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Foreign Debt, Capital Controls, and Secondary Markets: Theory and Evidence from Nazi Germany*

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Abstract

We investigate how internal distribution motives can interfere with the economic objectives of capital controls. In order to do this, we provide a model showing that elite capture can affect optimal debt repatriations and the management of official reserves under capital controls. Relying on these theoretical insights and a wealth of quantitative and qualitative historical evidence, we study one of history's largest debt repatriations - that of 1930s Germany. We show that the authorities kept private repatriations under strict control, thus avoiding detrimental macroeconomic effects, while allowing discretionary repatriations in order to reap internal political benefits.

JEL: E65, F38, H63, N24

Keywords: Sovereign risk, Capital controls, Elite capture, Germany, Nazi regime, Foreign debt, Secondary markets

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The Protestant Ethic...

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

Hermann Abs, Head of the German Delegation at the 1952 London Conference on German External Debts¹

...and the Spirit of Capitalism.

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

1 Introduction

Capital controls are ubiquitous. According to the latest version of the database in [Fernández, Klein, Rebucci, Schindler, and Uribe \(2016\)](#), in 2019 only 7 countries out of the 100 analyzed had no capital controls of any kind and only 33 countries could be classified as having generally unimpeded capital flows. While capital controls are amply discussed in the recent macroeconomic literature, the political economy of these policies and their impact on the quality of institutions have been largely overlooked, despite potentially important adverse effects on macroeconomic outcomes. For example, two recent review articles ([Rebucci and Ma, 2019](#); [Erten, Korinek, and Ocampo, 2021](#)) do not address the political economy implications of capital controls.

Pervasive capital controls deeply affect economic life and even fundamental personal freedoms in extreme cases. Regulatory hurdles, micromanagement, and government control increase the importance of discretionary administrative decisions, thus enabling elites close to the political power to exploit the regulatory framework to their advantage, a phenomenon known as elite capture.³ [James \(2020\)](#) highlights the intrinsic arbitrariness that follows when capital controls are imposed, while [Rajan and Zingales \(1998\)](#) outline the connection between capital flows and relationship-based capitalism. Relationship-based capitalism and other forms of elite capture, in turn, can hinder the emergence of “good” institutions, or contribute to the deterioration of existing ones, with potentially long-term effects on sovereign defaults ([Reinhart and Rogoff, 2004](#)), capital flows ([Alfaro, Kalemli-Ozcan, and Volosovych, 2007](#); [Schularick and Steger, 2010](#); [Matsuyama, 2014](#); [Broner and Ventura, 2016](#)), growth ([North, 1990](#); [Acemoglu, Johnson, and Robinson, 2005](#)), and public goods provision ([Hinnerich and Pettersson-Lidbom, 2014](#)).

In this paper, we address the question of how internal distribution motives interfere with the economic objectives of capital controls. We offer both a theoretical model and a case study focusing on one dimension of capital controls: government control of secondary market

¹[Klug \(1993, page 54\)](#), originally from [Schwarz \(1982, page 60\)](#).

²[James \(2004, page 59\)](#). When these transactions took place, Abs was a director at Deutsche Bank. After World War II he would become a key figure in German and world financial circles.

³Evidence of elite capture exists for both developing countries ([Johnson and Mitton, 2003](#); [Andersen, Johannesen, and Rijkers, 2021](#)) and advanced ones ([Faccio, 2006](#); [Tahoun, 2014](#)).

transactions for debt securities, in other words debt repatriations.⁴ We show that elites can exploit capital controls for their gain, leading to a loss of foreign reserves that runs counter to the reason the controls were established in the first place. Regardless of the reason why they were introduced, capital controls provide an *opportunity* for the elite to privately profit from a public policy - with private gains obviously serving as the *motive*. More generally, we argue that political economy considerations should not be overlooked when analyzing policies that limit economic freedoms: this applies to capital controls, as well as to macroprudential policies at large.

On the theory front, we build on and generalize the main intuitions of [Bulow and Rogoff \(1991, henceforth BR\)](#) and the Secondary Market Hypothesis of [Broner, Martin, and Ventura \(2008, 2010, henceforth BMV\)](#). In our model, agents have outstanding foreign-currency private debt and the domestic government imposes capital controls over all outflows in order to protect its foreign exchange (FX) reserves, thereby forcing its citizens to default by blocking repayments to foreigners. In international investments, this is referred to as *transfer risk*. In this situation, foreign creditors are willing to sell their claims below face value, and domestic debtors are willing to buy them if they believe that, once repatriated, this debt will be enforced between domestic agents. An arbitrage opportunity therefore arises for domestic agents who can access foreign currency. However, repatriating debt precisely causes the detrimental macroeconomic effects that capital controls aim at avoiding.

We show that when there is *de facto* government control over FX reserves⁵ (which hinders the functioning of secondary markets), a necessary condition for the government to allow the use of FX for repatriations is the presence of an elite that has the government's favor. The government gains control over the relative size of the slices of the cake (the internal distribution), at the cost of reducing the size of the cake (some resources are transferred to foreigners). This extends the seminal work by BR, who show that a utilitarian social planner should never allow debt repatriations as they decrease overall welfare. The strength of the elite and its size, as well as structural parameters such as the enforceability of debt contracts and the quality of public spending, will determine the magnitude of the repatriations. We also allow for varying degrees of capital controls and partial default on foreign debt, and show that the main results are robust to the inclusion of privately held FX resources (which breach the government's complete control over repatriations).

We demonstrate the relevance of our model by studying the debt repatriations carried out in 1930s Germany - one of the largest episodes of its kind - and show that these repatriations are explained by elite favoritism under capital controls. Repatriations started as a private

⁴We use the more general term *repatriations* instead of *buybacks*, which is often used in the macro and corporate finance literature. Repatriation occurs when a domestic agent buys debt issued by any domestic entity and held by a foreign agent, whereas a buyback refers to the issuer repurchasing its own debt. Sovereign buybacks often resurface as a policy option: not only in the oft-cited South American debt crisis of the 1980s, but also during the European debt crisis of the 2010s (*Buying Back Greek Debt Rewarded Hedge Funds*, The New York Times, December 24, 2012) and the 2016 U.S. presidential election campaign (*Donald Trump wants to buy back Treasury bonds on the cheap*, The Economist, May 6, 2016), for example.

⁵A *de jure* domestic moratorium on payments to foreigners is not sufficient for the emergence of an arbitrage opportunity, since secondary markets will allow foreign debt to be repatriated, as shown by BMV.

initiative in 1931 and, at their peak in 1933, amounted to 2% of German GDP. Despite the German authorities gaining increasingly stronger control over foreign exchange operations, they did not completely suppress the repatriations. Smaller, but still significant amounts of debt were repatriated after controls were tightened in 1934, while FX reserves continued to fall. In total, 33% of all German long-term foreign debt was repatriated by private entities (Klug, 1993).

Thus, large amounts of debt were repatriated despite the scarcity of foreign currency and the authorities' stringent oversight over its use. This afforded substantial arbitrage profits and other advantages to those who could carry out such operations thanks to the spread between the domestic and international prices of German securities. We rationalize the authorities' choice to allow repatriations as a way to reward their supporters and allies, whom we characterize as the elite, in line with James (2020). Since the records of individual repatriation operations have not survived,⁶ we use extensive novel financial data and historical evidence to corroborate our interpretation. The existing literature on favoritism and elite capture in Nazi Germany also supports our interpretation. Ferguson and Voth (2008), for example, show that firms with ties to the Nazi regime outperformed those without such ties on the stock market. Bel (2010) finds that garnering support for the Nazi Party was one of the main drivers of the wave of privatizations in the mid 1930s, as were the policies aimed at increasing the monopoly power of large industrial firms (Crane, 2020).

Besides, being a tool to supporters and influential figures, repatriations were also a tool to control, which supported the Nazis' totalitarian goals. In a world of strict capital controls, private companies were eager to allow interference in their operations in exchange for coveted foreign exchange (Kobrak, 2003). As Ellis (1940b, page 167) put it at the time: “[t]he aim of exchange control [...] after the advent of the National Socialists was the furtherance of their economic and political power both abroad and at home.”

It should come as no surprise that the Nazi Party was more than willing to put the bureaucratic might of the state behind its political objectives, even if the aggregate economic gains were limited or negative. A counterpoint to rewarding supporters in Nazi Germany was the persecution of other groups, above all Germans Jews. As recently shown by Ritschl (2019) for the systematic dispossession of Jews, and by Huber, Lindenthal, and Waldinger (2021) for the “Aryanization” of private firms, these policies did not lead to any substantial windfall for Germany as a whole, and they were even downright destructive at times. Notably, foreign exchange laws were employed as a tool in both policies, highlighting another dark side of capital controls.

In general, capital controls range from simple provisions to avoid excessive risk-taking in some business sectors (e.g. pension funds and insurance) to complete government control

⁶The vaults of two key institutions for the implementation of capital controls, the *Konversionskasse* and the *Golddiskontbank* - both offshoots of the Reichsbank - were located in what became East Berlin, and were reportedly destroyed or looted upon Soviet occupation. Before the London Debt Conference of 1952, Germany and the U.S. went through a verification process to determine which German bonds were held outside Germany before the end of the war (the so-called Validation Law). This was done to prevent the repayments that were established by the London Debt Conference and meant for U.S. creditors from going to the holders of looted bonds (U.S. Department of State Bulletin, 1952).

over all capital inflows and outflows. They can take one or more of the following (partially overlapping) forms: a) a crisis tool e.g. to stop bank runs and capital flight (e.g. Greece from 2015 to 2019) or to prevent large capital outflows that would endanger the stability of the exchange rate and debt sustainability (e.g. Iceland from 2008 to 2017); b) a macroprudential policy tool, e.g. in the form of control over inflows, aimed at achieving one or more of these policy objectives: reducing pressure on the exchange rate,⁷ altering the composition of flows, reducing their volume, and allowing for a more independent monetary policy;⁸ c) a temporary tool (Klein, 2012; Reinhart and Smith, 2002) which may evolve into a long-term policy, e.g. the exchange control systems established in the U.K. and other European countries during World War II, which stayed in place well into the 1970s (Dooley, 1996); d) a defining and essential feature of an economic system, as in contemporary China or India.

Our case study spans points a), c), and d), thus providing evidence on varying degrees of capital control implementations and their political economy implications, which are relevant for many countries today. Moreover, historically it has been relatively common for capital controls to take the form of exchange controls (Ghosh and Qureshi, 2016), which facilitate restrictions on the current as well as the capital account. The German case is therefore far from unique and illustrates a point raised by Hayek (1944, page 92): “The extent of the control over all life that economic control confers is nowhere better illustrated than in the field of foreign exchanges.”

The rest of the paper is structured as follows. Section 2 provides a brief overview of the related literature. Section 3 presents a model of debt repatriations under a non-utilitarian government. Section 4 provides the relevant historical background for our case study. Section 5 presents our analysis of German capital controls and repatriations in the 1930s, which is organized around three fundamental questions, namely i) why did repatriations start as a private initiative in 1931?; ii) what motivated the authorities’ policy choices?; iii) what explains the price differential between the German bonds traded domestically and those traded abroad? Section 6 concludes.

2 The related literature

BMV show that well-functioning secondary markets serve as an enforcement mechanism for sovereign debt even when default penalties are low. This is because they allow foreign creditors to sell their claims to domestic agents, thereby circumventing any blocks on direct repayments. Thus, only by controlling secondary markets can the sovereign acquire a discrimination technology against repayments to foreign bondholders. Broner, Erce, Martin, and Ventura (2014, henceforth BEMV) introduce the crowding-out of productive domestic

⁷The new mercantilist policies of foreign reserve accumulation might complement this objective. For an overview of the prudential vs. mercantilist motive for reserve accumulation, see Costinot, Lorenzoni, and Werning (2014), Ghosh, Ostry, and Tsangarides (2017), and Pasricha (2020).

⁸See Magud, Reinhart, and Rogoff (2018) for a literature review and further discussion of these points. In this paper, we refer to exchange controls as representative of capital controls due to the de facto impact which they have on capital flows and the direct control over economic life which they impose.

investments due to private agents repatriating sovereign debt, showing that the commitment achieved through secondary markets can have additional costs apart from the transfer of resources abroad. BEMV and BMV, as well as [Wright \(2006\)](#), provide some of the rare examples in the capital control literature where the powers and incentives of the social planner are separate from those of domestic private agents. We show that this aspect is empirically relevant and we develop it further by explicitly modeling it as transfer risk.

In line with the basic mechanisms of the Secondary Market Hypothesis, [Brutti and Sauré \(2016\)](#) find that a considerable portion of the sovereign debt was repatriated by domestic agents in crisis countries during the European debt crisis of the early 2010s and its aftermath, contributing to the reduction of sovereign debt spreads between EU countries. [Arslanalp and Sunder-Plassmann \(2021\)](#) show that repatriations are a common feature of sovereign debt crises. The idea of selective defaults underlies the secondary market framework and the ensuing empirical literature. Such defaults are common: two-thirds of sovereign defaults since 1980 have been characterized by the differential treatment of domestic and foreign debtors ([Erce and Mallucci, 2018](#)). [Reinhart and Rogoff \(2014\)](#) document that most sovereign defaults are selective against foreigners, and when a domestic default occurs, it is with low levels of foreign debt. Despite this, studies on the topic have been scarce.⁹ Our paper contributes to this literature by studying one of history’s most notorious and consequential episodes of selective default.

Our work also relates to an older literature on the political economy of capital controls. [Alesina and Tabellini \(1989\)](#) propose a model in which the decision to impose capital controls is not driven by overall welfare considerations, but by the interests of the constituency supporting the government. In a similar spirit, [Alfaro \(2004\)](#) builds an overlapping generation model in which the conflict is between workers (the young) and capitalists (the old) rather than between left- and right-wing voters (as in Alesina and Tabellini) and the imposition of capital controls will depend on both the median voter and the country’s status as a capital exporter or importer. [Schulze \(2000\)](#) offers a public choice model to investigate under what conditions governments may want to impose capital controls, as well as to study the incentives for private agents to evade them.

⁹Work on selective defaults includes [Guembel and Sussman \(2009\)](#), who provide a political economy model of sovereign debt where defaulting on foreign creditors is linked to how the debt burden distribution impacts the median voter. In [Erce and Díaz-Cassou \(2010\)](#), the government can discriminate against either foreign or domestic agents, depending on the source of liquidity pressure and the structure and strength of the banking system. [D’Erasmus and Mendoza \(2016\)](#) study domestic default in a heterogeneous-agent model without secondary markets and no creditor discrimination. They show that default costs and a non-utilitarian social planner are necessary to ensure debt sustainability and avoid a domestic default. [Erce and Mallucci \(2018\)](#) document how the distribution of debt among domestic and foreign creditors influences selective defaults, together with the role of legal jurisdiction and not only creditor residence. For a general overview of the literature on sovereign debt and defaults, the reader can refer to [Aguiar and Amador \(2014\)](#).

3 A model of debt repatriations

3.1 Base Model

We consider an optimization problem in which a government must allocate an endowment of a scarce resource W - foreign reserves - between two uses: public spending G and private debt repatriations X . The timeline of events is summarized in Figure 1.

X is given to a group of citizens¹⁰ who are thus authorized to carry out debt repatriations and make a profit on the operation: capital gains are realized by buying the debtor country’s private debt in international markets - if it trades at a discount - and reselling it on the domestic market where it trades at face value. The difference in price stems from capital controls, which affect repayments to foreigners but not to domestic citizens. Every citizen inherits a unit of debt issued in a previous period to foreign creditors, so that total debt D_0 also represents the debtor country’s population size. All debt is private and when issued it is pooled together from all citizens and securitized at no cost, so that every unit of debt traded both in the primary and secondary market bundles the same fraction of individual debt from every citizen.

The government of the debtor country sets the degree ϕ_c of an isolationist policy between zero (complete isolation from international capital markets) and one (complete openness). When the parameter is less than unity, only a proportion ϕ_c of private resources is allowed to be paid back to creditors, effectively shielding the remaining proportion $(1 - \phi_c)$ from being seized by creditors when the debt is due. This amounts to a decision imposed by the government on its citizens to (partially) default on foreign creditors. The choice of the degree of isolationist policy for the base case is assumed to be exogenous to the repatriation problem, for example based on long-term political considerations.

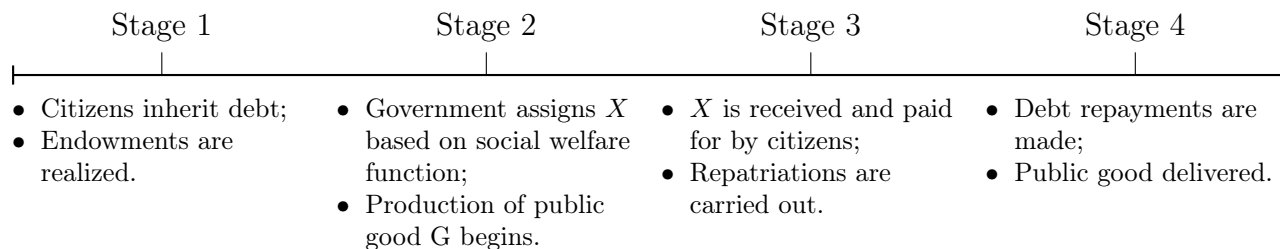


Figure 1: Timeline

3.1.1 Government

The government allocates an endowment of foreign reserves W between two uses, G and X , such that

$$W = G + X \tag{1}$$

¹⁰Citizens populate the same country and inherit the same amount of debt. We refer to all debtors collectively as the debtor country. Creditors are risk-neutral foreigners who operate in international capital markets.

where all quantities involved are non-negative. G affects all citizens equally, while X is used by the supporters to repatriate the domestic debt held abroad so that they can reap private benefits in the form of capital gains. Without X , citizens cannot carry out debt repatriation operations and only the government can determine the amount of X supplied. The isolationist policy ϕ_c and the government control over X represent the two different channels of capital controls: ϕ_c affects debt servicing directly, while control over X impacts secondary markets, therefore limiting debt ownership changes between foreign creditors and citizens. Citizens have to pay for X from their own endowments¹¹ but this amount does not contribute to W (see Figure 1). The government chooses the socially optimal level of X such that it maximizes U , a weighted sum of the incomes of two mutually exclusive and collectively exhaustive groups of citizens, namely supporters s and non-supporters ns :

$$U = \alpha D_0 \omega_s y_s[X] + (1 - \alpha) D_0 (1 - \omega_s) y_{ns}[X] \quad (2)$$

The incomes of groups s and ns are $y_s[X]$ and $y_{ns}[X]$ respectively, where square brackets denote that they are a function of X ; y_s and y_{ns} will be discussed in detail later. Out of population D_0 , the share of supporters is ω_s and consequently $D_0 \omega_s$ and $D_0 (1 - \omega_s)$ are the group sizes of supporters and non-supporters, respectively. Finally, $0.5 \leq \alpha \leq 1$ is a structural parameter that represents government preference for its supporters. The social welfare function U should then be interpreted in terms of preferences over groups, while taking into account group sizes. The double-weighting system with α and ω_s in equation (2) denotes the presence of elite capture, where a small group of citizens can have a disproportionate effect on the social planner's allocation of resources.¹²

3.1.2 International Markets and Creditors

Following BR, for a given X , the remaining amount of outstanding debt D_x held by foreign creditors *after* repatriations is:

$$D_x = D_0 - X/P_x \quad (3)$$

where P_x is the post-repatriation price of the debt. Given that repatriations simply amount to purchasing debt on the open market, P_x must also reflect the value of debt for creditors who do not sell, that is, the expected repayments at maturity R_x divided by outstanding debt post-repatriation:

$$P_x = R_x/D_x. \quad (4)$$

¹¹For tractability, we assume at parity.

¹²D'Erasmus and Mendoza (2016) offer an example of related work where the social planner is not utilitarian. However, their model does not take group size into account: when the only weight in the social welfare function represents a biased preference for a group over another, group sizes are implicitly taken as equal. Different group sizes are essential to describe a variety of historically significant episodes such as i) an oppressed minority (e.g. the persecution of Jews during the 1930s-40s in Germany), ii) a minority oppressing the majority of the population (e.g. Apartheid).

Combining (3) and (4) provides clear insight into the mechanism that drives prices after repatriations:

$$P_x = \frac{X + R_x}{D_0} \quad (5)$$

According to equation (5), given a pre-repatriation debt of D_0 , the relation between X and R_x is essential for price dynamics. For example, if R_x was unaffected by X then the full amount of X could be seen as a transfer of resources to creditors (through the open-market operation of nominal value X), which they would have never recovered otherwise. Expectations of repayments R_x are formed rationally by creditors who possess the same information as the government and citizens, and solve the government's planning problem. R_x is based on a publicly known enforcement technology σ at the disposal of creditors, which allows them to seize debtor assets as a function of the latter's total private resources net of X , conditional on the openness of capital markets:

$$R_x = \min\{\sigma[X|Y_p, \phi_c], D_x\} \quad (6)$$

where Y_p is the total amount of private resources in the debtor economy forming the basis for the repayment of debt and ϕ_c is the degree of capital controls exogenously set by the government. Government resources W are outside creditors' reach.

Function σ satisfies conditions $1 > \partial\sigma/\partial Y_p \geq 0$ and $0 \geq \partial\sigma/\partial X > -1$ meaning that creditors gain from the additional resources that they can seize in the debtor economy but less than one-for-one.¹³ Function σ defines the relation between X and R_x , whose importance is highlighted in equation (5), and consequently its choice will drive debt repatriation (the amount of X chosen by the government) through its impact on the price, effectively linking ϕ_c with a control over secondary markets. Specifying the relation between a non-zero R_x and X also leads to partial repatriations ($D_x > 0$).¹⁴ An example of a capital control implementation scheme is shown in equation (7) where we assume that creditors seize a positive fraction β , constant and less than unity, of available resources:

$$\sigma_a[X|Y_p, \phi_c] = \beta\phi_c(Y_p - X) \quad (7)$$

Function σ effectively represents the implementation of capital controls: how exactly do private agents finance the repatriation operations? We are interested in particular in how X affects the availability of resources that can be claimed by foreign creditors.

¹³In a strategic (i.e. voluntary) partial default, the threat of enforcement makes the debtor pay the remaining (non-defaulted) debt, i.e. the debtor will be indifferent between having σ resources seized or voluntarily repaying the same amount. The value of σ cannot be higher than available resources Y_p , as this represents a costly enforcement process in the case of strategic default. If $\sigma[X|Y_p, \phi_c] < D_x$ when $Y_p \geq D_x$, $X = 0$ and $\phi_c = 1$, then σ can be interpreted as allowing for a subsistence income that has priority over debt repayments.

¹⁴When $\beta = 0$ (the case of BMV) eq.(5) becomes $P_x = X/D_0$, which then simplifies in (3) to get $D_x = 0$. BMV propose a variation of their model (Example 9, page 1544) that allows for what can be interpreted as debt repatriations under impaired secondary markets. However, also in that case all debt is repatriated.

In our base case σ_a , the assumption is that a portion ϕ_c of funds X is taken from domestic resources Y_p within creditors' reach (thus reducing their claims through σ_a), while the remaining portion $(1 - \phi_c)$ of X is taken from funds that are otherwise completely shielded from creditors. The amount $(1 - \phi_c)X$ does not reduce creditors' claims through σ and σ_a can therefore be considered as a "neutral" case in which funds X are taken at the same time (respectively in proportion $(1 - \phi_c)$ and ϕ_c) from shielded and unprotected domestic resources Y_p . This implies that X and σ_a are always negatively correlated.

The effect of an increase of X on P_x is always non-negative, however the magnitude of the price variation ultimately depends on σ . Different choices of σ would give rise to different $\partial P_x / \partial X$ even with the same ϕ_c and β , therefore allowing different dynamics of P_x .¹⁵ This shows that the effect of capital controls over debt repatriations manifests itself not only through the *amount* of resources involved in the default episode, but also importantly through the *structure* of capital markets.

3.1.3 Domestic market and citizens

Before defining Y_p , the amount of private domestic resources that plays a role at the *macro* level, we consider the resources available to each citizen. Citizens are rational and maximize their own income $y_{s,ns}$. Every citizen, government supporter or not, receives the same amount of endowments ε . Let us remind the reader of the debt securitization assumption and that outstanding debt for each citizen is normalized to one, so the total amount of debt in the country, D_0 , also represents the population size. Citizens are exogenously divided into government supporters s and non-supporters ns , each group respectively of size $\omega_s D_0$ and $(1 - \omega_s) D_0$, with $1 \geq \omega_s \geq 0$. Citizens have to repay the unit of debt issued in the previous period. Given ϕ_c , after repatriations each citizen will repay an amount ρ :

$$\rho[X] = P_x D_x / D_0 + (X / P_x) / D_0 = R_x / D_0 + (D_0 - D_x) / D_0 \quad (8)$$

where the second equality follows from equations (4) and (3) applied to the first and second term respectively. The first term represents repayments to foreign bondholders (affected by capital controls), with an outstanding amount after repatriations D_x traded at price P_x . The second term represents total debt repayments made domestically at face value, where X / P_x is repatriated debt. Both terms are divided by population size D_0 so that ρ represents per capita debt repayments.

The government provides a public good G that equally affects all citizens, whose individual private benefit from the public good is $\gamma(W - X) / D_0$, where $1 > \gamma \geq 0$ is a constant and $W - X = G$ comes from the government budget constraint (1).

Supporter demand for X will be positive if supporters profit from the operation in the form of capital gains. However, when X is positive every citizen (supporter or not) suffers from both i) a decrease in the provision of public good and ii) higher debt repayments ρ to other domestic agents due to the repatriated bonds.

¹⁵In Appendix A we consider different cases for σ and discuss the connection with corporate debt buybacks.

Under full information, each citizen in the supporter group is aware that other supporters want to engage in repatriation operations and will thus internalize the detrimental effects of other supporters' repatriations. Citizens also know that the government is aware of their preferences and that it will allow a non-negative socially optimal amount of X following (2). We assume that, within group s , there is no particular pecking order for the allocation of reserves, so that the total amount of X supplied by the government is equally shared among all supporters, i.e. $X/(\omega_s D_0)$, and that this sharing rule is known to citizens.

Summing up all the elements discussed until now, we get the individual supporter income y_s as a function of X :

$$y_s = \underbrace{\varepsilon}_{\text{endowments}} + \underbrace{\frac{\gamma(W - X)}{D_0}}_{\text{public good}} + \underbrace{\frac{X/(\omega_s D_0)}{P_x}}_{\text{debt repatriated}} \overbrace{\frac{X}{\omega_s D_0}}^{\text{capital gains from repatriation}} - \underbrace{\rho}_{\text{debt repayments}} \quad (9)$$

The amount of debt repatriated minus the cost of repatriation form the individual private gains from repatriations, where both terms depend on the *individual* amount of resources available, namely $X/(\omega_s D_0)$. Instead, for the second term and in ρ what matters is the *total* amount of reserves X used for repatriations, as this affects the government budget constraint and *aggregate* quantities R_x and D_x .

Since non-supporters are not allowed to participate in repatriations, the income for each member of the group, as a function of X , is:

$$y_{ns} = \varepsilon + \frac{\gamma(W - X)}{D_0} - \rho \quad (10)$$

As both y_s and y_{ns} are post-repatriation resources, the whole amount cannot be considered as part of Y_p , the total private resources that form the base of seizable assets. If we exclude capital gains (as they are themselves part of the repatriation operation) and public goods (e.g. roads and armaments), then it is only endowments ε for the whole population that contribute to term Y_p , such that $Y_p = \sum \varepsilon$, where the summation applies to all citizens. For simplicity of exposition we rule out cases of “excusable” default implying that, with no capital controls and repatriations, ε is enough to cover the outstanding debt.

3.2 Results

The government chooses X^* , the optimal value of X , by maximizing social welfare (2) subject to resource constraint (1), given: Equations (3), (4), (5), (6), (7), (8), (9), (10), and structural parameters α , ω_s , ϕ_c , β , γ , D_0 , and W .

Result 1. *A utilitarian social planner, i.e. with no bias for either group ($\alpha = 0.5$), is a sufficient condition for a socially optimal $X^* = 0$.*

Result 2. *The necessary condition for X^* to be positive is $\alpha > 0.5$. Under this condition, there exist wide ranges of all other structural parameters such that $X^* > 0$.*

In general, the greater the value of α , the wider the range of structural parameters that lead to $X^* > 0$ and the greater the highest attainable magnitude of X^* . The interested reader can refer to Appendix A for the proofs, the impact of each structural parameter on the solution, numerical simulations of different parametrizations of the model, as well as for the results for different specifications of σ .

Here we discuss two important parameters - α and ω_s - which directly and jointly affect the social welfare function. An increase in ω_s always reduces the gains from additional X and is not dependent on α . The magnitude of the effect of an increase in α , instead, does depend on ω_s : it is invariably positive when $\omega_s < 0.5$ and ambiguous otherwise, in the latter case, it also depends on the values of the other structural parameters.¹⁶

Figure 2 presents an example of how the two parameters affect X^* . The results presented here are not driven by the values of the other structural parameters. For instance, γ is not the main source of the detrimental effects of repatriations: a lower value of γ (a lower loss of forfeiting public spending) does indeed increase the area in space (α, ω_s) where $X^* > 0$ (i.e. the black contour line in graph 2b is pushed up and left) and does not affect the maximum level of X^* attainable in that space. However, the detrimental effect of higher repatriations on social welfare remains predominant through the channel of ρ (equation 8).

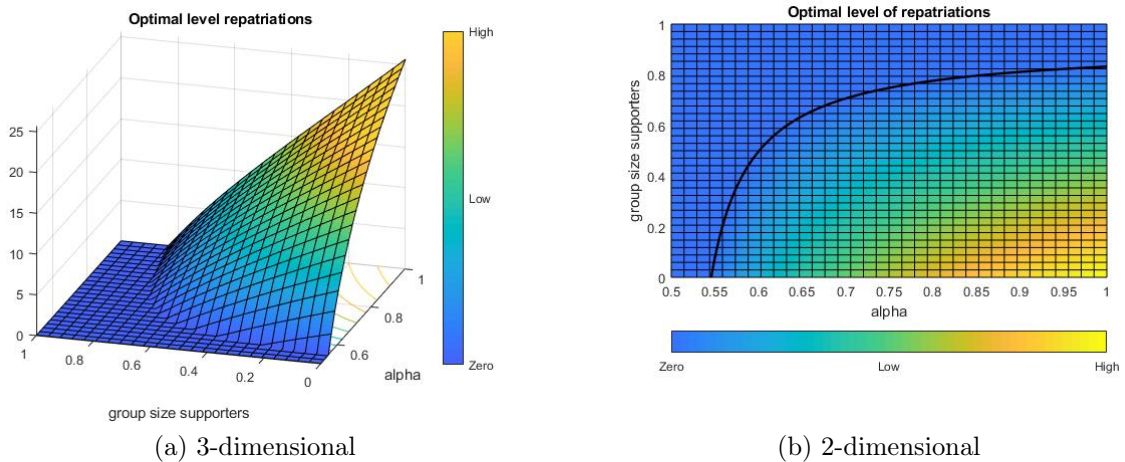


Figure 2: A representative example of X^* as a function of α and ω_s , for given values of β , γ , and ϕ_c . Note that the α axis begins at 0.5. The black line in the right panel is the boundary between zero and positive solution sets.

Both a smaller β and a smaller ϕ_c reduce the maximum X^* attainable with any combination of α and ω_s , and they both increase the area in space (α, ω_s) where $X^* > 0$. The results of the numerical simulations that illustrate this point can be found in Appendix A.7.

¹⁶See appendix A.7 for further details and for comparisons of these results with the closest literature.

The role of ω_s (the size of the group of supporters) stands out when considering a larger group, everything else equal: $\omega_s = 1$ (all citizens are favored) corresponds to the case of BR, where collective and group interests match perfectly and therefore $X^* = 0$. If an individual within the group could deviate from the government decision, then she would make capital gains at the expense of all others: the government solves exactly this coordination problem. In general, when $X^* > 0$, the higher the number of citizens allowed to engage in repatriations, the lower X^* becomes, until it quickly reaches zero again; note that ω_s need not necessarily reach unity for $X^* = 0$. This happens because, as ω_s increases, the *collective* detrimental effects of repatriations in the form of higher domestic repayments in ρ are gradually internalized by more supporters and capital gains cannot compensate for this. Conversely, decreasing ω_s when $X^* > 0$ will lead to a higher X^* .

3.3 Imperfect control over domestic agents

The assumption that the government can centralize control over all domestic foreign exchange can be relaxed by allowing for a class of domestic agents who has access to funds F , which are outside of the government's jurisdiction, and are differently impacted by capital controls. Private offshore funds owned by domestic agents are an example of such funds. As discussed in Sections 4.2.1 and 5.2.1, their role plays a role in our case study.

Domestic agents who own such private reserves of foreign currency do not need to apply for X if they wish to repatriate debt. Expected creditor enforcement over F can be modeled as:

$$R_{x,F} = \min\{\sigma_F[X_F|F, \phi_F], D_x\} \quad (11)$$

where $\sigma_F[X_F|F, \phi_F] = \beta_F \phi_F (F - X_F)$ and X_F is the amount of resources used for repatriations from F . The degree of creditor enforcement on $F - \beta_F$ - can differ from β in σ_a , reflecting the effect of jurisdiction on debt enforcement. Similarly, the effect of capital controls on $\sigma_F - \phi_F$ - is allowed to differ from the base case of σ_a , as domestic policies offer weakened or no protection outside the government's jurisdiction. Equations (3) and (4) are modified to include this additional class of agents, such that equations (5) and (8) change to:

$$P_x = \frac{(X + R_x) + (X_F + R_{x,F})}{D_0} \quad (12)$$

$$\rho[X, X_F] = (R_x + R_{x,F})/D_0 + (D_0 - D_x)/D_0 \quad (13)$$

The impact of X_F on the optimal choice of X can be seen in the following example. We assume that between stages 2 and stage 3 of the timeline (Figure 1) there is an intermediate stage in which offshore funds owners decide whether to repatriate, before the rest of domestic agents and after observing ϕ_c . This is without loss of generality and can be justified by the fact that X_F does not require any government approval. Once X_F is chosen by the owners of the offshore funds, it will have impact on prices through equation 12. The increase in price in this stage will have a dual effect on the optimal choice of X by the government. First, a higher price will reduce capital gains from repatriations, everything else given. Second, it

reduces the amount of debt that can be repatriated for a given value of X , therefore limiting the increase of ρ . Both these effects will lead to a meaningful reduction of X^* only to the extent that the price increase is substantial.¹⁷

The limited change in ρ affects all citizens alike and does not impact the optimization problem of the government. However, the distribution of capital gains across supporters and non-supporters might affect X^* , but only if it is observable by the government. In fact, if ownership of F is uniformly distributed among citizens, or if the distribution of F is not known to the government, then social welfare function (2) will not change and optimal X^* will not be affected beyond the effect of higher prices described in the previous step. If the government observes that F is disproportionately owned by non-supporters (relative to their population share), instead, this will generally increase X^* .¹⁸

By focusing on the interpretation of F as offshore funds, we can discuss further implications of allowing for these resources. One can assume that such funds were established for a particular reason by domestic agents, who would not want to demobilize them if gains from repatriating debts are small. Therefore, a high X_F can only be expected when a large capital gain can be realized through repatriations. This gain, in turn, will be determined by the value of ϕ_c exogenously set by the government through its effect on P_x . Another consideration is that offshore funds might be protected from being directly seized or controlled by the domestic government due to the lack of jurisdiction or the secrecy of the funds. However, if the government discovers the existence of funds F , their owners and their domestically held assets still fall under the jurisdiction of the government and can therefore incur penalties. Even if secret at first, the probability of the government finding out about offshore funds will be correlated to the government's willingness to detect them, which could be signaled by tighter controls ϕ_c . The nature of offshore funds, therefore, implies that while X_F can apparently be chosen freely from government control, in practice the choice is not independent from domestic policy and from similar political economy considerations as those of the base model.

For the reasons above - and without additional motives - it is realistic to expect that the introduction of mild capital controls would not mobilize the full amount of F for repatriations. A higher degree of capital controls might induce more X_F to be repatriated - especially if paired with an amnesty for funds illegally established or undeclared - but the magnitude will depend on the specification of σ_F . At the same time, an amnesty provides an additional tool of discrimination to the domestic government. Additionally, government in need of foreign reserves might decide to confiscate private funds in order to gain possession of F to add to W , instead of encouraging repatriations and the related loss of foreign exchange to foreigners. The choice by the government between a forced repayment in domestic currency in exchange for F or allowing for repatriations will also be subject to the same conditions of favoritism that characterize the granting of resources X for repatriations.

One last element to be discussed is the size of F relative to D_0 . If F is very large, the

¹⁷This can be mapped into the base model by considering ϕ instead of ϕ_c , where the former is an average of ϕ_c and ϕ_F , respectively weighted by relative size of W and F relative to D_0 .

¹⁸When X^* is not a corner solution.

model reflects the original BMV intuition that secondary markets outside of government’s control completely drive the repatriation dynamics. On the other hand, a smaller F represents an intermediate case between BR and BMV and together with the choice of β_F and ϕ_F , the model can flexibly incorporate more realistic scenarios of limited government control.

In summary, this extension makes the role of secondary markets and the impact of government control over them explicit. In the example presented, offshore funds introduce another channel of repatriations which remains open despite domestic controls aimed at curbing capital flight. The extension also shows that domestic policy and the same elite favoritism mechanism as in the base model can play a determinant role in repatriations from offshore funds as well. Therefore the inclusion of funds outside the government’s control, which leave open a channel for unwanted (for the social planner) repatriations, will not fundamentally alter the conclusions of the base model, but only the magnitude of X^* . In many plausible scenarios, even this effect will be limited.

4 Debt repatriations in 1930s Germany

In this section, we provide the historical background for our case study, while in Section 5 we outline our interpretation of the event. Overall, the case study complements and supports our theoretical model in three ways. First, it shows that the incentives of the private actors involved in an important historical repatriation episode are consistent with those described in our model. Second, it illustrates that the otherwise puzzling actions of the German authorities are explained by favoritism. Finally, it demonstrates that secondary markets played a fundamental role in the German episode, consistently with the Secondary Market Hypothesis of BMV which underpins our theoretical framework.

4.1 Background

4.1.1 The 1920s credit boom and the onset of the Great Depression

After World War I, the winning powers imposed a heavy burden of reparation payments on a defeated Germany.¹⁹ The country defaulted on reparation payments practically from the start, and its policy of passive resistance to the ensuing Franco-Belgian occupation of the Ruhr contributed to the country spiraling into devastating hyperinflation in 1923. To help Germany maintain its monetary stability and meet reparation payments, the 1924 Dawes Plan established a new schedule for reparation payments and a floated loan with maturity in 1949, the proceeds of which went to Germany (Clement, 2004).²⁰

The Dawes Plan also made reparation payments de facto junior with respect to commercial debts. This opened the way for considerable capital inflows (Ritschl, 2013) and, in the

¹⁹The so-called London Schedule of Payments was established in 1921, but uncertainty remained as to how much Germany would eventually have to pay (Schuker, 1988).

²⁰The majority of the 7% gold bonds were issued in the U.S. and the U.K., with other minor blocks issued in France, Switzerland, the Netherlands, Belgium, Sweden, and Italy (Auld, 1934).

second half of the 1920s, all sectors of the German economy borrowed heavily on international capital markets. By the end of the decade, Germany's foreign debt (including reparations) amounted to over 86% of GDP (Table 1). The U.S. was Germany's principal creditor, with holdings of over 40% of the total foreign private and public debt. Accordingly, the dollar was the main currency of denomination. Germany's industry was the principal debtor in the country, accounting for almost 62% of total foreign debt. A large share - around 46% - of German foreign commercial debt was short term, i.e. with a maturity of less than one year. Appendix B.1 provides further details on the composition of the debt.

The seniority of reparations and commercial debts was eventually reversed by the Young Plan, drafted and adopted between 1929 and 1930 (Ritschl, 2012, 2013).²¹ The Young Plan, combined with the start of the Great Depression, caused a dramatic sudden stop of capital flows to Germany. In 1931, the country experienced a full-blown twin crisis in which fiscal troubles, the foreign debt burden, and the fragility of the banking sector fed off each other in a downward spiral (Schnabel, 2004).²² Following a sharp fall in GDP, the foreign-debt-to-GDP ratio reached its peak at the end of 1931, exceeding 100% (Ritschl, 2013).²³ The same year, Germany also began its protracted default on foreign creditors by interrupting repayments of some loans.

4.1.2 The many guises of default: foreign economic policy in the 1930s

As the crisis unfolded, substantial debt repatriations by Germans began.²⁴ Table 1 reports the estimates reconstructed by Klug (1993) for 1932-1938 and our estimates based on archival sources for 1931. The German authorities introduced stringent exchange controls in the summer of 1931 in order to curb the massive capital flight which the German economy was experiencing, some of which took the form of repatriations (Bonnell, 1940; Child, 1958; James, 1985). The main feature of this policy - based on similar legislation during World War I and the hyperinflation - was a restriction of the availability of foreign exchange for private agents, achieved by giving the Reichsbank (the central bank) a monopoly over all foreign exchange (Hahn, 1989). Additionally, the authorities regulated the use of the foreign exchange that they granted.

Exchange controls limited the amount of repatriations that could be carried out and led to the appearance of a spread between the prices of German securities held abroad and those in Germany, since any difference in the valuation of the securities between domestic and foreign investors could not easily be arbitrated away. The following announcement issued by a German corporation to its U.S. bondholders in July 1932, two weeks before the 7 million dollars in gold bonds that it had issued under New York law came to maturity, gives a sense

²¹The Young Plan provided a new reparation schedule and fresh bond issuance. The bonds were issued mostly in French francs, dollars, sterling, and Swedish crowns. The Dawes bond service was maintained.

²²A large literature exists on the 1931 crisis. See, for example, Ferguson and Temin (2003), Temin (2008), Schnabel (2009), Ritschl and Sarferaz (2014), and De Broeck and James (2019).

²³The figure in Table 1 refers to mid-1931, when the ratio had not yet reached the 100% mark.

²⁴Some debt repatriations also took place in the 1920s, but were quantitatively negligible (Klug, 1993).

Year	GDP (1)	Reserves		Private and Public Debt (4)	Reparations (NPV) (5)	Total Debt (4)+(5) (6)	Debt/GDP (4)/(1) (7)	Repatriations Face value (8)	Repatriations/ Debt (8)/(6) (9)
		Official (2)	Secret (3)						
1928	89.05	2.89	-	27.0	40	67.0	75.2%	-	-
1929	89.25	2.66	-	31.0	46	77.0	86.3%	-	-
1930	82.93	2.73	-	32.6	35	67.6	81.5%	-	-
1931	69.15	1.16	-	33.6	34	67.6	97.8%	0.30	0.4%
1932	56.44	0.92	-	25.9	-	25.9	45.9%	0.56	3.3%
1933	57.72	0.40	0.04	23.2	-	23.2	40.2%	1.18	5.1%
1934	64.38	0.08	0.10	18.1	-	18.1	28.1%	0.58	3.2%
1935	71.75	0.09	0.20	17.3 ^δ	-	17.3	24.1%	0.54	3.1%
1936	79.65	0.07	0.24	16.4	-	16.4	20.6%	0.30	1.8%
1937	89.11	0.08	0.30	14.8	-	14.8	16.6%	0.15	1.0%
1938	99.19	0.08	0.42	13.9	-	13.9	14.0%	0.19	1.4%

Table 1: German GDP, reserves, foreign debt, and debt repatriations, billions of Reichsmarks (RM). Source: the debt series is from [Bundesbank \(1976\)](#), the GDP and reparations series are from [Ritschl \(2013\)](#), the debt repatriation series is from [Klug \(1993\)](#) for 1932-38, while the figure for 1931 is our lower bound estimate based on archival evidence from *Germany Country File, Bank of England Archive OV34/148: Special Advisory Committee Basel 1931* and *OV34/179: Germany Moratorium. Report of the committee appointed to examine and interpret the figures submitted by the Reichsbank, May 30th 1933*. We subtract the 1931 figure from Klug’s 1932 one, since the author assigned all repatriations having taken place until that year to the latter in the absence of a precise breakdown. The large decline in reparations in 1930 is due to the different NPV of the new schedule of payments introduced with the Young Plan. The official reserves are from [Ellis \(1940a\)](#) and include gold and foreign currency; all values are end-of-year, except for 1928 for which the January 1929 figure is used. The secret reserves in RM are obtained by subtracting the official reserves from the total reserves reported in [Banken \(2009\)](#), Tabelle 33, pp. 241. δ : the missing figure is linearly interpolated.

of the practical impact of exchange controls and transfer risk in this early phase:

The German Foreign Exchange Control having denied permission for the transfer out of Germany of sufficient funds to pay the above described Notes in cash at maturity, the undersigned [...] offers to repay [...] five percent of [...] principal in cash, and the balance by the issue of [...] six per cent Guaranteed Gold Notes, Due July 15, 1937[.]²⁵

Despite some debt relief from international creditors - especially the Lausanne Conference of July 1932, which de facto put an end to reparation payments - and the start of the recovery from the Depression, the rise to power of the NSDAP in January 1933 pushed Germany further down the path of external default. The reinstatement of Hjalmar Schacht as president of the Reichsbank in March of the same year, and his further appointment as head of the *Reichswirtschaftsministerium* (Ministry of the Economy) in August 1934 were emblematic events, as he was a resolute and vocal opposer of war reparations and of what he saw as connected debts, such as the Young and Dawes loans ([Schacht, 1934](#); [James, 1985](#)). Marking the official start of Germany’s generalized foreign debt default, a new Law

²⁵From [Kuczynski \(1933\)](#).

on Payments Abroad was approved in May 1933, forcing all foreign debts not covered by the 1931 Standstill Agreements - excluding interest and amortization payments for the Dawes loan and interest payments for the Young loans - to be repaid through a subsidiary of the central bank (the *Konversionskasse*) and reducing the service of debts to 75% of the June 1933 level.

The German government introduced aggressive measures even with regard to the Dawes and Young loans, which had previously commanded a privileged status. In May 1933, Germany unilaterally revoked the Gold Clause (Clement, 2004). This meant that the loans would now be serviced on the basis of their nominal value rather than on that of their original gold value. The final act came in the spring of 1934, when Germany instituted a complete transfer moratorium - enforced from July of that year - which formalized its default on all foreign obligations (Ellis, 1941), and made the German default the largest of the interwar era (Reinhart and Rogoff, 2013).

4.2 The practice of debt repatriations

As Germany's default progressed and official control over the economy increased, official oversight over the repatriations grew and the foreign-exchange-granting process became increasingly ripe for arbitrariness and the pursuit of political objectives. Despite this, private initiative remained predominant as the incentive for German firms and individuals to carry out these operations was their own gain, setting such operations apart from government-coordinated repatriation (buyback) episodes, such as those that characterized the 1980s debt crises.

Notwithstanding their uncoordinated nature, the repatriations were large, reaching their peak at 2% of German GDP in 1933. In total, as Klug (1993) estimates, 33% of all German long-term foreign debt was repatriated to Germany, including 35% of all long-term dollar-denominated debt, and a further 7% was repatriated in the form of scrip and blocked accounts. Seen another way, the repatriations amounted to almost 3% of 1932 global debt (of which Germany had a 14% share). To put this in perspective, in the 1980s, 4.1% of the initial stock of debt was repatriated by several countries through coordinated negotiated schemes.

While regulations surrounding repatriations were many and often revised, in practice, these operations were carried out in three main ways with the same fundamental economic repercussions.²⁶ First, firms and individuals could directly request foreign currency for a repatriation operation. The decision regarding the allocation of foreign exchange was made by the regional tax authorities where the applicant resided, following the guidelines of the German Minister of the Economy in conjunction with the German Minister of Finance and the German Minister of Agriculture (Hahn, 1989). Any funds granted would be earmarked for a specific operation, which would then be reported back to the Reichsbank. Before the

²⁶As Ellis (1940a, page 9) recounts, there were “three general exchange-control laws, upwards of 50 separate decrees of amendment and adaptation, and something in the neighborhood of 500 administrative rulings, to say nothing of clearing, compensation, and payment agreements with partner countries.”

stricter exchange controls implemented in 1934, domestic agents could bypass the authorities' direct approval by buying foreign currency that was already eligible for repatriations on the market (see Section 5.1). Second, firms could carry out a repatriation using part of their export proceeds, a system devised by finance minister Schacht and the powerful Employer Association (*Reichsverband der Deutschen Industrie*) (Kobrak, 2003). If a company could demonstrate that its production costs exceeded world prices, the Reichsbank could allow it to purchase German bonds in the foreign country where the export took place.²⁷ The third way to carry out repatriations was also tied to exports, but involved blocked accounts and scrip - essentially arrears of German foreign debt service - rather than bonds, and required the *Konversionskasse* and *Golddiskontbank* - both Reichsbank subsidiaries - to play a mediating role between buyers and sellers. This form of repatriations became predominant after 1935 and remained sizable until 1939 (Klug, 1993). In Appendix B.4, we provide further details on this type of operation.

Whether purchased through simple financial transactions or export proceeds, and whether by the original issuer or another agent, the foreign currency bonds could be converted into RM bonds after repatriation.²⁸ Following conversion, the bonds were serviced in RM and could be sold back to the original issuer or, from June 1934, on the domestic stock market.

The way in which repatriations were carried out did not affect the ensuing gains. If the buyer was not the original issuer, the bond could either be held to maturity or sold at the higher prices prevalent in Germany. If the debt was purchased by the original issuer, accounting profits could be realized by extinguishing the bonds bought back below face value. Besides accounting profits, repatriations offered debtors the possibility of at least partially evading the blanket external default imposed by the sovereign and which might not have been in their interest. Some companies, for example, may have wished to continue servicing their foreign debts to preserve their ties with their foreign counterparts. Buybacks offered the opportunity to not completely renege on foreign obligations.

Repatriations tied to exports were the object of much debate among contemporaries, mainly because the German government, in the cases when it officially acknowledged repatriations, justified them as export subsidies.²⁹ Heuser (1934), along with many contemporaries, considered repatriations as a genuine way to subsidize German exports; Einzig (1934) wrote that Germany had found a way of "eating [its] cake and keeping it." However, a number of authors have questioned this interpretation. Balogh (1938), Ellis (1941), and Child (1958), for example, concurred on the fact that repatriations only gained ground in trade policy by mid-1932, while the practice had already started in 1931. Moreover, the government and Reichsbank managed to impose their complete control over repatriations only after the 1934 transfer moratorium (Ellis, 1940a). Before that, Reichsbank President Hans Luther

²⁷On average, only 50% of export proceeds could be used to repurchase bonds (at least officially), while the rest had to be handed over to the Reichsbank.

²⁸See Appendix B.3 for details on conversions.

²⁹For example, in a memorandum prepared in English by the German government: *FOLIO FHG/3: The Repurchase of German Foreign Bonds*, Berlin, January 26, 1934, London School of Economics and Political Science Archive.

expressed disappointment at the German authorities' failure to curb debt repurchases more effectively, while the Ministry of the Economy, although viewing the practice more favorably, was also eager to keep it under strict control (James, 1985). Ellis also expressed doubts as to whether the repurchase of bonds and blocked accounts could be directly linked to genuinely additional exports, especially after 1933, when the perpetuation of exchange controls ceased to have an economic rationale and was instead based on the political objectives of the National Socialist regime. He also highlighted that the arbitrariness of the export subsidy procedure was akin to that in the direct allocation of foreign exchange to private individuals (Ellis, 1940b). Finally, Klug (1993) provided archival evidence that the Economics Ministry did not consider the price differential between New York and Berlin to be high enough for the additional export practice to be beneficial, given the foreign exchange shortage faced by Germany.

More fundamentally, the use of repatriations as subsidies rested on their limited scope. Unrestrained or large-scale repatriations would have rapidly eroded the price spread between Germany and financial centers abroad, thus reducing or eliminating arbitrage profits for German exporters. In light of these considerations, the view that repatriations were a large-scale export promotion tool has to be ruled out.

Klug (1993) offered a different interpretation of the repatriations, seeing them as a tool to reduce Germany's foreign debt overhang. He claimed that the secrecy of many repatriation operations allowed a significant spread between prices in Berlin and international financial centers to remain, independently of the amount repatriated. If international creditors had indeed been unaware that the assets they sold were being repatriated to Germany, they would have sold their claims at *ex ante* prices rather than *ex post* prices.³⁰ Thus, according to Klug, Germany managed to reduce its foreign debt burden through these operations, even if only marginally: an estimated 2% of the face value of its 1933 debt stock. This reading of events stands in contrast with the open-market framework of Bulow and Rogoff (1988, 1991), in which the knowledge of repatriations allows creditors to extract benefits from the operations. It also clashes with the result that secret repatriations must be extremely large to lead to meaningful macroeconomic benefits (Cohen and Verdier, 1995).

Some German entities did indeed engage in substantial repatriation operations. The largest and most notorious was orchestrated by Joseph Goebbels in 1933 to replenish the empty coffers of the Nazi Party. However, the goal of the operation was clearly not debt reduction,³¹ and large as it was, it did not have a macroeconomically relevant dimension. The operation, which relied on foreign middlemen, was relatively successful at achieving its primary goal of reaping arbitrage profits for the NSDAP by repurchasing debt throughout Europe and possibly the U.S. However, it is clear from the contemporary press that creditors knew that German debt was being repatriated. The middlemen used, Norris and Wreszynski, already enjoyed a reputation as *thawers* of frozen German debts, and towards the end of

³⁰In our model, as in BR, this would mean that the term D_x in (3) does not reflect the true size of the outstanding debt anymore.

³¹Bank of England, OV34/85, Colonel Norris (*Siepmann memorandum*), March 11, 1936, from Klug (1993).

their operation, this was very public information.³² In fact, press reports from the time claim that sale prices in these operations were significantly higher than the going market price, a fact which is consistent with the open-market framework of our model (Equation 5) and contrary to Klug’s *secret-buyback* framework. The exact origin of the funds used in the operation remained unknown for a while, but even that part of the operation was eventually uncovered by French and British security services in May 1934. The fact that the Nazi Party itself could not carry out such a scheme to full fruition shows the sheer difficulty of such secret operations.

Klug’s *cure for overhang* interpretation has other shortcomings. First, Germany arguably stopped facing a debt overhang sometime in 1932-33 when the de facto end of war reparations and devaluations in the main debtor countries drastically reduced Germany’s foreign debt burden. Thus, when overhang reduction was most needed, repatriations were scarcely used as a policy tool and they continued long after Germany stopped facing a crushing foreign debt. Second, the use of debt repatriations to reduce the foreign debt burden appears of little value for a country heading towards economic isolationism and war.³³ Finally, Klug himself showed that if the debt repatriations did lead to any reduction in the market value of the German foreign debt, then it was minimal because market prices responded, albeit imperfectly, to these operations. A government-sanctioned, decade-long mobilization of thousands of individuals and companies, as well as billions of RM, to bring about a minimal reduction in the value of the foreign debt appears highly unrealistic.

4.2.1 Funding the repatriations

An aspect of the German repatriations that is not explored in the existing literature is how they were funded. We present a brief outline of our calculations of the amount of foreign exchange needed to carry out the 1930s repatriations and highlight that these calculations lead to the issue of “missing” foreign exchange.³⁴ The likely use of offshore funds to cover this gap is important because it adds a layer of complexity to the mechanisms involved in the repatriations. We tackled this from a theoretical perspective in Section 3.3; in Section 5.2.1, we discuss how this affects our interpretation of German repatriations. For now, it suffices to say that the evidence points to very similar political economy mechanisms to those of “standard” repatriations.

The starting point for our calculations is Klug (1993)’s face value figures of repatriated debt.³⁵ The total repatriations estimated by Klug - around 4 billion RM between 1931 and 1939 - may actually be a lower bound. According to Klug himself, around 40% (33% in

³²*Fast Thawers*, Time Magazine, April 9, 1934. For more details, see Appendix B.5.

³³Some recorded debt repatriations, mainly of Austrian debt, took place as late as 1944 (Klug, 1993). It is unclear what the advantage of foreign debt reduction was to Germany after 1932-33, let alone in the midst of World War II.

³⁴The details are provided in Appendix B.6.

³⁵While Klug originally reconstructed these figures at market value to then convert them at face value using the prevailing discounts, the original figures were not provided by the author, nor was enough information given to arrive at them independently.

the form of bonds and 7% in scrip and blocked accounts) of German long-term foreign debt in 1932 was repatriated. Klug does not define what qualifies as long term; therefore, in an attempt to provide an upper bound for repatriations, we consider all German debt in 1932 - approximately 25.9 billion RM - to have been long term. A 40% reduction implies an upper-bound total of approximately 7 billion repatriated face value of German debt - approximately 1.75 times the amount estimated by Klug - once the the depreciation of foreign currencies following the exit from the Gold Standard of Germany's main creditors is accounted for.

We convert both Klug's original value and the estimated upper bound into the RM equivalent of foreign exchange used for repatriations relying on the timing of repatriations illustrated in Table 1, the corresponding bond prices that we have collected (see Section 5.3), and several scenarios regarding the geographical distribution of repatriations. Some of the repatriations involved blocked accounts and scrip rather than bonds, but their discount was very similar to that of bonds (see Appendix B.4), so we assume that these discounts were indeed the same throughout our calculations.

The most important aspect of the breakdown of repatriations is the share that took place in the U.S./continental Europe, where larger market discounts applied, and in the U.K., where discounts were substantially smaller. Since this breakdown is not known, we construct an upper-bound estimate in which all repatriations took place in London and involved the bonds with the lowest discount (Dawes bonds) and a lower-bound one in which all repatriations took place in New York and involved the bonds with the highest discount (Young bonds).³⁶ Since we know that more repatriations took place in the U.S./Europe compared to the U.K., in our baseline we assume that 60% of repatriations took place in the former and 40% in the latter.

Based on these assumptions, we estimate the market value of repatriations between 1931 and 1939 to have been between 1.6 and 2.8 billion RM, when we employ Klug's original total, and between 2.7 and 4.9 billion RM, when we employ our upper-bound face value estimate. The foreign exchange produced by Germany in this period, which represents the total maximum amount available for repatriations, can be calculated from the balance of payments data provided by Ritschl (1991, 2002) and Banken (2009). Ritschl's numbers put this figure at around 2.2 billion RM for 1932-39, while Banken's are slightly higher: 2.9 billion RM for the period 1933-39.³⁷ Thus, our rough calculations indicate that if all foreign exchange generated was convertible and employed for repatriations, this may have been enough to fund all transactions. However, several plausible scenarios give rise to "missing" foreign exchange, up to an estimated maximum of 2.7 billion RM. The natural candidate to cover this shortfall is the offshore wealth of German individuals and companies. The huge capital flight caused by the 1931 crisis - around 3.4 billion RM (Ritschl, 2002) - means that such funds likely existed and could be used for profitable repatriation operations by those eager to bring funds back to Germany after the worst of the crisis was over.

³⁶We use New York's market discount to also represent continental Europe's because, when the data overlaps, the two are very close, but the data is more complete for the former than the latter.

³⁷Germany also had secret foreign exchange reserves, which Schacht managed to accumulate during the 1930s. These were not employed for repatriations and increased over time (see Table 1).

5 Our interpretation

We draw on the existing literature, new quantitative and qualitative evidence, and our theoretical framework to answer three key questions. 1) Why did the repatriations start in 1931? 2) How can the behavior of the German authorities be explained? 3) What explains the price differential between the German bonds traded at home and abroad? The answers to these three questions will have to be considered in relation to each other to provide a comprehensive and internally consistent overall picture.

5.1 Why did the debt repatriation start in 1931?

The reasons behind the start of the repatriation of German debt are the least controversial element of the episode. Germany’s spiraling descent into the Great Depression explains why default risk on German foreign debt increased dramatically between 1929 and 1931. At the same time, German investors perceived a widespread internal default as unlikely for both political and economic reasons. The selective default risk led to different valuations of German debt between domestic and foreign investors.³⁸ On the one hand, this spurred foreign investors to liquidate their holdings of German debt and recoup what they could through secondary market sales. On the other, it led German individuals and companies to purchase German securities abroad to hold them to maturity, sell them on, or extinguish them when they were the original issuers. As a result, large-scale debt repatriations started as an entirely private initiative in 1931.

However, in the summer of the same year, the authorities began regulating and restricting the access of German investors to secondary markets with the introduction of exchange controls. Consistently with our model and BMV’s original insight, these restrictions were met with hostility by foreign creditors. A 1937 statement by the Council of Foreign Bondholders, for example, declared that restraints on bond repurchases would be met with “strong and [...] effective criticism on the ground that, by limiting the market in such bonds, it would act detrimentally to the bondholders” (Eichengreen and Portes, 1990b). The Creditor Representatives were even more explicit about the benefits of the repatriations stating in 1934 that “German manufacturers and German debtors are benefited, as also are the foreign creditors, the holders of German dollar bonds, the demand for which at improved prices has been considerably increased as a result of these transactions.”³⁹ A representative of financial firm Hallgarten & Co., at the hearings of the U.S. Securities and Exchange Commission, declared: “I feel that any buying that is created in the market is beneficial, wherever it comes from. [...] repatriation acts as a support of the market [...] from a market point of view it

³⁸Different assessments of sovereign risk between domestic and foreign investors are not uncommon (Eaton, Gersovitz, and Stiglitz, 1986; Claessens, Diwan, Froot, and Krugman, 1991) and are justified by the actual differential treatment that domestic and foreign creditors often receive (Reinhart and Rogoff, 2014; Broner, Didier, Erce, and Schmukler, 2013; Erce and Mallucci, 2018). In our model, this is reflected in creditor expectation R_x .

³⁹Opening Statement of the Creditor Representatives, Berlin, May 4, 1934, via Klug (1993, Page 37).

[the practice of repatriations] is desirable” (Securities and Exchange Commission, 1937, page 504).

This qualitative evidence is confirmed by the quantitative analysis of bond prices in Section 5.3, which shows that the tightening of exchange controls widened the spread between the prices of German securities traded at home and abroad. This reinforces our argument and the cornerstone of our model: secondary markets (in our model, X) can mitigate or even offset the effects of reductions in creditors’ expectations of repayments, R_x . Consequently, our analysis also strongly supports the crux of BMV’s Secondary Market Hypothesis. In recent work on the inter-creditor dimension of the German default, [Accominotti, Albers, and Oosterlinck \(2021\)](#) highlight similar mechanisms to ours. They show that more senior creditors, specifically those based in the U.K., acquired German debt from junior ones while secondary markets functioned well, whereas once these markets became geographically segmented, transactions dwindled and spreads appeared.

1933		1934	
Month	Premium, %	Month	Premium, %
August	122.0	January	148.5
September	124.8	February	149.5
October	125.0	March	153.0
November	120.5	April	158.5
December	129.5	May	156.5
		June	200.0
		July	215.0
		August	250.0

Table 2: Premium for Foreign currency eligible for debt repatriations over regular foreign currency. Source: U.S. Tariff Commission, Foreign Trade and Exchange Control in Germany. Report No. 150, 2d Series. Washington 1942, via [Child \(1958\)](#), page 118-119).

The appearance of a spread between the prices of German securities traded domestically and internationally also raised German investors’ incentives to participate in secondary markets as potential arbitrage profits increased.⁴⁰ In these early phases, the still imperfect oversight by the authorities over foreign exchange operations also opened the way to repatriations financed with offshore funds. Germans wishing to repatriate wealth previously transferred abroad - as a consequence of the 1931 crisis, for example - could do so via the repatriation route, which additionally allowed them to reap arbitrage profits.

Private sector initiative remained dominant despite increasingly stricter official oversight over the repatriations. In 1933, for example, a vibrant market emerged in which currency eligible for repatriations sold at large, growing premiums over regular foreign currency exactly because of the potential arbitrage profits, which could be realized with repatriations (Table 2). However, this market also had the unintended consequence of aiding the concentration

⁴⁰In the model, this is represented by the government setting $\phi_c < 1$, which leads to a positive capital-gain term appearing in Equation (9).

of the repatriations in the hands of a few large banks, “which facilitated control by the authorities on which types of securities could be repatriated” (Child, 1958, page 118-19). The market ceased to exist altogether with the provisions of the August 1934 New Plan, which made *eligible* foreign exchange (i.e. foreign exchange that could be used for the repatriations) non-transferable. This did not stop the repatriations, as the authorities allowed such operations to continue at least until 1939.

5.2 How can the behavior of the German authorities be explained?

The behavior of the German authorities is the most puzzling element of the episode. Repatriations were a transfer of scarce resources to foreigners. Why was foreign exchange, a scarce and coveted resource, put aside for these operations? Why would a country marching towards war and autarky continue allowing repatriations well into the late 1930s?⁴¹

To garner a deeper insight into the German authorities’ motivation with regard to repatriations, it is useful to distinguish the main phases of Germany’s foreign and domestic economic policy; we identify three. The first goes from the introduction of exchange controls in the summer of 1931 to the formalization of the transfer moratorium in 1934. The second begins with this latter event and ends with Hermann Göring becoming the plenipotentiary of the Four Year Plan. The last phase consists in the run-up to World War II, when Göring’s extreme policies dominated the scene. Naturally, there was a strong degree of continuity in both economic and policy terms across these phases, but the periodization is useful to highlight key differences.

The first phase was characterized by the emergency introduction of exchange controls to stem the outflow of capital from Germany. Despite these controls, which were initially rather porous (Ellis, 1940a), foreign reserves continued to deteriorate rapidly (see Table 1). In this early phase, well-connected players could take advantage of the system and benefit from repatriations, but the transferability of foreign exchange, the presence of a vibrant market for its trading, and the potential use of offshore funds for repatriations meant that market mechanisms provided the opportunity for exploiting arbitrage opportunities to a relatively broad segment of German society. This, together with the end of reparations in 1932, eroded the spread that had opened up between the prices of German securities traded in Berlin and abroad in correspondence with the 1931 crisis and the introduction of exchange controls (see our analysis of bond prices in Section 5.3).

A first blow to this unstable status quo was the rise to power of the Nazis in January 1933 and the reinstatement of Hjalmar Schacht to the head of the Reichsbank shortly thereafter, an event which we also identify in our analysis of bond prices (see Section 5.3). However, another year passed before a truly new regime for reparations came into being with the Transfer Moratorium of July 1934. Besides formalizing and extending the German default,

⁴¹Another significant element in the authorities’ decision-making process is the selective default decision. As discussed in Section 5.1, this decision underpins the different default probability expected by domestic and foreign creditors and the price spread documented in Section 5.3. As such, it is important for our interpretation of the whole episode. However, this decision is unrelated to the political economy mechanisms discussed in the rest of the paper, and, for reasons of brevity, we tackle it in Appendix B.7.

the moratorium was accompanied with a substantial strengthening of the machinery for the control of all foreign exchange operations, including repatriations. Not coincidentally, this developments corresponded to a crucial consolidation of Hitler's grip on power. This was exemplified by merging the positions of chancellor and president following Paul von Hindenburg's death and the elimination of internal opposition within the NSDAP in the so-called Night of the Long Knives.

The increased control over foreign exchange operations had two effects. On the one hand, it gave the government the ability to more easily direct foreign exchange towards its political goals, rearmament above all. On the other, it made the competition for foreign exchange fiercer and political connections became all the more valuable, since they were more crucial than ever to obtain resources. Consequently, appeasing cronies through foreign exchange concessions also became politically more beneficial, and quantitatively significant repatriations continued during this period (See Table 1).

Despite tight exchange controls and attempts to increase foreign exchange inflows through export promotion, Germany's foreign reserves continued to dwindle, bringing the country to the brink of a foreign exchange crisis in 1936. This was driven by the competition of different sectors of the economy for foreign exchange, and above all by the import needs of a rapidly accelerating rearmament effort. In this phase, the views of Schacht and Göring started diverging with regard to the looming exchange crisis. While Schacht saw the need to reduce the foreign exchange demands of rearmament and/or other sectors of the economy, Göring was willing to entertain far more unorthodox policies (Schweitzer, 1962).

Eventually Göring won, as he became the plenipotentiary of the Four Year Plan with power over all foreign exchange dealings. Soon, he enlisted the help of the head of the SS Security Office, Reinhard Heydrich, as well as of the Gestapo (Banken, 2006). Under Göring's supervision, the wealth of German citizens and companies came under closer scrutiny. Germans were forced to turn any gold in their possession over to the government, while companies' foreign capital was considered at the disposal of the authorities. An order required all foreign companies controlled by Germans to remit funds not essential for their running, as well as any future surplus funds, to the Reichsbank for conversion into RM). The enforcement of the order was facilitated by the creation of 30 new regional foreign exchange offices (*Devisenstellen*) (Kobrak and Wüstenhagen, 2006). German Jews were particularly hard hit by these developments and by the introduction of harsher punishments, including the death penalty, for "economic sabotage," a crime perpetrated by alleged foreign currency law violators (Bajohr, 1997; Banken, 2006).⁴² These increasingly harsh foreign exchange regulations are also picked up by our analysis in Section 5.3.

Any benefit which may have been extracted from the repatriations depended on their limited use and the persistence of the price spread between German securities at home and abroad. This, combined with the impossibility of keeping any large repatriation operations secret, meant that only a limited segment of Germany's population and companies could

⁴²Austrian and Czech gold and foreign exchange reserves were also put at the service of German rearmament needs following the annexations of Austria and the Sudetenland in 1938 (Banken, 2003, 2009). Despite this, foreign exchange shortages remained a source of continuous concern in the run-up to WWII.

realistically stand to gain from the repatriations. These considerations suggest that limited and tightly controlled debt repatriations may have been a useful political tool for the government. By rationing foreign exchange and controlling its use, the German authorities were able to rule out large-scale foreign debt repayment, ensure the existence and persistence of a price differential between securities traded in domestic and foreign financial markets, and choose who would benefit from being allowed to carry out the repatriations.

It is well established that favoritism in Nazi Germany had a strong economic component. Firms connected to the regime had superior stock-market performance (Ferguson and Voth, 2008), while the privatization of companies nationalized during the Great Depression was used by the Nazis to garner political support (Bel, 2010), as were policies aimed at protecting and extending the market power of large industrial firms (Crane, 2020). A counterpoint to this favoritism also existed in the form of dispossessing and persecuting different sections of the German population, especially German Jews. The economic consequences of this were not limited to individuals: firms undergoing “Aryanization” suffered in terms of stock prices, dividends, and asset returns (Huber, Lindenthal, and Waldinger, 2021). The coercive power of the state was put behind the pursuit of Nazi ideology, even if the economic repercussions were negative.

Granting the possibility of repurchasing foreign debt abroad was another way of favoring supporters and strengthening alliances. The assignment of foreign exchange was highly bureaucratized and arbitrary, especially as time passed and regulations became more stringent and complex (Ellis, 1940b; James, 2020). The more supposedly economically motivated additional export system relying on repatriations was no exception; Ellis (1940a, page 43) states: “[...] the ‘additional’ exports involved a procedure which entailed far-reaching official supervision of the whole export trade, and the very looseness of the concept proved to be an easy device for favoring certain exporters and discriminating against others.” Against this backdrop, select industries, individuals, and companies benefited greatly from the repatriations (James, 1985).

The Weimar governments, which preceded the Nazi regime, were intertwined with Germany’s traditional conservative elite. This may have influenced the allocation of foreign exchange in the early phases of exchange control, but it is clear that arbitrariness and favoritism reached their peak under Nazi rule. Strong connections existed between the NSDAP and the industrialists who provided support for Hitler’s rise to power, aided the consolidation of his power, and offered the material means to fulfill his goals of rearmament and territorial conquest (Schweitzer, 1964; Crane, 2020).

Exclusion from repatriations was not just a punishment in terms of missed opportunities, but also meant that companies whose debt was repatriated without their involvement now faced a de facto higher debt burden, as our model also shows. Rewarding some segment of society while punishing another was two sides of the same coin to the extent that these two activities shared the same tools: with the 1934 New Plan, the emigration of German Jews was integrated into the blocked account system, by transforming emigrants’ assets into such accounts, which were then converted into foreign exchange at heavy discounts (Klug, 1993; Ritschl, 2019). At the same time, alleged currency law violations were used to force Jewish

owners out of their businesses in the process of “Aryanization” and the involvement of the Gestapo from 1936 led to an escalation in which “most of the new currency regulations were aimed not only at halting capital flight but also at robbing the entire Jewish population of all its assets” (Banken, 2006, page 16).

While complete records of repatriation operations have been lost, making it impossible to reconstruct a complete picture of the favoritism and arbitrariness in the allocation of foreign exchange, a number of prominent examples illustrate these mechanisms. For instance, the companies *Miag Mühlenbau und Industriegesellschaft* and *Schering AG* - tied to the regime because of their involvement in rearmament⁴³ - handsomely profited from special foreign exchange operations made possible by their close ties with government bureaucracy both before and during the Nazi era (Klug, 1993; Kobrak, 2003). With the blessing of finance minister Schacht, large industrial firms could report only their net foreign exchange balances rather than every single operation, something that would allow them to circumvent obtaining explicit authorization for repatriations, as well as for other operations involving foreign exchange (Schweitzer, 1964). Particularly powerful companies - such as chemical giant I.G. Farben - enjoyed especially favorable treatment in their foreign exchange dealings (Schweitzer, 1960).

Individuals and organizations other than companies could also benefit from repatriations. Hermann Abs - an important figure in post-World War II Germany and a Deutsche Bank director in the 1930s - made large personal profits by purchasing German debt abroad and selling it for higher prices in Germany (James, 2004). Finance Minister Count Schwerin von Krosigk carried out a personal repatriation operation in November 1933, but was only granted half of the foreign exchange he had initially requested (Klug, 1993). As already discussed above, the NSDAP employed foreign intermediaries to (secretly) buy large quantities of German debt throughout Europe in order to make profits by selling it domestically in a period when it was particularly cash-strapped (precisely between Autumn 1933 and Spring 1934).

The rationing of foreign exchange also served as a tool to extend the government’s control over corporations and the private sector more generally. As Ellis (1940a, page 132) stated in reference to exchange controls: “The institution persisted because it was an instrument par excellence of political power - political power not only over other states but equally significantly over vested economic interests within the country. The National Socialist state developed this totalitarian instrument to one of its most formidable weapons.” Desperate to increase their foreign exchange quotas to import raw materials, subsidize exports, or simply make arbitrage profits, companies curried favor with the Nazi regime, cooperating ever more closely with the government to help it achieve its political and economic goals (Feldman, 2001; Kobrak, 2003).

In summary, repatriation concessions afforded the government considerable political advantages in the form of both carrots and sticks. The drawback of these operations was the opportunity cost of the foreign exchange used in the repatriations, but, thanks to a pervasive control of the economy, the government could manage these costs according to its preferences

⁴³Bundesarchiv Militärarchiv Freiburg RH 8/1765.

and priorities.

5.2.1 The political economy of offshore-funded repatriations

In Section 4.2.1, we showed that, even if all convertible foreign exchange produced by Germany during the 1930s was employed for repatriation operations, it may not have been enough to carry the totality of these operations. Our theoretical framework has explicitly considered the role of offshore funds (Section 3.3), showing that favoritism is likely to affect repatriations involving such funds as well. Here, we tackle the issue in reference to the interpretation of our case study, structuring our discussion around three points: i) the quantitative importance of offshore-funded repatriations, ii) the treatment of offshore funds by the German authorities, and iii) the concrete use of offshore funds in Nazi Germany.

Regarding the first point, according to our calculations, the “missing exchange” was between 0 and 2.7 million RM, suggesting that nearly half of repatriations may still have been funded using reserves and export proceeds, even in the scenario most favorable to the use of offshore funds. A relatively minor role for offshore-funded repatriations would help explain why direct evidence of such operations is so scarce.

Our analysis of the price of German bonds (Section 5.3) supports the idea that the use of offshore funds did not break the link between foreign exchange scarcity within Germany and repatriations. If the use of scarce foreign exchange reserves had not been key, and offshore funds could have provided a substitute for them, we would not expect to see such strong reactions to the tightening of exchange controls over the spread of German securities. In other words, if repatriations using offshore funds had played a dominant role, we would not expect a negative relationship between the size of repatriations (and secondary market prices) and exchange controls. On the contrary, the tightening of controls made penalties for undeclared offshore funds stricter and this may have incentivized the repatriation of offshore funds; this would have meant more repatriations and higher secondary market prices abroad. Clearly resources coming from Germany played a central role.

Regarding the second point, we argue that German offshore funds were subject to tight official scrutiny and that the German authorities considered these resources to be at their disposal, making them akin to official reserves. The legal framework of the foreign exchange laws was adjusted to reflect this, especially from 1934 onwards, in line with the Nazi ideology of private property as the collective property of the German people (*Volksgut*) (Banken, 2006).

Chancellor Heinrich Brüning attempted to extend control over funds held by Germans abroad already in 1931. However, as the Nazis came to power and solidified their control over the economy and society, the attention of the authorities turned more acutely towards these reservoirs of coveted foreign currency. With the tightening of capital controls over the course of the 1930s, increasingly severe penalties were introduced by the authorities for undisclosed offshore funds. In 1936, Göring, as the newly established foreign currency commissar with absolute powers, ordered the seizure of all assets held by Germans abroad (Banken, 2003).

German businesses and individuals, while keen to please and obtain favors from the regime, also had a strong interest in shielding part of their foreign operations using offshore

assets. This is most evident in the practice of *Tarnung* (camouflaging or cloaking foreign assets), which was widely employed in the interwar period. While this practice was traditionally interpreted as a way for German businesses to shield themselves from potential expropriation by hostile foreign governments, an equally, if not more important motive was avoiding interference from the German government (Kobrak and Wüstenhagen, 2006; Jones and Lubinski, 2012). In fact, *Tarnung* was explicitly opposed by the German authorities, except for brief periods or on an ad hoc basis.

As in other facets of the economy, the Nazis took a pragmatic approach in their dealings with individuals and companies, especially when turning a blind eye on officially prohibited operations - or even facilitating them - supported the pursuit of their political goals. Thus, arbitrariness and favoritism strongly affected the way in which the German authorities dealt with offshore funds and assets as well.

A clear example of this comes from a brief period when the government supported cloaking operations due to increased fear of foreign expropriation, namely in September 1938 during tensions with other countries over German territorial claims in Czechoslovakia. The order that allowed cloaking clarified that licenses should only be given to *reliable* companies. Beiesdorf - a pharmaceutical and skin-care firm - was denied a license because it was identified as a Jewish company (Jones and Lubinski, 2012). After the Munich Agreement, the order was reversed and only cloaking operations that could demonstrate that they would not reduce the flow of foreign exchange to Germany were allowed. Good relationships with the authorities were key both in obtaining a license in the first place, and in keeping it afterwards (Kobrak and Wüstenhagen, 2006).

Schering AG, a company already discussed in connection with standard repatriations, provides another illustrative example. In 1934, the Reichsbank readily did not force the company to sell some shares it held in the U.S. - the dollar proceeds of such an operation would normally have been handed over to the Reichsbank in exchange for German currency - because the shares commanded a price that was perceived to be too low. Instead, the central bank allowed Schering to use these shares as collateral for a five-year loan which was then used to carry out profitable bond and blocked account repatriations (Kobrak, 2003).

Regarding the third and final point, we argue that the political economy mechanisms that determined the incentives of both private agents and authorities in repatriations involving offshore funds were the same as those governing “standard” repatriations, particularly from 1934 onwards, when the authorities strengthened the exchange control machinery. As for the rest of the exchange control system, regulations concerning offshore funds were complex and often changed. As in the case of standard repatriations, however, the basic principles and incentives governing these operations were fairly straightforward.

The impetus to repatriate the funds could come from either the government or private individuals and businesses. As illustrated, the government had the clear goal of extending its control over all German-owned assets abroad. These assets could be sold to raise foreign currency or strategically left abroad either to continue generating resources, achieving another goal, or to simply favor an ally or otherwise powerful private actor. Using repatriating funds to purchase German debt was a convenient intermediate step that allowed private

companies and individuals to benefit from these operations in terms of arbitrage profits. The government was in no way obligated to allow the repatriation of debt in the context of bringing offshore funds back to Germany. In many instances, private individuals were simply forced to sell their assets and turn over the foreign exchange proceeds to the Reichsbank. This is precisely what happened to private gold holdings within Germany after all. Permitting repatriations was an arbitrary decision by the government, which, as in standard repatriations, came with the cost of forgoing part of the foreign exchange made in the sale of assets. By sacrificing part of the foreign exchange to allow the repurchase of German debt, the government could reward allies, but also increase compliance; this was relevant since, as discussed above, cloaking foreign assets was a relatively widespread practice.

Private investors and companies could also also manifest their interest to repatriate assets, independently of the government’s initiative, for the simple reason that it served their purposes. Doing so in cooperation with the authorities could afford the goodwill of the state and avoid the risk of investigation by the extensive apparatus in place to enforce foreign currency laws and regulations.

To sum up, the self-interest of private actors and the political goals of the German authorities worked in tandem to make repatriation a quantitatively substantial phenomenon. The different origins of the funds employed in the repatriations did not alter the political economy of the episode in an appreciable way, especially once the government extended its control over the wealth of Germans abroad.

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

The price spread between German bonds traded domestically and on international financial markets reflected the different expectations of domestic and foreign creditors regarding default on the one hand, and the efficacy of the exchange control system at limiting arbitrage and the transfer of resources abroad on the other. We study the drivers of the spread and its consistency with our theoretical framework using weekly data on German bond prices in New York, London, and Berlin between 1930 and 1940. In this structural break analysis, we employ an “agnostic” methodology, whereby we treat both the break dates and number of breaks as a priori unknown, and link each identified break to a significant historical event. This analysis provides compelling evidence that restrictions on secondary market access for Germans were associated with increases in the spread and well corresponds with the narrative of the phases of exchange controls discussed in Section 5.2. We thus find support for our interpretation of the case study, as well as for one of the fundamental building blocks of our model, the Secondary Market Hypothesis of BMV. The exogeneity of capital control measures with respect to the price spread has been discussed above in the overview of the case study and further supports our findings.

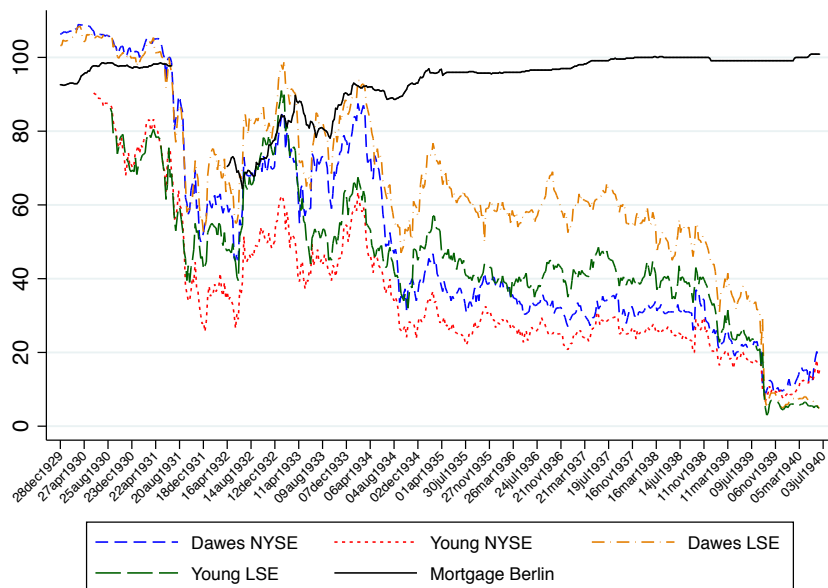


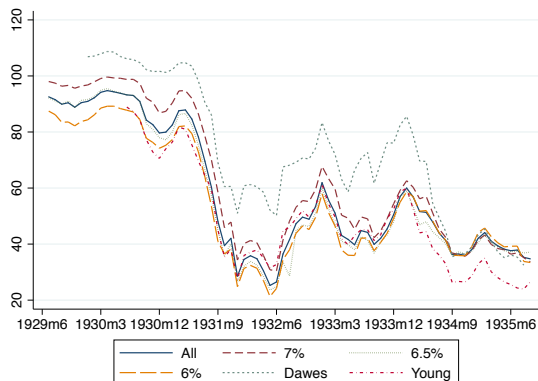
Figure 3: The price of Young and Dawes bonds in New York & London, and of mortgage bonds in Berlin. End of the week quotations. NYSE = New York Stock Exchange, LSE = London Stock Exchange. Source: New York, [The Annalist \(1930-1940\)](#); London, [The Financial Times \(1929-1932\)](#) for 1929-32 and [Brown and Burdekin \(2002\)](#) for the rest of the period; Berlin, [Global Financial Data \(2020\)](#).

5.3.1 Data and methodology

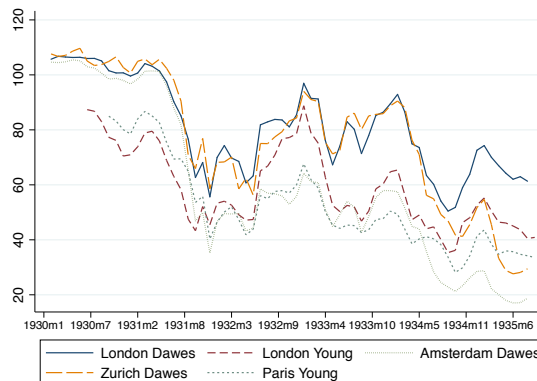
Figure 3 presents weekly data for the Dawes and Young bonds traded on the New York and London Stock Exchanges, as well as quotations of German mortgage bonds on the Berlin Stock Exchange. The sample begins in December 1929 (the Young series starts in June 1930 in New York and in September 1930 in London) and ends in June 1940. The data was manually collected from [The Annalist \(1930-1940\)](#) for New York and [The Financial Times \(1929-1932\)](#) for London until the end of 1932, when we splice it with data from [Brown and Burdekin \(2002\)](#). The Berlin mortgage bond data comes from [Global Financial Data \(2020\)](#). Two data issues are immediately apparent: i) the series for Berlin is incomplete, as the Stock Exchange was closed from July 1931 to April 1932; ii) these bonds may not be representative of other categories of German bonds.

To deal with the first issue, we reconstruct the missing data for the bonds traded in Berlin assuming four different scenarios, all but one involving an eight-week slump in prices correlated to the dynamics of the U.S. stock market. Three of the four scenarios differ in the timing of the start of the slump (ranging from July to August 1931), whereas the dynamics for the rest of the missing subsample are all based on interpolated monthly data of representative German fixed interest securities from the League of Nations Statistical Yearbook 1932-33. The fourth reconstructed series consists of a linear interpolation for the whole missing subsample. We use these four reconstructed Berlin bond series to obtain 16 different spread series, four for each foreign-traded bond series studied (Dawes and Young)

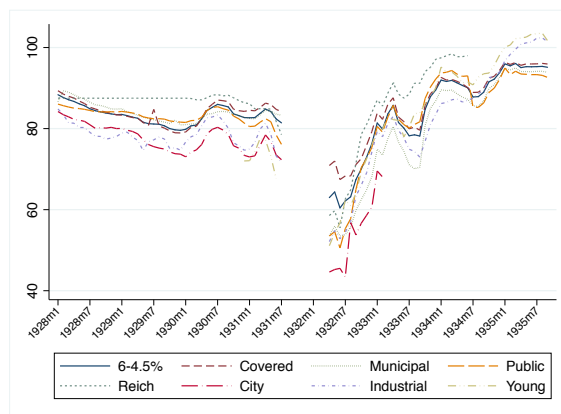
and for each location (New York and London).⁴⁴



(a) New York



(b) Other international markets



(c) Berlin

Figure 4: The price of German bonds in different financial markets. Monthly averages. Source: [Institut für Konjunkturforschung \(1933, 1936\)](#).

To assess the representativeness of the bonds, we turn to the monthly data in Figure 4. This figure reports the prices of a wide range of bond types and locations. Panel (c) illustrates that the prices of different types of public and private bonds traded in Berlin were highly correlated with each other, while panels (a) and (b) show that the Young and Dawes bonds traded in New York and London were representative of a broad range of German bond types abroad.

The high correlation across bond types in international financial markets has a simple historical explanation: changes in sovereign risk dominated issues related to specific bond types.⁴⁵ Additionally, since the introduction of exchange controls in 1931, the decision to

⁴⁴See Appendix C for more details.

⁴⁵The privileged status of Young and Dawes loans compared to other foreign loans may actually work in our favor because it partially shielded these bonds from fluctuations due to temporary shifts in economic

repay foreign debts, whether public or private, rested with German authorities, making all German foreign debt de facto sovereign.⁴⁶ Some differences existed in the treatment of foreign creditors based on location, with British ones receiving a more favorable treatment than other creditors on average (Auld, 1934; Eichengreen and Portes, 1988a,b; Accominotti, Albers, and Oosterlinck, 2021), but macro developments were similar for all foreign creditors, thus leading to common dynamics. Similarly, in Berlin, macroeconomic and political developments drove the evolution of bond prices. Crucially, financial markets in the 1930s were sophisticated, could process a large amount of information, and efficiently incorporated investors' expectations (Lehmann-Hasemeyer and Streb, 2016). Additionally, sovereign bonds were widely traded in secondary markets, thus making their prices informative (Eichengreen and Portes, 1990a; Stone, 1991).

A simple visual inspection of the data in Figures 3 and 4 allows concluding that the prices of German bonds traded in Berlin followed a very different path compared to similar bonds traded abroad, a finding confirmed by break analysis. We follow the dynamic optimization procedure of Bai and Perron (1998, 2003), which estimates the break dates of a univariate process for a given number of breaks, after having tested for the optimal number of breaks with a battery of different tests. We assume an autoregressive process of the first order, in which the constant term and the autoregressive coefficients of the model are both subject to structural breaks. This means that we allow for breaks both in the level and the persistence of the process. We also control for local market conditions with an exogenous regressor that reflects the evolution of the respective stock market. Appendix D provides further technical details.

5.3.2 Results

Across all 16 spread series, there is support for a number of breaks between four and seven. We present the results that allow for the highest number of breaks reasonably supported by each model. We summarize the key findings of the analysis in Table 3, while the full results for each spread series, including break dates and confidence intervals, are reported in Appendix E. The results are remarkably consistent across different locations (London and New York), bond types (Young and Dawes), and assumptions regarding the evolution of the Berlin bond prices during the closure of the stock exchange. The results are further robust to different specifications of the models, to the use of a different stock index for New York, and to the series of interest being the price level of the Dawes and Young bonds abroad instead of the spread.⁴⁷ This latter point confirms the fact that the impact of capital control measures is reflected in changes in the prices of German bonds abroad and, thus, in the expected probability of repayment of foreign creditors, rather than in changes in the domestic expectations regarding repayment.

conditions, policy, and creditor expectations, making the structural breaks we find more reliable.

⁴⁶This state of affairs carried on into the settlements of interwar German debts at the London Debt Agreement of 1953, where both private and public debts were negotiated jointly.

⁴⁷See Appendix E.1 for details.

Break #	Event	Earliest and latest break week among all models	Effect on the spread
1	Introduction of exchange controls	11 April 1931 - 10 October 1931	↑
2	Cancellation of reparations (Lausanne Conference)	11 June 1932	↓
3	Reichstag fire/Reinstitution of Schacht as Reichsbank president	11 February 1933 - 4 March 1933	↑
4	Transfer moratorium and strengthening of exchange controls	3 March 1934 - 5 May 1934	↑
5	Further strengthening of exchange controls	14 July 1937 - 4 September 1937	↑
6	New foreign exchange controls announced and implemented	1 October 1938 - 31 December 1938	↑
7	Germany invades Poland and World War II begins	26 August 1939 - 2 September 1939	↑

Table 3: Historical events corresponding to the break dates in the German bond spread series. For full results, including confidence intervals for each of the breaks, see Appendix E.

For each identified break, Table 3 shows the earliest and latest point estimate of the break date across all 16 models. More precisely, because we use end-of-week data, we report the date of the Saturday of the first week of the new regime following a structural break. The table also reports whether each break led to a higher or lower spread and the historical event associated with each break.

Critical junctures in Germany’s history in this period - such as the Lausanne Conference of 1932, the Reichstag fire and reinstatement of Hjalmar Schacht as president of the Reichsbank in 1933, and the start of World War II in 1939 - appear as structural breaks. Being able to pick out these episodes, which had clear bearing on the repayment probability of foreign creditors, is reassuring and lends credibility to our empirical strategy. However, most importantly for our purposes, the majority of the breaks are associated with events featuring the introduction and strengthening of exchange controls. This is consistent with the Secondary Market Hypothesis and, thus, also with our theoretical approach.

The first break we find corresponds to the start of the German debt crisis and of the exchange control system in the summer of 1931. This break date is not estimated as consistently across the different models as the other breaks for two main reasons. First, the break corresponds to the period when the German stock exchange was closed and, therefore, the period for which we rely on a reconstructed spread. This reduces the likelihood of identifying a clear break. Reassuringly, however, we find very similar break dates when we perform our analysis solely on the foreign debt price levels rather than the spread, indicating that the reconstruction of the data is not driving the results. Second, and more importantly, although in retrospect the start date of Germany’s exchange control system can clearly be identified, a large degree of uncertainty regarding the nature of the controls existed at the time. The measure was widely seen as temporary, and provisions to make the controls effective were introduced only gradually as Germany’s crisis deepened (Ellis, 1940a). This helps explain why the different models identify different weeks for the start of this new regime. Nonetheless, our statistical procedure clearly identifies a structural break in this crucial period, unambiguously indicating a worsening of the prospects of repayment for foreign creditors in connection with the first restrictions on trading on secondary markets.

The second break we identify is the only one connected with a decrease, rather than

an increase in the spread. This is not surprising since the break is clearly linked to the aforementioned Lausanne Conference of June-July 1932, which de facto put an end to war reparation payments, thus raising the expected value of the remaining German debts.

We identify a further downward break in February/March 1933, in relation with two significant events clearly spelling out more hostility towards foreign creditors. The first is the Reichstag fire on February 27, followed by the introduction of the Reichstag Fire Decree the following day. The decree eliminated a large number of civil liberties and suppressed freedom of the press. As such, it was a first step in dismantling the Weimar constitution and paving the way for Nazi dominance over German society. The second is the reinstatement of Schacht as the head of the Reichsbank. Schacht was a complex figure: he was both a staunch opponent of reparations - he also believed the Young loan to have been imposed on Germany immorally (Schacht, 1934) - and a friendly figure in international financial circles. His actions after 1933 were unambiguously bad news for foreign investors. Even before the transfer moratorium and the consolidation of exchange controls in 1934, he took important steps that reduced the foreign exchange available for debt repatriations and foreign debt service. In particular, his first act as the new Reichsbank president was the unilateral decision to repay a large loan obtained by his predecessor from foreign central banks, which had represented a much-needed foreign exchange reserve buffer for the Reichsbank.

The complete transfer moratorium and the introduction of even tougher exchange controls in 1934 are connected to a further increase in the bond spread and to the fourth identified break. This legislation - announced after the so-called Transfer Conference of April-May and enforced from July 1934 - put debt repurchases under stricter than ever control, and perfected the complete monopoly of the Reichsbank over foreign exchange operations. This increased oversight by the authorities also made offshore-funded repatriations increasingly difficult to carry out.

We are also able to identify two further tightenings of exchange controls, which followed the change in leadership with regard to foreign exchange policy from Schacht to the even more radical Göring in 1936. The first took place in May-September 1937, while the second is connected to the announcement and implementation of what has been identified as the “normative climax” of foreign exchange law in November-December 1938 (Hahn, 1989, page 879).⁴⁸

The last break we identify is not an episode of financial repression or an event directly connected to Germany’s foreign debt. However, its importance for the probability of repayment of foreign debt holders is difficult to dispute. This is the outbreak of World War II, represented by the Molotov-Ribbentrop pact and the German invasion of Poland on September 1, 1939.

Our results are also notable for what we do not find. In particular, we detect no breaks in relation with several changes in the service of German foreign debts, such as the May 1933

⁴⁸May 27, Deutsches Reichsgesetzblatt, Jahrgang 1937, Teil I, Nr. 65, p. 600-601; and September 16, Deutsches Reichsgesetzblatt, Jahrgang 1937, Teil I, Nr. 105, p. 1018-19. November 8: Anträge auf Zuteilung von Devisen. December 12: Bekanntmachung des Gesetzes über die Devisenbewirtschaftung. Source: Deutsches Reichsgesetzblatt Jahrgang 1938, Teil I, Nr. 211, p. 1733-48.

Law on Payments Abroad, which marked the start of Germany’s soon-to-be-complete default on its foreign debt.⁴⁹ The lack of breaks associated with these events is reassuring for our analysis, as these were changes that did not impact, in practice, the expected repayments to foreigners, as the existing exchange controls were already stricter than the nominal revisions in debt service.⁵⁰

To sum up, the breaks we find correspond to either key historical events or episodes related specifically to Germany’s foreign debt, usually accompanied with partial or total defaults, or restructurings. The distinctive features of these episodes, compared with those for which we do not find structural breaks, is the tightening of foreign exchange controls. In line with our model, the evidence accumulated, and our reading of the history, we conclude that exchange controls, by limiting the access of Germans to secondary markets, closed the “backdoor” channel through which the effects of limited foreign debt services and increased default probability for foreign debt holders could be offset.

6 Conclusion

This paper has looked back at history for insights on debt crises and the effects of capital controls. More precisely, we have studied the repatriations of foreign debt carried out by Germans under strict capital controls throughout the 1930s, one of the largest episodes of its kind, finding that political economy mechanisms played a key role. Previous studies of the episode could not explain all its main aspects, both at the micro and macro level. We show that the main features of the repatriations can be explained through the lens of modern macroeconomic theory, specifically with a model that merges the main intuitions of [Broner, Martin, and Ventura \(2010\)](#) - on the role of secondary markets in sovereign risk - and [Bulow and Rogoff \(1991\)](#) - on the sub-optimality of repatriations - and extends them to allow for elite capture.

We argue that, despite the scarcity of foreign reserves, debt repatriations were not suppressed altogether once the authorities stepped in to curb capital flight, because they allowed the pursuit of specific micro-objectives. In fact, key companies, influential individuals, and the Nazi Party itself profited from these operations in the form of large capital gains, hidden

⁴⁹While it could be argued that the moratorium on foreign payments implemented in May 1933 did not initially affect the Dawes bonds and touched only the amortization of the Young bonds ([Toniolo, 2005](#)), one would expect such an event to have affected the expected probability of repayment for all German foreign debts. Moreover, the Young and Dawes bonds were directly impacted by the events of May 1933, given that the German government unilaterally revoked the *Gold Clause*, which meant that the Dawes and Young bonds started being serviced on the basis of their nominal value rather than on that of their original gold value.

⁵⁰This can be easily rationalized through the lens of our model: price P_x will not be affected by a reduction in the nominal value of the promised repayment if ϕ_c is low enough, such that the price already incorporates the loss. For example: if the outstanding debt is 100 and ϕ_c is such that the available resources for repayment are 70 ($P_x = 0.7$), then if the debtor announces that they will only consider the face value of their debt to be 90, this will not move the price, as the resources available to creditors remain 70, while the nominal debt is still 100.

export subsidies, or the reduction of private debt exposure. At the same time, their use as a systematic macro tool was ruled out by the authorities since they knew that it would have led to excessive debt repayments, capital flight, the depletion of official reserves, and welfare losses for the German economy as a whole.

The mechanisms outlined by our model have a wide applicability beyond the German case study, particularly to countries prone to elite capture. This line of research can be extended by further investigating the economic and political mechanisms that lead to the emergence of elites, as well as their feedback effect on the economy in the context of cross-border transactions. Additional avenues for research also include studying the feedback relation between quality of institutions (broadly defined) and capital controls and its effect on both short-run and long-run economic outcomes.

References

- ACCOMINOTTI, O., T. N. H. ALBERS, AND K. OOSTERLINCK (2021): “Selective Default Expectations,” *mimeo*.
- ACCOMINOTTI, O., AND B. EICHENGREEN (2016): “The Mother of All Sudden Stops: Capital Flows and Reversals in Europe, 1919-1932,” *Economic History Review*, 69(2), 469–492.
- ACEMOGLU, D., S. JOHNSON, AND J. A. ROBINSON (2005): “Institutions as a Fundamental Cause of Long-Run Growth,” in *Handbook of Economic Growth*, ed. by P. Aghion, and S. Durlauf. Elsevier.
- AGUIAR, M., AND M. AMADOR (2014): “Sovereign Debt,” in *Handbook of International Economics*, ed. by G. Gopinath, E. Helpman, and K. Rogoff, vol. 4. Elsevier.
- ALESINA, A., AND G. TABELLINI (1989): “External Debt, Capital Flight and Political Risk,” *Journal of International Economics*, 3-4, 199–220.
- ALFARO, L. (2004): “Capital Controls: A Political Economy Approach,” *Review of International Economics*, 12(4), 571–590.
- ALFARO, L., S. KALEMLI-OZCAN, AND V. VOLOSOVYCH (2007): “Capital Flows in a Globalized World: The Role of Policies and Institutions,” in *Capital Controls and Capital Flows in Emerging Economies: Policies, Practices, and Consequences*, ed. by S. Edwards. University of Chicago Press.
- ANDERSEN, J. J., N. JOHANNESSEN, AND B. RIJKERS (2021): “Elite Capture of Foreign Aid: Evidence from Offshore Bank Accounts,” *Journal of Political Economy*, Forthcoming.

- ARSLANALP, S., AND L. SUNDER-PLOSSMANN (2021): “Sovereign Debt Repatriation During Crises,” *mimeo*.
- AULD, G. P. (1934): “The Dawes and Young Loans: Then and Now,” *Foreign Affairs*, 13(1), 6–25.
- BAI, J., AND P. PERRON (1998): “Estimating and Testing Linear Models with Multiple Structural Changes,” *Econometrica*, 66(1), 47–78.
- (2003): “Computation and Analysis of Multiple Structural Change Models,” *Journal of Applied Econometrics*, 18(1), 1–22.
- BAJOHR, F. (1997): »*Arisierung*« in Hamburg. *Die Verdrängung der jüdischen Unternehmer 1933-45*, Hamburger Beiträge zur Sozial- und Zeitgeschichte, Band 35. Hamburg: Christians.
- BALOGH, T. (1938): “The National Economy of Germany,” *Economic Journal*, 48(191), 461–497.
- BANKEN, R. (2003): “Die deutsche Goldreserven- und Devisenpolitik 1933-1939,” *Jahrbuch für Wirtschaftsgeschichte / Economic History Yearbook*, 44(1), 49–78.
- (2006): “The Influence of the SS on the Foreign Exchange Controls and the Despoilation of the German Jews, 1935-1941,” *UC Berkeley: Institute of European Studies*.
- (2009): *Edelmetallmangel und Großraubbwirtschaft. Die Entwicklung des deutschen Edelmetalsektors im »Dritten Reich« 1933-1945*, Jahrbuch für Wirtschaftsgeschichte, Beiheft 13. Akademie Verlag.
- BEL, G. (2010): “Against the Mainstream: Nazi Privatization in 1930s Germany,” *Economic History Review*, 63(1), 34–55.
- BONNEL, A. T. (1940): *German Control over International Economic Relations, 1930-1940*. The University of Illinois Press.
- BRONER, F., T. DIDIER, A. ERCE, AND S. L. SCHMUKLER (2013): “Gross Capital Flows: Dynamics and Crises,” *Journal of Monetary Economics*, 60, 113–133.
- BRONER, F., A. ERCE, A. MARTIN, AND J. VENTURA (2014): “Sovereign Debt markets in Turbulent Times: Creditor Discrimination and Crowding-out Effects,” *Journal of Monetary Economics*, 61, 114–142.
- BRONER, F., A. MARTIN, AND J. VENTURA (2008): “Enforcement Problems and Secondary Markets,” *Journal of the European Economic Association*, 6(2-3), 683–694.
- (2010): “Sovereign Risk and Secondary Markets,” *American Economic Review*, 100(4), 1523–55.

- BRONER, F., AND J. VENTURA (2016): “Rethinking the Effects of Financial Globalization,” *Quarterly Journal of Economics*, 131(3), 1497–1542.
- BROWN, W. O., AND R. C. K. BURDEKIN (2002): “German Debt Traded in London during World War II: A British Perspective on Hitler,” *Economica*, 69, 655–669.
- BRUTTI, F., AND P. SAURÉ (2016): “Repatriation of Debt in the Euro Crisis,” *Journal of the European Economic Association*, 14(1), 145–174.
- BULOW, J., AND K. ROGOFF (1988): “The Buyback Boondoggle,” *Brookings Papers on Economic Activity*, 2, 675–715.
- (1991): “Sovereign Debt Repurchases: No Cure for Overhang,” *Quarterly Journal of Economics*, 106(4), 1219–1235.
- BUNDESBANK (1976): *Deutsches Geld- und Bankwesen in Zahlen, 1876-1975*. Knapp.
- CHILD, F. C. (1958): *The Theory and Practice of Exchange Control in Germany*. Martinus Nijhoff.
- CHONG, T. T. L. (1995): “Partial parameter consistency in a misspecified structural change model,” *Economics Letters*, 49(4), 351–357.
- CLAESSENS, S., I. DIWAN, K. FROOT, AND P. KRUGMAN (1991): “Market-based Debt Reduction: Principles and Prospects,” *World Bank Policy and Research Series*, 16.
- CLEMENT, P. (2004): “The Touchstone of German Credit: Nazi Germany and the Service of the Dawes and Young Loans,” *Financial History Review*, 11(1), 33–50.
- COHEN, D., AND T. VERDIER (1995): “‘Secret’ Buy-backs of LDC Debt,” *Journal of International Economics*, 39(3-4), 317–334.
- COSTINOT, A., G. LORENZONI, AND I. WERNING (2014): “A Theory of Capital Controls as Dynamic Terms-of-Trade Manipulation,” *Journal of Political Economy*, 122(1), 77–128.
- CRANE, D. A. (2020): “Fascism and Monopoly,” *Michigan Law Review*, 118(7), 1315–1370.
- DE BROECK, M., AND H. JAMES (2019): “Germany in the Interbellum: Camouflaging Sovereign Debt,” in *Debt and Entanglements Between the Wars*, ed. by T. Sargent, G. Hall, M. Ellison, A. Scott, H. James, E. Dabla-Norris, M. De Broeck, N. End, M. Marinkov, and V. Gaspar. International Monetary Fund.
- D’ERASMO, P., AND E. G. MENDOZA (2016): “Distributional Incentives in an Equilibrium Model of Domestic Sovereign Default,” *Journal of the European Economic Association*, 14(1), 7–44.
- DOOLEY, M. P. (1996): “A Survey of Academic Literature on Controls Over International Capital Transactions,” *IMF Staff Papers*, 43, 639–687.

- EATON, J., M. GERSOVITZ, AND J. E. STIGLITZ (1986): “The Pure Theory of Country Risk,” *European Economic Review*, 30(3), 481–513.
- EICHENGREEN, B., AND R. PORTES (1988a): “Foreign Lending in the Interwar Years: the Bondholders’ Perspective,” *University of California Berkeley, Department of Economics Working Paper*, 8886.
- (1988b): “Settling Defaults in the Era of Bond Finance,” *CEPR Discussion Papers*, 272.
- (1990a): “The Interwar Debt Crisis and Its Aftermath,” *The World Bank Research Observer*, 5(1), 69–94.
- (1990b): “Dealing With Debt: The 1930s and the 1980s,” *NBER Working Papers*, 2867.
- EINZIG, P. (1934): *Germany’s Default: The Economics of Hitlerism*. Macmillan and co. limited.
- ELLIS, H. S. (1940a): “Exchange Control, 1931-1939: From an Emergency Measure to a Totalitarian Institution,” *Quarterly Journal of Economics*, 54(4), 1–158.
- (1940b): “The Past and Future of Exchange Control,” *Quarterly Journal of Economics*, 54(4), 159–217.
- (1941): *Exchange Control in Central Europe*. Harvard University Press.
- ERCE, A. (2012): “Selective Sovereign Defaults,” *Federal Reserve of Dallas Working Paper, Globalization and Monetary Policy Institute*, 127.
- ERCE, A., AND J. DÍAZ-CASSOU (2010): “Creditor Discrimination during Sovereign Debt Restructurings,” *Working Paper, Banco de España*, 1027.
- ERCE, A., AND E. MALLUCCI (2018): “Selective Sovereign Defaults,” *International Finance Discussion Papers, Board of Governors of the Federal Reserve System*, 1239.
- ERTEN, B., A. KORINEK, AND J. A. OCAMPO (2021): “Capital Controls: Theory and Evidence,” *Journal of Economic Literature*, 59(1), 45–89.
- FACCIO, M. (2006): “Politically Connected Firms,” *American Economic Review*, 96(1), 369–386.
- FELDMAN, G. (2001): *Allianz and the German Insurance Business, 1933-1943*. Cambridge University Press.
- FERGUSON, T., AND P. TEMIN (2003): “Made in Germany: The German Currency Crisis of July 1931,” *Research in Economic History*, 21, 1–53.

- FERGUSON, T., AND H.-J. VOTH (2008): “Betting on Hitler - The Value of Political Connections in Nazi Germany,” *Quarterly Journal of Economics*, 123(1), 101–137.
- FERNÁNDEZ, A., M. W. KLEIN, A. REBUCCI, M. SCHINDLER, AND M. URIBE (2016): “Capital Control Measures: A New Dataset,” *IMF Economic Review*, 64(3), 548–574.
- FROOT, K. (1989): “Buybacks, Exit Bonds, and the Optimality of Debt and Liquidity Relief,” *International Economic Review*, 30(1), 49–70.
- GHOSH, A. R., J. D. OSTRY, AND C. G. TSANGARIDES (2017): “Shifting Motives: Explaining the Buildup in Official Reserves in Emerging Markets Since the 1980s,” *IMF Economic Review*, 65(2), 308–364.
- GHOSH, A. R., AND M. S. QURESHI (2016): “What’s In a Name? That Which We Call Capital Controls,” *IMF Working Papers*, 16/25.
- GLOBAL FINANCIAL DATA (2020): <http://www.globalfinancialdata.com/>.
- GUEMBEL, A., AND O. SUSSMAN (2009): “Sovereign Debt without Default Penalties,” *Review of Economic Studies*, 76(4), 1297–1320.
- HAHN, H. J. (1989): “German Foreign Exchange Control - Rise and Demise,” *The International Lawyer*, 23(4), 873–890.
- HAYEK, F. A. (1944): *The Road to Serfdom*. University of Chicago Press.
- HEUSER, H. K. (1934): “The German Method of Combined Debt Liquidation and Export Stimulation,” *Review of Economic Studies*, 1(3), 210–217.
- HINNERICH, B. T., AND P. PETTERSSON-LIDBOM (2014): “Democracy, Redistribution, and Political Participation: Evidence From Sweden 1919–1938,” *Econometrica*, 82(3), 961–993.
- HUBER, K., V. LINDENTHAL, AND F. WALDINGER (2021): “Discrimination, Managers, and Firm Performance: Evidence from ‘Aryanizations’ in Nazi Germany,” *Journal of Political Economy*, 129(9), 2455–2503.
- INSTITUT FÜR KONJUNKTURFORSCHUNG (1933): *Konjunkturstatistisches Handbuch*. R. Hobbing.
- (1936): *Konjunkturstatistisches Handbuch*. R. Hobbing.
- JAMES, H. (1985): *The Reichsbank and Public Finance in Germany, 1924-1933: A Study of the Politics of Economics during the Great Depression*. Fritz Knapp Verlag.
- (2004): “Banks and Business Politics in Nazi Germany,” in *Business and Industry in Nazi Germany*, ed. by F. R. Nicosia, and J. Huener. Berghahn Books.

- (2020): “Neoliberalism and its Interlocutors,” *Capitalism: A Journal of History and Economics*, 1(2), 484–518.
- JOHNSON, S., AND T. MITTON (2003): “Cronyism and capital controls: evidence from Malaysia,” *Journal of Financial Economics*, 67(2), 351–382.
- JONES, G., AND C. LUBINSKI (2012): “Managing Political Risk in Global Business: Beiersdorf 1914–1990,” *Enterprise & Society*, 13(1), 85–119.
- KATONA, G. M. (1934): “How Real Is the German Recovery?,” *Foreign Affairs*, 13(1), 26–44.
- KLEIN, M. W. (2012): “Capital Controls: Gates versus Walls,” *NBER Working Papers*, 18526.
- KLUG, A. (1993): “The German Buybacks 1932–1939: A Cure for Overhang?,” *Princeton Studies in International Finance*, 75.
- KOBRAK, C. (2003): “The Foreign-Exchange Dimension of Corporate Control in the Third Reich: The Case of Schering AG,” *Contemporary European History*, 12(1), 33–46.
- KOBRAK, C., AND J. WÜSTENHAGEN (2006): “International Investment and Nazi Politics: The Cloaking of German Assets Abroad, 1936–1945,” *Business History*, 48(3), 399–427.
- KRUGMAN, P. (1988): “Market-Based Debt-Reduction Schemes,” *NBER Working Papers*, 2587.
- KUCZYNSKI, R. R. (1933): “Germany and Gold,” *The Annals of the American Academy of Political and Social Science*, 165(1), 207–209.
- LEAGUE OF NATIONS (1932–33): *Statistical Yearbook*. Geneva.
- (1938–39): *Statistical Yearbook*. Geneva.
- LEHMANN-HASEMEYER, S., AND J. STREB (2016): “The Berlin Stock Exchange in Imperial Germany: A Market for New Technology?,” *American Economic Review*, 106(11), 3558–76.
- MAGUD, N. E., C. M. REINHART, AND K. S. ROGOFF (2018): “Capital Controls: Myth and Reality—A Portfolio Balance Approach,” *Annals of Economics and Finance*, 19(1), 1–47.
- MATSUYAMA, K. (2014): “Institution-Induced Productivity Differences and Patterns of International Capital Flows,” *Journal of the European Economic Association*, 12(1), 1–24.
- NORTH, D. (1990): *Institutions, Institutional Change, and Economic Performance*. Cambridge University Press.

- PASRICHA, G. (2020): “Estimated Policy Rules for Capital Controls,” *IMF Working Papers*, 20.
- POOLE, K. E. (1939): *German Financial Policies 1932-1939*. Harvard University Press.
- RAJAN, R. G., AND L. ZINGALES (1998): “Which Capitalism? Lessons From The East Asian Crisis,” *Journal of Applied Corporate Finance*, 11(3), 40–48.
- REBUCCI, A., AND C. MA (2019): “Capital Controls: A Survey of the New Literature,” *NBER Working Papers*, 26558.
- REINHART, C. M., AND K. S. ROGOFF (2004): “Serial Default and the Paradox of Rich-to-Poor Capital Flows,” *American Economic Review*, 94(2), 53–58.
- (2013): “Financial and Sovereign Debt Crises: Some Lessons Learned and Those Forgotten,” *CEPR Discussion Paper Series*, 9750.
- (2014): “This Time is Different: A Panoramic View of Eight Centuries of Financial Crises,” *Annals of Economics and Finance*, 15(2), 215–268.
- REINHART, C. M., AND R. T. SMITH (2002): “Temporary controls on Capital Inflows,” *Journal of International Economics*, 57(2), 327–351.
- RITSCHL, A. (1991): “Die Deutsche Zahlungsbilanz 1936-1941 und das Problem des Devisenmangels vor Kriegsbeginn,” *Vierteljahreshefte für Zeitgeschichte*, 1, 103–123.
- (2001): “Nazi Economic Imperialism and the Exploitation of the Small: Evidence from Germany’s Secret Foreign Exchange Balances, 1938-1940,” *Economic History Review*, 54(2), 324–345.
- (2002): *Deutschlands Krise und Konjunktur, 1924-1934. Binnenkonjunktur, Auslandsverschuldung und Reparationsproblem zwischen Dawes-Plan und Transfersperre*. Berlin: Akademie-Verlag.
- (2012): “The German Transfer Problem, 1920-1933: A Sovereign Debt Perspective,” *European Review of History: Revue Européenne d’Histoire*, 10, 943–964.
- (2013): “Reparations, Deficits, and Debt Default: The Great Depression in Germany,” in *The Great Depression of the 1930s*, ed. by N. Crafts, and P. Fearon. Oxford University Press.
- (2019): “Financial Destruction: Confiscatory Taxation of Jewish Property and Income in Nazi Germany,” *LSE Economic History Working Papers*, 297.
- RITSCHL, A., AND S. SARFERAZ (2014): “Currency vs. Banking in the Financial Crisis of 1931,” *International Economic Review*, 55(2), 349–373.
- SCHACHT, H. (1934): “German Trade and German Debts,” *Foreign Affairs*, 13(1), 1–5.

- SCHNABEL, I. (2004): “The German Twin Crisis of 1931,” *Journal of Economic History*, 64(3), 822–871.
- (2009): “The Role of Liquidity and Implicit Guarantees in the German Twin Crisis of 1931,” *Journal of International Money and Finance*, 28(1), 1–25.
- SCHUKER, S. (1988): *American Reparations to Germany, 1924–1933*. Princeton University Press.
- SCHULARICK, M., AND T. M. STEGER (2010): “Financial Intergration, Investment, and Economic Growth: Evidence from Two Eras of Financial Globalization,” *The Review of Economics and Statistics*, 92(4), 756–768.
- SCHULZE, G. G. (2000): *The Political Economy of Capital Controls*. Cambridge University Press.
- SCHWARZ, H. P. (1982): *Die Wiederstellung des Deutschen Kredits: das Lodoner Schuldenabkommen*. Belser Verlag.
- SCHWEITZER, A. (1960): “Business Power Under the Nazi Regime,” *Zeitschrift für Nationalökonomie / Journal of Economics*, 20(3/4), 414–442.
- (1962): “Foreign Exchange Crisis of 1936,” *Zeitschrift für Nationalökonomie / Journal of Institutional and Theoretical Economics*, 118(2), 243–277.
- (1964): “Business Policy in a Dictatorship,” *The Business History Review*, 38(4), 413–438.
- SECURITIES AND EXCHANGE COMMISSION (1937): *Report on the Study and Investigation of the Work, Activities, Personnel and Functions of Protective and Reorganization Committees*, Part V: Protective Committees and Agencies for Holders of Defaulted Foreign Governmental Bonds. Washington DC: United States Government Printing Office.
- STONE, M. R. (1991): “Are Sovereign Debt Secondary Market Returns Sensitive to Macroeconomic Fundamentals? Evidence from the Contemporary and Interwar Markets,” *Journal of International Money and Finance*, 10(Supplement 1), S100–S122.
- TAHOUN, A. (2014): “The Role of Stock Ownership by US Members of Congress on the Market for Political Favors,” *Journal of Financial Economics*, 111(1), 86–110.
- TEMIN, P. (2008): “The German Crisis of 1931: Evidence and Tradition,” *Cliometrica*, 2, 5–17.
- THE ANNALIST (1930-1940): *The Annalist: A Journal of Finance, Commerce and Economics*, vol. 35-56 of *January 1930 - October 1940*. The New York Times Company.
- THE FINANCIAL TIMES (1929-1932): *The Financial Times & Weekly Supplements*, December 1929 - December 1932.

TONIOLO, G. (2005): *Central Bank Cooperation at the Bank for International Settlements, 1930–73*. Cambridge University Press.

U.S. DEPARTMENT OF STATE BULLETIN (1952): “Validation of German Dollar Bonds,” Vol. 27, 608–614.

WRIGHT, M. L. (2006): “Private Capital Flows, Capital Controls, and Default Risk,” *Journal of International Economics*, 69(1), 120–149.

Appendix

A Base Model

A.1 Additional figures related to Result 2

Result 2 (section 3.2) can be easily observed in Figure 5. Each boxplot summarizes the distribution of X^* for 50625 different combinations of underlying values of the structural parameters, given a value of α (on the horizontal axis) and fixing $D_0 = 100$. It shows our main result (result 1) that when $\alpha = 0.5$ then $X^* = 0$ independently of the combination of the other structural parameters. Additionally, it conveys the intuition that the greater the value of α , the wider the range of structural parameters that lead to $X^* > 0$ and the greater the highest attainable magnitude of X^* (on the vertical axis). In section A.2 we provide similar evidence for alternative specifications of σ .

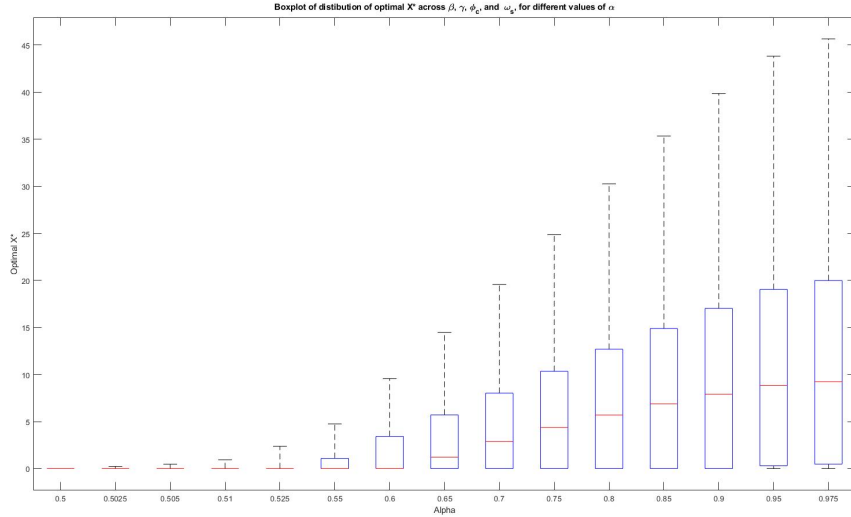


Figure 5: Boxplot of the distribution of X^* for different values of α .

For each value of α , the model is solved for all combinations of 15 values for each of the parameters β , γ , ω_s , ϕ_c , for a total of 50625 grid points *for each value of α* . The 15 values are: (0.025, 0.05, 0.10, 0.125, 0.15, 0.20, 0.25, 0.35, 0.45, 0.55, 0.65, 0.75, 0.85, 0.95, 0.975). Horizontal axis is not to scale.

Both a smaller β and a smaller ϕ_c reduce the maximum X^* attainable with any combination of α and ω_s , and they both increase the area in the space (α, ω_s) where $X^* > 0$. To show this point, Figure 6 plots the percentage of possible combinations of α and ω_s that lead to $X^* > 0$, as a function of ϕ_c and for different representative combinations of β and γ .⁵¹

⁵¹This is calculated as the area of the projection of the surface $X^*[\alpha, \omega_s] | X^* > 0$ on the (α, ω_s) plane.

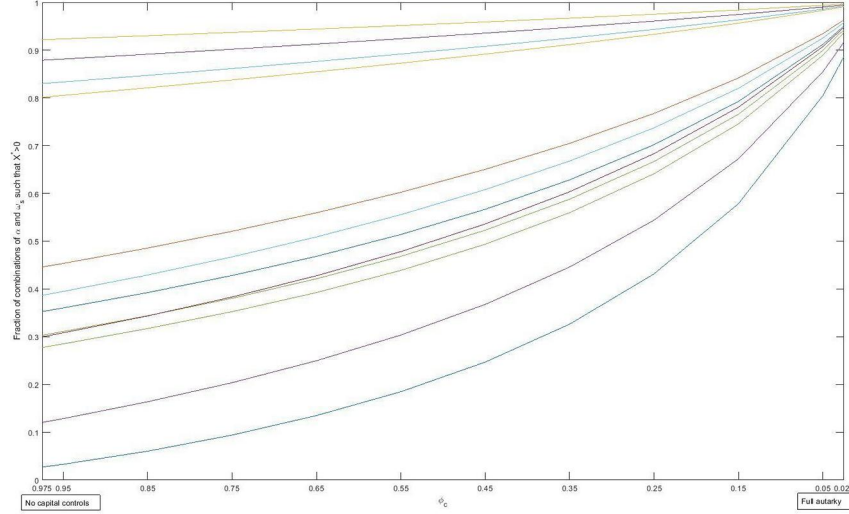


Figure 6: Percentage of possible combinations of α and ω_s that lead to $X^* > 0$, as a function of ϕ_c and for different representative combinations of β and γ . Reverse scale for ϕ_c : moving to the right increases capital controls.

A.2 Alternative enforcement technology σ

Here we consider two alternative specifications⁵² for σ :

$$\sigma_b[X|Y_p, \phi_c] = \beta(\phi_c Y_p - \max\{0, X - (1 - \phi_c)Y_p\}) \quad (14a)$$

$$\sigma_c[X|Y_p, \phi_c] = \beta \max\{0, \phi_c Y_p - X\} \quad (14b)$$

Function σ_b (14a) covers the case where X originates first from domestic resources shielded by capital controls (which amount to $(1 - \phi_c)Y_p$) and only when, and if, these are exhausted by X , funds are taken from resources available to creditors through σ . We can view this case as one more favorable to creditors relative to the reference one because, for low levels of X , some resources normally already defaulted upon will be transferred to creditors without a corresponding decline in expected repayments. Only when enough X has been used for repatriations, given ϕ_c , will resources available to creditors begin to decline, thus reducing σ_b . This implies no correlation between X and σ_b for low levels of X and a negative correlation for higher levels.

In contrast to the previous case, σ_c (14b) can be viewed as one more favorable to debtors, where X is financed first with resources that would have otherwise been seized by creditors, implying a negative correlation between X and σ_b for low levels of X and no correlation for higher values.⁵³

⁵²The function could be linear or nonlinear; [Bulow and Rogoff \(1991\)](#) provide more necessary conditions for the nonlinear case. We do not include an intercept for tractability. This would represent debt enforcement independent of capital controls e.g. military occupation.

⁵³This is not the only way to see that this case is favored by debtors. In the context of private commercial

We now show that the main results of the model presented in Section 3 hold also under a different enforcement technology σ . The two graphs in Figure 7 are constructed in exactly the same way as Figure 5, except that σ_b and σ_c (equations 14a and 14b) are substituted in each case for σ_a . Under all three scenarios, when $\alpha = 0.5$ then $X^* = 0$, and $X^* > 0$ only if $\alpha > 0.5$. As argued in Section 3, σ_b is the technology that, among the three proposed, discourages repatriations the most. In fact, when the boxplot in Figure 5 (in the main text) is compared with the boxplot in Figure 7a it can be noted that, as expected, the distribution of X^* has more mass towards zero in the case of σ_b , but nonetheless it allows for positive X^* under some parameter combinations when $\alpha > 0.5$. On the other hand, the model under σ_c - the technology that most encourages repatriations - has less mass of X^* on the zero outcome, but also in this case when $\alpha = 0.5$, then $X^* = 0$.

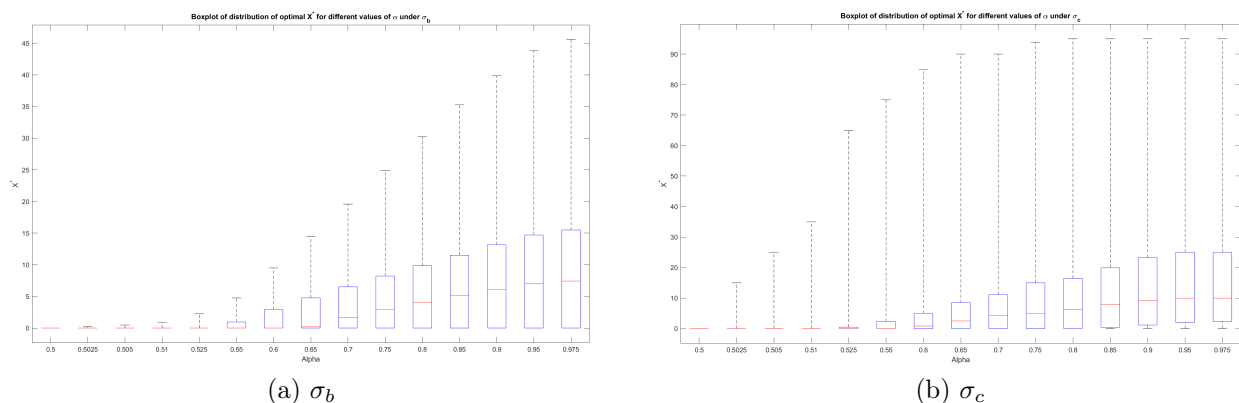


Figure 7: Boxplot of the distribution of X^* for different values of α , under σ_b and σ_c . For each value of α , the model is solved for all combinations of 15 values for each of the parameters β , γ , ω_s , ϕ_c , for a total of 50625 grid points for each value of α . The 15 values are: (0.025, 0.05, 0.10, 0.125, 0.15, 0.20, 0.25, 0.35, 0.45, 0.55, 0.65, 0.75, 0.85, 0.95, 0.975). Horizontal axis not to scale.

A.3 On the role of β and γ

The marginal effects of both β and γ have been already discussed in the main text. In Figure 8 we show the joint effect on X^* of β and γ , for representative given values of ϕ_c , α , and ω_s , and fixing $D_0 = 100$.

debt traded domestically (i.e. creditors and debtors share the same jurisdiction, so $\beta = 1$ representing perfect enforcement of contracts) this corresponds to corporate debt buybacks, where an issuer buys back its own debt. Buybacks are therefore always beneficial because, lacking better investment opportunities, in exchange for less than a dollar, they allow retiring a dollar's worth of collateral that could be seized in the event of default. See [Bulow and Rogoff \(1988\)](#) for details and limitations of this case.

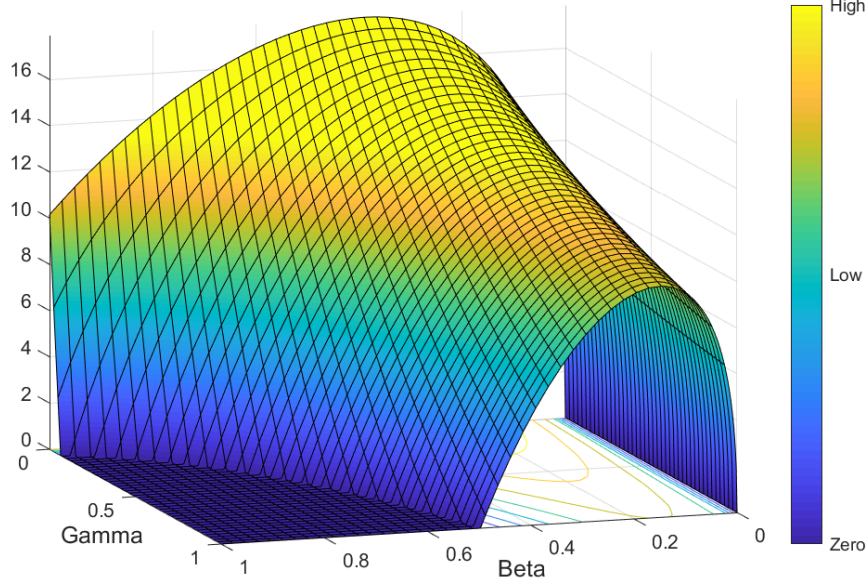


Figure 8: Optimal X^* on the vertical axis. ϕ_c was fixed at 0.8, $\omega_s = 0.1$, and $\alpha = 0.7$.

A.4 Proofs

Result 1. *A utilitarian social planner, i.e. with no bias for either group ($\alpha = 0.5$), is a sufficient condition for a socially optimal $X^* = 0$.*

Proof. The FOC of the social planner's optimization problem can be written as:

$$\underbrace{(2\alpha\omega_s - \alpha - \omega_s + 1)}_{\text{every citizen}} \underbrace{\left(-\underbrace{\left(\frac{\partial(\frac{X}{P_x})}{\partial X} + \frac{\partial R_x}{\partial X} \right)}_{\substack{\Delta \text{external default net} \\ \text{of domestic repayments}(-)}} - \underbrace{\gamma}_{\Delta G(-)} \right)}_{\text{supporters only}} + \alpha \underbrace{\left(\frac{\partial(\frac{X}{P_x})}{\partial X} - 1 \right)}_{\substack{\Delta \text{capital gains} \\ (+)}} = 0 \quad (15)$$

When $\alpha = 0.5$, the FOC simplifies to $-\partial R_x / \partial X = 1 + \gamma$, which under σ_a is $\beta\phi_c = 1 + \gamma$, where, however, $\beta\phi_c < 1 + \gamma$ always holds irrespective of (admissible) parameter values. Therefore, the boundary value $X^* = 0$ maximizes the social welfare function. It can be easily verified that the same result holds under σ_b and σ_c and, more generally, when $-\partial R_x / \partial X$ is less than $1 + \gamma$.

Result 2. *The necessary condition for X^* to be positive is $\alpha > 0.5$. Under this condition there exist wide ranges of all other structural parameters such that $X^* > 0$.*

Proof. It follows from analysis of the FOC (15).

A.5 An increase in ω_s always reduces X^*

The marginal effect of ω_s on the FOC (eq. 15) is (assuming $\alpha > 0.5$ and σ_a):

$$(2\alpha - 1) \left(\underbrace{-\left(\frac{\partial(\frac{X}{P_x})}{\partial X} + \frac{\partial R_x}{\partial X}\right)}_{\substack{\text{positive} \\ \geq 1}} \underbrace{-\gamma}_{\substack{\text{negative} \\ \geq -1}} \right) < 0 \quad (16)$$

Thus an increase in ω_s always reduces X^* .

A.6 On the effect of an increase in α and its interaction with ω_s

Under the same assumptions as above we study the marginal effect of an increase in α on the FOC:

$$(2\omega_s - 1) \left(\underbrace{-\left(\frac{\partial(\frac{X}{P_x})}{\partial X} + \frac{\partial R_x}{\partial X}\right)}_{\substack{\text{negative} \\ \geq 1}} \underbrace{-\gamma}_{\substack{\text{negative} \\ \geq -1}} \right) + \underbrace{\frac{\partial(\frac{X}{P_x})}{\partial X} - 1}_{\text{positive}} \quad (17)$$

The sign of equation (17) will crucially depend on the sign of $(2\omega_s - 1)$.

- When $\omega_s \leq 0.5$, the condition is always positive and an increase in α increases X^* , unless the non-negativity condition on $X = 0$ is binding.

For the case when $\omega_s > 0.5$, it is easier to rewrite equation (17) and to replace the actual derivative of R_x :

$$\underbrace{(2 - 2\omega_s)}_{\geq 0} \underbrace{\frac{\partial(\frac{X}{P_x})}{\partial X}}_{\geq 1} + \underbrace{(2\omega_s - 1)}_{> 0 \ \& \ \leq 1} \underbrace{(-(-\beta\phi_c) - \gamma)}_{> -1 \ \& \ < 1} - 1 \quad (18)$$

- When $\omega_s = 1$, the first additive term goes to zero and only the additional marginal costs are left. In this case, an increase in α always decreases X^* . Remember that when $\alpha = 0.5$ then $X^* = 0$, so $X^* = 0$ holds for any value of α .
- When $0.5 < \omega_s < 1$, the sign of the effect of an increase in α on X^* will depend on the balance between the additional marginal benefits and costs, therefore on the actual values of the structural parameters. One can see that lower additional marginal costs are associated with higher values of β and ϕ_c (the additional domestic repayments are not much larger than what foreigners would get) and lower values of γ (less income forfeited through the public good). The additional marginal gains, on the other hand, are higher with higher values of β and ϕ_c .

A.7 Comparison with related models

Comparing our model to the closest literature allows us to highlight some interesting features and novelties of our approach. We generalize BR’s main result over another dimension of policy making by means of simple microfoundations, thus separating individual and collective interests. The main economic force at play is still one that leads to $X^* = 0$, and for the same reason as in BR. However, in our case, that force can be countered by an unequal government preference for the welfare of different groups of citizens, which pushes the government to adopt a policy $X^* > 0$ because detrimental effects are borne by all citizens (through equation 8 and decreased public good provision), while the benefits are only enjoyed by the preferred group.⁵⁴

As previously discussed, direct relation with the results of BR is evident when considering a higher ω_s (the supporters group size), everything else equal: the extreme case of $\omega_s = 1$ (all citizens are supporters) is exactly the case of BR, where collective and group interests match perfectly and therefore $X^* = 0$. If an individual within the group could deviate from the government decision, then she would make capital gains at the expense of all others: the government solves exactly this coordination problem. In general, when $X^* > 0$, the higher the number of citizens allowed to engage in repatriations, the lower X^* becomes, until it quickly reaches zero again; note that ω_s need not necessarily reach 1 for $X^* = 0$. This happens because, as ω_s increases, the *collective* detrimental effects of repatriations in the form of higher domestic repayments in ρ are gradually internalized by more supporters and capital gains cannot compensate for this (equation 15). Conversely, decreasing ω_s when $X^* > 0$ will lead to a higher X^* . Note that these outcomes in the spirit of BR can be observed on the *supply* side of X , i.e. the government’s choice of X that maximizes the social welfare function.

A comparison with BMV must start by highlighting one key difference: in the language of our model, BMV assume that the government can control β and nothing else, and that trade on secondary markets is purely driven by unregulated private incentives.⁵⁵ Similarly to BMV, in our model agents also have private incentives to repatriate but, as in BR, the government controls X , thereby limiting private demand for it.

In BMV, when debt is in foreign hands the government will of course choose $\beta = 0$ to strategically default on foreigners, the socially preferable outcome. However, smoothly functioning secondary markets allow for a full circumvention of that policy as citizens can access any level of X they can afford to repatriate debt for their own profit. In equilibrium *all* debt is therefore repatriated (i.e. $D_x = 0$)⁵⁶ and no strategic default is possible when $\phi_c = 1$. In contrast with BMV, we allow R_x to be non-zero and its relation with X defined in σ : this permits partial repatriations ($D_x > 0$).

⁵⁴BR note that by relaxing some conditions in their model they can numerically obtain a positive optimal X . However, they find that this holds only for a range of structural parameters values they deem unrealistic.

⁵⁵To fully compare our model to BMV one must assume $\omega_s = 1$ and no government spending (1) (or $\gamma = 0$).

⁵⁶To see this, note that when $\beta = 0$, eq.(5) becomes $P_x = X/D_0$, which then simplifies in (3) to get $D_x = 0$. BMV propose a variation of their model (Example 9, page 1544) that allows for what can be interpreted as debt repatriations under impaired secondary markets. However, also in that case all debt is repatriated.

It is in this comparison with BMV that the crucial role played by secondary markets stands out the most. In fact, given β and ϕ_c , in our model the values of the different σ are generally not the same. Since different specifications of σ represent alternative implementations of capital controls, this shows that *how* secondary markets are impaired matters and it should be explicitly modeled, separately from other sources of debtor-creditor interaction.

Other papers, notably [Krugman \(1988\)](#) and [Froot \(1989\)](#), also reach the conclusion that sovereign buybacks can be socially beneficial under specific conditions. While noting that their frameworks are very different from ours, they depart most notably by assuming the specific case of $\beta = 1$, an assumption closer to a case of corporate buyback (see footnote 53). This highlights the importance of studying more general frameworks for debt repatriations, especially when it concerns the debtor-creditor interaction as in function σ .

An issue featured prominently in most models mentioned in this section is that of debt overhang. We do not address it directly, but overhang can be included by adding two small extensions to the model. First, an alternative use for the government endowment not used for repatriations, representing the efficient domestic allocation of resources potentially affected by foreign debt. Second, the resources that creditors can seize (Y_p) should depend on this allocation of resources. However, since our model generalizes BR by using similar model mechanics of international markets, and because the channel of debt overhang reduction increases resource allocation efficiency, we believe it would lead to a higher or at most unchanged X^* , which would only strengthen our result.

B Further historical background

B.1 The composition of German debt in 1931

Data collected from archival sources provides further insights into the context in which the German debt repatriations took place. In particular, we have a snapshot of the nature and composition of German foreign commercial debts at the end of November 1931, in the early stages of repatriations (Table 4). As mentioned in the text, the USA was Germany’s principal creditor and industry the principal debtor. England, the Netherlands, Switzerland, France and the Bank for International Settlements also had significant holdings. Although America’s lending to Germany has been often highlighted as exceptional and at least partially politically motivated - [Schuker \(1988\)](#) called it “American reparations to Germany” - the USA was the principal lender of the 1920s for a good number of countries. [Accominotti and Eichengreen \(2016\)](#) have shown that around 66% of all European bond issues between 1924 and 1928 took place in New York.

The geographical distribution of short-term debt was somewhat different from its long term counterpart, with the USA playing a less prominent role and the debt being more evenly distributed across the other principal creditors. The distribution of short term debt amongst debtor sectors was also different, with the industrial sector playing a slightly smaller role and the public sector’s share being higher than that for overall debt .

German commercial foreign debt was issued in a variety of currencies, but the US Dollar

Panel A: Total debt					
Creditor country	Debt share	Debtor sector	Debt share	Currency	Debt share
USA	41.72%	Industry	61.68%	US Dollar	50.0%
Netherlands	16.96%	Public bodies	16.38%	Pound Sterling	11.8%
Switzerland	12.96%	Banks	15.35%	Reichsmark	10.7%
UK	12.94%	Reichsbank & Golddiskontbank	3.67%	Swiss Franc	9.7%
France	4.79%	Private citizens	2.41%	Dutch Guilder	9.2%
BIS	3.49%	Insurance companies	0.40%	French Franc	3.6%
Italy	0.69%	Schools, churches etc.	0.11%	Other currencies	4.9%
Other countries	7.35%				

Panel B: Short-term debt					
Creditor country	Debt share	Debtor sector	Debt share	Currency	Debt share
USA	30.99%	Industry	53.77%	US Dollar	41.8%
Netherlands	16.28%	Public bodies	8.11%	Pound Sterling	12.6%
Switzerland	15.72%	Banks	25.80%	Reichsmark	14.5%
UK	13.26%	Reichsbank & Golddiskontbank	7.31%	Swiss Franc	11.1%
BIS	6.97%	Private citizens	4.45%	Dutch Guilder	10.4%
France	5.11%	Insurance companies	0.46%	French Franc	3.2%
Italy	0.72%	Schools, churches etc.	0.11%	Other currencies	6.3%
Other countries	10.96%				

Table 4: The composition of German foreign commercial debts, November 1931. Short-term debt is defined as having maturity of a year or less. BIS= Bank for International Settlements. Source: Bank of England Archive OV34/69: *Die Auslandsverschuldung Deutschlands nach dem Stande von 30. November 1931*.

was the principal currency of denomination. Around 50% of the debt was issued in US currency, 12% in British Pounds, 11% in Reichsmarks, 10% in Swiss Francs and 9% in Dutch Guilders. In line with the composition of creditors, the US dollar played a relatively smaller role in short-term debt, while other currencies made up larger shares.

B.2 Debt relief, controls and repatriations

B.2.1 International debt relief

International creditors attempted to offer some relief to German debtors. On June 21, 1931, US President Hoover introduced a one-year moratorium on German intergovernmental debts and reparations, while the Reichsbank received a \$100 million emergency loan from other central banks. In addition, the first Standstill Agreement - signed in August 1931 - meant that approximately 6.3 billion Reichsmarks of German short-term debts were frozen (Clement, 2004). The agreement was renewed until 1939 with German debtors only making yearly partial payments. Finally, the Lausanne Conference of July 1932 de facto put an end to reparation payments, hugely reducing Germany's external debt. The Dawes and Young obligations, instead, were preserved (Clement, 2004).

B.2.2 Trade and the exchange control system

Writing in the post-war period, [Child \(1958\)](#) saw the exchange control system as a highly sophisticated trade policy tool, in line with views prevalent in the 1930s expressed, for example, by [Heuser \(1934\)](#), [Einzig \(1934\)](#) and [Katona \(1934\)](#). Child argued that the German authorities used the system to manipulate the size, direction and terms of trade in Germany's favor, by exploiting the country's monopolistic/monopsonistic position in certain markets, especially in South-Eastern Europe and Latin America.

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

Another contemporary, [Ellis \(1940a\)](#), concurred with the trade tool interpretation, but restricted its validity to a limited time frame, arguing that, after 1933, the perpetuation of exchange controls ceased to have an economic rationale and was, instead, based on political objectives of the National Socialist regime. Specifically, he argued that, as the National Socialist government's *Aktive Konjunkturpolitik* (active business cycle policy) gained importance after 1934, exchange controls were an essential tool for guaranteeing the coexistence of expansionary monetary and fiscal policies with a fixed exchange rate. In other words, they became an effective financial repression tool aimed at channeling resources to government financing. At the same time, they were one of the many facets of the NSDAP's totalitarian control of trade, investment and the economy in general.

In a modern reassessment of Nazi Germany's trade policy, [Ritschl \(2001\)](#) has ruled out a successful attempt by the German authorities to significantly shape trade flows before WWII, at least in European markets. Matters changed with military occupation, after which the exploitation of occupied countries became enormous.

B.2.3 The size of repatriations in the secondary literature

Although full credit must be given to [Klug \(1993\)](#) for exposing the fact that the German repatriations were much larger than previously believed and for providing the most reliable estimates of their size, he did somewhat mischaracterize the extent to which contemporary commentators and economists were unaware of the timing and magnitude of such operations. On page 19 he stated: "Earlier scholarly accounts of the buybacks all accepted the claim of the German authorities that no bonds were repurchased after November 1933 and that the

total amount repurchased from the beginning of 1932 was RM 781 million (Harris, 1935, p. 38; Bonnell, 1940, p. 56; Ellis, 1941, p. 300).” Yet the cited Ellis, for example, reported that bond and Blocked Marks repurchases in the context of export subsidization were between 500 and 700 million RM per year based on reconstructions by the financial press in an earlier publication (Ellis, 1940a, page 83). These amounts are actually higher than those estimated by Klug for those same years and illustrate that, not only were contemporaries aware that this was a large phenomenon, which also explains why it was so widely discussed at the time, but also had full knowledge that repatriations carried on well after 1934. Klug also believed pre-1932 repatriations to have been negligible, but our figure for 1931, estimated using archival sources, highlights that the practice was already widespread in that year.

B.3 The conversion of foreign bonds

As discussed in Section 4.2, repatriated foreign currency bonds could be converted into domestic RM bonds.⁵⁷ The principal governmental actor involved in this operation was the Reichsbank subsidiary: the Golddiskontbank. The Bank physically took custody of the repatriated foreign bonds from the bondholders and issued new RM-denominated bonds. An example of this can be seen in Figure 9, which features both the original and reissued bond. This particular bond was Austrian - issued by the Styrian Water Power and Electricity company - and was converted in December 1939. In fact, after the Anschluss of 1938, Austrian foreign bonds were eligible for conversion by the German Golddiskontbank. In this case, the bond, originally issued in 1929, for a face value of \$50 was converted into a 132 RM bond, implying an exchange rate of 2.64 RM per dollar, slightly above the official 2.5 exchange rate. The coupon of the bond was reduced from the original 6% to 4.5% in line with the mandated interest rate within Germany.

Interestingly, the initiative for converting the bonds could come from both the holders of the repatriated bonds and the original issuers. The former had several reasons for engaging in conversions. First, this would ensure the regular and full servicing of the bonds, albeit with a reduced coupon and in domestic rather than foreign currency. Second, from June 1934, converted bonds could be sold on the stock market, opening the way to immediate and large arbitrage profits. The final motivation for the conversion of bonds was the increasing scrutiny under which foreign currency holdings of Germans came as the Nazi government tightened its grip on the German economy and society. Conversion offered the possibility of turning foreign currency assets into domestic ones at advantageous conditions.

Bond issuers also had reasons to propose and incentivize the conversion of bonds. The principal one, already outlined in Section 4.2, is that the blanket foreign default imposed by the sovereign might not have served the needs and desires of individual bond issuers. Reputational considerations and the desire to preserve ties with foreign suppliers, clients and other counterparts spurred some debtors to encourage the repatriation of their bonds by issuing public offers of conversion. Conversion also facilitated the buyback of the bonds by the company at a later stage. This was especially relevant if the issuer could not carry

⁵⁷We thank Josefin Meyer and Hans-Georg Glasemann for useful comments and discussions on this topic.

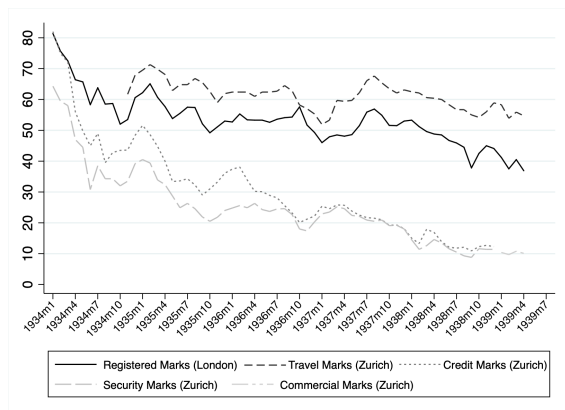
[82738]. **Umtauschangebot.**
Reichsmarktschuldverreibungen gegen Dollarbonds der gemeinschaftlich von uns aufgenommenen durch Hypothek gesicherten mit 6½% verzinslichen und in 20 Jahren amortisierbaren Dollaranleihe vom Jahre 1928 (Dortmund Municipal Utilities Twenty-Year Sinking Fund 6½% Mortgage Gold Bonds, Due October 1, 1948).
 Wir machen hierdurch den inländischen Besitzern unserer Dollarbonds nachfolgendes Angebot, an das wir uns bis zum 15. April 1934 gebunden halten: Wir sind bereit, gegen je \$ 1000.— Nennwert obiger Anleihe nebst Zinsseheinen, fällig am 1. Oktober 1933 und ff. RM 3000.— Nennwert neuer, mit 3½% jährlich verzinslicher, auf den Inhaber lautender Reichsmarktschuldverreibungen nebst Zinsseheinen, fällig am 1. Oktober 1933 und ff. auszutauschen.
 Die näheren Bedingungen sind aus unserem ausführlichen Umtauschangebot ersichtlich, das bei den Banken oder unmittelbar bei der Geschäftsstelle der Dortmund Gas-Werk Aktiengesellschaft, Dortmund, Auf dem Berge 34, angefordert werden kann.
 Es wird hier auf folgendes hingewiesen:
 1. Zins- und Tilgungstermine der Schuldverreibungen decken sich mit denjenigen der Dollarbonds.
 2. Sowohl zertifizierte, wie nicht zertifizierte Dollarbonds sind zum Umtausch zugelassen. Zertifizierte Dollarbonds sind mit Zertifikatsbescheinigungen einzureichen. Nicht zertifizierte Dollarbonds ist ein Affidavit beizufügen, dessen Inhalt in dem ausführlichen Umtauschangebot bekanntgegeben ist.
 3. Inländische Besitzer von Dollarbonds, die das vorstehende Angebot annehmen wollen, werden gebeten, dieses auf vorgeschriebenem Vordruck der Deutschen Golddiskontbank Umtausch- und Hinterlegungsstelle, Berlin SW 111, entweder unmittelbar oder durch Vermittlung von Banken mitzuteilen. Diese Mitteilung muß bis zum 15. April 1934 bei der genannten Stelle eingegangen sein. Der Mitteilung sind die umzutauschenden Dollarbonds beizufügen. Werden die Stücke noch im Ausland aufbewahrt, ist Bescheinigung einer Bank beizufügen, in der dem inländischen Besitzer bezeugt wird, daß er seit dem 15. April 1934 Inhaber der Stücke ist. Die im Ausland aufbewahrten Stücke selbst sind spätestens bis zum 28. April 1934 nachzureichen.
 4. Die eingeleiteten Dollarbonds gehen in unser Eigentum über, werden aber von der Deutschen Golddiskontbank als Sicherheit für die auszuhängenden Reichsmarktschuldverreibungen treuhänderisch verwahrt und verpfändet. Sämtliche für die Dollaranleihe gestellten Sicherheiten bleiben auch für die Reichsmarktschuldverreibungen wirksam.
 5. Die zu zahlende Körperschaftsteuer wird von uns erlassen.
 Dortmund, den 21. März 1934.
Dortmunder Gas-Werk Aktiengesellschaft.
Dortmunder Wasserwerks-Gesellschaft mit beschränkter Haftung.
Dortmunder Straßenbahnen-Gesellschaft mit beschränkter Haftung.

(a) Municipal utility companies, Dortmund

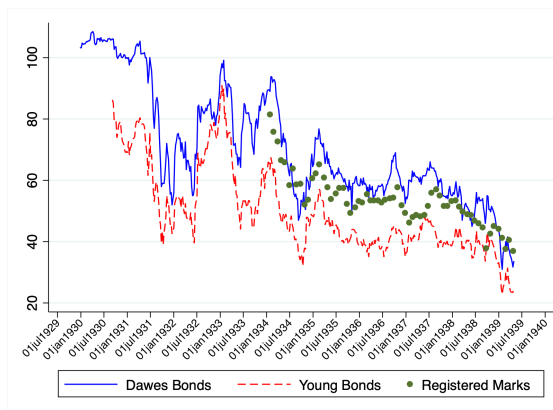
[1009]. **Umtauschangebot.**
 Wir, die inländischen Besitzer der Reichsmarktschuldverreibungen unter der Aufsicht von 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 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2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 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2746, 2747, 2748, 2749, 2750, 2751, 2752, 2753, 2754, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2795, 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 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3576, 3577, 3578, 3579, 3580, 3581, 3582, 3583, 3584, 3585, 3586, 3587, 3588, 3589, 3590, 3591, 3592, 3593, 3594, 3595, 3596, 3597, 3598, 3599, 3600, 3601, 3602, 3603, 3604, 3605, 3606, 3607, 3608, 3609, 3610, 3611, 3612, 3613, 3614, 3615, 3616, 3617, 3618, 3619, 3620, 3621, 3622, 3623, 3624, 3625, 3626, 3627, 3628, 3629, 3630, 3631, 3632, 3633, 3634, 3635, 3636, 3637, 3638, 3639, 3640, 3641, 3642, 3643, 3644, 3645, 3646, 3647, 3648, 3649, 3650, 3651, 3652, 3653, 3654, 3655, 3656, 3657, 3658, 3659, 3660, 3661, 3662, 3663, 3664, 3665, 3666, 3667, 3668, 3669, 3670, 3671, 3672, 3673, 3674, 3675, 3676, 3677, 3678, 3679, 3680, 3681, 3682, 3683, 3684, 3685, 3686, 3687, 3688, 3689, 3690, 3691, 3692, 3693, 3694, 3695, 3696, 3697, 3698, 3699, 3700, 3701, 3702, 3703, 3704, 3705, 3706, 3707, 3708, 3709, 3710, 3711, 3712, 3713, 3714, 3715, 3716, 3717, 3718, 3719, 3720, 3721, 3722, 3723, 3724, 3725, 3726, 3727, 3728, 3729, 3730, 3731, 3732, 3733, 3734, 3735, 3736, 3737, 3738, 3739, 3740, 3741, 3742, 3743, 3744, 3745, 3746, 3747, 3748, 3749, 3750, 3751, 3752, 3753, 3754, 3755, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3764, 3765, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3779, 3780, 3781, 3782, 3783, 3784, 3785, 3786, 3787, 3788, 3789, 3790, 3791, 3792, 3793, 3794, 3795, 3796, 3797, 3798, 3799, 3800, 3801, 3802, 3803, 3804, 3805, 3806, 3807, 3808, 3809, 3810, 3811, 3812, 3813, 3814, 3815, 3816, 3817, 3818, 3819, 3820, 3821, 3822, 3823, 3824, 3825, 3826, 3827, 3828,

but, available data suggests that their price probably tracked those of German bonds traded in the same markets (see Figure 11).

Scrip was also arrears. More precisely, it was German currency with no legal tender, which was used from June 1933 to pay 50% of the debt service (70% from December of the same year) on non-*Standstill* debts. Scrip could be purchased by those wishing to import German goods in foreign financial centers (often at substantial discount). After the export transaction, the scrip was converted into RM by the *Golddiskontbank* at an exchange rate that allowed the central bank to share in the profits of the operation.



(a) Different categories of blocked accounts traded in London and Zurich



(b) Registered Marks and German bonds traded in London

Figure 11: Quotations of blocked accounts.

Prices of blocked accounts are monthly averages except for the first ten months of 1934, for which mid-month values are given. Prices for blocked accounts are the end of the week quotations. Source: the blocked accounts data comes from [Ellis \(1940a\)](#); the London bonds quotations are from [The Financial Times \(1929-1932\)](#) for 1929-32 and [Brown and Burdekin \(2002\)](#) for the rest of the period.

As seen, scrip and blocked account operations were fairly similar to each other and involved the transfer of these depreciated Reichsmarks from foreign creditors to Germans exporters, who could then turn these into regular Reichsmarks for a profit. Initially, foreign importers would procure these assets to be used in partial payment (up to 60%) of German goods on financial markets. From June 1933, this passage was no longer necessary, as the repatriation of these assets started to take place through the mediation of the *Konversionsskasse* and the *Golddiskontbank*. The economic mechanisms underpinning the operations, however, did not change. As stated by [Heuser \(1934, page 213\)](#): “The fact that the foreign creditor prefers an immediate realization of his claim, even at the risk of a loss, rather than the postponement of it to an uncertain future, is again at the basis of the new scheme. The main difference between the old and the new method lies in the fact that the export price reduction is now effected internally, independently of the foreign importer, for whom it is no longer possible or necessary to acquire depreciated marks in order to obtain German goods at a lower price.”

Heuser provided a schematic representation of this newer system, which illustrates its

complex working and the various players, both public and private, involved. We reproduce this scheme in Figure 12 for the reader interested in the details of the repatriations carried out in this more intricate manner. The specific discounts applied to the various transactions capture the situation in the first half of 1934, after the Law on Payments Abroad (approved in May 1933) and successive modifications to the level of debt service were passed, but before the complete moratorium of July 1934 was enforced.

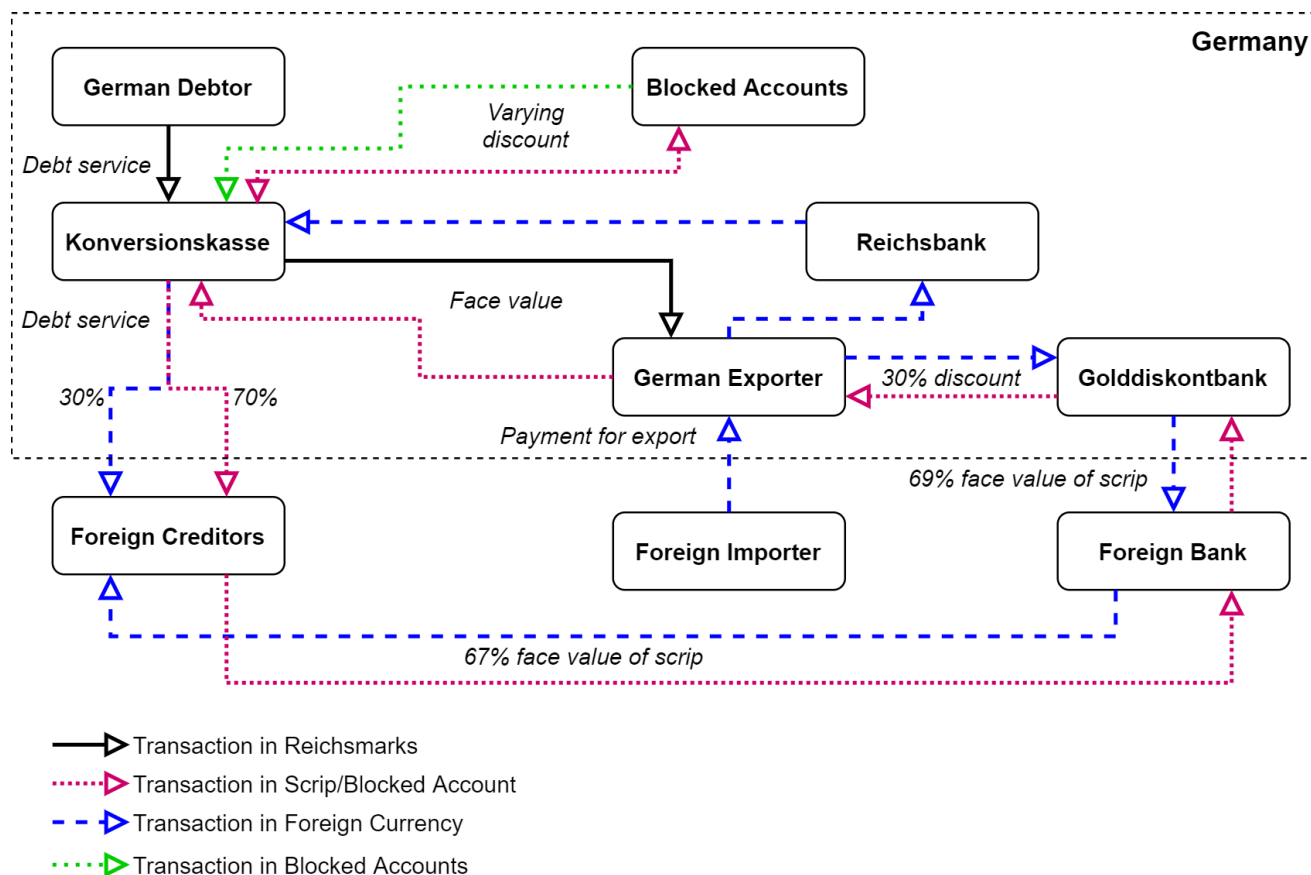


Figure 12: The repatriation scheme involving scrip and blocked accounts. The diagram refers to the period after May 1933, and the various discounts and debt service levels to the period between December 1933 and July 1934. Source: adapted by the authors from Heuser (1934).

The operations worked as follows. The German debtor would pay the debt service in RM to the Konversionskasse. 30% of this service would be transferred by the Konversionskasse to the foreign creditor in foreign exchange provided by the Reichsbank, as long as this did not exceed 4% of the principal. The rest of the service would be paid in scrip, which, as mentioned, was German currency with no legal tender. The creditor could turn the scrip over to a bank in its country of origin for 67% of its face value, leading to a total 77% debt service. The bank would then sell the scrip to the Golddiskontbank at 69% of its face value. At the same time, a German exporter could obtain authorization - after “proving” that its production costs exceed world prices - to use part of the foreign exchange from its

export transactions to purchase scrip from the Golddiskontbank at 30% discount. The scrip obtained could then be turned into RM at face value at the Konversionskasse leading to a profit that would make up for the supposed sale below cost. The rest of the foreign exchange, the amount depended on the estimate of the loss incurred by the exporter in the sale abroad, would be transferred to the Reichsbank.

Transactions with blocked accounts operated within this system as well. The difference was simply that the owner of blocked accounts could liquidate its outstanding balances at the Konversionskasse at discounts that depended on the original claim generating the blocked account. The owner of the liquidated blocked accounts would receive either scrip or claim certificates, which would then enter the additional export system.

B.5 Colonel Francis Norris and Siegfried Wreszynski

Norris and Wreszynski were a British subject and a citizen of Danzig, respectively. Norris had been a member of the Inter-allied Commission of Control in Germany, a body set up by the Treaty of Versailles. The two enjoyed some tabloid fame in 1933-35 due to their lavish *Park-lane millionaires* lifestyle in London and Paris, as well as for the curiosity surrounding the nature of their fortunes. Sometimes as trustees, other times as debt factors, they would intermediate the unfreezing of blocked accounts and the repatriation of German bonds for large holders, such as banks, large companies (e.g. Unilever), and the Vatican.

Accusations of fraud made by some of their clients in England, France, and the Netherlands are difficult to assess, as they could be part of larger political power plays to dismantle their operation. In any case, their demise was as quick as their rise. Norris was indicted in France in May 1934 and expelled from the country in 1935, yet never arrested. Wreszynski was arrested in Amsterdam in 1938 for small-time frauds, only three years after a diamond-packed wedding to Norris' former wife and herself a business partner. After his release four years later he went into hiding, as he was a Jew in occupied Netherlands. After the war, he was sentenced for frauds, committed during his hiding, against families of captured Dutch resistance members.

B.6 The “true” size of repatriations: tentative calculations

In Section 4.2.1 of the main text, we provided the broad strokes of our rough calculations designed to determine whether the foreign exchange generated by Germany in the 1930s was sufficient to carry out the debt repatriations. Here we provide a more thorough description.

We start with the face value of repatriations. Klug (1993) estimated this to be approximately 4 billion Reichsmarks for the period 1931-39. We also estimate our own upper-bound based on the same author's additional assertion that around 40% of German long-term debt was repatriated. Since no definition of “long-term” is provided by the author, and in line we are desire to provide an upper bound of repatriations, we make the assumption that all 25.9 billion Reichsmarks of German debt were long-term. In reality, official reports of the

time report German foreign long-term debt to have been roughly 50% of the total,⁵⁸ with “long-term” being defined as exceeding one year maturity. A 40% reduction of said debt implies a roughly 10.4 billion Reichsmarks fall in the value of the debt between 1931 and 1939. This is an upper bound also because some of the repatriations took place after 1939, but we will consider that all repatriations took place until then for the sake of this exercise and also because later repatriations involved Austrian debt as well, which is not included in the 1932 figure.

In the next step, we discount the depreciation of debtor creditor’s currencies following their departure from the Gold Standard. The currency composition of the debt is provided in Table 4. We obtain the exchange rate depreciation vis-a-vis the Reichsmarks from the League of Nations Statistical Yearbooks (Table 5). As a measure of depreciation of undefined “other currencies”, we employ a simple average of all other currencies of denomination. Accounting for depreciation, the upper bound face value of the depreciation is roughly 7 billion Reichsmarks.

Currency	Δ in exchange rate vis-a-vis the RM, 1932-38
US Dollar	-40%
Pound Sterling	-39%
Swiss Franc	-32%
Dutch Guilder	-15%
French Franc	-57%

Table 5: Depreciation of the creditor countries’ currencies.

Source: authors’ calculations based on data in the [League of Nations \(1932-33, 1938-39\)](#)

The last step of the calculation consists in turning the face values of repatriations, both Klug’s original number and our upper bound estimate, into actual Reichsmarks of foreign exchange spent. This requires employing the market discount prevailing at the time and place the repatriations took place (we use the average market discount of the year, calculated from our weekly price data). While price dynamics were very similar across bonds, discount levels differed mainly due to different coupons (e.g. Dawes bonds had a higher coupon than Young bonds, and therefore traded at a lower discount to equalize the yield). This means that the specific bonds involved in the repatriations matter.

Unfortunately, we have no precise information on either the geographical breakdown of the repatriations or the bonds involved. Moreover, we have complete price data for our whole period only for New York and London. Therefore, we create three scenarios aiming to capture the lower and upper bounds of repatriations, as well as a reasonable middle-ground. In the upper bound estimate, all repatriations took place in London - where lower discounts both compared to continental Europe and the United States prevailed - and involved the bonds with the lowest discount (Dawes bonds). In the lower-bound estimate, all repatriations took

⁵⁸Bank of England Archive OV34/69: *Die Auslandsverschuldung Deutschlands nach dem Stande von 30. November 1931*

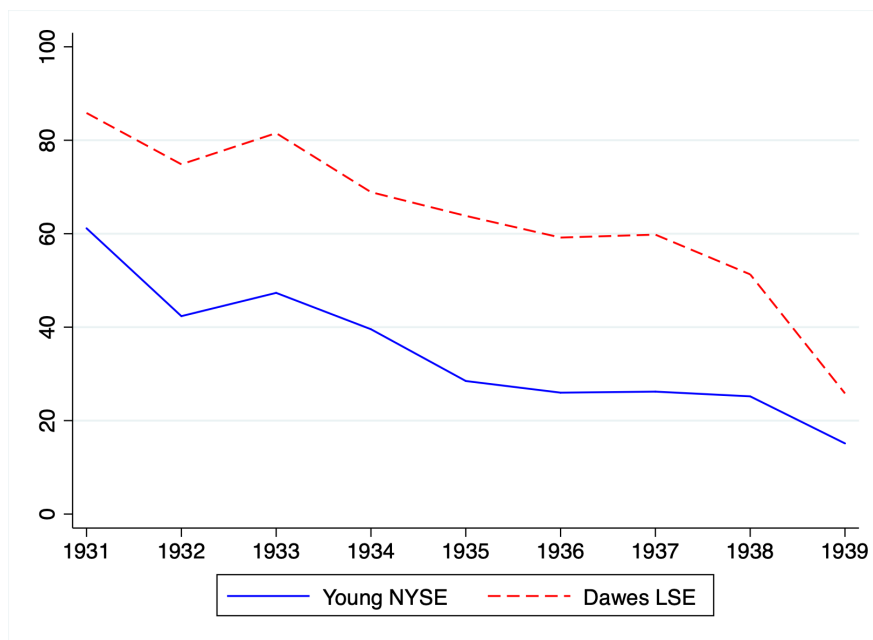


Figure 13: Average yearly bond prices used in our calculations.

Yearly average of end of the week quotations. NYSE = New York Stock Exchange, LSE = London Stock Exchange. Source: New York, [The Annalist \(1930-1940\)](#); London, [The Financial Times \(1929-1932\)](#) for 1929-32 and [Brown and Burdekin \(2002\)](#) for the rest of the period

place in New York - where a higher discount than London, but similar to that of continental Europe, prevailed - and involved the bonds with the largest discount (Young bonds). Since we know that more repatriations took place in the US/Continental Europe compared to the UK, in our baseline we assume 60% of repatriations took place in the former and 40% in the latter. Table 6 presents the results of these estimations for all three scenarios and for both estimates of the face value of repatriations.

Based on Klug's estimate		Based on new upper bound of estimate	
Scenario 1: lower bound	1.6	Scenario 1: lower bound	2.7
Scenario 2: baseline	2.3	Scenario 2: baseline	4.0
Scenario 3: upper bound	2.8	Scenario 3: upper bound	4.9

Table 6: Estimates of the foreign exchange spent on repatriations (billions of RM equivalent), 1931-39. Source: authors' calculations, see text.

B.7 The selective default decision

The German government's decision to implement a sovereign default on foreign creditors involving both public and private debts, while enforcing domestic payments, was in line with the objectives of the NSDAP - autarky, rearmament and territorial expansion. We can also

identify an economic rationale for the decision - which may be more relevant for Weimar governments - by framing the selective default decision based on factors identified by [Erce \(2012\)](#) as crucial for such a decision: 1) the source of the liquidity pressure, 2) the health of banking system, 3) the sources of financing for the economy. Almost half of Germany's foreign commercial debt accumulated in the 1920s was short-term. Towards the end of the decade, rolling over this debt became increasingly difficult, due to the provisions of the Young Plan, the onset of the Great Depression and the deteriorating financial circumstances in the United States and other creditor nations. Thus, the evidence points to a strong liquidity pressure coming from abroad. Additionally, Germany underwent a devastating banking crisis in 1931. This made it very unpalatable for the authorities to impose further pressure on a crippled financial sector in the form of an internal default. Moreover, exchange controls were introduced precisely in order to shield the domestic economy and the banks from capital flight. The precarious health of Germany's banking system might have therefore further discouraged the German authorities from not enforcing domestic payments.

While Germany relied heavily on foreign borrowing to finance reparations payments, as well as its public and private sectors, during the 1920s, international financial markets were essentially shut for German borrowers starting from 1929, particularly for medium and long-term loans.⁵⁹ After the deluge in foreign borrowing of 1924-28, the German economy started moving towards trade and financial autarky, especially after the NSDAP ascended to power in 1933. In this context, access to foreign borrowing became of limited importance, paving the way for external default.

To conclude our discussion, we point out that there was a limited and implicit form of internal default in 1930s Germany. The work-creation and rearmament programs of the National Socialist government relied on financial repression, of which the exchange control system, with its ability to stop outward capital flows, was an important part ([Ellis, 1940a](#)). Financial repression meant that short-term assets were transformed into long-term ones through ad-hoc consolidation loans, interest rates and dividends were unilaterally reduced and kept artificially low, and the government employed substantial disguised money printing (through tools such as *Mefowechsel*) to finance growing government deficits in the second half of the 1930s ([Poole, 1939](#); [De Broeck and James, 2019](#)).

C Reconstructed spread series

The Berlin Stock Exchange was closed between July 1931 and April 1932. We reconstruct the missing values under different scenarios, all but one involving an eight-week slump in prices correlated to the dynamics of the US stock market (data from Global Financial Data). The scenarios differ in the timing of the slump (ranging from mid-July to August until

⁵⁹An important exception is the Young loan of 1930 ([Ritschl, 2012](#)) and the fact that, as [Ritschl \(2001\)](#) puts it, “during its first two years Nazi Germany was successful in attracting fresh credit despite the continuation of the standstill agreement and the default of 1933/34 on long term credit. One reason may have been the discrimination against (mostly American) long term debt in favor of continuing service on (mostly British) short-term credits (this is Schuker’s hypothesis)”.

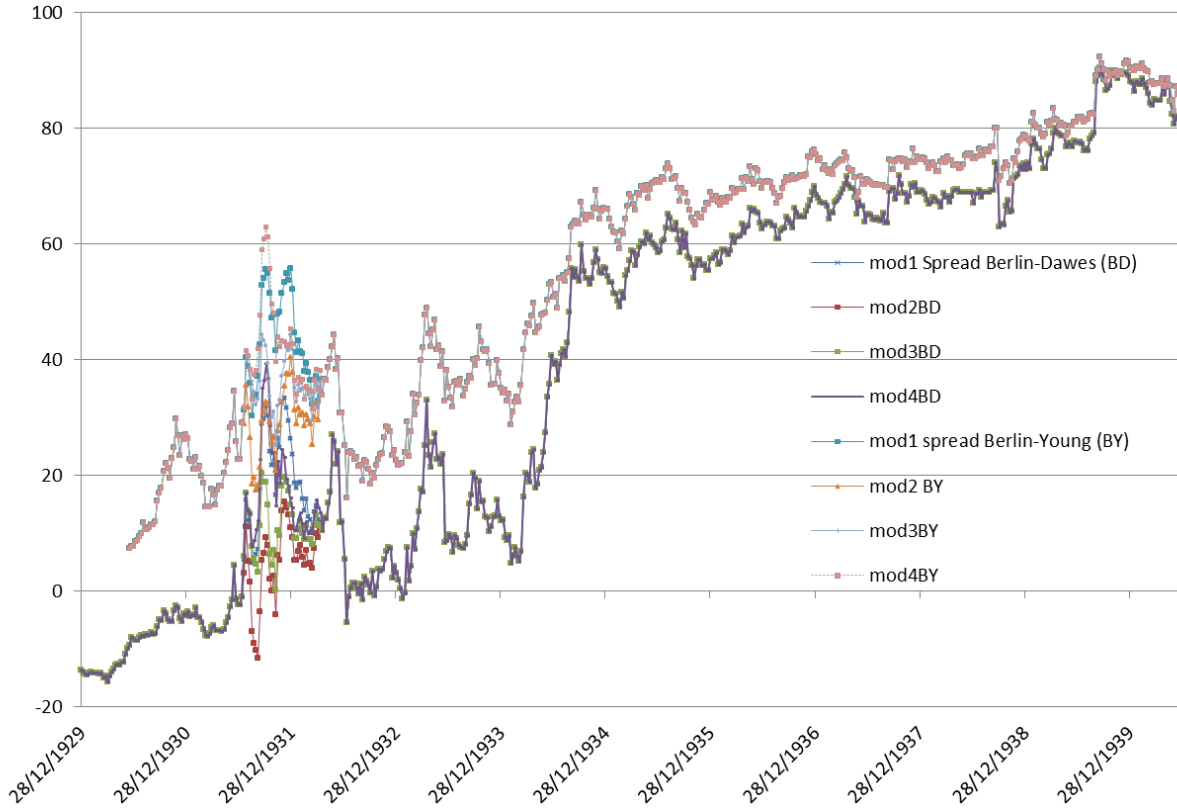


Figure 14: Four reconstructed spreads series of Dawes and Young bond prices traded in New York with respect to mortgage bonds prices traded in Berlin. Weekly frequency. See main text for sources.

October-November 1931), whereas one consists in a linear interpolation for the whole missing subsample. For the three scenarios where we reconstruct a crash we use an underlying trend for the whole subsample, upon which we “add” the crash. The trend is constructed from the [League of Nations \(1932-33\) Statistical Yearbook](#), where we find monthly yields for a sample of representative German fixed interest securities for the period when the Berlin Stock exchange was closed. We take the implied monthly growth rate of these representative securities and linearly interpolate them to get weekly figures.

We then use these reconstructed series for the Berlin mortgage bonds to get four different spreads series for the Dawes and Young bonds respectively, in NY and in London, for a total of sixteen spread series, all available in the data files. Figure 14 shows the eight reconstructed spread series for New York: with respect to Young and Dawes bonds alike, the series obviously overlap for the whole sample, except for the reconstructed subsample. Data for the London series can be found in the Matlab data files.

D Empirical Methodology

The dynamic optimization procedure of [Bai and Perron \(1998, 2003\)](#) finds the structural breaks dates (T_1, \dots, T_m) of a partial structural change model such that:

$$(\hat{T}_1, \dots, \hat{T}_m) = \underset{T_1, \dots, T_m}{\operatorname{argmin}} \sum_{j=1}^{m+1} \sum_{t=T_{j-1}+1}^{T_j} [y_t - \hat{\alpha}_{j[T_j]} - \hat{\rho}_{j[T_j]} y_{t-1} - \hat{\beta}_{[T_j]} z_t] \quad (19)$$

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

D.1 Practical implementation

We implement this algorithm using a Matlab “translation” of the original GAUSS code of [Bai and Perron \(2003\)](#) downloaded from the website of Yohei Yamamoto, Hitotsubashi University. We subsequently modified the code (see comments in the file `brcode.m` for more details). We set the trimming value h as suggested by [Bai and Perron \(2003\)](#), except in some cases concerning Young bonds, where we augment the value of h by 10-15%. This is done because our series for Young bonds in London has 36 observation less at the beginning of the sample than the London Dawes bonds, and the series in New York has 24 observations less than the New York Dawes bonds series. This not only means that the two Young series start in a period of higher volatility but also that the beginning of the sample is very close to the reconstructed subsample. We do not believe that augmenting h , however minimally, could lead to a “false” break date being selected in that first part of the sample, as the result of [Chong \(1995\)](#) applies in this case.

The confidence intervals are calculated allowing for the moment matrix of the data to vary across the identified regimes. For each of the bonds the reported confidence intervals are those estimated from the model with most breaks among the reported ones. For a break that is present both in a model with M and $M+1$ breaks its confidence interval is in practice not affected, if so only marginally, when estimated from the model with $M+1$ breaks.

E Full structural breaks results

[Intentionally left blank. Table on next page.]

Series	Break							Other
	1	2	3	4	5	6	7	
LSE Dawes M1	26 Sept 1931 29/8/31-28/11/31	11 June 1932 9/4/32-18/6/32	4 March 1933 25/2/33-1/4/33	10 Mar 1934 24/2/34-7/4/34		31 Dec 1938 30/7/38-7/1/39	2 Sep 1939 2/9/39-2/9/39	
LSE Dawes M2	11 Apr 1931 21/06/30-25/07/31	11 June 1932 26/03/32-25/06/32	4 March 1933 25/2/33-1/4/33	10 Mar 1934 24/2/34-21/4/34		31 Dec 1938 27/8/38-7/1/39	2 Sep 1939 2/9/39-2/9/39	
LSE Dawes M3	1 Aug 1931 27/6/31-26/9/31	11 June 1932 16/04/32-18/06/32	4 March 1933 25/2/33-1/4/33	10 Mar 1934 24/2/34-14/4/34		31 Dec 1938 13/8/38-7/1/39	2 Sep 1939 2/9/39-2/9/39	
LSE Dawes M4	26 Sep 1931 27/6/31-28/11/31	11 June 1932 2/4/32-18/6/32	4 March 1933 25/2/33-1/4/33	10 Mar 1934 24/2/34-14/4/34		31 Dec 1938 13/8/38-7/1/39	2 Sep 1939 2/9/39-2/9/39	
LSE Young M1	10 Oct 1931 1/8/31-26/12/31	11 June 1932 28/5/32-11/6/32	11 Feb 1933 11/2/33-18/02/33	3 Mar 1934 17/2/34-31/3/34		31 Dec 1938 9/7/38-7/1/39	2 Sep 1939 26/8/39-2/9/39	
LSE Young M2		11 June 1932 28/5/32-11/06/32	11 Feb 1933 11/02/33-18/02/33	10 Mar 1934 3/2/34-7/4/34	14 Aug 1937 23/1/37-2/10/37	26 Nov 1938 19/11/38-14/1/39	2 Sep 1939 12/8/39-2/9/39	23 Mar 1935 24/11/34-20/07/35
LSE Young M3	26 Sep 1931 27/06/31-14/11/31	11 June 1932 04/06/32-18/06/32	11 Feb 1933 11/2/33-18/2/33	3 Mar 1934 17/2/34-21/4/34		31 Dec 1938 20/8/38-7/1/39	2 Sep 1939 26/8/39-2/9/39	
LSE Young M4	10 Oct 1931 05/09/31-07/11/31	11 June 1932 04/06/32-11/06/32	11 Feb 1933 11/2/33-18/2/33	3 Mar 1934 17/2/34-14/4/34		31 Dec 1938 13/8/38-7/1/39	2 Sep 1939 26/8/39-2/9/39	
NYSE Dawes M1	11 Jul 1931 18/04/31-18/07/31	11 June 1932 28/05/32-11/06/32	11 Feb 1933 4/02/33-4/03/33	5 May 1934 28/4/34-2/6/34	4 Sep 1937 30/1/37-4/9/37	1 Oct 1938 24/9/38-18/2/39	26 Aug 1939 4/3/39-9/9/39	
NYSE Dawes M2	5 Sep 1931 11/07/31-26/09/31	11 June 1932 14/05/32-25/06/32	11 Feb 1933 4/02/33-4/03/33	5 May 1934 28/4/34-9/6/34	4 Sep 1937 23/1/37-4/9/37	1 Oct 1938 24/09/38-11/2/39	26 Aug 1939 18/3/39-9/9/39	
NYSE Dawes M3	11 July 1931 18/04/31-18/07/31	11 June 1932 28/05/32-18/06/32	11 Feb 1933 04/02/33-04/03/33	5 May 1934 28/4/34-9/6/34	4 Sep 1937 16/1/37-4/9/37	1 Oct 1938 1/10/38-11/2/39	26 Aug 1939*	
NYSE Dawes M4	3 Oct 1931 12/9/31-17/10/31	11 June 1932 21/05/32-18/06/32	11 Feb 1933 4/2/33-4/3/33	5 May 1934 28/4/34-2/6/34	4 Sep 1937 23/1/37-4/9/37	1 Oct 1938 24/9/38-18/2/39	26 Aug 1939 4/3/39-9/9/39	
NYSE Young M1	4 Jul 1931 23/5/31-18/7/31	11 June 1932 28/5/32-11/6/32	11 Feb 1933 4/2/33-25/2/33	3 March 1934 24/2/34-28/4/34	4 Sep 1937 21/11/36-4/9/37	26 Nov 1938 5/11/38-21/1/39	26 Aug 1939 22/7/39-16/9/39	
NYSE Young M2		11 June 1932 28/5/32-18/6/32	11 Feb 1933 11/2/33-18/2/33	3 March 1934 24/2/34-21/4/34	17 Apr 1937 20/2/37-17/7/37	26 Nov 1938 5/11/38-31/12/38	26 Aug 1939 5/8/39-23/9/39	9 Nov 1935 12/10/35-4/1/36
NYSE Young M3	4 Jul 1931 2/5/31-11/7/31	11 June 1932 4/6/32-18/6/32	11 Feb 1933 11/2/33-25/2/33	3 March 1934 24/2/34-28/4/34	4 Sep 1937 14/11/36-11/9/37	26 Nov 1938 5/11/38-14/1/39	26 Aug 1939 29/7/39-16/9/39	
NYSE Young M4	10 Oct 1931 12/9/31-17/10/31	11 June 1932 4/6/32-11/6/32	11 Feb 1933 11/2/33-25/2/33	3 March 1934 24/2/34-5/5/34	4 Sep 1937 24/10/36-11/9/37	26 Nov 1938 19/11/38-13/5/39	26 Aug 1939*	

Table 7: Breaks and corresponding confidence intervals for the various spread series of German bonds between Berlin, London and New York. LSE= London Stock Exchange, NYSE= New York Stock Exchange. *only with highest number of breaks supported by the SupF test.

E.1 Robustness checks

Our results are robust to allowing for different forms of heteroskedasticity across regimes of the moment matrix of the regressors and of the variance of the residuals, as available in the code and documented in [Bai and Perron \(2003\)](#). We also use a different control variable for New York, specifically a subindex of 40 industrial bonds (included in the dataset). Another robustness check consists of running the analysis on the price level of the bonds instead of the spread . Moreover, for all models we repeat the analysis with the dependent variable y as the spread series (the results of which are reported in the main text), the foreign (NY or London) price level, or the log-level of the foreign price, always controlling for the level of the stock index.