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Abstract

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JEL Classification: F13, F34, G12, G15, H63, N24, N44

Keywords: sovereign risk, Debt default, secondary markets, creditor discrimination

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August 18, 2021

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1 Introduction

Not all creditors are equal in sovereign debt default episodes. While default penalties are usually considered to be the main reason why sovereign debtors repay their external debts, creditors differ in their ability to impose costs on defaulting governments. So when facing repayment difficulties, a sovereign government might decide to discriminate between its various creditors. Such behavior is known as *selective debt default*.

Selective debt defaults are a common phenomenon. For instance, defaulting governments frequently discriminate between domestic and foreign creditors (Gelpern and Setser, 2004; Kohlscheen, 2009; Erce and Díaz-Cassou, 2010; Erce and Mallucci, 2018; D'Erasmo and Mendoza, 2020) or between different classes of foreign creditors (Schlegl et al., 2019). During the Greek debt restructuring of 2012, some investors—especially distressed debt funds that had purchased foreign-law bonds and decided to hold out—received much more favorable conditions than other creditors (Chamon et al., 2018).

How do selective default expectations affect sovereign bond trading and sovereign risk premia? Measuring selective default expectations is challenging by nature as it requires observing what creditors with different seniority statuses are willing to pay for the same sovereign bond. Yet, if that bond can be traded on a secondary market, it has a unique market price. Hence, while junior and senior creditors might assign a different risk premium to the same bond, these risk premia are generally not observable. An alternative consists in examining the premia on different bonds issued by the same debtor. However, such bonds typically differ in several characteristics such as their currency of denomination, coupon or maturity, making it difficult to identify selective default expectations (Chamon et al., 2018).

In this paper, we study the incidence of selective default expectations on the sovereign bond market in a historical laboratory: the German external default of the 1930s. Our analysis is based on a unique empirical setting. Exactly identical German government bonds (Dawes bonds) were traded continuously on European creditor countries' markets during the 1930s but residents of these different countries did not expect to receive the same treatment from Germany in case of default. In addition, as the prospect of a default became more concrete following the German government's announcement of a transfer moratorium in June 1934, creditor governments organized the geographical segmentation of secondary markets for German bonds and made it technically impracticable to arbitrage these bonds across borders. These exceptional conditions make this episode a unique case study for studying the effect of selective default expectations.

Using a simple analytical framework, we show that, when secondary debt markets are integrated, expectations of selective default on different countries' bondholders cannot be observed in bond prices (or yields) but are reflected in the quantities of bonds traded across countries. By contrast, when secondary markets are geographically segmented, the prices of identical bonds can diverge across various creditor markets. We show that, when liquidity differentials are minimal, the yield spread between identical bonds traded on various

markets represents a selective default risk premium.

We collect daily prices of the German External Loan of October 1924 (the Dawes loan) in London, Paris, Zurich, and Amsterdam from January 1930 to August 1939. We also assemble archival evidence on the volume of German Dawes bonds traded between these different markets. Prices for identical Dawes bonds were roughly equal across all European secondary markets between January 1930 and June 1934 (when markets were integrated) but selective default expectations were perceptible in the quantities of bonds traded across markets. We report evidence that junior creditors responded to the risk of selective default by selling German bonds to senior creditors. Prices of Dawes bonds then diverged between June 1934 and August 1939 (when markets were segmented). During those years, price differentials were both substantial and persistent. These differences cannot be attributed to liquidity differentials across markets but instead reflected investors' expectations of a selective default on certain countries' bondholders.

Our analysis allows us to gauge the extent of the selective default risk premium. Throughout the second half of the 1930s, bond market participants treated British creditors as if they had a senior claim over continental creditors. Dawes bonds traded at a significantly lower yield in London than in other European markets. For instance, the mean spread between the London and Paris Dawes bond yield was as high as 6.6 percentage points between June 1934 and August 1939 – even though the cash flow (coupon) for French and British bondholders remained identical until the outbreak of World War II. On each continental European market during that period, the selective default risk premium accounted on average for 40-50% of the total risk premium.

Why did market participants expect bondholders from certain countries to be treated more favorably than bondholders from other countries? A historical narrative reveals that creditors' economic power vis-à-vis the debtor was a key determinant of their seniority rank. Investors' perceptions of a lower risk of default on British bondholders stemmed from Germany's economic dependence on the UK. Because London occupied a central position in the global trading and financial system of the 1930s and the German economy was strongly dependent on the British Empire's raw materials, the UK could potentially inflict great economic damage on Germany. It follows that defaulting on British bondholders could have entailed much larger costs for the German government than would defaulting on continental European creditors.

Perceptions that British bondholders would be treated more favorably were also reinforced by the commercial measures that the various creditor countries' governments adopted following Germany's announcement of a debt moratorium. Germany's ability to repay its external debts hinged on its capacity to generate sufficient export revenues–an issue known as the 'transfer problem'. Creditors' commercial policies towards Germany however diverged following the 1934 debt moratorium. On the one hand, the UK ended up granting Germany generous trade conditions in return for securing repayment to British bondholders. On the

other hand, continental governments organized the seizure of German export earnings through heavy 'trade clearing' systems as a means of directly repaying bondholders. Yet these coercive measures resulted in a rise in trade costs and a decline in Germany's bilateral exports to continental creditors, thereby jeopardizing further interest payments to those bondholders.

We also present a statistical model to explain the dynamics of selective default expectations. We explore the effect of various news events on the selective default risk premium in each continental market in a difference-in-differences setup. This analysis first reveals that selective default expectations increased in response to negative news about Germany's overall ability and willingness to repay its external debt. A deterioration in the debtor government's overall creditworthiness was thus associated with an increase in the perceived risk of selective default on the most junior creditors. Second, we show that specific news about debt repayment to senior (UK) bondholders had no significant impact on selective default expectations in the junior (continental) creditors' markets. Good (bad) news about Germany's bilateral relationship with its most senior creditor resulted in an increase (decrease) in general default risk but not in selective default risk. Finally, the selective default risk premium in a given creditor country responded strongly to news about the bilateral relationship between that country and Germany. Such news could thus affect the seniority ranking among junior creditors.

Finally, we explore how market perceptions about the seniority structure of German government debt evolved after Germany selectively defaulted on two of its continental creditors. In April and June 1935, the German government reduced coupon payments to Swiss and Dutch bondholders, respectively. We establish that these partial, selective defaults changed market perceptions about the relative seniority rank of continental creditors. From spring 1935 onward, investors anticipated that French bondholders would be those on whom Germany would default next. However, market participants viewed the most senior (i.e. UK) bondholders as remaining more likely to be preserved from further defaults.

Our paper is related to several strands of the sovereign debt literature. Several authors have reported empirical evidence on selective sovereign debt defaults. Gelpern and Setser (2004), Kohlscheen (2009), Erce and Díaz-Cassou (2010), Erce and Mallucci (2018), and D'Erasmo and Mendoza (2020) document that foreign and domestic residents have often been treated differently in recent episodes of sovereign debt default. Waldenström (2010) and Papadia and Schioppa (2020) report similar evidence for the period of the 1930s and 1940s in Scandinavia and Germany, respectively. Schlegl et al. (2019) show that sovereign governments do not treat all types of foreign creditors equally. Chamon et al. (2018) report evidence that sovereign bonds issued under a foreign jurisdiction trade at a premium compared to bonds issued by the same debtors under domestic law, indicating that a risk of selective default is priced in these bonds. Simon (2015) identifies a selective default risk premium associated with inflation-indexed sovereign bonds (as opposed to nominal bonds) within the

euro area during the European debt crisis of 2008-2012. However, to our knowledge, our paper is the first to provide a proper identification of the effect of selective default expectations on both sovereign bond trading and sovereign risk premia. In addition, our study is the first to analyze the risk that a government discriminates between creditors from various countries.

Second, our research speaks to a theoretical literature that has shown how secondary markets can serve as an enforcement mechanism for sovereign debt. Guembel and Sussman (2009) and Broner et al. (2010) document that in the presence of deep secondary markets, (a) sovereign governments cannot discriminate between domestic and foreign creditors and (b) the decision to default can therefore be analyzed as a pure problem of domestic wealth redistribution. To the extent that sovereign governments are reluctant to default on domestic creditors, the presence of secondary debt markets offers a rationale for why external debts are repaid even in the absence of default costs. The historical episode that we analyze provides empirical evidence on the relationship between sovereign defaults and secondary markets. In line with the theory, our analysis reveals that, when different types of creditors are free to trade debt instruments on a globally integrated secondary sovereign market, no selective default risk premium is priced in sovereign bonds. In such conditions, we show that junior creditors tend to sell their bonds to senior ones, therefore making a selective default practically impossible to implement. Yet our historical case study also shows that authorities could effectively organize the segmentation of sovereign debt markets in the 1930s and preclude different types of bondholders from exchanging bonds in order to discriminate between them. Given the technology available such as blockchain, such market segmentation and creditor discrimination should be even easier to implement today.

Our paper is also related to an extensive literature—going back to Bulow and Rogoff (1989)—that links the sustainability of sovereign debt to creditors' threats of trade sanctions. Researchers have provided evidence on the use and effectiveness of trade sanctions by measuring the impact of defaults on trade flows between creditor and debtor countries (Rose, 2005; Borensztein and Panizza, 2010; Fuentes and Saravia, 2010; Martinez and Sandleris, 2011; Kuvshinov and Zimmermann, 2019) or by focusing on particular historical episodes (Weidenmier, 2005; Tomz, 2007). Our historical case study provides mixed lessons for the effect of trade sanctions. On the one hand, it shows that the threat of trade sanctions can be effective for certain creditor countries that enjoy sufficient economic power. On the other hand, it reveals that policies detrimental to a debtor country's trade can also reduce its ability to repay and reveal damaging for bondholders. The existence of a transfer problem therefore incentivizes creditors to grant debtor countries trade concessions.

Finally, our paper is part of a literature that exploits historical episodes of market segmentation to provide empirical evidence on a variety of financial phenomena. For example, Koudijs (2015, 2016) focuses on periods in which bad weather conditions resulted in the suspension of information flows between the London and Amsterdam capital markets during the eighteenth century to study the effect of news and the incidence

of insider trading on stock prices. Chambers et al. (2018) examine the price of US railroad bonds cross-listed in New York and London during the first era of globalization of 1873-1913 to measure the effect of geography and partial market segmentation on firms' cost of capital. Waldenström (2010) uses the segmentation between the Swedish and Danish bond markets during the Second World War to test theoretical predictions regarding the costs of domestic versus external sovereign debt defaults. Chan et al. (2008) also exploit the segmentation of the Chinese equity market between A-shares (reserved to domestic investors) and B-shares (reserved to foreign investors) prior to 2001 to measure the effect of asymmetric information on stock prices.

The remainder of the paper proceeds as follows. Section 2 provides the historical background to the German debt default of the 1930s. In Section 3, we quantify the selective default risk premium priced in German government bonds after the default of 1934. Section 4 analyzes the determinants of selective default expectations and the factors affecting the perceived seniority structure of German government debt. Section 5 concludes.

2 The German default of the 1930s

Following the end of the First World War, Allied countries sought 132 billion marks in reparations from defeated Germany (around 2.5 times the GNP of 1913).[1] The perception in Germany that the requested amounts were too high translated into an unwillingness to pay. As a result, tax collection stalled and the government borrowed extensively from the Reichsbank to cover the budget deficit. This approach made possible the hyperinflation that plagued the German economy in 1922 and 1923 (Ritschl, 2012). Germany's first international bond issue of the interwar period was born from these circumstances. Since the German hyperinflation jeopardized international economic stability and since any further reparation payments depended on appreciably reducing that inflation, the UK and US governments proposed a new plan to restore the German economy and monetary system. Through the Dawes Plan, victor countries agreed to reschedule reparation payments and to promote an international loan that would enable Germany to stabilize its currency and return to the gold standard. The eponymous loan—officially called German External Loan of October 1924—was issued in October 1924 on nine different markets (see Appendix A.1.1 for details).

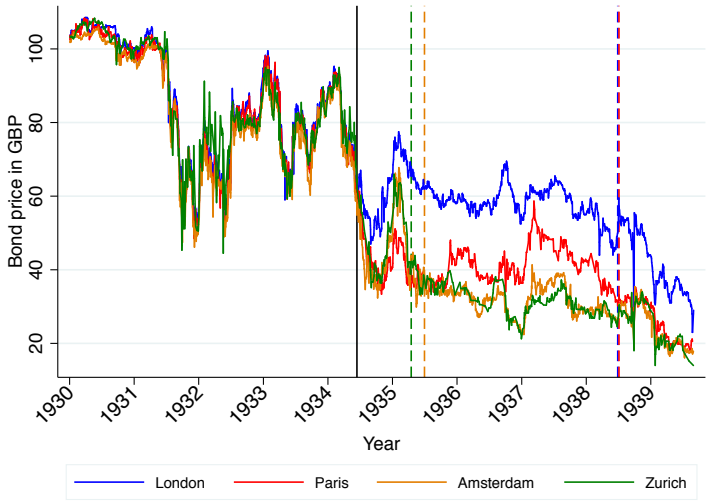
The Dawes loan led the way to an unprecedented foreign borrowing spree by the German public sector, private companies, and other private entities (Ritschl, 2002). The years 1924-1928 were characterized by a rebound in global economic activity, trade, and capital flows (Feinstein and Watson, 1995; Accominotti and Eichengreen, 2016). Despite the already high debt levels due to reparations, foreign investors were keen on lending to Germany under a special clause of the Dawes Plan that granted seniority to commercial debt service

[1] See Ritschl (2012) for the corresponding numbers. The Allies never really expected Germany to repay the so-called C-bonds, which amounted to around one half of the total reparations.

over reparations payments (Ritschl, 2012).

This borrowing spree came to a halt after the tightening of US monetary policy in 1928 and the stock market crash of October 1929, whereupon foreign lending slowed down dramatically. The sudden stop in German capital inflows resulted also from details of the Young Plan, which was written in early 1929 to replace the Dawes Plan and settle the reparations issue. The new plan, which was likewise accompanied by a bond issue, abolished the transfer protection clause of the Dawes Plan. As a consequence, foreign investors became increasingly wary of making new loans to the German government and private sector (Ritschl, 2012). The situation evolved into a full-blown financial crisis in spring 1931, when German banks faced a run on their deposits and the Reichsbank's currency reserves dwindled (James, 1985; Ferguson and Temin, 2003; Schnabel, 2004).

Figure 1: Dawes Bond prices, 1930-1939



Notes: The figure plots the daily prices of Dawes bonds denominated in British pounds (GBP) on the London, Amsterdam, Paris, and Zurich markets from January 1930 to August 1939. The data were hand-collected from various archives (see Appendix A.1.2 for details). The solid vertical line marks the beginning of discriminatory treatment of the Dawes bonds on June 14, 1934. The dashed vertical lines mark the first coupon reduction for the respective markets central to this study (Zurich/CH: April 17, 1935; Amsterdam/NDL: June 14, 1935; London/UK: July 1, 1938; Paris/FR: July 1, 1938; see also Appendix A.1.2 for details).

The resulting change in expectations is mirrored in the evolution of the price of the Dawes bond across European markets (Figure 1). The falling price during the second quarter of 1931 reflects the deterioration of trust in the German government's ability to service its debt. The growing mistrust culminated on July 15, when the German government suspended convertibility of the Reichsmark and introduced capital controls in response to the global financial crisis. These emergency measures were designed to prevent rapid repatriation of foreign capital, especially short-term assets, held in Germany. By the standstill agreement of September 19, 1931, Germany's banking creditors agreed to the freezing of their short-term assets in Germany in exchange for uninterrupted interest payments (Forbes, 1987; Accominotti, 2012, 2019). The German government continued to service its long-term external debts in full after the standstill and also after the Lausanne Agreement of July 1932, which suspended reparations payments (Clement, 2004). Bond prices temporarily recovered as

investors regained trust in Germany's ability to pay. Yet that trust was shattered by Hitler's ascension to power in January 1933 (Figure 1).

With the Nazis in power, the path towards a default on sovereign debt became more evident. On May 15, 1933, the Reichsbank communicated to its international creditors that German foreign exchange reserves had become so low that further orderly sovereign debt service would soon be impossible.[2] The long negotiations that ensued gave way to a two-tiered compromise whereby the German government continued to service central government loans (the Dawes and Young loans) in full but reduced payments on all provincial and municipal loans.[3] The following year was marked by a sequence of acrimonious negotiations that would drag on until the announcement of a more radical debt moratorium in June 1934. Against the backdrop of Germany's ever decreasing currency reserves, authorities led by Reichsbank President Hjalmar Schacht periodically demanded fresh concessions from creditors (Clement, 2004). On 14 June 1934, the German government finally announced a complete transfer moratorium on all long-term foreign liabilities and the end of the special status of the Dawes and Young loans, effective at the beginning of July.

The German default on the Dawes loan proceeded sequentially throughout the 1930s. First, the German government selectively defaulted on US creditors on 14 June 1934. It reduced the interest service on the American (US dollar) tranche of the Dawes loan by 25 percent (effective October 1934) but continued to fully service the coupon of the sterling tranche held on the markets of its European neighbors.[4] At the same time, the German government entered into separate debt settlement negotiations with each European creditor nation. Partial defaults on the sterling tranche of the Dawes loan did not occur until later. The dashed lines in Figure 1 mark changes in the interest payments that were the outcome of these negotiations. In April 1935, the German government reduced interest payments on all bonds held by Swiss residents from 7 to 4.5 percent. In June 1935, the coupon on Dawes bonds in Dutch ownership was reduced to 3.5 percent, and in August 1938 the German government reduced interest payments to French and UK bondholders to 5 percent. Finally, all interest and principal repayments were suspended when the Second World War broke out in September 1939.

The sterling tranche of the Dawes loan had been floated in five foreign countries (Belgium, France, United Kingdom, the Netherlands, and Switzerland), and sterling Dawes bonds were subsequently quoted regularly on four of these five countries' markets (Amsterdam, London, Paris, and Zurich).[5] These bonds

[2] See 'Telegram for the Reichsbank to the Bank of England,' 15 May 1933, Bank of England archives, London, United Kingdom (BoE henceforth), G1-445.

[3] Likewise, amortization payments into the sinking fund continued for the Dawes loan (Clement, 2004, p. 39). For the special status of the Dawes loan, see also 'Letter from the Chairman of the British Long Term and Medium-Term Creditor Committee to the Treasury', 19 October 1933. BoE, G1-445.

[4] Germany's bilateral trade balance was in surplus with all creditor countries but the United States, a state of affairs that the German government used as justification for discriminating against American bondholders. See 'U.S. Investors and Dawes Loan', *Financial Times*, 15 October 1934.

[5] Additionally, around 0.7% of the overall sterling tranche were issued in Germany.

were identical in that they were all initially issued in the same currency (£) at 92% of par, had the same coupon (7%), were repayable at par in October 1949, and had no gold clause. However, Figure 1 shows that the prices for these identical bonds diverged following announcement of the German external debt moratorium in June 1934. Dawes bonds traded at a systematically higher price in London than in any other continental market throughout the period. This suggests that investors considered that British bondholders were less likely to be defaulted upon than continental bondholders. A note recovered in the archives of the German Finance Ministry confirms this interpretation. This document noted that London's quotation of the German Dawes bond was "the firmest and the highest" and that the bonds were "quoted significantly weaker on all other international stock exchanges (...) compared to London." The author also pondered the option that British residents be granted "preferential treatment" with regards to the amortization of their bonds.[6] It also appears that investors considered French bondholders as the second most senior (after British bondholders) and that Swiss and Dutch bondholders were viewed as the most junior. The difference between the London and Paris price is particularly striking as the Dawes bond's cash flow remained identical for British and French creditors throughout the whole period under consideration.

Private holders affected by selective defaults had few legal recourses by which to recoup payment. Under the 'absolute immunity' doctrine (Weidemaier and Gulati, 2018), which was recognized by all jurisdictions at that time, creditors could not sue the German government in a foreign court in order to enforce their rights. In one famous case, a Swedish holder of German government (Young) bonds sued the bond trustee (the Bank for International Settlements) in a Swiss court for violating the *pari passu* clause when making interest payments to Germany's preferred bondholders. Although the court acknowledged that Germany had breached that clause, the bond trustee was not held responsible because it acted only as an intermediary in the debt contract and was therefore justified in following the German government's instructions. So in contrast to the 2014 decision in *Republic of Argentina v. NML Capital Ltd.*, the bondholder lost the case (Kim, 2014; Gelpern, 2016).

3 Identifying selective default risk

3.1 Selective default expectations with and without market integration

We present a simple analytical framework to guide our analysis of German bond yields across European creditor markets.[7] Our purpose here is not to develop a complete model of the pricing of selective default risk but to highlight the necessary conditions to infer selective default expectations from sovereign bond yield data.

[6] "Englands Glaeubigerstellung gegenueber Deutschland", 10 November 1937, Bundesarchiv, Berlin, Germany (BArch henceforth), R2.320.

[7] See Schulze and Wolf (2008) for a related analytical framework applied to the integration of grain markets.

Let us suppose that a sovereign government has borrowed from creditors in two foreign countries s and j by issuing bonds on their respective markets. The bonds issued in the two markets are identical. They are denominated in the same currency, have the same maturity date and the same coupon C. Let P_s and P_j be the prices of these bonds in the respective markets. The price differential can be expressed as $\ln(\frac{P_s}{P_j}) = p_s - p_j$.

We first examine the case where investors can freely trade bonds between the two countries' bond markets. Consider the decision of an investor who wants to take advantage of price differentials between markets. Moving bonds between markets causes transaction costs T. We can express these costs in proportion to P_s by employing the parameter $\tau > 0$ so that $P_s(1 - e^{-\tau}) = T_{js}$. Arbitraging bonds from j to s is only profitable when $P_s > P_j + T_{js}$ or after some transformation:

$$\tau < p_s - p_j \tag{1}$$

Therefore, arbitrage only takes place when the relative price difference between markets is larger than the transaction cost parameter or, assuming symmetric costs of moving bonds between j and s, when $p_s - p_j \notin [-\tau, \tau]$.

The bond's current yield Y in market $i = \{j, s\}$ is defined as the ratio of its coupon C to its market price P_i. It follows from (1) that $\tau < \ln(\frac{C}{Y_s}) - \ln(\frac{C}{Y_j})$, or:

$$\tau < \ln\left(\frac{Y_j}{Y_s}\right) \tag{2}$$

The current yield Y_i can also be decomposed into four components:

$$Y_i = R^F + \pi_i^{DG} + \pi_i^{DS} + \psi_i \tag{3}$$

where R^F is the international risk-free rate, π^{DG} is a premium associated with the risk that the sovereign government defaults on all bondholders (a general default risk premium), π_i^{DS} is a premium reflecting the risk that it only defaults on country i's bondholders (a selective default risk premium), and ψ_i is a liquidity premium.

Let us now suppose that the average investor expects the sovereign debtor to first default on bondholders residing in country j in case of repayment difficulties. This means that bonds held in country j (the junior country) are subject to selective default risk ($\pi_j^{DS} \geq 0$). By contrast, since a default on country s's bondholders would come last and by definition involve a general default, the selective default risk premium is zero for bonds held in country s ($\pi_s^{DS} = 0$). All bonds, however, carry a positive general default risk premium ($\pi^{DG} \geq 0$).

In the absence of trading restrictions, the investor can always decide in which market to buy or sell the bond. Therefore, the bond's liquidity premium has to be the same in both markets ($\psi_s = \psi_j$).[8] The ratio of current yields of j and s is thus $\frac{Y_j}{Y_s} = 1 + \frac{\pi^{DS}}{Y_s}$ and accordingly (2) becomes:

$$\tau - \ln\left(1 + \frac{\pi^{DS}}{Y_s}\right) < 0 \tag{4}$$

Equation (4) shows why a substantial selective default risk premium cannot be observed in bond yields when arbitrage between markets is allowed. In order to see this, let us suppose that the transaction cost parameter is as large as $\tau = 5\%$, that the bond's price in market s is $P_s = 100$ and that its coupon is $C = 7\%$.[9] In that case, any perceived selective default risk premium $\pi_j^{DS} > 0.36\%$ induces investors to transfer bonds from j to s. Note that not all investors do necessarily have the same perception of selective default risk. In the extreme case where equation (4) is fulfilled for all investors, all bonds are transferred from market j to market s and the former market ceases to exist.

If, however, trading restrictions prevent investors from arbitraging bonds between countries, the secondary bond markets of s and j will be geographically segmented. For instance, in our case study, creditor countries' governments banned the sale of German government bonds that were not in the possession of a domestic resident at a given date on their respective market. If markets are geographically segmented, a larger differential can emerge between the yields of identical bonds traded on two different countries' markets. The yield differential between s and j reflects both a selective default risk premium and a liquidity premium:

$$Y_j - Y_s = \pi_j^{DS} + \psi_j - \psi_s \tag{5}$$

This simple analytical framework shows that two necessary conditions are needed in order to identify selective default expectations in sovereign bond yield premia across different creditor markets. First, the various creditor countries' secondary bond markets have to be geographically segmented. Second, liquidity differentials across markets need to have a negligible impact on yield spreads. We show that, due to exceptional circumstances, these two conditions were met in the case of German government bonds in 1934-1939. This makes this episode an ideal laboratory to study selective default risk.

[8] This does not mean that arbitrage does not entail liquidity costs for arbitrageurs as they might face a delay in finding a buyer or seller on a given market. However, such liquidity costs would be part of the transaction cost T.

[9] For expositional clarity, we assume implausibly high transaction costs here. Edwards et al. (2007) estimate that secondary, round-trip transaction costs range between 3 and 150 basis points on the US corporate bond market. The coupon rate assumed here corresponds to that of the Dawes bond.

3.2 Market segmentation

In order to measure selective default risk, it is first necessary to find an empirical setup in which creditor countries' secondary bond markets are geographically segmented. Figure 1 documented significant price differentials for identical German government bonds across European markets following the partial default on the American USD tranche. Dawes bonds traded at a higher price in London than in Paris, Amsterdam and Zurich. This suggests that British bondholders were perceived as senior and that, from 1934 onward, the various secondary debt markets ceased to be integrated.

Until the German government announced its intention to default on its external debt on 14 June 1934, physical arbitrage of the Dawes bonds between countries was common as we know from volume data and from a contemporary textbook written for bank apprentices (Kämpfe and Prater, 1928, p. 169). Following the announcement of the moratorium, creditor countries' governments began to undertake separate debt settlement negotiations with Germany. Each creditor government attempted to secure the best terms for its residents. Differential treatment of various European bondholders could only occur if bondholders from different creditor countries were prohibited from exchanging their bonds with each other on secondary markets. Therefore, creditor countries' governments aimed to suspend international arbitrage by prohibiting foreigners from selling their Dawes bonds. New trading regulations imposed that any bond traded on a given creditor country's market now had to be sold along with an affidavit certifying that the bond was in possession of a domestic resident at the date of the moratorium (14 June 1934). Certified bonds could then be traded by any investor on the respective market.[10]

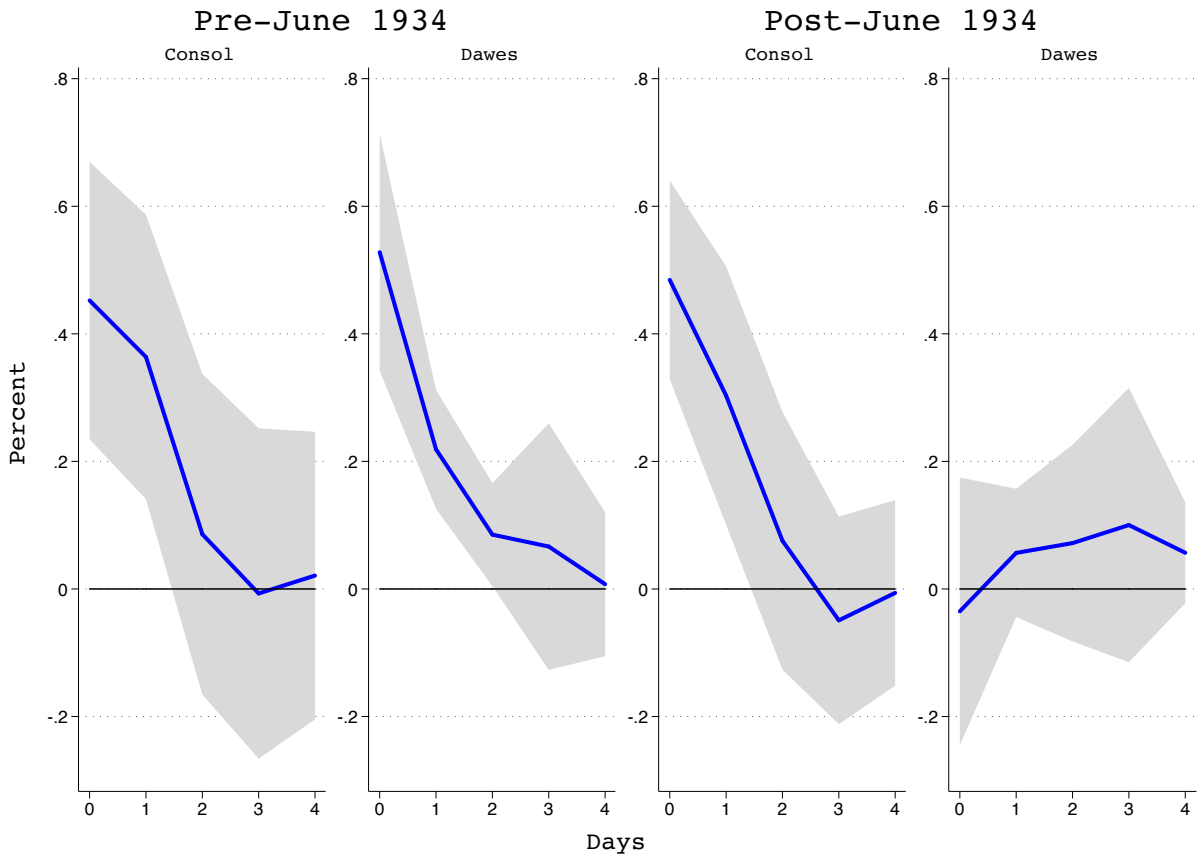
To what extent were these official trading restrictions efficient at achieving the segmentation of secondary debt markets? A traditional approach towards characterizing the dynamics of asset prices across markets consists in measuring their comovement through correlations or impulse response functions (Chordia et al., 2005). Following the latter approach, we estimate how a one percentage change in the current yield in one bond market (London) affected the yield of the exact same bond in another market (Paris) employing Jordà's (2005) local projections method. We perform this exercise on daily data for two different bonds: a) the German government (Dawes) bond and b) the British Consol (the principal British government long-term bond traded at that time). The two bonds were denominated in pounds sterling and were traded in both Paris and London in 1930-1934. However, whereas international arbitrage of German Dawes bonds was suspended as of June 1934, investors remained free to purchase and sell British Consols on both the Paris and London markets throughout the whole period. The British Consol therefore serves as an ideal control group to assess

[10] See "Ban on sales of foreign-owned bonds," *Financial Times*, 22 June 1934. The UK Stock Exchange Committee for General Purposes ruled on 21 June 1934 that "until further notice no bonds of the Dawes and Young loans will be a good delivery unless accompanied by a declaration by a banker (British) or stock broker (member of London or Provincial Stock Exchanges) that they were on 15 June 1934 the property of a British subject." Other European countries introduced similar affidavit or certification requirements. For a comparison of affidavit regulations in October 1934, see BArch, R2501.6743, Sheets 78ff.

the effect of trading restrictions on the bond market after 1934.

Figure 2 reports the respective impulse responses of the Paris Dawes and Consol yields following a 1-percent shock to the same bond yields in London before and after the legal segmentation of the Dawes bond market in June 1934. Before the adoption of trading restrictions, the Paris Consol and Dawes markets reacted similarly to a shock on the London market and both bonds' yields adjusted fully within three days. However, after June 1934, we observe marked differences in the impulse responses between the two securities. Whereas the Consol yields in Paris and London continued to be closely related, a change in the Dawes yield in London from then on had no statistically significant effect on that same bond yield in Paris. This suggests that the measures adopted in June 1934 to organize the geographical segmentation of secondary markets for German government bonds were fully effective. By contrast, the London and Paris secondary markets for British government bonds remained fully integrated.

Figure 2: Impulse response functions for Paris market in response to London shock

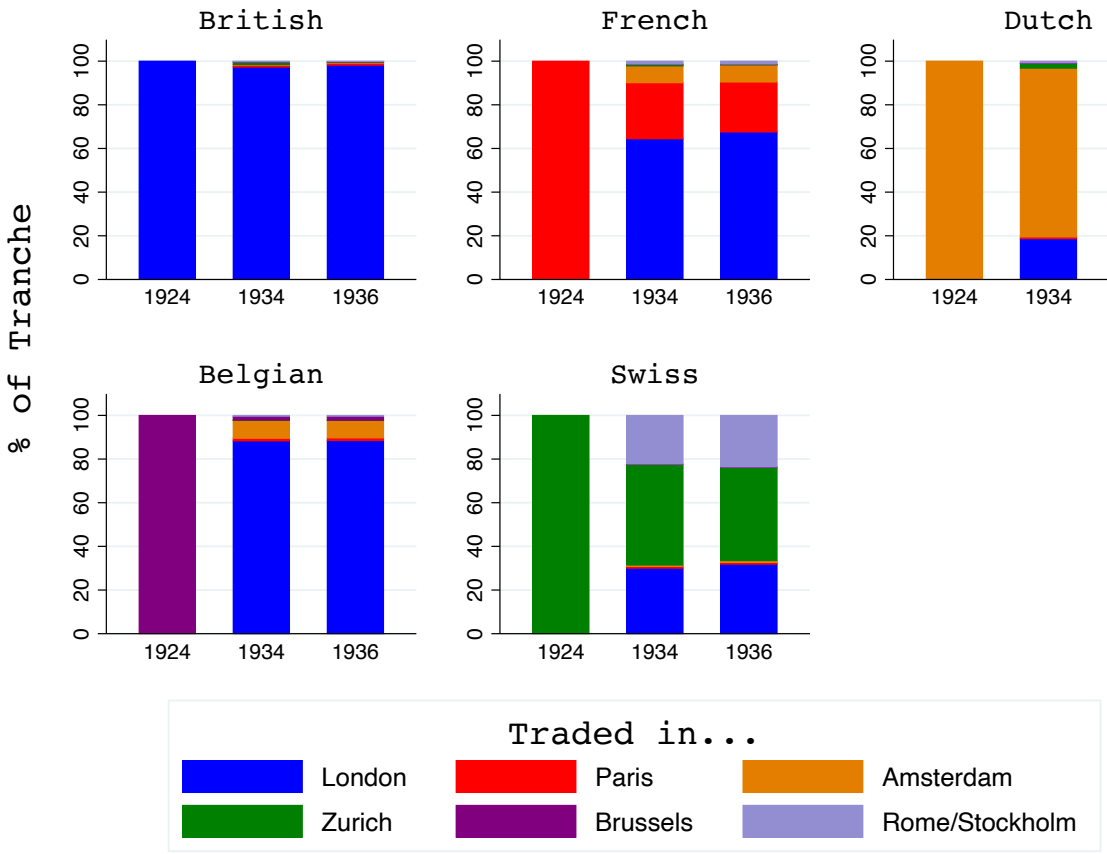


Notes: The figures depict impulse responses in the Paris market of a 1-percentage point shock in the London market for the Dawes and Consol bond yields, respectively. The impulse responses are estimated using Jordà's (2005) local projections approach with a horizon of 5 days. Missing values in both data series are treated as if there was no trade and thus they are replaced with the most recent previously available value. The pre-default period is 1 January 1930 to 14 June 1934; the post-default period is 15 June 1934 to 31 August 1939. The grey-shaded areas reflect 99% confidence bands. For details on the bond data, see Appendix A.1.

It is possible to provide even more direct evidence on market integration by looking at the volumes of German Dawes bonds traded between European markets before and after the debt moratorium of June

1934. Sterling Dawes bonds had been initially issued in 1924 in five different tranches corresponding to the five countries of issuance. Interest payments were processed through designated paying agents and each bond had a unique identifier. Data contained in archival records allow us to compute the value of outstanding bonds of each tranche on seven European stock exchanges at various dates (see Appendix A.1.4). For example, we can compute the share of outstanding Dawes bonds of the French tranche which were held in the United Kingdom and vice versa.

Figure 3: Circulation of the various GBP Dawes bond tranches in European bond markets



Notes: This figure shows the share of outstanding German GBP Dawes bonds of each tranche of issue held in each foreign European creditor market in 1924 (issue date), 1934, and 1936. For each tranche and year, the blue, red, orange, green, dark purple, and light purple bars correspond to the share of bonds of each tranche held in London, Paris, Amsterdam, Zurich, Brussels, and Rome/Stockholm, respectively. The total volume of Dawes bonds circulating on foreign European markets decreased significantly between 1924 and 1934 as the German government progressively redeemed parts of the tranches and encouraged the repatriation of foreign bonds to Germany (see Klug, 1993; Papadia and Schioppa, 2020). The share of redeemed and repatriated bonds is not shown in the figure. Data for 1934 and 1936 were computed from the Bank of England archives: OV34/281 (interest payments), OA-26-2 (amounts outstanding). See Appendix A.1.4 for more details on the calculation.

Figure 3 reports the shares of sterling Dawes bonds of each tranche of issue (British, French, Dutch, Belgian and Swiss tranches) circulating on the various foreign European secondary markets (London, Paris, Amsterdam, Zurich, Brussels, and Rome/Stockholm) in 1924, 1934 and 1936. The figure reveals that a large share of the Dawes bonds were traded across borders between the issue date (1924) and the announcement of the German debt moratorium (1934). In particular, 64% and 88% of the outstanding bonds of the French and Belgian tranches circulating on foreign markets were held in London by 1934 and a significant portion of the

Swiss and Dutch tranches (30% and 19%, respectively) were also in the hands of British investors. By contrast, only a tiny share (2.75%) of the outstanding bonds issued under the British tranche were held by continental European investors in 1934. The evidence is consistent with the simple analytical framework presented above. When secondary markets for German bonds were integrated, selective default risk was not reflected in bond yield differentials but in cross-border trading volumes. Between 1924 and 1934, selective default expectations induced the junior creditors of France, Belgium, the Netherlands and Switzerland to sell their bonds to British creditors who were perceived as senior.

In contrast, Figure 3 shows that no significant transfer of German bonds occurred across countries between 1934 and 1938. This suggests that the affidavit and certification processes were extremely efficient at preventing arbitrage between markets. From 1934 onward, it became virtually impossible to transfer German government bonds across borders. Secondary debt markets became segmented and selective default risk was now reflected in bond yield spreads.

3.3 Liquidity

Our simple framework suggests that, if secondary debt markets are geographically segmented, the yield spread between identical bonds held in a senior and a junior country reflects both a liquidity premium and a selective default risk premium. A second condition for being able to identify selective default risk is therefore that liquidity differentials between markets are minimal. As the bond volumes issued and traded differed substantially across markets,[11] it is not ex-ante implausible that large liquidity differentials existed between London and continental markets. In this sub-section however, we rule out that such liquidity differences can explain the yield differentials observed between markets.

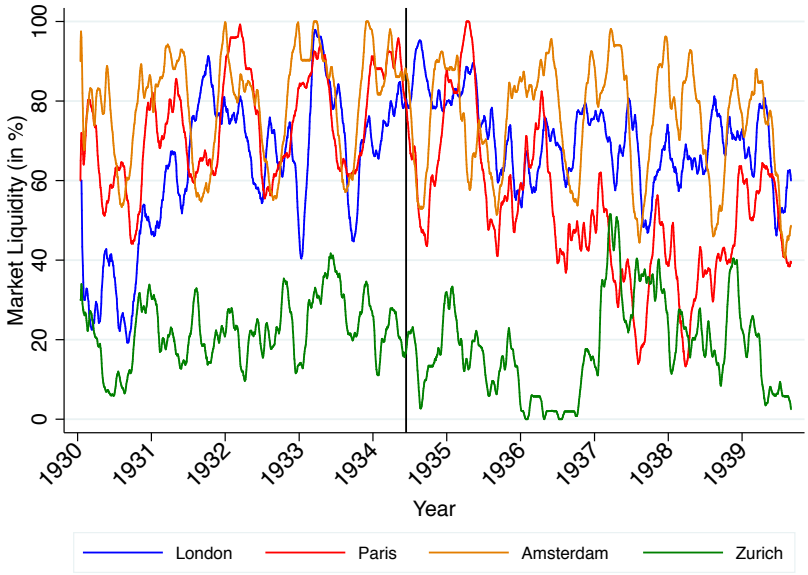
In the absence of bid-ask spread data, the proportion of trading days with non-zero returns typically provides a good measure of liquidity in modern and historical finance studies (Bekaert et al., 2007; Campbell et al., 2018). Analogously, we define liquidity L_i as the percentage of the previous ten trading days during which a change in the quoted price of the Dawes bond was observed in market i.[12] This measure underestimates actual trading activity for two reasons. First, newspapers often did not report the price of bonds when that price had not changed compared to the previous day. In the absence of any recorded change in the bond price on a given day, we assume that no trade had taken place that day even though it cannot be entirely ruled out that a trade did take place at the previous price (Campbell et al., 2018). Second, such non-reporting makes

[11] In 1924, the number of Dawes bonds (expressed in the most common denomination of £100) issued was the following for each European market: London (120,000), Paris (30,000), Amsterdam(25,000), and Zurich (23,600). In 1934, the estimated number of Dawes bonds circulating was the following for each market: London (107,432), Paris (6,591), Amsterdam (15,145), and Zurich (6,228). See Appendix A.1.4 for details on the calculation.

[12] We account for the fact that continental stock exchanges were open from Monday to Saturday, whereas the London Stock Exchange was closed on Saturdays for most of the period under consideration (see Appendix A.1.2 for details).

it impossible to identify 'true missings': days when the price did change but newspapers failed to report it. By assumption, these days are treated as if no trade had occurred.

Figure 4: Liquidity across markets



Notes: This figure plots our measure of liquidity of the sterling Dawes bond markets in London, Paris, Amsterdam and Zurich. Liquidity on any given day is defined as the percentage of the previous ten trading days for which the quoted price changed. For presentation purposes, our liquidity measure is smoothed using a 60-day moving average. For details on the sources for the bond price data, see Appendix A.1.

Figure 4 maps our liquidity measure for the four European secondary markets. Even though our measure is potentially downward-biased, it suggests that trading activity remained high after the moratorium of June 1934. In Paris, the Dawes bond was traded at least every other day (average liquidity: $\overline{L_{Paris}} \approx 51\%$) in Amsterdam three out of four days ($\overline{L_{Amsterdam}} \approx 74\%$) and London was situated in between ($\overline{L_{London}} \approx 70\%$). While the Zurich market was substantially less liquid ($\overline{L_{Zurich}} \approx 18\%$), it still had at least one active trading day per week.[13] The ensuing liquidity ranking of markets (I. Amsterdam, II. London, III. Paris, IV. Zurich) does not match the ranking of bond prices in Figure 1, where we observe that Dawes bonds traded at roughly the same price in Zurich and Amsterdam, at a higher price in Paris than in those two markets, and at a constantly higher price in London than in any continental market. This ranking comparison thus suggests that liquidity differentials were not the main drivers of bond yield spreads between markets.

More formally, we can test for the impact of liquidity differentials on yield spreads by estimating the following equation:

$$(Y_j - Y_s)_{jt} = \beta(L_j - L_s)_{jt-1} + \gamma_{jp} + \eta_t + \epsilon_{jt}, \tag{6}$$

where $(Y_j - Y_s)$ is the current yield spread between the junior country's market j and the senior country's

[13] Unlike the London market, the Zurich market opened on Saturdays.

market s (London). η_t is a fixed effect for trading day t, which controls for shocks that move all three junior markets j (Paris, Amsterdam, and Zurich). γ_{jp} is a market $\times$ period p fixed effect, where p denotes the month or week in the sample (depending on the specification). It controls for j's average spread in the respective time period.

Table 1: Liquidity differentials and spreads

	Dependent variable: Yield spread $(Y_j - Y_s)$			
	'missing' observations are dropped		'missing' observations are replaced with last available value	
	(1)	(2)	(3)	(4)
Liquidity differential$_{t-1}$	0.279	-0.220	-0.055	-0.208
	(0.31)	(0.29)	(0.28)	(0.23)
Fixed effects	market×week i. s.; day	market×month i. s.; day	market×week i. s.; day	market×month i. s.; day
N (observations)	1875	2019	3924	3933
Adj. overall R^2	.97	.95	.97	.94
Within R^2	0.00	0.00	0.00	0.00

Notes: This table reports the results of regressions of the Dawes bond yield spread (relative to London) in each continental market on our liquidity differential measure (see text for more details). Abbreviation 'i. s.' stands for 'in sample'. Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered on the day and on the market $\times$ week/month i.s. dimension.

We estimate equation (6) by pooling all junior countries' markets j. We treat missing observations in two different ways in the regressions. First, we drop all observations for which either Y_s or Y_j are missing (assuming these days are 'true missings' and should thus be excluded from the analysis). Second, we replace missing observations with the last available yield recorded (assuming a missing observation indicates the absence of a change in the bond price and yield).

Table 1 reports the results. As expected, the liquidity coefficient is negative in most regressions, indicating that an increase in liquidity on a given market is associated with a decrease in the bond yield spread (relative to London). However, the coefficients are far from being statistically significant, independently of whether we treat 'missing observations' as truly missing (column 1 and 2) or as days without trades (column 3 and 4). Even if the point estimates were statistically significant, the coefficients' economic significance would be very small - the standardized coefficients for columns (3) and (4) are, respectively, -0.004 and -0.014. Liquidity differentials therefore did not have a substantial impact on bond spreads. This finding chimes well with other historical studies of bond markets (see Campbell et al., 2018, on bonds traded on the London stock exchange in the 19th century). Liquidity differentials fail to explain the divergence of Dawes bond yields across markets.

3.4 Quantifying the selective default risk premium

The analysis above shows that secondary markets for German government bonds became geographically segmented in 1934 and that the yield spread between markets was not driven by liquidity differences. We now return to the yield decomposition derived from our analytical framework (Section 3.1).[14] Combining definitions (3) and (5), we can decompose the bond yield in junior country j as follows:

$$Y_j = R^F + \pi^{DG} + \psi_s + \pi_j^{DS} + \psi_j - \psi_s \tag{7}$$

Based on the evidence reported in the previous section, we set the difference in liquidity premia between the junior country j and the senior country s to zero ($\psi_j - \psi_s = 0$). For the ease of exposition and because it is consistent with our data, we assume that there is no liquidity premium in the yield Y_s in the senior market relative to the safe asset ($\psi_s = 0$).[15] We can thus decompose the Dawes bond yield in each European creditor country j as the sum of a risk-free rate, a general default risk premium, and a selective default risk premium:

$$Y_{jt} = R_t^F + \pi_t^{DG} + \pi_{jt}^{DS} \tag{8}$$

We use the yield on the British Consol (long-term government bond) as a proxy for the international risk-free rate R_t^F. The Consol was considered an international safe asset during this period, comparable to a US government bond today. Our analytical framework shows that the spread between R_t^F and the current yield of the most senior creditor must reflect the general default risk as a default on the most senior creditor by definition involves a general default ($\pi_t^{DG} = Y_{st} - R_t^F$). The premium associated with the risk of a selective default on creditor country j's bondholders can then be defined as the spread between the London bond yield and the local yield ($\pi_j^{DS} = Y_{jt} - Y_{st}$). We compute the current yield in each market based on the Dawes loan's original coupon rate of 7 percent.[16]

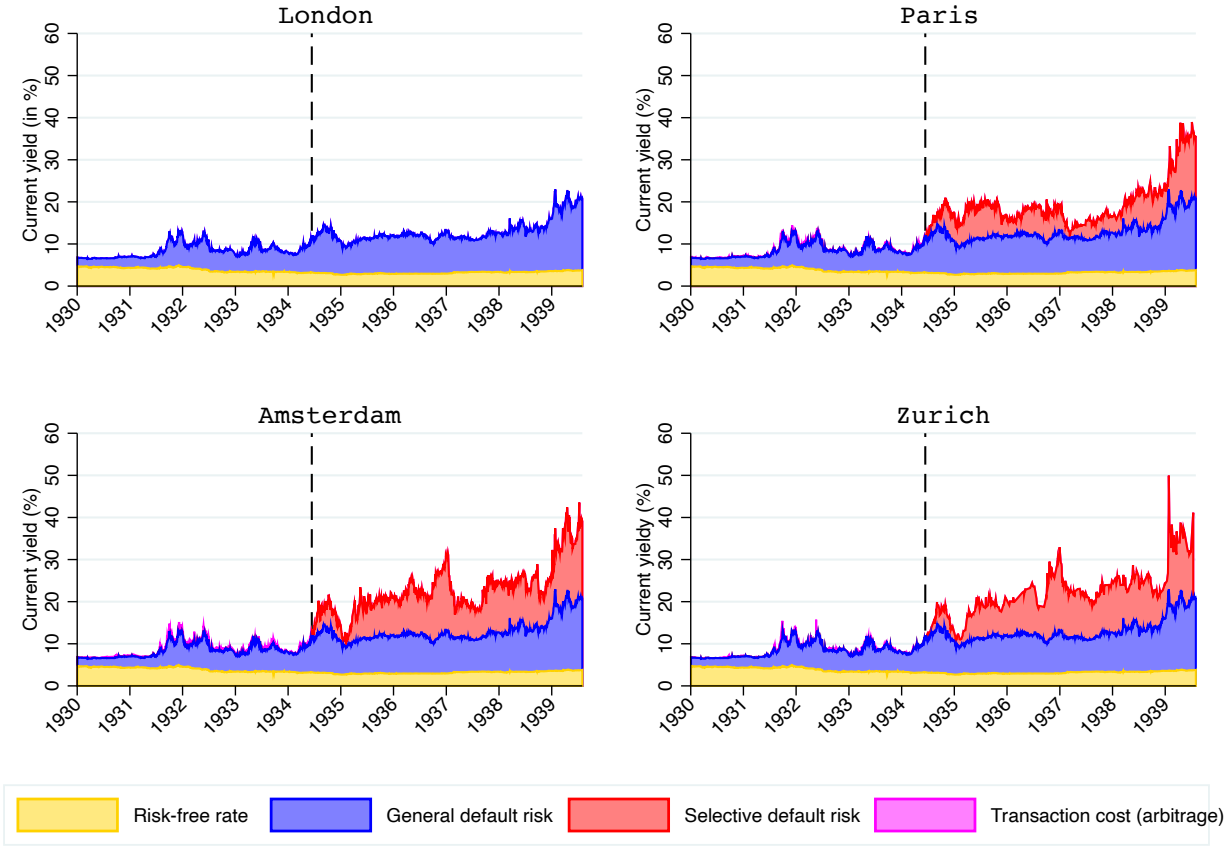
Figure 5 presents the decomposition, which shows that selective default expectations were substantial and differed greatly across countries. From June 1934 to August 1939, the risk premium associated with a selective default on French, Dutch, and Swiss bondholders was, on average, 6.5 percentage points, 9.7 percentage points, and 9.5 percent percentage points, respectively—as compared with a general default risk premium of

[14] In Appendix B.1 we discuss and provide evidence against three implausible alternative explanations that lie outside of our framework: a differential perception of war risk, a home currency bias, different marginal investors across creditor countries, and asymmetric information between bondholders of the different countries.

[15] When regressing the spread between the Dawes bond yield and the British Consol yield in London on the liquidity measure and annual, monthly or weekly fixed effects, we obtain no consistently positive significant coefficients for the liquidity variable (Appendix B.3).

[16] We ignore subsequent changes in the coupon following the various selective defaults on Swiss and Dutch bondholders (the decomposition for the Paris market is unaffected). We study the risk implications of these selective defaults on coupons in Section 4.3.

Figure 5: Decomposition of German government bond yields



Notes: This figure plots the decomposition of the current yield of the sterling Dawes bond (German government bond) in London, Paris, Amsterdam, and Zurich from 1 January 1930 to 1 August 1939 based on the initial 7-percent coupon payment. See text for details on the decomposition. In all four graphs, the vertical bar marks the German debt moratorium of 15 June 1934. Transaction costs are approximated here by the bond yield spread relative to London before this date and are zero afterwards as arbitrage was no longer possible.

9.8 percent and a safe rate of 3.2 percent. On average, the selective default risk premium thus accounted for around 40% of the total risk premium on German bonds traded in Paris and approximately 50% in Amsterdam and Zurich during the 1934-1939 period.

Selective default expectations also varied significantly over time. After increasing from mid-1935 to early 1937, they temporarily receded in 1937-1938 before rising again at the beginning of 1939 as Europe came closer to war. While selective default risk premia were highly correlated across creditor markets, this correlation was stronger for the Amsterdam-Zurich pair (0.98) than for the Paris-Amsterdam and Paris-Zurich ones (0.88 and 0.85, respectively, see Appendix B.2). This probably reflects the fact that Franco-German political and financial relations were not governed by the same factors as Dutch-German and Swiss-German relations. Below, we explore how news about Germany's relationship with its various creditors determined the time-series and cross-sectional variations in selective default risk.

Finally, selective default expectations significantly co-moved with general default risk. The coefficients of correlation between the selective and general default risk premia are, respectively, 0.67, 0.56 and 0.45 for

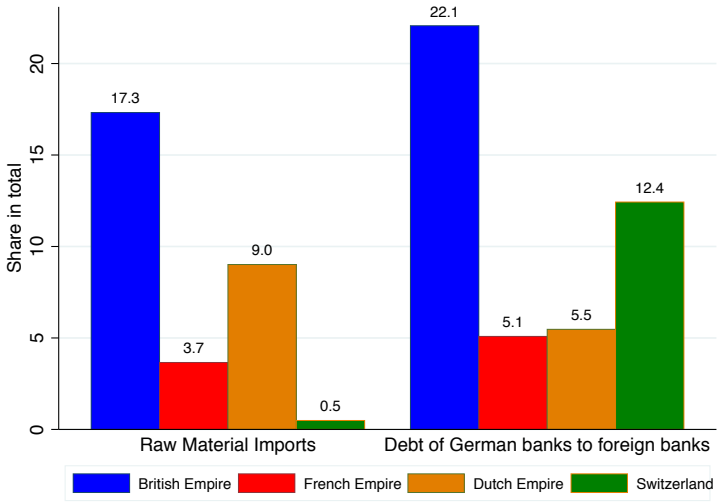
the Paris, Amsterdam and Zurich markets between 1934 and 1939 (Appendix B.2). This suggests that market expectations of creditor discrimination varied together with Germany's overall ability or willingness to service its external debts. The increased likelihood of a general default therefore also raised the probability of a selective default in the eyes of investors. We explore this phenomenon in further depth in the next section.

4 The determinants of selective default risk

4.1 Explaining seniority ranks

The evidence presented so far shows that investors considered British holders of German government bonds as senior relative to continental ones and that a selective default risk premium was priced on the various European markets for German debt. Why did this seniority structure emerge? In the following, we explore the determinants of selective sovereign default expectations. To this end, we first present a brief historical narrative of the financial and commercial relationships between Germany and its creditors during the 1930s.[17]

Figure 6: Raw material dependence and financial integration (1932)



Notes: The figure plots the share of the respective creditor country in the total of German raw material imports in 1932 (left) and debt of German bank owed to foreign banks as of November 30, 1932 (right). The overall exposure of German banks to foreign banks was substantial—about 6% of national income. Sources are detailed in appendices A.4.1 and A.4.2.

Investors' perceptions that British bondholders had a senior status were inextricably linked to Germany's economic dependence on the United Kingdom. The Nazi government's primary economic objective during the 1930s was to purchase the (imported) raw materials necessary for rearmament (Ellis, 1941, p. 205; Tooze, 2006, p. 73). Since London occupied a central place in the global trading and financial system, German authorities realized that they were strongly dependent on the UK in order to achieve their aims. Among the

[17] This narrative is based on several archival records (the UK National Archives, German Federal Archives, Bank of England archives and Bank of France archives) as well as on the historical literature.

countries central to this study, the British Empire remained Germany's chief supplier of raw materials, totaling between 15% and 19% of its imports throughout the 1930s (left panel of Figure 6). Even when imported from elsewhere, raw material products often transited through the London commercial center and were financed by London City banks, which were large suppliers of short-term credits for Germany (right panel of Figure 6). Berlin therefore feared that the UK could potentially cut Germany off from access to these essential products and cause it severe economic damage.[18]

Given its position, the UK could make a credible threat to impose economic sanctions on Germany and its bargaining power largely explains why investors viewed British bondholders as senior. Furthermore, as the Reich slipped towards default, measures adopted by creditors' governments had the effect of strengthening those initial expectations. All creditor countries threatened to impose commercial and financial sanctions on Germany.[19] However, creditors also realized that Germany faced a "transfer problem" as its ability to repay its external debts hinged on its capacity to generate sufficient export revenues.[20] Following the 14 June 1934 announcement of a debt moratorium, each European creditor nation therefore conducted comprehensive trade and debt settlement negotiations with the German government.[21]

These negotiations led to different outcomes. On the one hand, the United Kingdom ended up granting Germany advantageous trade conditions (Wendt, 1971; Forbes, 2000, p. 110). Signed on 1 November 1934, the Anglo-German Payments Agreement aimed at facilitating trade between the two countries and, in doing so, at allowing the Reich to generate substantial export revenues in order to guarantee debt servicing to British bondholders (Ellis, 1940, p. 57).[22] One analyst viewed this treaty as an "act of economic appeasement" and noted that Germany had secured "immense advantages" through it (Einzig, 1941, pp. 96-98). Yet the treaties concluded with continental creditors (France, Switzerland, and the Netherlands) were much less favorable to Germany. They all introduced a payment clearing system through which revenues from German exports

[18] According to an internal memo of the German Economics Ministry, the City of London was "still today the world's leading commercial centre" and "a large share of German raw material imports transit[ed] through London." See 'Vermerk zur englischen Note', 23 June 1934, Politisches Archiv des Auswärtigen Amts, Berlin, Germany (PA AA henceforth), R117.265. On the importance to Germany of the British Empire's supply of raw materials, see also 'Zur Drohung Gross Britanniens mit einem Clearing gegen Deutschland', 19 June 1934, BArch, R2.318, Sheets 28ff.

[19] On 26 May 1934, for example, the French ambassador in Berlin notified Germany's Foreign Minister Von Neurath that the French government was considering the imposition of a new tariff on German imports in "reprisal" if the Reich interrupted the service of Dawes and Young bonds. See 'Note by Von Neurath', 26 May 1934, PA AA, R117.123. Within two weeks of Germany's announcement of a German moratorium, the British Parliament also passed a bill authorizing the government to impose a unilateral clearing and trade sanctions on Germany (Wendt, 1971, p. 190).

[20] See, for example, the mail exchange between the President of the Dutch Central Bank and Governor of the Bank of England on German debts. 'Letter from Leonardus Trip to Montagu Norman', 26 February 1934, BoE, G1/446.

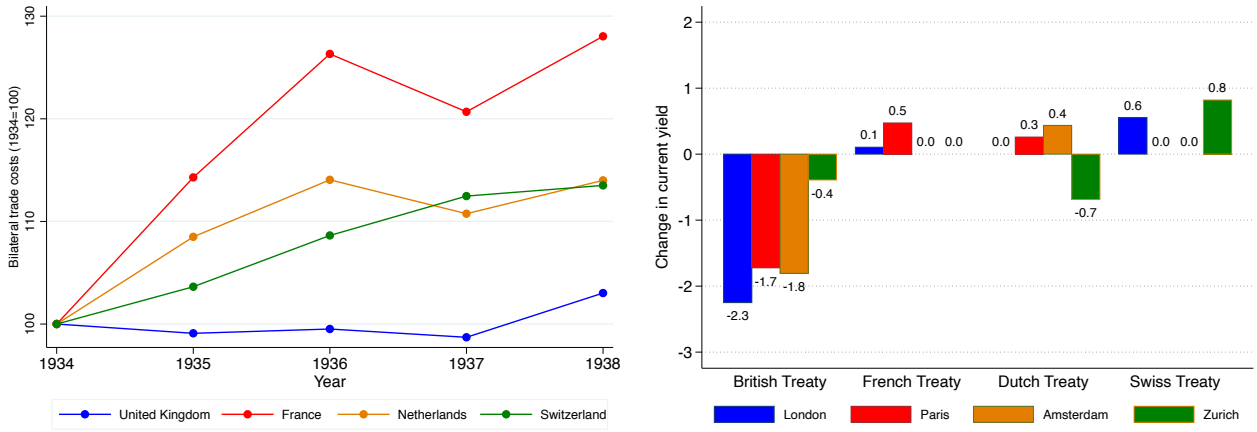
[21] In the meantime, Germany continued to pay full interest to European holders of Dawes and Young bonds. This was ratified in the British case through the Anglo-German Transfer Agreement of 4 July 1934 (Wendt, 1971, p. 213).

[22] See 'Anglo-German Payments Agreement', UK National Archives, London, United Kingdom, FO 93/36/139. As part of the agreement, the Bank of England also granted the Reichsbank a generous £400,000 loan for the liquidation of Germany's outstanding commercial debts (Forbes, 2000, pp. 110f).

were directly seized to reimburse creditors.[23]

The clearing systems proved to be extremely detrimental to German trade (and, hence, to bondholders) in the years that followed. Figure 7(a) plots the evolution of Germany's bilateral trade costs with the four European creditors (see Jacks et al., 2011, for details on the measure). While Germany's bilateral trade costs with the UK remained relatively constant in the second half of the 1930s, trade costs with other creditors increased heavily. The ensuing reduced bilateral exports to continental countries jeopardized continued payments to bondholders under the clearing systems. These conditions ultimately led to the selective default on Dutch and Swiss bondholders in April and June 1935, respectively. At the same time, lesser obstacles in the trade with the United Kingdom manifested Britain's status as the senior creditor.

Figure 7: Trade costs and market reactions to trade negotiations



(a) German bilateral trade costs

(b) Market reaction to trade treaties

Notes: Panel (a) shows annual bilateral trade costs between Germany and the four European creditor countries from 1934 to 1938. The data are from Jacks et al. (2011) for the United Kingdom, France and the Netherlands. Data for Switzerland are our own estimate (see Appendix A.4.3). Panel (b) plots the change in the Dawes bond's current yield consecutive to (i) the Anglo-German Payments Agreement of 1 November 1934; (ii) the French-German Agreement on Commercial Payments of 28 July 1934; (iii) the Dutch-German Agreement on Compensation Traffic of 13 October 1934; and (iv) the Swiss-German Agreement on Compensation Traffic of 26 July 1934. The dates of the various treaties are from Huhle (1937). The measure reported is the difference in the current yield between the two trading days before and after the announcement of the signature of each treaty. Zeros are reported when no change was recorded between the two dates. Although the Franco-German treaty was concluded on July 25th and signed on July 28th, *The Economist* reported as early as July 21st that a Franco-German agreement had been reached (see *The Economist*, 'Investment Notes', July 21, 1934, p. 122). We therefore use this date as the event date for that treaty.

Figure 7(b) shows that bondholders had anticipated the consequences of the various creditors' commercial policies towards Germany. It compares the reaction of the Dawes bond yield to the announcement of the treaties with each of the four European creditor nations. All four agreements guaranteed maintenance of the Dawes bonds' full service in the near future and therefore removed uncertainty for bondholders. However, while both UK and continental bondholders reacted positively to the signature of the Anglo-German treaty (possibly because it increased Germany's general ability to repay its debts), they remained skeptical towards the other treaties, which imposed higher trade costs.

[23] For example, the French-German agreement of July 1934 stipulated that 15.75 % of the daily value of French imports from Germany were to be credited to a special Reichsbank account with the French-German Office for Commercial Payments and used to pay coupons of the Dawes and Young loans. See 'Franco-German Agreement on Commercial Payments', 28 July 1934, Banque de France archives, Paris, France, 1069199005/49.

4.2 The dynamics of seniority

The above narrative elucidates why, throughout the 1934-1939 period, investors considered the UK as Germany's most senior creditor. However, the selective default risk premium also varied substantially over time and across the junior (continental) creditors (Figure 5). These evolutions must have been driven by the arrival of new information, which led investors to update their expectations. Employing a difference-in-differences framework, we now explore how various types of news affected the general level of selective default expectations and changed the relative size of the selective default risk premium across continental creditors.

To analyze the pricing of information across markets, we generate a list of potentially relevant news events from two distinct data sources: the *Financial Times (FT)* and the *Chronicle of International Events (Chronicle)*. In order to avoid biasing our selection, we first extract the universe of articles that contain the keyword "Dawes" from the *FT*. We then code the corresponding articles according to (a) whether they report positive or negative news for bondholders and (b) whether these events affected all creditor countries or only a subset of them—and, if the latter, which one(s). Our restriction to the keyword "Dawes" results in the omission of certain critical political events. Hence, we complement our data with Germany-related events from the *Chronicle*, which records all noteworthy international political events as well as all bilateral and multilateral treaties signed each month.[24] Appendix A.2 contains a detailed description of all events as well as coding rules.

Table 2: The events dataset

Event affects...	Total Number	Negative	Positive
1. All creditors	66	43	23
2. Most senior creditor (UK) only	35	9	26
3. Junior creditor (1 or 2 out of: France, Switzerland, or Netherlands)	44	15	29
$\sum$ All events	145	67	78

Notes: This table presents the number of occurrences of various types of events included in the event study analysis. Events were identified using two sources: the *Financial Times (FT)* and the *Chronicle of International Events (Chronicle)*. See text for details.

Table 2 reports the main features of the events dataset. There are 145 events in total, 46% of which relate to all creditors. These include, for example, general news about Germany's ability to repay its external debt (e.g. news that a new German bond issue was oversubscribed) or general political events (e.g. when the League

[24] After removing duplicates that are recorded in both sources, we add four important political events in German history of the 1930s that escaped our data generating process. In particular: the passage of the Nuremberg laws, the Reichskristallnacht ('Night of Broken Glass'), the authorization of Goering's Four-Year Plan, and the order for Germany's naval expansion.

of Nations declared Germany's infringement of the Versailles Peace treaty).[25] 24% of the events relate to UK bondholders exclusively (i.e. they do not explicitly pertain to the other creditors). An example of such an event would be a newspaper report on Anglo-German talks about the service of the Dawes bond.[26] The remaining 30% of the events are those that pertain to one or two of the continental creditors (France, Switzerland, or the Netherlands), but not to the United Kingdom. An example of such an event would be a report on the progress of Franco-German trade negotiations.[27]

We first explore how the first two types of news in Table 2 (general news about Germany's ability or willingness to repay and news specific to UK bondholders) impact selective default expectations. To this end, we blend a difference-in-differences approach with a classical event study framework (see e.g. Neuhierl et al., 2013, for a recent application). Consider the following definition of an abnormal yield AY for junior creditor j at time t:

$$AY_{jt} = Y_{jt} - E(Y_{jt}|X_{it}), \tag{9}$$

where Y_{jt} is the realized and $E(Y_{jt}|X_{it})$ the expected yield based on information X_{it}. In a classical event study analysis, the expected yield is usually predicted based on the coefficient obtained from a pre-event linear regression of the yield on a market index. Thanks to the historical accident we are analyzing—the exact same bond was traded on various segmented markets—we do not have to rely on this method. Instead, we use use the yield of the Dawes bond traded in London (Y_s) as a 'control group' to predict the expected yield. Let us now define the expected yield as the sum of the average spread $Y_j - Y_s$ between the German bond yield in the junior country j and in the senior country s five days prior to the arrival of the news and the yield in the senior country at time t:

$$E(Y_{jt}|X_{it}) = \frac{\sum_{t=-5}^{-1} Y_{jt} - Y_{st}}{5} + Y_{st} \tag{10}$$

Substituting equation 10 into 9 shows that the abnormal yield is equal to the difference in the spread at time t and the average spread in the 5-day period preceding the event:

$$AY_{it} = (Y_{jt} - Y_{st}) - \frac{\sum_{t=-5}^{-1} Y_{jt} - Y_{st}}{5} \tag{11}$$

This formulation resembles a difference-in-differences approach, where the first difference is encap-

[25] 'Reich Bond Issue Oversubscribed', *Financial Times*, September 19, 1935; 'Germany and the League', Oct. 22, 1935, *Chronicle* (Jan 1936, p. 136).

[26] 'Dawes and Young Talks To-Day', *Financial Times*, June 27, 1934.

[27] 'The Franco-German Trade Pact', *Financial Times*, July 13, 1937.

sulated in the yield spread itself, and the second difference originates in the before-after comparison of the spread. To analyze whether news affecting Germany's overall creditworthiness or news about its specific relationship with its most senior creditor affected expectations of a selective default on junior bondholders, we could thus simply pool all observations corresponding to each event type and test whether the abnormal yield AY following a news shock is significantly different from 0. We can however also translate this event study formulation into a panel regression framework. This latter approach has the advantage of allowing us to control for liquidity differentials between markets j and s before and after the event. We thus estimate the following equation at the creditor-event level:

$$(Y_{jte} - Y_{ste}) = \alpha + \beta \, \text{NEWS}_t + \eta(L_{jte} - L_{ste}) + \gamma_{je} + \epsilon_{jte} \tag{12}$$

where $(Y_{jte} - Y_{ste})$ is the spread between the Dawes bond yield in the junior creditor's market j (Paris, Amsterdam or Zurich market) and the senior creditor's market s (London market) at day t of event e and is equivalent to our measure of selective default risk. We employ a symmetric event window around the advent of the news. For each event e, t indexes the 5 days prior to the arrival of the new information, the day the news arrives, and the 5 days following the news' arrival ($t = \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$). γ_{je} is an event-creditor-country fixed effect. The term $(L_{jte} - L_{ste})$ measures the liquidity differences between markets j and s. As before, liquidity is measured as the percentage of days of the last 10 trading days in which price changes indicate active trading (see discussion in Section 3.3). Including this variable may however introduce a 'bad control' problem as trading might become more active simply because of the arrival of new information. We thus provide all estimates with and without the liquidity control. Finally, NEWS_t is a dummy variable taking the value 0 for all $t < 0$ and 1 for $t \geq 0$. Consequently, β measures the effect of the news shock on selective default risk.

The upper panel of Table 3 reports estimates of the impact of news about Germany's overall creditworthiness on the selective default risk premium. The results reveal that negative news about Germany's likelihood of default led to an increase in selective default expectations on junior (continental) creditors' markets. This means that bad general news about Germany's position had on average a less pronounced effect on the Dawes bond yield in the senior creditor country (the United Kingdom) than in the junior creditor countries (France, the Netherlands, and Switzerland). In other words, the selective default risk premium increased with general default risk. However, we do not find a corresponding effect for positive news, possibly because good news about Germany's overall position were not sufficient to significantly alter default expectations in the 1930s. These results hold when controlling for liquidity differences across markets (columns 3-4) and when restricting the sample to the Paris market only (columns 5-6).[28] They resonate with Chamon et al.'s (2018) re-

[28] French bondholders received the same coupon as those in the UK throughout the entire sample period, i.e. they were treated

Table 3: Seniority and selective default risk

	Dependent variable: Spread in current yield ($Y_j - Y_s$)					
	Baseline		Liquidity control		Paris only	
	News pertaining to all bondholders					
	bad news	good news	bad news	good news	bad news	good news
News shock	0.30***	0.05	0.27***	0.05	0.28**	0.10
	(0.10)	(0.08)	(0.10)	(0.08)	(0.12)	(0.10)
Liquidity differential			1.01*	0.00	0.21	0.52
			(0.59)	(0.42)	(0.61)	(0.57)
N (observations)	839	812	839	812	321	303
N (Event-market)	130	136	130	136	48	45
Adj. overall R^2	.93	.97	.93	.97	.94	.98
Within R^2	0.02	0.00	0.04	0.00	0.05	0.02
	News pertaining to UK bondholders only					
	bad news	good news	bad news	good news	bad news	good news
News shock	0.15	0.13	0.13	0.13	0.28	0.18
	(0.14)	(0.13)	(0.13)	(0.13)	(0.17)	(0.15)
Liquidity differential			0.45	0.14	0.81	0.90
			(0.70)	(0.63)	(0.47)	(0.87)
N (observations)	126	406	126	406	53	157
N (Event-market)	20	66	20	66	8	23
Adj. overall R^2	.97	.98	.97	.98	.95	.98
Within R^2	0.01	0.01	0.02	0.01	0.09	0.06

Notes: This table presents the results of event study regressions for two types of news: a. general news, pertaining to all bondholders, about Germany's overall ability or willingness to repay its external debt (upper panel) and b. news, pertaining to UK bondholders only, about the UK-German relationship (lower panel). See text for more details on the specification. Two-way-clustered standard errors (Event-market & date dimension) are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Observations for which prices are *not* recorded in both markets (the London market s *and* the continental market j) are treated as missing. Appendix B.4 reports qualitatively similar results for regressions where missing observations are replaced with the last previously available yield on any given day.

cent finding for modern sovereign bond markets, in which the premium on domestic-law bond yields (relative to foreign-law ones) rises when the level of credit risk increases.

The lower panel of Table 3 explores the impact of news specific to the relationship between Germany and its most senior creditor (the UK) on the selective default risk premium. The results suggest that such news about the Anglo-German relationship had no significant effect on selective default expectations. This result fits with our analytical framework above (see Section 3.1). Since the UK was the most senior creditor, any bad (good) news about Germany's willingness to repay UK bondholders should have increased (decreased) expectations of a general default (affecting all creditors). Such an increase in general default risk should, however, not be reflected in the yield spread between the junior and senior markets as that spread only measures selective default risk. Higher risk for British bondholders was passed through to continental markets. Consequently, markets considered that bad (good) news for British bondholders were also bad (good) news for

in the exact same way as were their British counterparts.

continental bondholders.

Finally, we analyze the impact of the third type of news—i.e. news about the bilateral relationship between Germany and each of its junior creditors—on the selective default risk premium in continental markets. We thus estimate the following pooled difference-in-differences-in-differences equation:

$$(Y_{jte} - Y_{ste}) = \alpha + \delta(NEWS_t \times TREATED_{je}) + \eta_{Ne} + \gamma_{je} + \epsilon_{jte} \tag{13}$$

where the term $(Y_{jte} - Y_{ste})$ is again the yield spread between the junior and senior creditor market and $NEWS_t$ is an indicator for the arrival of news of the type described above. As in equation (12), the fixed effect γ_{je} is a constant for each market-event combination. In contrast to the simple difference-in-differences setup above, however, this equation exploits a third layer of variation: the fact that certain events pertained to one or two, but not all continental markets. We introduce another set of fixed effects (η_{Ne}) which consist in the interaction of the indicator $NEWS_t$ (taking the value one for all post-event days) with an indicator variable for each event e. This allows us to capture the general information content relevant to all creditors that a given news might carry. $TREATED_{je}$ is a dummy variable taking the value one for creditor countries j that are affected by the news event e and zero for creditors that remain unaffected. Consequently, the treatment effect δ measures the effect of news shocks on the treated markets relative to all untreated markets.

Table 4: Information updates and creditor re-ranking

	Dependent variable: Selective default risk $(y_j - y_s)$			
	bad news	good news	bad news	good news
News treatment	0.35*	-0.34**	0.35**	-0.29*
	(0.17)	(0.16)	(0.17)	(0.15)
Liquidity differential			-0.15	0.76*
			(0.65)	(0.38)
N (observations)	200	354	200	354
N (Event-market)	34	54	34	56
Adj. overall R^2	.98	.99	.98	.99
Within R^2	.16	.42	.16	.43

Notes: This table presents the results of event study regressions for news about Germany's relationship with each of the three continental creditor countries (France, the Netherlands and Switzerland). See text for more details on the specification. Two-way-clustered standard errors (Event-market & date dimension) are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Observations for which prices are *not* recorded in both markets (the London market s *and* the continental market j) are treated as missing. Appendix B.5 reports qualitatively similar results for regressions where missing observations are replaced with the last previously available yield on any given day.

Table 4 reports the treatment effects of positive and negative news. The results show that the arrival of new information about a given continental creditor's relationship with Germany resulted in a change in the selective default risk premium on that country's market. Bad news for a given creditor country's bondholders increased the premium by .35 percentage points on average on the corresponding market (relative to the other creditors' markets). Given the differences in the selective default risk premium across the three markets,

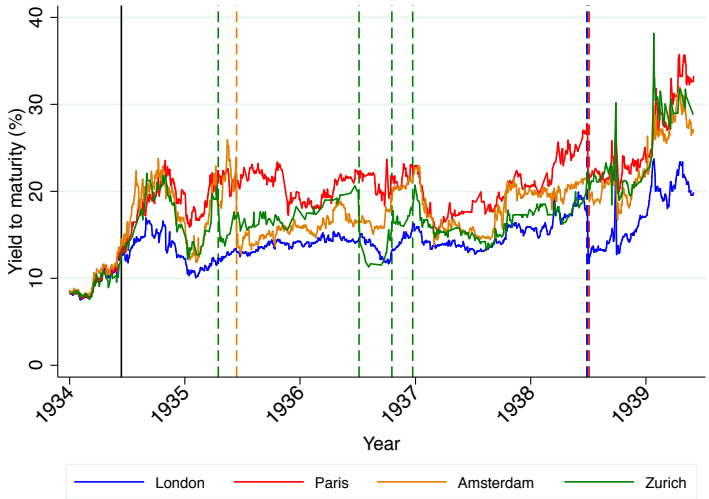
such magnitude is economically meaningful. Conversely, good news for a given continental creditor country lowered the selective default risk premium on the corresponding market (relative to the other markets).

In sum, our analysis of the pricing of new information reveals that bad news about Germany's overall ability or willingness to repay its external debt resulted in a rise in expectations of selective default on continental (junior) creditors. Consistent with the fact that the UK was the most senior creditor, specific news about the Anglo-German relationship did not affect the selective default risk premium on continental markets. By contrast, good and bad news about Germany's bilateral relationship with its continental creditors affected the relative size of the selective default risk premium across these countries' markets.

4.3 Selective defaults and the seniority structure of sovereign debt

Beginning in the second quarter of 1935, the German government partially defaulted on the Swiss and Dutch bondholders by reducing the coupon payments through multiple agreements. It continued to fully serve the bonds held by British and French residents until summer 1938. Did the selective defaults on Dutch and Swiss bondholders change investors' expectations about the seniority structure of Germany's sovereign debt? In other words: Did investors believe that bondholders who had already been subject to a selective default would be spared further defaults? Figure 5 (in Section 3.4) presented the decomposition of the current yield based on the Dawes loan's original coupon of 7 percent. Hence, it did not account for coupon reductions that followed the German defaults. By contrast, Figure 8 reports the Dawes bond yield to maturity in the various markets after accounting for those coupon reductions.

Figure 8: Yields to maturity after accounting for coupon reductions



Notes: This figure displays the Dawes bond yield to maturity from January 1934 to August 1939 on the London, Paris, Amsterdam, and Zurich markets after adjusting for the various coupon reductions. The solid vertical bar marks the date of Germany's announcement of its debt moratorium (14 June 1934). Blue, red, orange, and green dashed vertical bars correspond to the dates of coupon reduction for Dawes bonds held by (respectively) British, French, Dutch, and Swiss residents. See Appendix A.1 for the corresponding documentation of the dates and details on the yield to maturity estimation.

An inspection of the ranking of yields to maturity calculated in this fashion allows us to assess whether the perceived seniority structure of German government debt changed following the successive selective defaults in the 1930s. In particular, we can determine whether markets continued to anticipate a higher probability of default on Dutch and Swiss bondholders—that is, after Germany had already selectively defaulted on these bondholders. It is apparent from Figure 8 that markets still viewed British bondholders as senior during the second half of the decade. Dawes bonds in British ownership traded at a lower yield to maturity than did those held by continental European residents, even though the former carried a higher coupon. No exceptions to this pattern are observed apart from a few months during the second half of 1936, when coupon payments to Swiss bondholders were temporarily suspended (i.e., a complete default on the coupon), and during the weeks immediately preceding the partial default on British and French bondholders in summer 1938.

Yet we also observe that, following the selective defaults on Swiss and Dutch bondholders in April and June 1935, respectively, Dawes bonds traded at a higher yield-to-maturity in Paris than in Amsterdam and Zurich. The selective defaults thus changed the perceived seniority ranking of continental creditors. After the German government partially defaulted on Swiss and Dutch creditors, investors expected that French bondholders would be next in line. However, no default on French bondholders occurred until August 1938, and even then they continued to be treated equally to British bondholders.

5 Conclusion

This paper presents empirical evidence on selective default risk with the aid of a unique historical laboratory: the German debt default in the 1930s. Identical German government bonds were traded in various European creditor countries, but the secondary markets for those bonds were geographically segmented and liquidity differences across markets were negligible. These unique circumstances allow us to measure expectations of selective default on bondholders from various creditor countries. We show that a large selective default risk premium was priced in German bonds on continental markets during 1934-1939, even when the German government continued to service those bonds fully. Depending on the market, the selective default risk premium accounted for up to half of the total risk premium on German government bonds. Our analysis reveals that market assessment of the seniority ranking of various bondholders depended on the extent of Germany's commercial and financial dependence on each creditor country and thus on the economic damage those countries could potentially inflict on Germany. Finally, we analyze the dynamics of the selective default risk premium and find that this premium responded strongly to news about Germany's overall creditworthiness as well as to events pertaining to the bilateral relationship between each creditor country and Germany. We also document that selective defaults, when eventually implemented, contributed to changing market perceptions of

the seniority ranks of the various continental European (junior) bondholders but did little to affect British bondholders' senior status.

The recent theoretical literature has shown how secondary debt markets can provide a powerful mechanism for making sovereign debt sustainable (Guembel and Sussman, 2009; Broner et al., 2010, 2014). Our historical case study confirms this view and illustrates how the risk of selective default cannot be priced in sovereign bonds when senior and junior creditors can exchange them on a secondary market. We also report evidence that, when creditor countries' secondary bond markets are integrated, expectations of selective default induce junior creditors to sell their bonds to senior ones. At the same time, the historical episode also illustrates how creditor and debtor governments can effectively organize the geographical segmentation of sovereign debt markets to enable the possibility of selective defaults. Even without the technology available nowadays, authorities had the power to suspend international bond arbitrage and orchestrate a selective default on international bondholders. As another wave of sovereign debt defaults has become all the more likely in the wake of the Covid-19 crisis, evidence from the 1930s reminds us of the factors that might make debtor countries discriminate against various foreign creditors.

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Appendix to
'Selective default expectations'
(Accominotti, Albers, Oosterlinck 2021)

Contents

A Data

A.1 Dawes bond

A.1.1 The tranches of the Dawes bond

Table A.1: Tranches of the Dawes bond

Currency	Country of issuance	Amount issued	Amount in GBP	% of overall amount	Amount in RM
US-Dollar	United States	USD 110,000,000	22,602,585	48.9%	461,770,810
Swiss Franc	Switzerland	CHF 15,000,000	561,658	1.2%	11,474,669
Italian Lira	Italy	ITL 100,000,000	47,150	0.1%	963,267
Swedish Krona	Sweden	SKR 25,200,000	1,362,438	2.9%	27,834,600
Sterling	Germany	GBP 320,000	320,000	0.7%	6,537,600
	United Kingdom	GBP 12,000,000	12,000,000	25.9%	245,160,000
	France	GBP 3,000,000	3,000,000	6.5%	61,290,000
	Switzerland	GBP 2,360,000	2,360,000	5.1%	48,214,800
	Belgium	GBP 1,500,000	1,500,000	3.2%	30,645,000
	Netherlands	GBP 2,500,000	2,500,000	5.4%	51,075,000
Totals			46,253,830	100%	944,965,745
Total Dawes issuance in % of national income of 1925					1.65%

Notes: All data on bond issuances are from Glaesemann (1993); For conversions of the amount into pound sterling/Reichsmark, we employ the compilation of exchange rates from the Federal Reserve Board (1943). National income as of 1925 is from Ritschl (2002, Table B1).

A.1.2 Sources for daily price data of Dawes bond

Primary sources for daily bond price data Daily Dawes bond prices for London and Zurich were hand-collected from daily issues of the *Handelsteil* of the *Neue Zürcher Zeitung*. At the time, the *Neue Zürcher Zeitung* published three daily issues on weekdays. From Monday to Friday, daily closing prices for Zurich are given in the evening issue of the same day, the closing prices for London are quoted in the morning edition of the following day. The prices for the Saturday market are given in the Monday morning issue. We verified the London prices taken from *Neue Zürcher Zeitung* by cross-checking quotes in the *Financial Times* at regular intervals. Prices for Amsterdam are taken directly from the official exchange price list, the *Officiele prijscourant der Vereeniging voor de Effectenhandel*.[1] Similarly, daily closing prices for Paris are taken from the *Bulletin de la Cote (Compagnie des Agents de Change de Paris)*. Digital copies of the *Bulletin de la Cote* were kindly made available by Riva and Hautcoeur (2015, 2018).

Trading days During the period under consideration, the stock exchanges of Paris, Amsterdam and Zurich were regularly open from Monday to Saturday. The London Stock exchange opened regularly on Saturdays starting on September 19, 1931, for the first time in 14 years.[2] After May 26, 1934, however, it returned permanently to being open only from Monday to Friday.[3]

[1] From October 15, two prices are recorded: one for bonds with an kettingverklaring (affidavit) about residency and one without it. We use the price for those with an affidavit for comparability.

[2] *Financial Times* of Monday, September 21, 1931, "Stock Exchange Saturday Opening".

[3] *Financial Times* of Saturday, May 26, 1934, "The Question of Saturdays".

Currency conversion Making Dawes bond prices comparable across the four markets requires converting daily prices on continental markets into pounds sterling. In order to reflect the contractual terms of the Dawes Loan, we take daily spot exchange rates from Accominotti et al. (2019).[4]

Pound sterling-denominated bonds were quoted in different ways on the various continental exchanges. In Paris, bond prices were quoted in French Francs.[5] We thus convert Paris prices into pounds sterling by dividing the original price by the spot GBP/FRF exchange rate ($XR_{GBP,FRF}$); i.e. :

$$P_{GBP,Paris} = \frac{P_{FRF,Paris}}{XR_{GBP,FRF}} \tag{1}$$

On the Amsterdam and Zurich markets, prices of pound sterling-denominated Dawes bonds were quoted as a percentage of the pound sterling par. To obtain the bond's price in local currency, investors had to multiply the quoted percentage Q_i by a fixed exchange rate (NLG 12 = GBP 1 for Amsterdam[6] and CHF 25.25 = GBP 1 for Zurich[7]). The bond prices in Dutch guilders and Swiss francs could then be converted into pounds sterling at the current GBP/NLG and GBP/CHF spot exchange rates. We thus convert Amsterdam and Zurich quotations of the GBP Dawes bond into pounds sterling as follows:

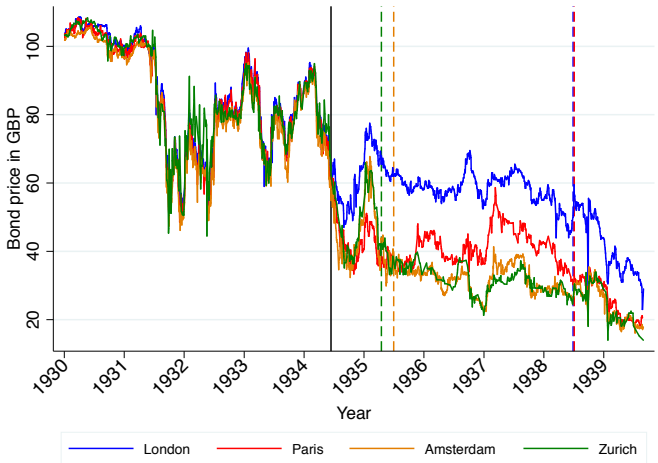
$$P_{GBP,Amsterdam} = \frac{Q_{Amsterdam} \times 12}{XR_{GBP,NLG}} \tag{2}$$

and

$$P_{GBP,Zurich} = \frac{Q_{Zurich} \times 25.25}{XR_{GBP,CHF}} \tag{3}$$

Figure A.1 shows that these conversions are correct. First, we do not observe a break in the price differentials after the UK devalued the GBP in September 1931. Second, since markets were not segmented until June 14, 1934, we would expect the differences between Dawes bond prices converted into pounds sterling across the different markets to be minimal (as it was possible to arbitrage these bonds between markets). This conjecture is verified in the data.

Figure A.1: Bond prices in GBP across markets



[4] In October 1934, the Bank for International Settlements described the contractual terms of the Dawes Loan in the following words: "It is to be noted that most tranches are issued in £ and that currently these bonds' coupons are payable in any place at the choice of the holder and at the current spot exchange rate. The other tranches are entirely national and, therefore, are only paid in local currency" (our translation from French). See BArch R2501.6743, Sheet 78 ff.

[5] See Compagnie des Agents de Change de Paris, *Bulletin de la Cote*.

[6] *Officiele prijscourant der Vereeniging voor de Effectenhandel*, Amsterdam.

[7] *Schweizerischer Bankverein*, Jahreskursblatt. Beilage zum Bericht No. 1/1932.

Yield to maturity calculation In the final part of our study, we employ the yield-to-maturity rather than the current yield. To calculate the internal rate of return and thus the yield to maturity, we employ the Stata IRR program by Sangiácomo (2013). At each date, we employ the coupon as documented in Table A.2. The payment at maturity is set to 100 and the final maturity date is set to October 1949.

Clearing agreements & de facto cash transfers As discussed in the main text, clearing agreements impeded the payment of the full 7% coupon for bonds traded on the Zurich (from April 17, 1935) and Amsterdam markets (from June 14, 1935). A few years later, the German government reduced coupon payments on Dawes bonds traded in London and Paris from 7% to 5% (July 1, 1938). Table A.2 reports all changes in the coupon rate of the Dawes bond in each market. The difference between the cash payment and stipulated coupon rate of 7% was typically continued to be paid in either funding bonds or so-called Dawes Marks. Since these alternative forms of payment were clearly not as good as cash, coupon reductions constituted partial defaults as discussed in the main text.

Table A.2: Clearing agreements and coupon changes

Market	Date of change	Coupon changes (cash transfers)	Further particulars on coupon	Citizenship rule	Comments	Source
London	July 1, 1938	7% → 5%	The reduction in the interest is to be used for amortisation.	British owners	In return for concessions, this definition includes all owners of London-issued sterling denominated bonds (rather than British citizens only).	Hofmann (1938)
Paris	July 1, 1938 / August 3, 1938	7% → 5%	The equal treatment with British creditors is confirmed by internal documents from the Reichsfinanzministerium (dated July 11, 1938), even though the change in the the treaty (August 3, 1938) makes no special reference to the Dawes bond.	French residents	The legal definition excludes bonds that were not held by French residents in July 1933 (and thus excludes arbitrage).	Bundesarchiv Lichterfelde Akte R2/278, p. 3; Deutsches Reich (1938)
Amsterdam	June 14, 1935	7% → 3.5%	The remaining 3.5% are paid in Dawes-Mark (equivalent to Registermark).	Dutch residents	The legal definition excludes bonds that were not held by Dutch residents in July 1933 (and thus excludes arbitrage).	*Financial Times* of June 15, 1935 "Dutch-German Transfers". The definitions of this "Transferprotokoll" are re-affirmed and reported in detail in Deutsches Reich (1936). Bundesarchiv Lichterfelde Akte R2/278, p. 62-63 ;Deutsches Reich (1938) reports that they are still valid in 1938.
Zurich	April 17, 1935	7% → 4.5%	The remainder was payable in so-called 'fundingbonds'. In fact, it seems that, despite their relative seniority, cash transfers were not made for the Dawes between April and October (but possibly later).			Kellenberger (1942, p. 184)
	July 6, 1936	4.5% → 2%	Remainder likely paid in so-called fundingbonds.			Kellenberger (1942, p. 189)
	October 18, 1936	2% → 0%	Full 7% payment in Dawes Mark			Kellenberger (1942, p. 189)
	December 23, 1936	0% → 2.5%	No explicit description, but second reference suggests that remainder was paid in Dawes-Mark.			Kellenberger (1942, p. 192; 195)
	June 30, 1937	2.5% = 2.5%	Remainder in Dawes-Mark			Kellenberger (1942, p. 195)
	June 30, 1938	2.5% → 4%	Remainder in Dawes-Mark			Kellenberger (1942, p. 197)
	July 5, 1939	4% → 2.75%	Remainder in Dawes-Mark			Kellenberger (1942, p. 200)

A.1.3 Definition of liquidity

We measure liquidity as the percentage of 'active' trading days among the last 10 trading days. A trading day is defined as 'active' if the change in the bond price (compared to the previous day) is different from zero. By definition, this indicator provides a lower bound measure of liquidity (see main text).

A.1.4 Volume data

In 1938, the Bank for International Settlements sent the Bank of England an overview of the Reichsbank's accounts with regards to the Dawes Loan (Bank of England Archives, OV34/281). It appears that the BIS had previously acquired this document from the German government. For each biannual tranche, the overview documents the German government's total coupon payments to holders of Dawes bonds. Coupon payments are broken down by tranche *and* paying agent. Paying agents were responsible for processing the payment of the coupons. For example, the Bank of England and Lazard Frères were the designated paying agents of the Dawes Loan in London and Paris, respectively.

Figure A.2: Source for interest payments (excerpt)

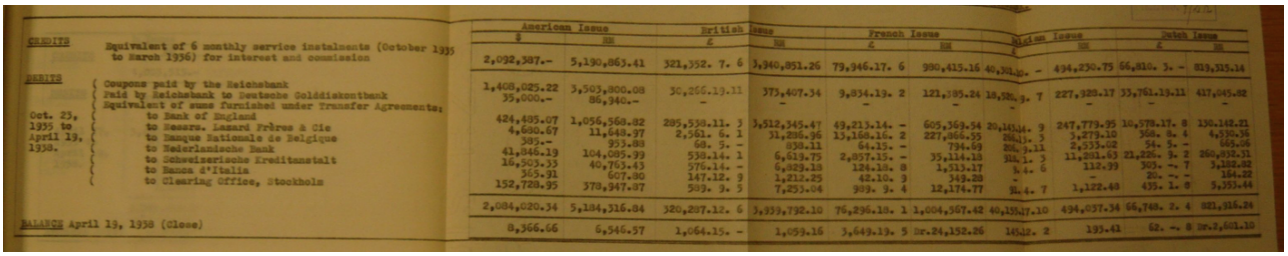


Figure A.2 presents an excerpt from this source, detailing the interest payments processed for April 1936. For each tranche of issue, it documents the amount paid to each paying agent. Dividing the respective interest payments by the corresponding coupon allows us to estimate the total face value of Dawes bonds of each tranche held in each market.[8] We use this method for October 1934 and April 1936 (details on minor adjustments are provided in the replication files). To arrive at the shares reported in Figure 3, we exclude repatriated bonds (i.e., bonds bought back by German residents on foreign European markets) whose coupons were paid by the Reichsbank.[9]

We also report estimates of the number of £100 denomination bonds circulating in each market in 1924 and 1934. The estimated numbers for 1924 are obtained by dividing the amount issued in GBP in each market by 100 (see Table A.1). For 1934, we divide the estimated face value of bonds circulating in each market by 100. There also existed £1,000 denomination Dawes bonds. These bonds traded at the same yield as £100 denomination bonds as we know from the French listings in the *Bulletin de la Cote (Compagnie des Agents de Change de Paris)*. For simplicity, we therefore show the estimated number of £100-equivalent Dawes bonds.

A.2 British Consol price in London and Paris

Daily British Consol prices in London and Paris were hand-collected from the following sources:

- London: *Commercial and Financial Chronicle*, an American weekly newspaper listing stock and bond prices on the US and foreign markets. This source is available online in pdf format through FRASER (administered by the St. Louis FED).
- Paris: *Bulletin de la Cote (Compagnie des Agents de Change de Paris)*. Data in pdf format including listings of foreign securities (among which, the British Consol) were made available to us by Riva and Hautcoeur (2015, 2018).

[8] The initial bi-annual coupon was 3.5% (= 7% annual). Coupon reductions for the Amsterdam and Zurich markets are documented in Table A.2. The only implicit assumption is that individuals do not cross borders to obtain their coupon payments; we assume, for example, that a bondholder located in London does not travel to Paris to obtain her coupon payment but instead prefers to walk to the Bank of England. This appears to be a fairly reasonable assumption.

[9] To check the validity of our computations, we add the estimated volume of outstanding bonds of each tranche circulating on the various foreign markets to the estimated volume of repatriated bonds. For each tranche, the sum of the two volumes perfectly matches the total number of outstanding bonds. Additional adjustments have to be made to validate our estimates for 1936 as the Reichsbank received payments for making additional transfers in blocked marks (Dawes Marks) to foreign bondholders. This, however, does not at all affect our estimate of the volumes of Dawes bonds of each tranche circulating on each foreign market.

A.3 Events data

A.3.1 Sources and search terms

Our events dataset draws on two sources: the *Financial Times* and the *Chronicle of International Events*. These sources are complements rather than substitutes. The former has a special focus on financial news. The latter lists all important commercial and political news.

Financial Times To cover the universe of financial news relevant to the movement of Dawes bonds, we rely on the archive of the *Financial Times* (provided by the Gale group). We search for all newspaper articles published between June 1934 and August 1939 that contained the term "Dawes". We then asked a research assistant (Timo Stieglitz) not involved in any other way in our research (and who thus looked at these articles with an external eye) to code each article according to the following characteristics:

- Erroneous match - does not relate to Dawes bonds (yes/no)
- Contains price description only (yes/no)
- Overall positivity of the article - (positive, negative, neutral)
- Contains financial news including news about German reserves and debt negotiations (yes/no)[10]
- Concerned party (creditor country)
  - Article relates specifically to one or more of the following four creditor countries:
    - United Kingdom
    - France
    - Netherlands
    - Switzerland
  - Article relates to all creditor countries because...
    - ... it concerns all of the four above countries.
    - ... it is an unspecific/general article on Germany.
    - ...it concerns another country (different from the four countries above) in which Dawes bonds are traded (e.g. United States or Sweden)

Chronicle of International Events For general political events, trade treaties and financial treaties, we rely on the universe of articles relating to Germany in the *Chronicle of International Events*. This chronicle was regularly published in the *The American Journal of International Law* and listed all important international events with a short description and further reference. The chronicle can be accessed through Jstor. We coded the events recorded in the *Chronicle* using the same procedure as for those identified in the *Financial Times*.

A.3.2 Further information on merging the event lists and coding rules

In a first step, we determined for each of the sources and each day whether there were positive, negative, or neutral news. When there were multiple news of different tones for the same date, we relied on a simple majority rule (two positive and one negative news make a 'positive' news day). When merging data from the *Financial Times* and the *Chronicle*, we ensured to remove duplicates by hand. Finally, we checked the list manually and added four events that we considered of historical relevance, but which remained unidentified using the above criteria. These are the passage

[10] Initially, we aimed at a more fine-grained coding, separating trade, political, and financial news. Unfortunately, the number of events was too small to employ this differentiation in our statistical analysis.

of the Nuremberg laws, the Reichskristallnacht, the authorization of Göring's 4-year plan, and the order for Germany's naval expansion.

Table A.3 reports the sources for each coded event. Column (1) shows the event date, column (2) shows whether the news was positive or negative and columns (3) to (6) show which countries were affected. Column (7) reports all the sources used for making our judgment on each event. The text reported in the column corresponds to the title of the newspaper articles returned by the search engine for the *Financial Times*. For the *Chronicle* and idiosyncratically added historical events (*HIS*), the text reported corresponds to our own short description of the corresponding event.

Table A.3: Sources - Coding of events

Date	Type	UK	FR	NL	CH	Source
15-Jun-1934	(−)	✓	✓	✓	✓	German Loans Drop at Amsterdam (*FT*), Germany's Defiant Action (*FT*), Germany's New Default (*FT*), Government Attitude (*FT*), Home Railways Dull (*FT*), Exchanged notes on private debts of Germany (*CHR*), Little Surprise in the City (*FT*), Salient Points from the News (*FT*), Six Months' Moratorium on All Loans (*FT*)
16-Jun-1934	(+)		✓	✓		Britain's Reply to Germany (*FT*), British Government Warns Germany (*FT*), Kaffirs Slump at Paris (*FT*)
18-Jun-1934	(+)	✓			✓	German Debt Comments (*FT*), German Debt Comments (*FT*)
19-Jun-1934	(−)	✓	✓	✓	✓	Germany Loses More Gold (*FT*)
20-Jun-1934	(+)	✓	✓	✓	✓	Emphatic Note to Germany (*FT*)
21-Jun-1934	(−)		✓			German Reply to Protest (*FT*), German Reply to Protest (*FT*)
22-Jun-1934	(+)		✓			Ban on Sales of Foreign-Owned Bonds (*FT*), Clearing Offices Bill (*FT*), Exchange Clearing Bill (*FT*), Improvement in India Loans (*FT*), Salient Points from the News (*FT*), Setting-Up of Debts Clearing Offices (*FT*), The Contango Agreement (*FT*)
23-Jun-1934	(+)		✓			An Olive Branch for Germany (*FT*), Government Says Default is Not Justified (*FT*), Text of British Reply (*FT*)
25-Jun-1934	(+)		✓			Berlin's Olive Branch (*FT*), Germany to Talk over Debts with Britain (*FT*)
26-Jun-1934	(+)		✓			Mr. Chamberlain Tells of Reichsbank Device (*FT*), Reich Offer Awaited (*FT*)
27-Jun-1934	(+)		✓			Dawes and Young Talks To-Day (*FT*), Debt Clearing Offices Bill Passed (*FT*), Declaration (*FT*), London Talks Open To-Day (*FT*), Further Strong Advance in British Funds (*FT*)
03-Jul-1934	(−)			✓		German Bonds Fall at Paris (*FT*)
04-Jul-1934	(+)		✓			Transfer Agreement (*CHR*)
05-Jul-1934	(+)		✓			Dawes and Young (*FT*), Exchange Agreement Move (*FT*), Full Interest on Dawes and Young Loans (*FT*), German Loans Rally (*FT*), Reich Ready to Negotiate Exchange Pact (*FT*), Salient Points from the News (*FT*), The Anglo-German Transfers (*FT*)
06-Jul-1934	(+)	✓	✓	✓	✓	Better Tone at Amsterdam (*FT*), British Funds Make Progress (*FT*), Dawes and Young Bonds Rise (*FT*), Stocks End around the Day's Best (*FT*)
09-Jul-1934	(+)		✓		✓	Bankers Meet at Basle (*FT*)
10-Jul-1934	(−)	✓				German Transfers (*FT*)
11-Jul-1934	(+)	✓	✓	✓	✓	Part Interest to Be Paid (*FT*), The Reichsbank Weekly Statement (*FT*)
12-Jul-1934	(+)	✓				Dawes & Young Loans (*FT*)
14-Jul-1934	(−)	✓	✓	✓	✓	Reich Debt Default (*FT*)
16-Jul-1934	(+)			✓		Franco-German Loans Pact (*FT*)
17-Jul-1934	(+)	✓	✓	✓	✓	New German Money Ban (*FT*)
18-Jul-1934	(−)	✓	✓	✓	✓	Pledged Revenues Order to Be Ignored (*FT*), Salient Points from the News (*FT*), Transfer Pact with France (*FT*)
19-Jul-1934	(−)	✓	✓	✓	✓	Dawes Loan Stir (*FT*), Salient Points from the News (*FT*)
20-Jul-1934	(−)	✓	✓	✓	✓	Dawes and Young Loans (*FT*)
24-Jul-1934	(−)			✓		Franco-German Commerce (*FT*)
26-Jul-1934	(+)		✓	✓	✓	Dawes & Young Loans (*FT*), German Note Cover Unchanged (*FT*), Mark Devaluation Fears (*FT*)
28-Jul-1934	(+)			✓		Signed series of commercial and financial agreements in Berlin (*CHR*)
30-Jul-1934	(+)			✓		Dawes and Young Obligations (*FT*), Salient Points from the News (*FT*)

31-Jul-1934	(+)			✓		Reich Trade Pact (*FT*)
02-Aug-1934	(+)				✓	Swiss Clearing Agreement (*FT*)
09-Aug-1934	(+)	✓				Holland Yields to Germany (*FT*)
18-Aug-1934	(+)	✓	✓	✓	✓	German Loans and Credit (*FT*)
31-Aug-1934	(−)		✓	✓	✓	Dr. Schacht's Plea for Full Moratorium (*FT*), Dr. Schacht's Plea for Full Moratorium (*FT*), Dr. Schacht's Plea for Full Moratorium (*FT*), Dr. Schacht's Plea for Full Moratorium (*FT*), Financial agreement signed with NDL (*CHR*), Germany and Its Debts (*FT*), Investment Support for British Funds (*FT*)
01-Sep-1934	(−)	✓	✓	✓	✓	Deplorable Impression (*FT*), Heavy Decline in German Bonds (*FT*)
03-Sep-1934	(+)	✓				German-Dutch Transfers (*FT*)
21-Sep-1934	(−)	✓	✓	✓	✓	Debt Moratorium (*FT*), Signed agreement for clearing system under control of Reichsbank (*CHR*)
04-Oct-1934	(+)	✓	✓	✓	✓	German Loan Interest (*FT*), Salient Points from the News (*FT*)
08-Oct-1934	(−)	✓	✓	✓	✓	Bank Chiefs Meet at Basle (*FT*)
10-Oct-1934	(+)	✓	✓	✓	✓	Rise in Reichsbank Gold Holdings (*FT*)
12-Oct-1934	(+)		✓			A Return of Confidence (*FT*), British Funds Quiet with Firm Tone (*FT*), Markets Shake off Fears (*FT*)
13-Oct-1934	(+)	✓	✓			Dawes and Young Loan Interest (*FT*), Interest on Dawes Loan (*FT*), Interest on Dawes Loan (*FT*), Salient Points from the News (*FT*), Subdued Week in Stock Markets (*FT*)
15-Oct-1934	(−)	✓	✓	✓	✓	U. S. Investors and Dawes Loan (*FT*)
17-Oct-1934	(−)	✓	✓	✓	✓	Multiple News Items (*FT*)
01-Nov-1934	(+)		✓			Initial agreement for settling trade dispute and liquidation of outstanding debt (*CHR*)
02-Nov-1934	(+)		✓			Dawes Loan (*FT*), Full Interest on Dawes and Young Loans (*FT*), Germany's Trade Debts to Be Met within a Year (*FT*), New Anglo-German Trade Plan (*FT*), Salient Points from the News (*FT*)
06-Nov-1934	(−)	✓	✓	✓	✓	Hope of Moderate Roosevelt Policy after Elections (*FT*)
16-Nov-1934	(−)	✓				Clearing agreement lapses denounced by netherlands (*CHR*)
03-Dec-1934	(+)			✓		Saar plebicite - Franco-German agreement (*CHR*)
05-Jan-1935	(+)	✓	✓	✓	✓	Swedish-German Clearing (*FT*)
15-Jan-1935	(+)		✓			85 Per Cent. For Germany (*FT*)
30-Jan-1935	(+)			✓		Saar convention signed (*CHR*)
05-Feb-1935	(+)		✓	✓		German Bonds in Demand (*FT*)
11-Feb-1935	(+)			✓		Signed agreement regarding change of customs regime in the Saar (*CHR*)
25-Feb-1935	(−)			✓		Causes of Francogerman Hitch (*FT*)
28-Feb-1935	(−)	✓	✓	✓	✓	Memel conflict escalating - exchange of notes (*CHR*)
16-Mar-1935	(−)	✓	✓	✓	✓	German rearmament proclaimed - notes of protests (*CHR*)
17-Apr-1935	(−)		✓			Budget Imparts Strength to British Funds (*FT*), Dawes Bond Service (*FT*)
20-Apr-1935	(−)	✓	✓	✓		Dawes Loan Protest (*FT*), German-Swiss Clearing (*FT*)
21-May-1935	(−)	✓	✓	✓	✓	Hitler's foreign policy decleration (*CHR*)
07-Jun-1935	(+)		✓			Exchanged notes for reciprocal recognition of load line certificates (*CHR*)
18-Jun-1935	(+)		✓			Note exchange on naval rearmament (*CHR*)
09-Jul-1935	(−)	✓	✓	✓	✓	Settlements Bank (*FT*)
01-Aug-1935	(+)		✓			German Debts (*FT*)
15-Sep-1935	(−)	✓	✓	✓	✓	Nuremberg laws passed (*HIS*)
16-Sep-1935	(+)	✓	✓	✓	✓	Dawes and Young Loans Interest (*FT*)
17-Sep-1935	(+)	✓	✓	✓	✓	Dawes and Young Loans Service (*FT*)
19-Sep-1935	(+)	✓	✓	✓	✓	Reich Bond Issue Oversubscribed (*FT*)
15-Oct-1935	(−)	✓	✓	✓	✓	Settlements Bank (*FT*)
21-Oct-1935	(−)	✓	✓	✓	✓	Germany ends LON membership (*CHR*)
06-Dec-1935	(+)		✓			Clearing Offices Act to Continue (*FT*)
13-Jan-1936	(+)	✓	✓	✓	✓	Mobilisation of Credits (*FT*), Salient Points from the News (*FT*)
20-Feb-1936	(+)	✓	✓	✓	✓	Standstill agreement extended (*CHR*)
07-Mar-1936	(−)	✓	✓	✓	✓	Hitler repudiates Locarno pact (*CHR*)
02-Apr-1936	(+)	✓	✓	✓	✓	Markets Encouraged by Revenue Surplus (*FT*)
13-Apr-1936	(−)	✓	✓	✓	✓	LoN formally declares Germany's infringement of Versailles (*CHR*)

08-May-1936	(−)		✓			German Bond Interest (*FT*)
13-May-1936	(+)		✓			Better Economic Position (*FT*)
30-Jun-1936	(+)		✓			German Debt Service (*FT*)
07-Aug-1936	(−)		✓			Germany's External Credit Problem (*FT*)
27-Aug-1936	(+)			✓		Possibility of Improving Political Relations (*FT*)
29-Aug-1936	(+)		✓	✓		Home Railways Firm (*FT*)
11-Sep-1936	(−)		✓			Cheerful in Tone (*FT*), French Franc Respite (*FT*)
14-Sep-1936	(+)	✓	✓	✓	✓	The Flow of Investment (*FT*)
30-Sep-1936	(+)	✓	✓	✓	✓	Schacht declares that currency will not be devalued (*CHR*)
18-Oct-1936	(−)	✓	✓	✓	✓	Göring given authority to implement Four Year Plan (*HIS*)
24-Oct-1936	(+)	✓	✓	✓	✓	German External 1924 Loan (*FT*)
04-Nov-1936	(−)	✓	✓	✓	✓	Order: Holders of non-quoted German bonds have to offer them to the German government (*CHR*)
18-Nov-1936	(−)	✓	✓	✓	✓	Germany recognises Franco (*CHR*)
02-Dec-1936	(+)		✓			Parcel agreement signed (*CHR*)
26-Jan-1937	(+)		✓			Dawes & Young Bonds (*FT*)
08-Feb-1937	(−)	✓	✓	✓	✓	Multiple News Items (*FT*), Salient Points from the News (*FT*), Settlements Bank Relations (*FT*)
09-Feb-1937	(+)	✓	✓	✓	✓	British Funds Develop Renewed Weakness (*FT*), Salient Points from the News (*FT*), Settlements Bank and Germany (*FT*)
21-Feb-1937	(+)	✓	✓	✓	✓	Extension of debt standstill (*CHR*)
15-Apr-1937	(+)		✓			Extension of trade agreement to British Dominions (*CHR*)
26-May-1937	(−)			✓		Dr. Schacht in Paris (*FT*)
31-May-1937	(−)			✓		New Scheme to Replace the Clearing Agreement (*FT*)
05-Jul-1937	(−)				✓	New German-Swiss Payments Pact (*FT*)
10-Jul-1937	(+)			✓		Trade agreement (*CHR*)
12-Jul-1937	(+)			✓		Increased Imports to Be Put on Cash Basis (*FT*)
13-Jul-1937	(+)			✓		The Franco-German Trade Pact (*FT*)
17-Jul-1937	(+)		✓			Naval agreement (*CHR*)
09-Sep-1937	(−)	✓	✓	✓	✓	Generally Dull, but Close above Worst (*FT*)
16-Oct-1937	(−)	✓	✓	✓	✓	Germanny refuses invitation to nine-power conference (*CHR*)
10-Nov-1937	(+)		✓			Air transport taxation (*CHR*)
04-Dec-1937	(−)	✓	✓	✓	✓	Hitler makes himself minister of war (*CHR*)
13-Dec-1937	(+)	✓	✓	✓	✓	Standstill agreement extended (*CHR*)
16-Dec-1937	(+)			✓		Frontier agreement on Saar (*CHR*)
12-Mar-1938	(−)	✓	✓	✓	✓	Invasion and Annexation of Austria (*CHR*)
11-Apr-1938	(−)		✓	✓		Austro-German Loans Abroad (*FT*)
03-May-1938	(−)	✓	✓	✓	✓	German moratorium applied to Austrian debts (*CHR*)
17-May-1938	(−)		✓			Austrian Loans (*FT*)
18-May-1938	(−)	✓	✓	✓	✓	Note exchange with the US over Jewish Property decree (*CHR*)
02-Jun-1938	(−)	✓	✓	✓	✓	Austrian Loan Talks Adjourned (*FT*), U. S. Concern (*FT*), Young and Dawes Loans Service (*FT*)
03-Jun-1938	(+)	✓	✓	✓	✓	Fresh Advance in British Funds (*FT*)
04-Jun-1938	(+)		✓			Germany's Debt Position (*FT*)
07-Jun-1938	(−)		✓	✓		Protest against German non-payment of Austrian loans (*CHR*)
09-Jun-1938	(−)		✓			London Meeting on Austrian Loans (*FT*), New and Old Loans (*FT*)
13-Jun-1938	(−)	✓	✓	✓	✓	Large Gold Turnover (*FT*)
17-Jun-1938	(−)		✓	✓		Clearing with Germany (*FT*), Index and News Summary (*FT*), Political Debts Condemned (*FT*), Principle of Responsibility Repudiated (*FT*)
18-Jun-1938	(−)	✓	✓	✓	✓	U. S. & Austria Loans (*FT*)
23-Jun-1938	(−)		✓	✓		London Talks on Austrian Debt (*FT*)
30-Jun-1938	(−)		✓			Austria Debt Talks (*FT*), Naval treaty (*CHR*)
01-Jul-1938	(−)				✓	German Bonds Held Abroad (*FT*), Swiss Pact with Reich Likely Interest Cut Sought (*FT*), Transfer Agreement (*CHR*)
02-Jul-1938	(+)		✓			Anglo-German Agreement (*FT*), Anglo-German Debts Agreement (*FT*), Austro-German Debt (*FT*), City View of the Agreement (*FT*), Country Bank Clearings (*FT*)
05-Jul-1938	(+)			✓		Paris Talks on Austria Loans (*FT*)

06-Jul-1938	(+)		✓			Anglo-German Payments Agreement (*FT*)
30-Jul-1938	(+)			✓		German Offers on Austria Debts (*FT*)
17-Aug-1938	(−)	✓	✓	✓	✓	Escalation of Czeckslovak question (*CHR*)
30-Sep-1938	(+)		✓	✓		Munich pact (*CHR*)
29-Oct-1938	(−)	✓	✓	✓	✓	Germany request colonies back (*CHR*)
09-Nov-1938	(−)	✓	✓	✓	✓	Kristallnacht (*HIS*), Debt Amortisation (*FT*)
12-Nov-1938	(−)	✓	✓	✓	✓	Confiscation of Jewish property (*CHR*)
17-Nov-1938	(−)	✓	✓	✓	✓	Dispute with the US over Austrian debts (*CHR*)
18-Nov-1938	(−)	✓	✓	✓	✓	Escalation of diplomatic feud with the US (*CHR*)
06-Dec-1938	(+)			✓		Non-aggression declaration signed at Paris, by which Germany (*CHR*)
21-Jan-1939	(−)	✓	✓	✓	✓	Result of Opposition to Nazi Finance (*FT*)
27-Jan-1939	(−)	✓	✓	✓	✓	Germany orders naval expansion (*HIS*)
10-Feb-1939	(−)		✓			German Standstill Debt Problems (*FT*)
15-Feb-1939	(+)			✓		Trade agreement with France (*CHR*)
03-Mar-1939	(+)	✓	✓	✓	✓	Germany offers non-agression pacts to some European countries (*CHR*)
15-Mar-1939	(−)	✓	✓	✓	✓	German annexation of Bohemia - ensuing political rift with UK and France (*CHR*)
23-May-1939	(+)	✓	✓	✓	✓	Inability of the British Government to bar transfer to the German Reichsbank Czech gold (*CHR*)
23-Jun-1939	(+)		✓			Anglo-Reich Transfer Pact Extended (*FT*)
21-Jul-1939	(+)			✓		Service on Dawes & Young Loans (*FT*)

Notes: For the following days, we deviate from our above coding rules to resolve duplicate issues and coding clashes: 15-Jun-1934: Duplicate removed. 21-Jun-1934: Article documents positive effect for the UK, negative for others. We take the positive effect for the UK only. 27-Jun-1934: There is a positive and a negative article reporting on the same event (London talks). We give the positive one preference. 09-Aug-1934: Duplicate removed. 21-Sep-1934: Duplicate removed. 13-Oct-1934: Article positive for the UK, negative for all others. We keep the positive for the UK. 02-Nov-1934: A news specific to the US is excluded here. 02-Nov-1934: Duplicate removed. 11-Sep-1936: We go for the negative event. There is also some positive sentiment in the "Cheerful in Tone" article of the same day. 09-Jun-1938: We take this meeting as the main news, not the article on 'New and Old Loans' of the same day which has a postive outlook for the UK. 30-Jun-1938: There is also a Navy treaty signed by the UK that day (Chronicle). We give precedence to 'Austria Debt Talks' in the FT 09-Nov-1938: We give the Reichskristallnacht priority over an article on debt amortisation (FT, 'Debt Amortisation').

A.4 Trade and financial integration

A.4.1 Financial integration data

Data on the German banks' exposure to foreign banks is from *Bundesarchiv (Koblenz), Nachlass Kastl Ludwig, N 1138/27*. The total amount of debt owed by German banks to foreign banks is 2425.7 million Reichsmark or 5.8% of national income (national income is taken from Ritschl, 2002).

A.4.2 Trade data

Data on Germany's bilateral, disaggregated trade come from the following sources:

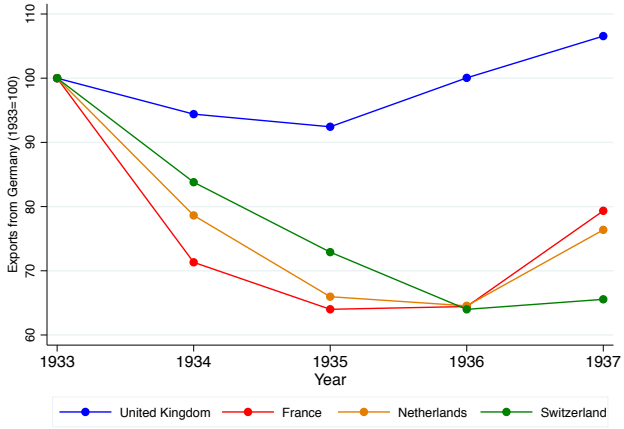
- 1930-1934: Statistisches Reichsamt (ed.). *Monatliche Nachweise über den auswärtigen Handel Deutschlands, Der Spezialhandel (Reiner Warenverkehr) nach Ländern*, Reimar Hobbing. Berlin
- 1935-1939: *Wirtschaft und Statistik*, Monthly issues April 1930 to January 1939;
- 1913-1938: League of Nations, *Memorandum on International Trade and Balances of Payments*.

A.4.3 Trade costs estimates

To measure Anglo-German, Franco-German, and Dutch-German bilateral trade costs, we use the data estimated by Jacks et al. (2011). Jacks et al. (2011)'s dataset does not report Swiss-German bilateral trade costs and we have to estimate them. We rely on Statistisches Reichsamt (1937, 1939, p. 10 and 16, respectively) to obtain Swiss-German bilateral trade data. All the other necessary inputs to estimate Swiss-German trade costs are in Jacks et al. (2011)'s dataset. The original Swiss trade data are in Reichsmarks.To keep them comparable with the data for the other country

pairs from Jacks et al. — which are all converted into 1990 US dollars —we calculate the ratios of Swiss over British exports and imports. We multiply these ratios with the respective value of British imports and exports in 1990 USD. This gives us the value of German-Swiss bilateral trade in 1990 USD.

Figure A.3: Germany's bilateral exports

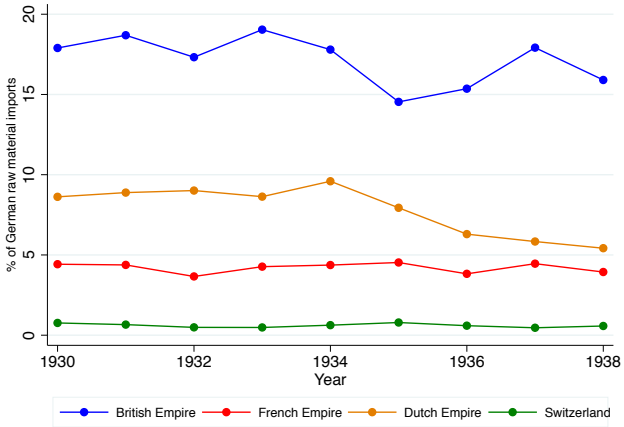


Notes: Data are from Statistisches Reichsamt (1937, 1939, p. 10 and 16 respectively).

To be sure, the observed pattern of trade costs we report is not an artefact of the deflation procedure or construction of the trade cost measure. Indexing nominal trade data (in Reichsmark) to 1933, Figure A.3 shows the evolution of German exports to the four countries of interest. The figure confirms the pattern observed for the bilateral trade cost measure (reported in the main text). However, in comparison to the analysis of exports only, the trade cost measure has the advantage of accounting for changes in GDP. This is particularly important here as these countries' economic growth trajectory differed greatly since they did not all recover from the Great Depression at the same time and at the same pace.

A.4.4 Trade in raw materials

Figure A.4: Gemany's raw material imports



Notes: Empire data are aggregated over colonies (and dominions in the British case). Source is *Monatliche Nachweise über den auswärtigen Handel Deutschlands, Der Spezialhandel (Reiner Warenverkehr) nach Ländern* (mutiple issues).

B Additional results and robustness

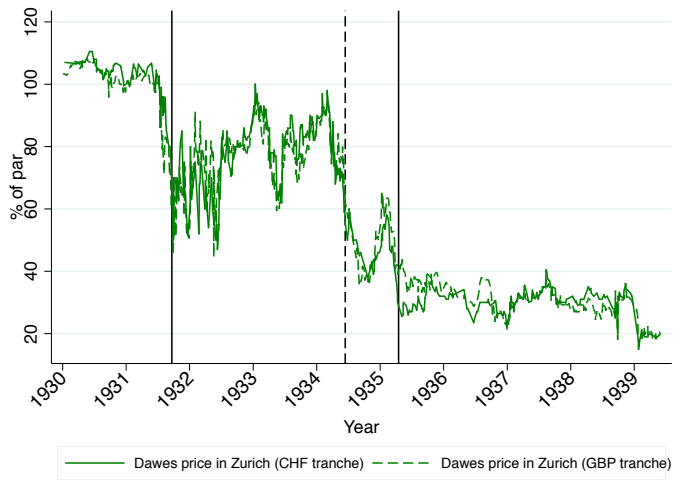
B.1 Alternative explanations for yield spreads

Our simple analytical framework interprets the Dawes bond yield spread between each continental market and the London market as a selective default risk premium. There are four potential alternative explanations for the spread that lie outside of our analytical framework: (1) war risk differentials, (2) home currency bias, (3) differing marginal investors across creditor countries, and (4) information asymmetries between bondholders of the different creditor countries. Below we discuss the plausibility of each of these alternative explanations in light of the magnitude of the selective default premium, the seniority ranking of each creditor country, and additional data. None of the four alternative hypotheses appears to be a likely explanation of the bond yield spread across markets.

(1) Differential war risks It could be argued that investors of the various creditor countries were facing different risks should a war break out because of different likelihoods of a German invasion. In this case, selective default risk would be connected to war risk—a different risk from the one that we aim to measure. However, invasion was not yet a major concern at the beginning of our sample period. Importantly, although the Dawes bond yield was higher in Paris than in London, it was also lower in Paris than in Zurich, even though Switzerland was much less likely to be invaded by Germany in the event of a war.

(2) Home currency bias Second, because all bonds we consider were issued and payable in sterling, non-UK Dawes bondholders held securities denominated in a currency other than their home currency. Even though foreign exchange markets were operational, investors might have had a home currency bias (as shown by Maggiori et al., 2020, for modern data). This bias might explain the lower yield observed for identical sterling-denominated bonds in London than in continental markets.

Figure B.1: Liquidity across markets



Notes: The graph shows two Dawes bonds in Zurich, one from the CHF tranche (and thus CHF-denominated) and one from the GBP-tranche (and thus GBP-denominated). All prices are daily and reported as a percentage of par. The vertical bars mark the devaluation of the pound sterling on 21 September 1931 (first bar), the German debt moratorium of 15 June 1934 (second bar), and the date of the Swiss-German clearing agreement marking the end of special treatment of the Dawes bonds (third bar). For details on the bond tranches, see Appendix A.1.

Fortunately, it is possible to rule out this explanation. While a large share of the Dawes Loan was denominated in sterling, several tranches had been issued in other currencies on European markets (see Appendix A.1.1 for an overview). On the Zurich market, two types of Dawes bonds were traded: CHF-denominated bonds and GBP-denominated bonds. The two types of bonds had the exact same characteristics except for the currency in which

they were denominated. Figure B.1 compares the prices of the GBP- and CHF-denominated Dawes bonds (expressed as a percentage of par) in Zurich from January 1930 to August 1939. The first vertical line marks the devaluation of the pound in September 1931. From that date onward, any potential home currency bias should have become apparent as the pound sterling depreciated sharply relative to the Swiss Franc (the Swiss Franc was not devalued until late 1936). However, there was almost no difference between the prices of the GBP- and CHF-denominated Dawes bonds even after the pound's devaluation. We also do not observe any price premium for CHF-denominated bonds between the German debt moratorium of June 1934 (dashed line) and the first partial default on Swiss bondholders (second solid line). The two bonds differed only in their currency of denomination but were otherwise identical. Therefore, if investors' home currency bias accounted for the price differentials between GBP-denominated Dawes bonds across the various creditor markets, one should have observed a decline in the Zurich price of the GBP-denominated bond relative to the CHF-denominated one following the segmentation of secondary debt markets. Since we do not observe such a pattern, the observed yield spread between markets cannot represent a home currency bias premium.

(3) Differing marginal investors Third, the existence of market segmentation—the very feature that allows us to identify selective default risk—implies that marginal investors differed across markets. Without individual portfolio data of the marginal investors, it is of course impossible to rule out that the marginal investors' risk aversion differed across markets. However, bond yield differentials across markets were substantial. For such large yield spreads to have emerged in the absence of selective default expectations, the various countries' marginal investors would have had to have radically different risk appetites and profiles. There is no indication that this was the case. Furthermore, historical evidence from World War I does not suggest that investors valued bonds very differently across the Channel (Bernal et al., 2010). These authors document that cross-listed Russian bonds traded at much the same price in London and Paris during World War I—even after wartime restrictions rendered arbitrage between the two centers impossible. They report evidence that, with the same available information, British and French investors priced Russian bonds in a similar way until the Russian Revolution of 1918.

(4) Asymmetric information between bondholders of the different markets Chan et al. (2008) explore the role of informational asymmetries between domestic and foreign investors in explaining the spread between A- and B-shares on the Chinese stock markets. Before 2001, A-shares could only be traded by Chinese residents, whereas B-shares could only be traded by foreign residents. The authors attribute close to 50% of the spread between A- and B- share prices to information asymmetries. It is however unlikely that informational asymmetries could have accounted for the observed Dawes bond yield spread between London and continental markets during the period under consideration. First, knowledge about German government bonds was much more widespread in the 1930s than knowledge about various Chinese stocks at the beginning of the 2000s. Rather than representing the valuation of a specific company, the market price of the Dawes bond reflected the ability of one of the largest economies of the time to repay her debts. In the aftermath of World War I, the international press regularly commented on the German government's actions and financial position. Second, whereas Chan et al. document the existence of asymmetric information between domestic and foreign investors, we show that a large yield spread emerged for identical Dawes bonds across various foreign creditor markets. We do not consider it plausible that British investors were more well-informed than continental ones about the German government's ability and willingness to repay its external debts. All four European creditor countries had a good-quality specialist financial press and newspapers published in the various creditor countries were also available in the others. In addition, large banks in the different countries typically had close correspondent relationships with each other and shared news about the various countries' economic and financial position through the phone or cable. Language barriers are also unlikely to have played a role here. German was spoken in a large part of Switzerland (including Zurich). The Dutch language is also typically considered closer to German than the French and English languages. Yet, Dawes bonds traded at higher yields in Zurich and Amsterdam than in London and Paris.

B.2 Correlation of risk premia

B.2.1 Cross-correlation of selective default risk

Table B.1: Cross-correlation of selective default risk

	Paris	Amsterdam	Zurich
Paris	1		
Amsterdam	0.884***	1	
Zurich	0.852***	0.976***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Sample: June 14, 1934-August 1, 1939

B.2.2 Correlation of selective default risk and general default risk

Table B.2: Seniority and selective default risk

	Selective default risk in...		
	Paris	Amsterdam	Zurich
General default risk	0.669***	0.563***	0.445***
	(19.59)	(22.96)	(9.57)
Observations	907	1045	453

Standardized beta coefficients; *t* statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Sample: June 14, 1934-August 1, 1939

B.3 Liquidity premium over risk-free rate

Table B.3 displays the result for the following regression:

$$(Y_{Dawes,t} - Y_{Consol,t}) = \beta L_{Dawes,t-1} + \gamma_p + \epsilon_t \tag{4}$$

where $(Y_{Dawes,t} - Y_{Consol,t})$ is the yield spread between the Dawes and the Consol in London on day t. $L_{Dawes,t-1}$ is the liquidity of the Dawes bond in $t-1$, ϵ an error term, and γ a period fixed effect. Regressions are run using three different versions of the period fixed effect (year in sample, month in sample, and week in sample) and two samples: before June 14, 1934 and after June 14, 1934. The six regressions do not show consistent evidence that a lack of liquidity of the Dawes bond in London was driving the yield differential between that bond and the risk-free (and fully) liquid Consol.

Table B.3: Role of liquidity for spread between Dawes and Risk-free rate

	Dependent variable: Spread between Dawes and Consol yields					
	June 14, 1934		June 14, 1934		June 14, 1934	
	Before	After	Before	After	Before	After
Dawes' liquidity (lagged)	0.44	-0.14	-0.26	0.70*	-0.10	0.26
	(0.53)	(0.49)	(0.20)	(0.40)	(0.12)	(0.19)
Time fixed effect (type)	Year in sample		Month in sample		Week in sample	
N	807	909	807	909	796	898
Adjusted R^2	.54	.85	.95	.95	.99	.99
Within R^2	.01	.00	.01	.02	.00	.00

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B.4 Seniority and selective default risk (with yield data interpolation)

Table B.4: Seniority and selective default risk

	Dependent variable: Selective default risk ($Y_j - Y_s$)					
	Baseline		Liquidity control		Paris only	
			News pertaining to all bondholders			
	bad news	good news	bad news	good news	bad news	good news
News shock	0.27**	0.11	0.32**	0.10	0.25*	0.05
	(0.11)	(0.09)	(0.15)	(0.09)	(0.14)	(0.12)
Liquidity differential			0.88	-0.25		
			(0.92)	(0.46)		
N (observations)	1430	1496	996	1007	528	495
N (Event-market)	130	136	130	136	48	45
Adj. overall R^2	.93	.96	.92	.96	.91	.97
Within R^2	.02	.01	.03	.01	.03	0.00
			News pertaining to UK bondholders only			
	bad news	good news	bad news	good news	bad news	good news
News shock	0.09	0.13	0.14	0.11	0.37*	0.11
	(0.15)	(0.12)	(0.14)	(0.14)	(0.17)	(0.15)
Liquidity differential			0.21	0.31	0.27	0.77
			(0.61)	(0.60)	(0.57)	(0.88)
N (observations)	220	726	142	485	57	168
N (Event-market)	20	66	20	66	8	23
Adj. overall R^2	.97	.98	.97	.97	.94	.98
Within R^2	.01	.01	.01	.01	.09	.03

Two-way-clustered standard errors (Event-market & date dimension) are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Yields are extrapolated with the last available value before calculating the spread.

B.5 Information updates and creditor re-ranking (with yield data interpolation)

Table B.5: Information updates and creditor re-ranking

	Dependent variable: Selective default risk ($y_j - y_s$)			
	bad news	good news	bad news	good news
News treatment	0.10	-0.33**	0.12	-0.27**
	(0.22)	(0.16)	(0.23)	(0.13)
Liquidity differential			0.55	0.57*
			(0.47)	(0.38)
N (observations)	374	616	254†	430 †
N (Event-market)	11	56	34	56
Adj. overall R^2	.98	.99	.98	.99
Within R^2	.18	.40	.22	.41

Two-way-clustered standard errors (Event-market & date dimension) are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. † some events are dropped due to collinearity/too few clusters.

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