foreign commercial debt was short-term. Towards the end of the 1920s, rolling over this debt became increasingly difficult, mainly due to the onset of the Great Depression and the deteriorating financial circumstances in the United States and other creditor nations. By studying the 1930s defaults for a panel of over 20 countries (including Germany), Papadia (2015) has shown that a large reliance on short-term financing was indeed a key driver of external default, even after a wide range of political and economic characteristics are controlled for. The evidence thus points to a strong liquidity pressure coming from abroad in 1930s Germany.

Second, Germany underwent a devastating banking crisis in 1931. This made it very unpalatable for the authorities to impose further pressure on a crippled financial sector in the form of an internal default. Sovereign defaults are known to have severe consequences for the banking sector due to the generally large holdings of government debt of banks. Moreover, exchange controls were introduced precisely in order to shield the domestic economy and the banks from capital flight. The precarious health of Germany's banking system might have therefore further discouraged the German authorities from not enforcing domestic payments.

Third, while Germany relied heavily on foreign borrowing to finance reparations payments, as well as its public and private sectors during the 1920s, international financial markets were essentially shut for German borrowers starting from 1929, particularly for medium and long-term loans.<sup>25</sup> Although the 1920s borrowing spree took off only with the signing of the Dawes Plan in 1924, after the hyperinflation was over, the German authorities could have foreseen the possibility of tapping up foreign credit markets already in the early post-war years and might thus have eschewed external default based on reputational considerations and presumably on a lack of political power. After the deluge in foreign borrowing of 1925-28, instead, the German economy started moving towards (partial) trade and financial autarky, especially after the NSDAP ascended to power in 1933. In this context, access to foreign borrowing became of limited importance, thus paving the way for external default.

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<sup>25</sup>An important exception is the Young loan of 1930 (Ritschl, 2012) and the fact that, as Ritschl (2001) put it, "during its first two years Nazi Germany was successful in attracting fresh credit despite the continuation of the standstill agreement and the default of 1933/34 on long term credit. One reason may have been the discrimination against (mostly American) long term debt in favor of continuing service on (mostly British) short-term credits (this is Schuker's hypothesis)".

Furthermore, due to the composition of Germany's debt in the aftermath of WWI, internal default was, essentially, the only option. Most of Germany's debts - with the exception of the newly imposed war reparations - were domestic, as opposed to those of the UK and France, who had borrowed heavily from the United States (Guinnane, 2004). Germany's debt burden in the post-WWI years was also constituted mainly of government debt arising from the war, while in the 1930s the whole economy was deeply indebted. While an economy-wide external default such as the German one can be disruptive, an economy-wide domestic default would put in question the security of property rights with potentially devastating consequences.

To conclude our discussion, we point out that there was a form of mild and implicit internal default in 1930s Germany. The work-creation program of the National Socialist government relied on financial repression, of which the exchange control system, with its ability to stop outward capital flows, was an important part (Ellis, 1940). The financial repression meant that short-term assets were transformed into long-term ones through ad-hoc consolidation loans, interest rates and dividends were unilaterally reduced and kept artificially low and the *Golddiskontbank* used the proceeds of promissory notes (*Solawechsel*) sold to commercial banks to purchase treasury bills, which were then rediscounted by the Reichsbank (Poole, 1939). These measures have much in common with other historical and recent episodes of financial repression and, although they do not represent a default in the classic sense, they are generally considered a de facto partial default on domestic holders of government debt.

## **7 Explaining the debt repatriations: the existing literature and its limits**

In this section, we discuss the two main explanations for the debt repurchases put forward in the existing literature. Both focus on providing a rationale for the authorities' tolerance, control and apparent promotion of the repatriations. Neither explanation outlines the incentives of those engaging in the repatriations from either the buy or sell side, except for acknowledging potential arbitrage profits due to the price differential of German bonds between domestic and foreign markets. Crucially, however, no attempt is made to explain the origin of the price differential itself. We also argue that, at times, previous explanations lack internal coherence.

### **7.1 The traditional explanation: foreign debt repatriations as export subsidies**

Traditional views of the debt repatriations were influenced by an imperfect knowledge of the true size of the phenomenon (Klug, 1993). Moreover, most authors were chiefly concerned with explaining the introduction and perpetuation of the exchange controls system, rather than the repatriations per se. Even with regards to the exchange controls, while most authors

concurred that the rationale behind their introduction in 1931 was stopping capital flight, explanations regarding their perpetuation differ.

Child (1958), for example, saw the exchange control system as a highly sophisticated trade policy tool. The author argued that the German authorities used it to manipulate the size, direction and terms of trade in Germany's favor by exploiting the country's monopolistic/monopsonistic position in certain markets, especially in South-Eastern Europe and Latin America. Ritschl (2001), however, has ruled out a successful attempt by the German authorities to exploit the country's dominant position before WWII, at least in European markets. By analyzing confidential trade data, he showed that Germany's ability to shape trade flows to its favor was minimal before the start of the conflict, but then reached massive size with military occupation.

Ellis (1940), instead, argued that, as the decade progressed and the National Socialist government's *Aktive Konjunkturpolitik* (active business cycle policy) gained importance, exchange controls became an essential tool for guaranteeing the coexistence of expansionary monetary and fiscal policies with a fixed exchange rate, while avoiding capital flight. In other words, they became an effective tool of the financial repression aimed at channeling resources to government financing, as well as one of the many facets of the NSDAP's totalitarian control of trade, investment and the economy in general.

While we believe the evidence points in favor of Ellis' interpretation, explaining the introduction and persistence of the exchange control system is not the purpose of this paper, and the topic has received a lot of attention in the past. We focus on documenting and explaining an offshoot of the exchange control system: the debt repatriations. In doing this, we believe we also shed some additional light on the motivation for the introduction and persistence of the exchange control system, part of which - we argue - was avoiding excessive external debt repayment.

Heuser (1934), along with many contemporaries, saw the debt repatriations as a way to subsidize German exports. This interpretation was supported by the fact that the German government, in the rare cases in which it acknowledged the existence of the practice, justified the repatriations as such.<sup>26</sup> Due to the devaluation of the Pound, the Dollar and other currencies following the departure of the respective countries from the Gold Standard, many German exports ceased to be competitive on world markets. If a company could demonstrate that its production costs exceeded world prices, the Reichsbank could grant it the possibility of repurchasing German bonds (similar operations were carried out with blocked accounts of foreigners in Germany) on foreign markets with part of the export proceeds, to then sell them in Germany for much higher prices.<sup>27</sup> The system represented a way to depreciate the

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<sup>26</sup>For example, in this memorandum prepared in English by the German Government: FOLIO FHG/3: The Repurchase of German Foreign Bonds, Berlin January 26 1934, London School of Economics and Political Science Archive.

<sup>27</sup>On average, only 50% of the export proceeds were used to repurchase bonds (at least officially), while the rest was compulsorily handed over to the Reichsbank. A detailed description of the mechanism can be found in Heuser (1934), page 212-214. These exports were "additional" (in German *Zusatzausfuhr*), in the sense that they would not have been possible without this disguised subsidy. In its attempt to appease creditors worried about the practice, the German government declared that, due to their additional nature,

Reichsmark on export markets, while avoiding depreciation in the nominal exchange rate.

Heuser (1934) and Child (1958) attributed Germany's reliance on overt and disguised export subsidies to the inapplicability of policies normally employed to stimulate exports and reduce imports. Devaluation was ruled out, at least initially, due to the large size of the foreign currency denominated debt, which would have increased dramatically in real value. Moreover, forfeiting the gold anchor might have led to an increase in the import prices of essential raw materials and to general inflationary pressures bearing unpleasant memories of the hyperinflation of less than a decade earlier (Ellis, 1940). The alternative to devaluation and export subsidies was represented by additional deflationary policies. Imposing these on an already depressed economy, however, might have caused violent social unrest and additional capital flight.

The additional export system was, according to Heuser, one of the few options left to Germany to increase exports and thus maintain the foreign debt service. More prosaically, Einzig (1934) wrote that Germany had found a way of "eating [its] cake and keeping it". Ellis (1940) concurred with this interpretation, but restricted its validity to a limited time frame, arguing that, after 1933, the perpetuation of exchange controls ceased to have an economic rationale and was, instead, based on political objectives of the National Socialist regime.

A number of authors have shed doubts on the interpretation of the debt repatriations as an export subsidy. Firstly, Ellis (1941), Balogh (1938) and Child (1958) concurred on the fact that exchange controls and debt repurchases gained some importance in trade policy only in the middle of 1932, while the debt repatriations started already in 1931. Ellis also expressed doubts as to whether the repurchase of bonds and blocked accounts could be directly linked to additional exports. Moreover, Klug (1993) showed that the *Reichswirtschaftsministerium* did not consider the price differential between New York and Berlin to be high enough for the additional export practice to be beneficial, given the foreign exchange shortage faced by Germany.<sup>28</sup>

## 7.2 Klug's reassessment: debt repatriations as a tool to reduce foreign debt overhang

In the most recent reassessment of the German repatriations, Klug (1993) argued that they were a tool to reduce Germany's foreign debt overhang. This interpretation has its roots in the theoretical literature, which originated from the 1980s Latin American debt crisis,

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they represented a source of foreign exchange, rather than a leakage, and as such they would help Germany meet its debt service.

<sup>28</sup>Klug also claimed that the fact that German exports expanded most between 1934 and 1936, when debt repatriations were low, is a sign that these were not instrumental in Germany's foreign economic policy. This argument does not consider the fact that debt repatriations might have been low exactly because they were not needed to subsidize exports. Furthermore, the introduction of Schacht's New Plan in 1934 meant that Germany started engaging heavily in bilateral trade and clearing agreements. These often comprised the direct exchange of goods, which increased German exports considerably without the need of explicit or disguised subsidies.

when economists discussed the merits of different forms of debt reduction, including market-based ones such as debt repurchases. Opinions on the practice varied widely, with some authors considering debt repatriations a useful instrument within the toolkit of developing countries attempting to lower their debt, and others considering them outright harmful for both debtors and creditors.<sup>29</sup>

With regard to Germany, James (1985) argued that debt repatriations contributed to restore the country's credibility abroad, a fact demonstrated, according to him, by increases in the price of German bonds traded abroad. In his study, Klug analyzed a large number of German bond issues in New York, finding that debt repatriations did indeed raise secondary market prices, but the effect was not strong. According to the author, this finding demonstrates that the Bulow and Rogoff (1988, 1991) framework, - which stipulates that repatriations raise the value of the residual debt, thus offsetting the benefits of the debt overhang reduction - does not apply to the German case. He therefore concludes that Germany might have marginally benefited from the repatriations in terms of overhang reduction.

In support of Klug's interpretation stands the wider experience of the 1930s debt crisis. According to Eichengreen and Portes (1990a), page 4 "[...] market-based debt reduction made a useful contribution to resolving the debt crisis of the 1930s by reducing the debt overhang and eliminating marginal creditors". The authors, however, do not mention Germany in their assessment of the role of debt repatriations in the 1930s, even though it carried out by far the largest of such operations.

We believe that Klug's interpretation has several limits. While German foreign debt did indeed fall sharply during the 1930s - commercial debt was more than halved, going from 32.6 billion in 1930 to 13.9 in 1938 - debt repatriations were a small part of this reduction. Of much greater importance was the departure of the USA and Great Britain - and eventually all countries - from the Gold Standard, which led to sizable devaluations of German debt denominated in foreign currency. The Lausanne Conference of 1932, moreover, put an end to the war reparations, further drastically reducing Germany's foreign debt burden.

The rapid recovery of the German economy in the second half of the 1930s also meant that the debt burden became lighter. Germany arguably stopped facing a debt overhang around 1932-33. However, the debt repatriations reached their peak precisely in 1933 and well before the government and Reichsbank managed to impose their complete control on the

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<sup>29</sup>Although the systematic study of debt repatriations is relatively recent, their practice has a long history. While they were almost unknown in the 19th century, they were widespread already in the 1930s (Klug, 1993), as the German episode shows. The main rationale for voluntary, market-based initiatives to reduce the debt overhang is that they can help overcome the free-rider problem among creditors Froot (1989). Each creditor has no interest in reducing her claims, especially if the debtor is believed to be on the wrong side of the debt Laffer curve. The reason is that, in this scenario, debt relief raises the value of expected repayment and, thus, of residual claims, benefiting remaining creditors. Froot, however, concludes that debt repatriations are difficult to work in practice, mainly due to the fact that finding the necessary resources is not trivial and that the exact dynamics behind the debt Laffer curve are difficult to measure. However, debt repatriations could be used as a signal of the willingness to reform (Bulow and Rogoff, 1991; Fernandez-Ruiz, 2000). The consensus appears to be that debt repatriations can be beneficial for both debtors and creditors only when they take place in the context of further concession and the senioritization of existing debts relative to new ones (Bulow and Rogoff, 1991; Detragiache, 1994).

practice, which happened only after the transfer moratorium of 1934 (Ellis, 1940). In fact, the Reichsbank president Hans Luther, expressed disappointment for the failure of the German authorities to curb debt repurchases more effectively, while the *Reichswirtschaftsministerium*, although viewing the practice with more favor, was also eager to keep it under strict control (James, 1985). Improvements were also recorded on the balance of payments around the same time (Ellis, 1940). These elements make it difficult to sustain the interpretation of the repurchases as a tool to reduce the debt overhang: when overhang reduction was most needed, repatriations were scarcely used as a policy tool, and they continued long after Germany stopped facing a crushing foreign debt.

The use of debt repatriations to reduce Germany's foreign debt appears even more unlikely for a country heading for political and economic isolationism and marching in rapid steps towards war. Some recorded debt repatriations, principally of Austrian debt, took place as late as 1944, in the full swing of the war (Klug, 1993) and it is unclear why the German government would want to reduce the debt overhang of Austria in the midst of the war.

Finally, Klug himself showed that, if the debt repatriations led to any reduction in the market value of the debt at all, then this was minimal. A government-coordinated mobilization of thousands of individuals and companies, as well as billions of Reichsmarks, to bring about a minimal reduction in the value of the foreign debt does not appear realistic.<sup>30</sup>

The principal limit of Klug's interpretation is that - alongside most of the 1980s literature - it considers debt repatriations only in the context of a coordinated program by a highly indebted country trying to reduce its debt overhang. Debt repatriations, however, can also be a private initiative of citizens and firms of a debtor country who value the debt differently from creditors abroad. Classens and Diwan (1989) argue that the difference in valuation can arise in three instances: 1) discount factors differ between creditors and debtors, 2) creditors receive an amount different from that paid by the debtors, 3) the perceived probability of default is different for citizens of the debtor and creditor countries. As we have argued above, it was indeed different default probabilities, concrete rather than perceived, between domestic and foreign bondholders that led to the German repatriations.

## 8 Conclusion

We have studied a relatively little-explored aspect of German economic history in the inter-war period: the large repurchases of foreign debt carried out by Germans between 1931 and

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<sup>30</sup>Klug further claimed that the National Socialist government was particularly attached to the practice of foreign debt repatriations, even though these began well before it rose to power. Barkai (1990), however, argues that the NSDAP had no clear economic ideology. Their method consisted in establishing some goals, and trying to reach them through trial and error and by leaving the technicalities to experts and bureaucrats, often outside the Nazi party, such as those of the *Wirtschaftsministerium* and the Reichsbank. James (1985) further argued that Reichsbank presidents Luther and Schacht used the pivotal role of the bank in foreign and economic policy to realise "their economic vision". These elements hardly suggest a harmonious and coherent economic policy in Germany in the first half of the 1930s.

1939. This paper critically assesses the considerations of contemporaries who observed and studied the episode<sup>31</sup> together with more recent studies by historians and economists<sup>32</sup>. We have argued that debt repatriations were not suppressed altogether once authorities stepped in during the Summer of 1931, because they allowed the pursuit of specific micro-objectives. Key industries, companies and influential individuals benefited from the repurchases in several ways. Debt repatriations were used as a hidden subsidy to promote exports, as a tool to reduce private debt exposure and as a way to make large arbitrage profits. At the same time, their use as a systematic macro-tool was ruled out by the fact that it would have led to excessive debt repayment and welfare losses for the German economy as a whole.

A theoretical framework which explicitly considers the role of secondary markets for sovereign debt applies extremely well to the German episode. We based our interpretation on the seminal work of Broner, Martin, and Ventura (2008, 2010) and extensions thereof which account for heterogeneous debtors, whose welfare is valued differently by the government, and heterogeneous creditors, whose information sets differ regarding the possibility of default. To our knowledge, this paper is the first detailed historical empirical case-study demonstrating the importance of secondary markets in foreign debt crises.

Our interpretation is supported by published and unpublished historical documents and archival sources, as well as quantitative analysis of weekly prices of German bonds in New York and Berlin. We have identified structural breaks in these series together with asymmetric confidence intervals which we then associate to key political and economic events. We find that government interventions and other events which hampered the functioning of secondary markets and made debt repatriations difficult had sharply negative effects on the price of bonds on the New York Stock Exchange. We do not find an association with other episodes that directly affected the servicing of German debt, except for an extreme event such as the beginning of WWII. The results of the empirical analysis match the predictions of the Broner, Martin, and Ventura (2008, 2010) model and its extensions.

In sum, this paper contributes to the understanding of the somewhat unclear case of debt repatriation in Germany in the 1930s. The principal finding is that international secondary markets prices for German bonds were hardly affected by changes in official policy: instead, the main drivers of price changes were factors affecting the efficiency of these markets. In line with these results, we find that buybacks were largely a private initiative exploiting arbitrage opportunities. Contrary to previous research, we do not find evidence that debt repatriations were a political attempt to deal with debt overhang. The extent of policy intervention was limited to attempting export subsidization and granting favors that came piggybacked with private repatriations initiatives. This paper also adds to the literature investigating the role of secondary markets on sovereign risk. Recent work by Broner, Erce, Martin, and Ventura (2014) shows that this literature can help explain some puzzling features of the current European debt crisis. We show that the underlying theoretical lenses they use can provide an useful framework and lead to novel insights also in quite different episodes.

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<sup>31</sup>Prominent examples are Einzig (1934), Heuser (1934), Harris (1935), Balogh (1938), Bonnel (1940) and Ellis (1941).

<sup>32</sup>In particular, Child (1958), James (1985) and Klug (1993).

# Primary Sources

Bank of England Archive, Germany Country File:

- OV34/69 - Die Auslandsverschuldung Deutschlands nach dem Stande von 30. November 1931
- OV34/148: Special advisory Committee Basel 1931
- OV34/179: Germany Moratorium. Report of the committee appointed to examine and interpret the figures submitted by the Reichsbank, May 30th 1933

London School of Economics and Political Science Archive:

- FOLIO FHG/3 - The Repurchase of German Foreign Bonds, Berlin January 26 1934, memorandum prepared in English by the German Government

The Annalist: A Journal of Finance, Commerce and Economics

- Vol. 35-56, January 1930 - October 1940, The New York Times Company

Foreign Exchange Control Laws, 1937-38:

- Deutsches Reichsgesetzblatt, Jahrgang 1937, Teil I, Nr. 65, p. 600-601
- Deutsches Reichsgesetzblatt, Jahrgang 1937, Teil I, Nr. 105, p. 1018-19
- Deutsches Reichsgesetzblatt, Jahrgang 1938, Teil I, Nr. 211, p. 1733-48: Anträge auf Zuteilung von Devisen & Bekanntmachung des Gesetzes über die Devisenbewirtschaftung

## References

- ACCOMINOTTI, O., AND B. EICHENGREEN (2013): “The Mother of All Sudden Stops: Capital Flows and Reversals in Europe, 1919-1932,” *NBER Working Papers*, 19580.
- BAI, J. (1997a): “Estimating Multiple Breaks One at a Time,” *Econometric Theory*, 13(03), 315–352.
- (1997b): “Estimation Of A Change Point In Multiple Regression Models,” *The Review of Economics and Statistics*, 79(4), 551–563.
- BAI, J., AND P. PERRON (1998): “Estimating and Testing Linear Models with Multiple Structural Changes,” *Econometrica*, 66(1), 47–78.
- (2003): “Computation and analysis of multiple structural change models,” *Journal of Applied Econometrics*, 18(1), 1–22.
- BALOGH, T. (1938): “The National Economy of Germany,” *Economic Journal*, 48, 480.
- BARKAI, A. (1990): *Nazi Economics: Ideology, Theory, and Policy*. Yale University Press.
- BONNEL, A. T. (1940): *German Control over International Economic Relations, 1930-1940*. The University of Illinois Press.
- BRONER, F., A. ERCE, A. MARTIN, AND J. VENTURA (2014): “Sovereign debt markets in turbulent times: Creditor discrimination and crowding-out effects,” *Journal of Monetary Economics*, 61(C), 114–142.
- BRONER, F., A. MARTIN, AND J. VENTURA (2008): “Enforcement Problems and Secondary Markets,” *Journal of the European Economic Association*, 6(2-3), 683–694.
- (2010): “Sovereign Risk and Secondary Markets,” *American Economic Review*, 100(4), 1523–55.
- BROWN, W. O., AND R. C. K. BURDEKIN (2002): “German Debt Traded in London during World War II: A British Perspective on Hitler,” *Economica*, 69, 655–669.
- BRUTTI, F., AND P. SAURÉ (2013): “Repatriation of Debt in the Euro Crisis: Evidence for the Secondary Market Theory,” *mimeo*.
- BULOW, J., AND K. ROGOFF (1988): “The Buyback Boondoggle,” *Brookings Papers on Economic Activity*, 2, 675–715.
- (1991): “Sovereign Debt Repurchases: No Cure for Overhang,” *Quarterly Journal of Economics*, 106, 1219–36.
- BUNDESBANK (1976): *Deutsches Geld- und Bankwesen in Zahlen, 1876-1975*. Knapp.

- CHILD, F. C. (1958): *The Theory and Practice of Exchange Control in Germany*. Martinus Nijhoff.
- CHONG, T. T. L. (1995): “Partial parameter consistency in a misspecified structural change model,” *Economics Letters*, 49(4), 351–357.
- CLASSENS, S., AND I. DIWAN (1989): *Market-Based Debt Reduction*, in *Dealing with the Debt Crisis*, Ishrat Husain & Ishac Diwan (eds.). World Bank.
- DETRAGIACHE, E. (1994): “Sensible Buybacks of Sovereign Debt,” *Journal of Development Economics*, 43(2), 317–333.
- EATON, J., M. GERSOVITZ, AND J. E. STIGLITZ (1986): “The Pure Theory of Country Risk,” *European Economic Review*, 30(3), 481–513.
- EICHENGREEN, B., AND R. PORTES (1990a): “The Interwar Debt Crisis and Its Aftermath,” *The World Bank Research Observer*, 5(1), 69–94.
- (1990b): “Dealing With Debt: The 1930s and the 1980s,” *NBER Working Papers*, 2867.
- EINZIG, P. (1934): *Germany’s Default: The Economics of Hitlerism*. Macmillan and co. limited.
- ELLIS, H. S. (1940): “Exchange Control, 1931-1939: from an Emergency Measure to a Totalitarian Institution,” *Quarterly Journal of Economics*, 54(4), 1–158.
- (1941): *Exchange Control in Central Europe*. Harvard University Press.
- ERCE, A. (2012): “Selective Sovereign Defaults,” *Federal Reserve of Dallas Working Paper, Globalization and Monetary Policy Institute*, 127.
- FERGUSON, T., AND H.-J. VOTH (2008): “Betting on Hitler - The Value of Political Connections in Nazi Germany,” *The Quarterly Journal of Economics*, 123(1), 101–137.
- FERNANDEZ-RUIZ, J. (2000): “Debt Buybacks, Debt Reduction, and Debt Rescheduling under Asymmetric Information,” *Journal of Money, Credit and Banking*, 32(1), 13–27.
- FLANDREAU, M., N. GAILLARD, AND U. PANIZZA (2010): “Conflicts of Interest, Reputation, and the Interwar Debt Crisis: Banksters or Bad Luck?,” *CEPR Discussion Papers* 7705.
- FREY, B. S., AND M. KUCHER (2000): “History as Reflected in Capital Markets. The Case of World War II,” *Journal of Economic History*, 60(3), 468–496.
- FREY, B. S., AND M. KUCHER (2001): “Wars and Markets: How Bond Values Reflect the Second World War,” *Economica*, 68, 317–333.

- FROOT, K. (1989): “Buybacks, Exit Bonds, and the Optimality of Debt and Liquidity Relief,” *International Economic Review*, 30(1), 49–70.
- GUINNANE, T. W. (2004): “Financial Vergangenheitsbewältigung: the 1953 London Debt Agreement,” *Economic Growth Center, Yale University, Discussion Paper*, 880.
- GUINNANE, T. W., H. S. ROSEN, AND K. L. WILLARD (1995): “Turning Points in the Civil War: Views from the Greenback Market,” *American Economic Review*, 86(4), 1001–18.
- HANSEN, B. E. (2001): “The New Econometrics of Structural Change: Dating Breaks in U.S. Labour Productivity,” *Journal of Economic Perspectives*, 15(4), 117–128.
- HARRIS, C. R. S. (1935): *Germany’s Foreign Indebtedness*. Oxford University Press.
- HEUSER, H. K. (1934): “The German Method of Combined Debt Liquidation and Export Stimulation,” *The Review of Economic Studies*, 1(3), 210–217.
- INSTITUT FÜR KONJUNKTURFORSCHUNG (1933): *Konjunkturstatistisches Handbuch*.
- (1936): *Konjunkturstatistisches Handbuch*.
- JAMES, H. (1985): *The Reichsbank and Public Finance in Germany, 1924–1933: a Study of the Politics of Economics during the Great Depression*. Frankfurt.
- (2004): *Banks and Business Politics in Nazi Germany*, in Business and Industry in Nazi Germany, Francis R. Nicosia and Jonathan Huener (eds). Berghahn Books.
- KENEN, P. B. (1991): “Debt Buybacks and Forgiveness in a Model with Voluntary Repudiation,” *International Economic Journal*, 5(1), 1–13.
- KLUG, A. (1993): *The German Buybacks 1932–1939: a Cure for Overhang?*, no. 75 in Princeton Studies in International Finance. Princeton University Press.
- KRUGMAN, P. (1988): “Market-Based Debt-Reduction Schemes,” *NBER Working Papers*, 2587.
- LEE, J., AND M. C. STRAZICICH (2003): “Minimum Lagrange Multiplier Unit Root Test with Two Structural Breaks,” *The Review of Economics and Statistics*, 85(4), 1082–1089.
- OOSTERLINCK, K. (2003): “The Bond Market and the Legitimacy of Vichy France,” *Explorations in Economic History*, 40, 326–344.
- OOSTERLINCK, K., AND J. LANDON-LANE (2006): “Hope Springs Eternal – French Bondholders and the Soviet Repudiation (1915–1919),” *Review of Finance*, 10(4), 507–535.
- PAPADIA, A. (2015): “Sovereign Defaults during the Great Depression: New Data, New Evidence,” *mimeo*.

- PERRON, P. (2005): “Dealing with Structural Breaks,” Boston University - Department of Economics - Working Papers Series WP2005-017, Boston University - Department of Economics.
- PIET, C. (2004): “The Touchstone of German credit: Nazi Germany and the service of the Dawes and Young Loans,” *Financial History Review*, 11(1), 33–50.
- POOLE, K. E. (1939): *German Financial Policies 1932-1939*. Harvard University Press.
- POWER, P. J. (1996): “Sovereign Debt: The Rise of the Secondary Market and its Implications for Future Restructurings,” *Fordham Law Review*, 64(6), 2701–2772.
- REINHART, C. M., AND K. S. ROGOFF (2013): “Financial and Sovereign Debt Crises: some Lessons Learned and those Forgotten,” *CEPR Discussion Paper Series*, 9750.
- RITSCHL, A. (2001): “Nazi Economic Imperialism and the Exploitation of the Small: Evidence from Germany’s Secret Foreign Exchange Balances, 1938-1940,” *Economic History Review*, 54(2), 324–345.
- (2002): *Deutschlands Krise und Konjunktur, 1924-1934. Binnenkonjunktur, Auslandsverschuldung und Reparationsproblem zwischen Dawes-Plan und Transfersperre*. Berlin: Akademie-Verlag.
- (2012): “The German Transfer Problem, 1920-1933: a Sovereign Debt Perspective,” *European Review of History: Revue europeenne d’histoire*, 10, 943–964.
- (2013): *Reparations, Deficits, and Debt Default: the Great Depression in Germany*, in *The Great Depression of the 1930s*, Nicholas Crafts and Peter Fearon (eds.). Oxford University Press.
- SCHUKER, S. (1988): *American Reparations to Germany, 1924–1933*. Princeton University Press.
- SCHWARZ, H. P. (1982): *Die Wiederstellung des Deutschen Kredits: das Lodoner Schuldenabkommen*. Belser.
- STONE, M. R. (1991): “Are Sovereign Debt Secondary Market Returns Sensitive to Macroeconomic Fundamentals? Evidence from the Contemporary and Interwar Markets,” *Journal of International Money and Finance*, 10(Supplement 1), S100–S122.
- TONIOLO, G. (2005): *Central Bank Cooperation at the Bank for International Settlements, 1930–73*. Cambridge University Press.

## A Reconstructed spread series

The Berlin Stock exchange was closed between July 1931 and April 1932. We reconstruct the missing values under different scenarios, all but one involving an eight-week slump in prices correlated to the dynamics of the US stock market (Global Financial Data). The scenarios differ in the timing of the slump (ranging from mid-July to August until October-November 1931), whereas one consists in a linear interpolation for the whole missing subsample. We then use these reconstructed series for the Berlin mortgage bonds to get four different spreads series for the Dawes and Young bonds respectively. The graph below shows the eight reconstructed spread series: with respect to Young and Dawes bonds alike, the series obviously overlap for the whole sample, except for the reconstructed subsample.

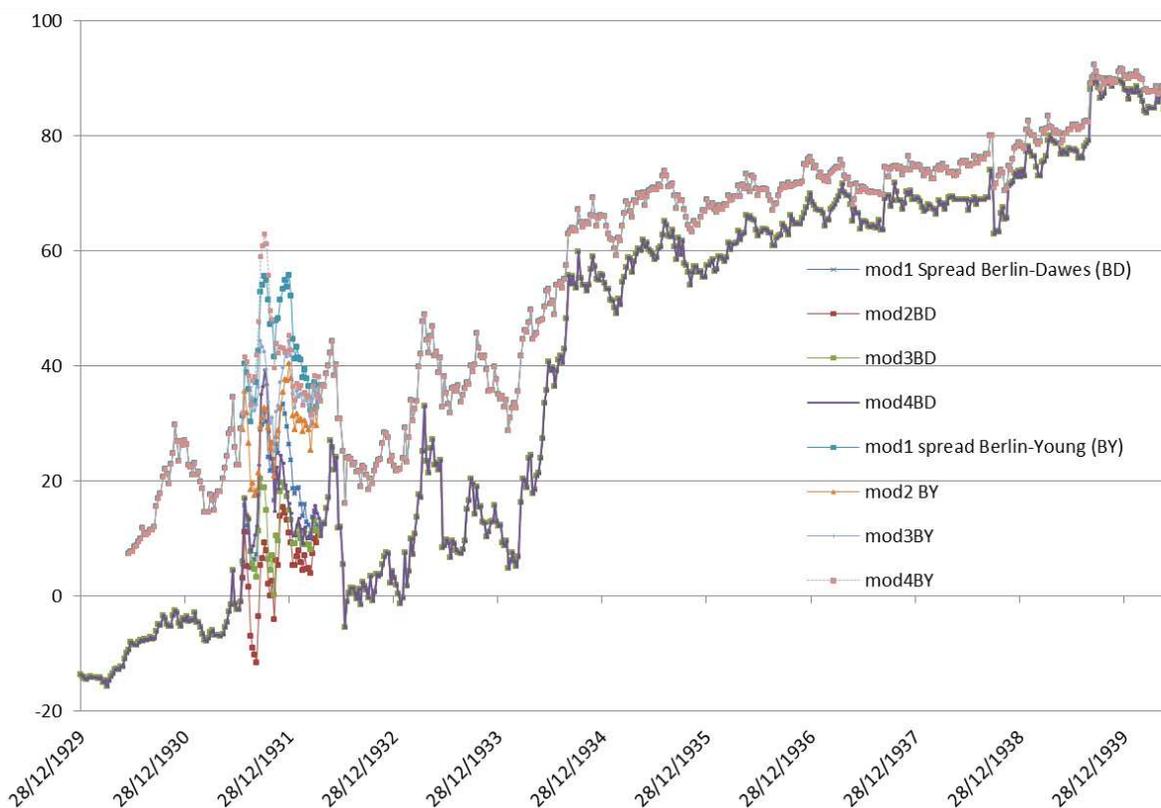


Figure 6: Different reconstructed spreads series of Dawes and Young bonds traded in New York with respect to mortgage bonds traded in Berlin; weekly frequency. See main text for sources.