

# WAS SCHACHT RIGHT?

## REPARATIONS, THE YOUNG PLAN, AND THE GREAT DEPRESSION IN GERMANY

Albrecht Ritschl

Universitat Pompeu Fabra (Barcelona/Spain)  
and CEPR

First Draft: October, 1995\*

This Version: November, 1996

### Abstract

The severity of the Great Depression in Germany has sometimes been blamed on the reparation burden in simplistic fashion. Alternative interpretations relied either on American exports or on malfunctions of the domestic economy, such as demand mismanagement or excessive wage increases during the preceding years. This paper argues for a more subtle link between Germany's macroeconomic performance and these policy responses to the reparation problem. I explain the foreign credit rush of Weimar Germany during the second half of the 1920s from the transfer protection clause of the Dawes Plan, which gave commercial credits de-facto seniority over reparation claims on Germany. I argue that the transition to the Young Plan in 1929 implied a reversal of this seniority scheme, causing a severe credit crunch in Germany that lasted throughout the Great Depression. That the Young Plan would have just this effect had been the prediction of Schacht, then president of Germany's central bank and leader of the German delegation to the Young Plan negotiations of 1929. Protesting against the Young Plan, Schacht resigned from the presidency of the Reichsbank, only to be re-appointed by the Nazis in 1933. I argue that whatever the criticism of Schacht's later conduct, his verdict of the Young Plan was right. A model of sovereign debt with limited contract enforcement is employed to identify a sequence of reparation regimes with varying degrees of relaxation of Germany's participation constraint in international credit markets. I conclude that given the high amount of German international borrowing during the mid-1920s, abandoning transfer protection in the Young Plan exposed Germany to credit contraction and deflationary budget policies even before the international beginning of the Great Depression. This may have forced her to deflate relative to her trade partners throughout the depression up until 1932.

JEL classification: N 14, N 24, F 32, F 34, F 41

Keywords: Germany, Great Depression, Sovereign Debt, Reparations

---

\*Thanks are due to Helge Berger, Knut Borchardt, Steve Broadberry, Ann Carlos, Gilles Chemla, Nick Crafts, Barry Eichengreen, Gerald Feldman, Tim Hatton, Larry Neal, Pierre Sicsic, and Mark Spoerer. However, I wrote the paper myself, and responsibility for its conclusions is entirely mine.

## I. Introduction

The German business cycle of the inter-war period is more volatile than that of other major European countries. Figure 1a) below compares Germany's output performance to Britain. The particular characteristics of Germany's performance have been the subject matter of extended debate. Under the impact of Keynes' (1919) polemic against the Treaty of Versailles, contemporaries almost automatically interpreted the violent German cycle in the light of the reparation problem. German postwar debates, however, have centered almost exclusively on fiscal mismanagement of domestic demand. Figure 1b) plots output against full-employment budget surpluses (represented here as full employment deficits), indeed exhibiting a marked procyclical pattern of public budgets during the whole period including the depression. Criticism of the Keynesian position has pointed out that budget restraint during the Great Depression was the result of credit constraints rather than deliberate policy (Borchardt, 1991). Figure 1c) shows the amounts of funded (solid line) and unfunded (dashed line) central government borrowing in Germany, which indicates that during the slump, funding problems did indeed exist. Borchardt had seen the reason for low creditworthiness in mounting economic instability during the years preceding the depression, notably excessive wage increases. Figure 1d) shows that an index of deflated unit labor cost (solid line), which under Cobb-Douglas conditions should fluctuate around 100, indeed increases during the late 1920s. Comparison with Great Britain, however, reveals increases of real unit labor cost as well (dashed line), which casts doubt on the coerciveness of the labor cost argument alone.

This paper attempts to reconcile these bits of evidence by taking a fresh look at the German foreign debt and reparation problem. It will be shown that by accounting for the balance of payment restriction, an explanation for the borrowing constraint on the public budget can be found. Examining the 1920s, this also offers an answer to the role of wage increases for the severity of the later depression. Figure 1e) plots reparations against the primary current account, which shows that high deficits during the 1920s were followed by surpluses precisely during the Great Depression. To explain these swings and their interactions with domestic aggregates, I employ a simple sovereign debt framework that pays special attention to the participation constraints in the international credit market and their interaction with the various reparation settlements. It is argued that the incentive problems introduced by the sovereign debt character of German reparations help explain the balance of payment dynamics shown in Figure 1. I identify the driving force to be the conflict between political and commercial creditors to Germany about the seniority of reparations over

commercial debt. This squares with results of Temin (1971) who had argued that the German credit rush must have had domestic causes which were independent from the New York stock market. Following the consensus of contemporaries and policy makers at the time, I attribute the wave of capital imports after the hyperinflation to the effects of transfer protection under the Dawes Plan of 1924. Transfer protection implied that reparations collected in Germany would only be transferred into foreign exchange if enough reserves were available in the Reichsbank to avoid a run. This gave debt service on commercial credits de-facto seniority over reparations. I will argue that with regard to expected future reparations, this "inverted" seniority clause made it rational for Germany to take in as much credit as possible.

The central interest of this paper is in the regime change introduced by the advent of the Young Plan of 1929 which abandoned transfer protection. Announcement of this plan in March, 1929, triggered off a major crisis in Germany. The immediate consequence were a run on the Reichsbank, the failed issue of a major public loan, failure of an international bank credit and a subsequent funding crisis of the public budget. On the political scene, the year between announcement and ratification of the Young Plan was characterized by infighting between the president of the Reichsbank, Schacht, and the government over whether or not to accept the Young Plan. In the course of this battle occurred the resignations, in turn, of the finance minister (Hilferding) and his under-secretary (Popitz), of Schacht as the president of the Reichsbank, and of central government (Müller), which after the ratification of the Young Plan was replaced by an emergency cabinet governing under presidential emergency decree. Schacht had predicted that given its high reparation demands, abandonment of transfer protection, and its punitive sanction clauses, accepting the Young Plan would expose Germany to a deep depression and trigger off political chaos. The subsequent discussions will show that whatever one may think about Schacht's later political conduct, his economic argument cannot be discarded.

This paper proceeds as follows. The next section introduces the main argument, elucidating the role of seniority clauses and their effect on Germany's balance of payments position. Sections III through V turn to the macroeconomic repercussions. Section III examines the incentive effects of the borrowing constraints in a simple growth context, showing that much of the credit rush of the 1920s can be explained by a consumption smoothing argument. Section IV focuses on the additional incentive effects introduced by the reparation agreements. It is shown that transfer protection under the Dawes Plan gave the Germans an incentive to over-borrow in an attempt to abuse their participation constraint for defaulting

on reparations. Introducing the Young Plan choked off further international credit and forced Germany into deflating her economy relative to her neighbors to produce the necessary primary current account surplus. Section VI concludes and presents some implications.

## II. German Reparations as a Problem of Sovereign Debt

In an imperfect world where binding state-contingent Arrow-Debreu contracts are absent, borrowers are prevented from defaulting only through the threat of sanctions and embargoes and, probably, through reputational forces. Reputation effects aside (whose weakness is documented with evidence from history e.g. in Eichengreen/Portes, 1989), only welfare losses through sanctions etc. remain. Assuming common knowledge, this implies a credit ceiling in the first place. If this is reached, a binding participation constraint arises, and the debtor is banned from further credit. In a stochastic environment where a debt overhang may occur nevertheless, the question of whether or not a given portion of debt will be served depends, among other things, on its seniority position. "Junior" debts which enjoy least seniority will become worthless first. This eventuality, which banking practice often tries to avoid through risk pooling and consortium formation when a debt overhang is imminent (Bulow/Rogoff, 1989), has empirical relevance for inter-war Germany, where debt took both commercial and political forms and risk pooling between both was not feasible.

### (i) The Dawes Plan Regime

The Allied reparations bill of 1921 had amounted to 132 bn gold marks in present value, equivalent to over 200 % of German pre-war national income. Attempts to enforce payment at the envisaged rates through sanctions failed in 1922, resulting in political chaos and hyperinflation. Even military occupation of the Ruhr district produced little revenue to the Allies. Given these conditions, the massive inflow of foreign capital into Germany during subsequent years is paradoxical. With reparations already more than exhausting Germany's willingness to pay, or the amount whose payment could credibly be enforced, it should be expected that Germany was effectively barred from foreign credit as long as reparations were in force.

To provide Germany with fresh money and circumvent this participation constraint, the Dawes Plan for German reparations of 1924 included a transfer protection clause. Under

this scheme, reparations would only be converted into foreign exchange if sufficient reserves were available to avoid a run on the *Reichsbank*. Therefore, transfer protection implied that in the event of foreign exchange shortage, commercial credits would be served first, thus leaving reparations only as a second charge. The mechanics of this are well understood in the political history literature on German reparations (Link, 1970, McNeil, 1986). This opened an incentive for German policy makers to take in commercial credit. Exhausting the credit ceiling by debt service on commercial loans, little room would be left for reparations. German policy-makers at the time were fully aware of this effect (e.g. Link, 1970). Although debt-plus-reparation service per period would be the same in the end, borrowing during an initial period would induce a one-time real resource transfer to Germany. Under the Dawes Plan regime of 1924 to 1928, Germany indeed borrowed the equivalent of 25% of her national income of 1929 abroad, largely from the U.S., thereby far outweighing reparation payments during the same period. This has been termed "American Reparations to Germany" (Schuker, 1988). This credit gamble was supported by tax privileges for foreign credits; it met with stiff but unsuccessful resistance on the part of the *Reichsbank* under the presidency of Schacht who attempted in vain to impose measures enforcing budgetary discipline. Repeated warnings of Schacht and of the reparations agent installed by the Dawes Plan, Parker Gilbert, finally created increasing nervousness about the safety of investments in Germany and provoked discussion about future credibility of the transfer protection clause. Following the lead of J.P. Morgan ("the Germans are a second-rate people", James, 1985), New York banks lowered the credit rating of Germany since late 1927. Lacking the benefits from further transfer protection, the German government accepted renegotiation of the Dawes Plan in mid-1928, hoping to be able to trade in transfer protection for lower reparation payments. Under the Dawes Plan, reparations annuities began to run into sizable amounts since 1927, bound to reach a steady state of 2.5 bn RM per year in 1929. To this would add some 1 bn RM of commercial debt service. The Germans hoped to attain a steady-state reparation annuity of some 1.4 bn RM, equivalent to that of 1927, to be paid unconditionally.

#### (ii) Transition to the Young Plan

Abandoning the transfer protection clause became the salient feature of the revised reparation scheme, announced as the Young Plan in early 1929. With reparations receiving full seniority over all other claims, the risk of future default or rescheduling now rested with commercial creditors. To the extent that the limit of repayment to which Germany

could credibly commit herself was already exhausted, this would preclude further commercial lending to Germany, forcing the country into a policy of deflation. Contrary to German hopes, reparations were fixed at a level only slightly below the steady-state Dawes annuities beginning in 1929. Stated in present value, the Young Plan amounted to some 40 bn RM, or about 50% of Germany's national income of 1929. To this added commercial debt of about 30 bn RM. Thus, the external debt of Germany on the eve of the Great Depression stood at almost 100% of GDP, which would indicate high country risk also by modern standards.<sup>1</sup>

Consequently, foreign lending to Germany came to a sudden halt. The degree to which reparation annuities had been adjusted to Germany's foreseeable "capacity to pay" (Moulton/McGuire, 1924) becomes apparent from the fact that all later credit proposals invariably failed. In mid-1929, attempts to replace the failed Hilferding loan of March, 1929, with credit opened by a New York bank failed because of French objections. As the Young Plan envisaged two last "mobilization" loans (the Young loan and, semi-officially, the so-called Kreuger loan), the French government expressed concerns that floating another loan might endanger the acceptance of the mobilization loans in international markets. As a consequence, government faced a mounting funding crisis that in late 1929 was averted by a short-term Reichsbank loan. This credit was consented by the Reichsbank, the reparations agent, and the French government only under the proviso that budget cuts be undertaken and a sinking fund for the amortization of Germany's floating debt be installed. German parliament succumbed to the pressure in late 1929, and as a consequence, the finance minister and his under-secretary, Hilferding and Popitz, resigned.

Confronted with the binding participation constraint, Germany was left with the choice between accepting or rejecting the Young Plan. The first option was adopted in March, 1930. Ratification of the Young Treaty was the last act passed under the Müller cabinet before it resigned. Carrying out the austerity policies now considered as necessary was left to an emergency cabinet under Brüning which governed by presidential emergency degrees, thus shifting responsibility away from the political parties who would not dare advertizing the coming austerity measures to their constituencies.

Rejecting the Young Plan was the option proposed by Schacht. Schacht warned that given the high annuities imposed on Germany by the Young proposal, Germany would have to deflate her economy relative to her neighbors under all possible contingencies.

---

<sup>1</sup>See Rogoff (1990).

Given the sanction clauses introduced into the Young Plan during the negotiation process of late 1929, default on reparations would be an impossibility without risking military intervention of the kind witnessed in 1923. Thus, the consequence of the Young Plan would be a severe depression that would culminate in a run on German credit and an international banking crisis. Schacht proposed instead to continue with the protected Dawes annuities, as in the event of an economic downturn the default risk would fall on reparations, not on international credit. Who was right?

### III. A Small Model of German Debt

In the following I shall consider a small model of German debt and reparations, which for the sake of simplicity has only two periods. A domestic policy maker is maximizing a social welfare function:

$$E(U) = \sum_{t=1}^2 \beta^{t-1} \frac{c_t^{1-\sigma}}{1-\sigma} \quad (1)$$

subject to the capital accumulation constraint:

$$k_{t+1} = (1-\delta) k_t + y_t - f_t - s_t - c_t \quad (2)$$

with  $k_t$  the current capital stock,  $\delta$  the depreciation rate,  $y_t$  as output,  $f_t$  net exports,  $s_t$  reparations and  $c_t$  consumption. Labor is supplied inelastically and indexed to 1. Thus, the Cobb-Douglas production function may be written as:

$$y_t = k_t^\alpha \quad (3)$$

In the following subsections, a variety of intertemporal restrictions on  $f_t$  and  $s_t$  will be considered. As these give rise to a class of non-recursive solutions to the problem at hand, standard dynamic programming techniques cannot be used (Kydland/Prescott, 1980; Marcat/Marimon, 1992, 1994). This is the main reason for limitation to a two-period model.

(i) Full Commitment

First consider the reference case in which the debtor country could fully commit herself to paying out any amount of debt service that does not violate her intertemporal budget constraint. Obviously, such a situation could only occur in extreme cases, e.g. when large foreign property exists that could serve as collateral, or under the pressure of military occupation. In the context of the model sketched above, assume that after a previous period of autarky, the country is opened to international capital movements in period 1 and that all credit transactions need to be completed by the end of period 2. Then, full commitment implies that:

$$f_2 = - (1+i) f_1 \quad (4)$$

where net exports in the second period are positive,  $f_2 > 0$ , in the case of a debtor country and vice versa and where  $i$  indicates the exogenous world market rate of interest. From the FOC of the policy maker's problem of period  $t$ , obtain:

$$(1 - \delta) + f'(k_{t+1}) = 1 + i \quad (5)$$

Absent any restrictions on foreign transactions, the optimal choice is of course to equate the domestic gross rate of return on capital to the world market interest rate. In period 1, borrowing will be positive if the domestic profit rate under autarky would exceed the world interest rate and vice versa. As Germany's recovery from World War I had slowed down due to the reparation struggles of 1921-23, there was scope for catching-up to the levels of productivity and capital endowment per worker. This is in line with results of Broadberry (1993) who has identified general patterns of European catching up with respect to the U.S.

Simple as the above exercise is, it delivers a message on the how such catching up takes place. Large scale borrowing in the international market enables a country to smooth out its consumption relative to output and investment. When international credit is opened in period 1, the latter two are still far below the steady-state level, while consumption already jumps to its equilibrium, where its further growth is solely determined by the country's rate of time preference and the world market rate of interest. Borrowing thus mostly takes the form of a consumption loan.

This resolves a conflict among contemporaries over the purpose and use of loans to Germany. The Dawes Plan had intended to improve her capital endowment and thus enable her to pay out future reparations more easily. Soon, however, it was observed that the relaxed budget constraint was more used for consumption purposes than for anything else.



The reparation agent complained repeatedly that the Germans wasted the money on soccer stadiums, public swimming pools, public housing, and most outrageous of all, the beginning electrification of her railway system, a luxury that her competitors in Europe would not afford for themselves (James, 1986). Studying intertemporal behavior makes it clear that such criticism was naive. Once the budget constraint of a forward-looking agent is relaxed, the result of re-optimization will always be an attempt to smooth out consumption over time. The German credit and consumption bonanza of the 1920s may well have been what Germany's foreign minister at the time, Gustav Stresemann, called a "dance on the volcano" (Link, 1970). But the above results suggest that even without the volcano, there would have been some dancing.

(ii) Partial Commitment: the General Case

Now suppose that due to the limited force of sanctions, embargoes, asset seizures, etc., the debtor country can only commit herself to some maximum repayment  $f_2^* \geq 0$  in the last period. To study the effects of this it is instructive to begin with

Case (a):  $f_2^* = 0$ , no commitment possible.

In this - rather extreme - case, sanctions have no effect; the country could retreat into the autarky position without incurring welfare loss. To analyze the situation, observe that the social planner would reoptimize in period 2, obtaining:

$$\frac{\partial U_2}{\partial f_2} = -c_2^\sigma (1+i) < 0 \quad (6)$$

Thus, it is always preferable for the domestic policy maker to behave in a time-inconsistent way and to default on the nation's external debt, choosing the corner solution  $f_2^* = 0$ . Assuming this is common knowledge and rationally expected by the creditors, no credit will be extended in the first place, i.e. in period 1. Backward induction establishes the same for period 0. A creditor that cannot commit to repayment in the last period will be unable to

attract credit in previous periods<sup>2</sup>.

True partial commitment is given if the debtor country can commit herself to limited but strictly positive resource transfers in the last period:

Case (b) :  $f_2^* > 0$  fixed.

This implies an upper bound on credit obtainable in period 1,

$$-f_1 \leq \frac{1}{1+i} f_2^* \quad (7)$$

denoting credit obtained in period 1 under the participation constraint by  $-f_1$  (note that as  $f$  is defined as net exports, net borrowing implies  $f < 0$ ). Whether or not the participation constraint is binding is found by evaluating the Kuhn-Tucker conditions of the problem, i.e.

$$\frac{\partial U}{\partial f_1^*} < 0 \Leftrightarrow |f_1^*| < |f^{**}|, \quad \frac{\partial U}{\partial f_1^*} = 0 \Leftrightarrow f_1^* = f^{**} \quad [\text{IV.8}]$$

where  $f^{**}$  is the optimal amount of borrowing in period 1 from the optimal borrowing policy without participation constraints in eq. (3) above. Evaluating the first of these conditions, one finds  $i < r < r_A$  where  $r$  is the domestic gross rate of interest under partial commitment and where  $r_A$  is the rate of interest under autarky. This means that if the participation constraint is binding, interest parity is not fully achieved. There is not enough capital import to enable the domestic social planner to smooth consumption completely. Instead, the consumption profile is steeper and capital accumulation flatter than in the optimum without credit constraints.

---

<sup>2</sup>This disregards possible reputation effects. Very much the same result is obtained by Marcet/ Marimon (1992) in a stochastic growth framework. Reputation and sovereign debt is studied e.g. in Grossman/van Huyck (1988). However, in the historical context of debt repudiation in the German hyperinflation, ruling out positive reputation seems uncontroversial.

#### IV. The Interaction of Debt and Reparations

##### (i) Fixed Lump-Sum Reparations and Limited Enforcement

Reparations enter the scene in very much the same way as debt service on international credit; the only exception being the absence of prior lending. Again, analysis will proceed stepwise. First assume reparations in period 1 to be fixed at some amount  $\bar{s}_1$ . Trivially, the domestic policy maker dislikes reparations, as  $\frac{\partial U}{\partial s_1} = -c_1^\sigma < 0$  everywhere: the desired reparation payment is zero. However, the debtor country does not get away with this. Assuming again a situation of partial commitment as in the last section, she would be able to commit herself to resource transfers of  $f_1^* > 0$ , where  $f_1^*$  is assumed to be exogenous to the decisions of the social planner.  $f_1^*$  determines the maximum amount of reparations plus debt service that can be exacted from the debtor country:

$$f_1 + s_1 \leq f_1^* \quad [\text{IV.9}]$$

In the absence of foreign debt in period 1,  $f_1^*$  is thus the upper limit for enforceable reparation payments. Note that as (in this example) the limit is exogenous, it is also non-distortionary: whatever the debtor country does, her creditors will come along and take away  $f_1^*$ . The argument extends automatically to all periods.

Simple as this exercise is, it points to a weakness of reparation debates and policies after World War I. While Keynes (1920) had dismissed astronomical reparation demands because the Germans could not pay, sovereign debt theory would dismiss them because the Germans would not pay. Indeed there is evidence of this already during the first years of German reconstruction from World War I. Inflation had come to a halt in mid-1920 after the Weimar constitution had been passed which provided central government with ample tax authority. However, when the news spread in late 1920 that Allied reparation demands would double the 40 bn gold marks proposed by Keynes (1919), a true tax boycott developed, supported by regional tax collection offices. The architect of Weimar's fiscal constitution, Erzberger, was accused in the press of conspiracy with the Allies, a charge that was

not made easier by the fact that he had led the German delegation to the armistice negotiations in November, 1918. Forced in 1921 to resign under humiliating circumstances, he was assassinated a few months later, as was Germany's foreign minister, Rathenau. Opposition against paying reparations even had an element of rationality: it was precisely the most reactionary parts of the German public who advocated that the Allies be forced to occupy Germany, "if necessary, up to the city of Koenigsberg" (Feldman, 1993).

Disagreement over reparation payments indeed led to the occupation in early 1923, not of Koenigsberg but the Ruhr district, Germany's heavy industry core. Germany's government called for passive resistance and began supporting the idling industries of the Ruhr. The first measure had the desired effect of minimizing the returns of occupation to the Allies. The second fueled hyperinflation even further, increasing the social cost of passive resistance to the German side.

This nicely demonstrates the mechanics of limited enforcement: on the one hand, even the use of military power may not guarantee reparations at high rates, not to mention the resource and reputational cost of military action. This lesson was learnt again by France in her German zone of occupation during 1945-1948 (Manz, 1968) and to some extent, by the Soviets in East Germany, where reparations were forgiven after the revolt of June, 1953 (Karlsch, 1993). On the other hand, defaulting on reparations entirely does not work either, as sanction mechanisms like occupation impose significant welfare losses on the debtor country. Paying just the amount that induces creditors to abandon their coercive measures is superior to continuing default (see Bulow/Rogoff, 1989, for an analysis of the renegotiation process).

## (ii) Reparations under Transfer Protection

We are now in a position to analyze the incentive effects of the Dawes Plan, which was negotiated as a solution to the conflict of 1923. Germany recommitted herself to paying reparations, albeit at fixed, rescheduled rates, which would increase to the full amount demanded in 1921 only by 1929. Her currency was tied to gold (see Bordo/Kydland, 1995, on the gold standard as a contingent commitment mechanism), and she received a stabilization loan, the Dawes loan of 1924/25. In exchange, the Allied occupation of the Ruhr was ended (while that of the Rhineland continued according to the timetable envisaged by the Peace Treaty).

The salient feature of the Dawes Plan, adopted under the influence of Keynes' warnings against transfer crises, was transfer protection. As described in Section II above, it is an escape clause giving seniority to commercial claims should a transfer crisis occur. Thus, with Dawes Plan reparations  $(s_1^D, s_2^D)$  adopted in period 1, the Dawes Plan implies that actual reparations per period are bounded from above by the difference between the maximum that Germany can pay out and commercial debt service:

$$s_t = \min \{ f_t^* - f_t; s_t^D \} \quad \forall f_t > 0 \quad (10)$$

In period 1, the transfer protection clause does not become binding, as the level of debt from previous periods is still trivial (here it is assumed to be zero). However, it may bind in the second period, provided that either the full Dawes annuity or the amount of commercial debt service in the absence of reparations is sufficiently close enough to the maximum  $f_2^*$ . To see this, obtain the social planner's welfare maximization problem in period 1,

$$U_1 = \frac{1}{1-\sigma} ((1-\delta) k_1 - k_2 + y_1 - f_1 - s_1)^{1-\sigma} \quad (11)$$

$$+ \beta \frac{1}{1-\sigma} ((1-\delta) k_2 - k^* + y_2 - f_2 - s_2)^{1-\sigma}$$

From this and using (10), find:

$$\frac{\partial U}{\partial f_2} \begin{cases} < 0, f_2 < f_2^* - s_2^D \\ = 0, f_2 \geq f_2^* - s_2^D \end{cases} \quad (12)$$

As soon as commercial debt service reaches a certain level, the opportunity cost of increasing it further becomes zero. Therefore, the debtor country behaves as if reparations were nonexistent as long as these are "small", and then switches to borrowing in period 1 at a maximum rate:

$$\frac{dU}{df_1} = \frac{\partial U}{\partial f_1} - \frac{1}{1+i} \frac{\partial U}{\partial f_2} = \begin{cases} -c_1^{-\sigma} + \frac{\beta}{1+i} c_2^{-\sigma} = 0, & f_2 < f_2^* - s^D \\ -c_1^{-\sigma} + \frac{\beta}{1+i} c_2^{-\sigma} \left(1 + \frac{ds}{df_2}\right) < 0, & f_2 \geq f_2^* - s^D \end{cases} \quad (13)$$

That this is so becomes evident from (10) again, as beyond the threshold, any further increase in commercial borrowing leads to a decrease in reparations by the same amount:  $ds_2/df_2 = -1, f_2 \geq f_2^* - s^D$ . The welfare function (11) and the two inequalities on the RHS of (12) are decreasing functions in  $s_2$  and  $s^D$ , respectively. If in (10) the critical value is reached or exceeded,  $s_2$  in (11) takes on the value  $f_2^* - f_2$ , and (11) becomes independent of  $f_2$ . Therefore, the farther away the capital-labor ratio is from the steady state in the initial period ( $f_1$  is high) and the higher reparation annuities are, the higher is the propensity of the economy to default on reparations. Once it is in the default area, its default is complete: as the sum of reparations-plus-debt service remains constant now, it is optimal to maximize borrowing in the first place.

This result may be restated in the parlance of agency theory. A reparations “contract” which allows the debtor country to issue senior debt is incentive compatible as long as reparation annuities are low enough not to prevent the debtor country from borrowing abroad as much as it would like in the absence of a participation constraint. The structure of the model is represented in Table 1 below.

Table 1: Default Areas when Debtor Country May Issue Senior Debt

/	no- default area	/	default area	/
$s^D = 0$	$s^D = f_2^* - f_2$	$s^D = f_2^* - f_2$	$s^D = f_2^*$	$s^D = f_2^*$

Table 1 shows that as reparations  $s^D$  grow from zero to the maximum of extortion,  $f_2^*$ , the incentive of the domestic policy maker changes once reparation claims exceed the difference between the maximum  $f_2^*$  and the amount of senior debt to be repaid,  $f_2$ , if restrictions and reparations were absent. In the default area, the debtor country “shirks” by taking in as much credit as possible in the first period and by repaying only a constant amount, namely the maximum  $f_2^*$ , in the second.

This incentive was well understood by the Germans from the very beginning. As a Foreign Office memorandum of 1924 stated it: "The more credit we can take in, the less we will have to pay out in reparations" (McNeil, 1986). Political historians (notably Schuker, 1988) have emphasized that the Germans played a reparations gamble. On the eve of the Young Plan negotiations, Germany's foreign secretary, Stresemann, opted for provoking a transfer crisis as soon as possible. His reasoning was that as Germany had taken commercial creditors as hostages to the reparation problem, paying out reparations while suspending debt service on commercial loans would be unacceptable to international creditors. Thus, reparations might eventually fall (Link, 1970). Later events proved Stresemann right. But first, Germany slid into a far deeper depression than even the worst gamblers had expected.

### (iii) Transition to First-Charge Reparations, I: Credit Limit Known with Certainty

In the context of the previous section, imagine for the moment that at the end of period 1, reparation creditors suddenly renounce on transfer protection. Clearly, as choices in period 1 can no longer be changed, the way into default is inevitable: as the sum of reparations plus debt service exceeds the feasible maximum, commercial creditors are left with only part of their credit repaid.

Such a scenario would be too simplistic, however. Even the most hazardous creditors would account for the risk that reparation creditors default on the transfer protection principle (note that this is indeed a default). Let there be a competitive market with risk-neutral commercial creditors who expect two reparation regimes, ( $D$ ) and ( $Y$ ), where the probability of continuing in period 2 with no transfer protection is  $0 < p(Y) \equiv p(s_2 = s_2^Y) < 1$ . In period 1, a  $D$  regime prevails. If a  $D$  regime occurs also in period 2, all lending to Germany is perfectly safe. If however regime  $Y$  occurs, this depends on the amount of credit outstanding. Thus, creditors will shy away from lending the full amount  $\frac{f_2^*}{1+i}$ . Under monopolistic conditions, the participation constraint for Germany

in period 1 would be the weighted average of  $\frac{f_2^*}{1+i}$  and  $\frac{f_2^* - s_2^Y}{1+i}$ , equal to the expected debt

service of period 2:

$$|f_1| = \frac{1}{1+i} (f_2^* - p(Y) \cdot s_s^Y) \quad (14)$$

However, commercial creditors do not pool their country risk in the first place. Instead, competition would enable Germany to borrow at the market rate of interest until the limits of safety,  $-f_1^{SAFE} = \frac{f_2^* - s_2^Y}{1+i}$ , are reached. With all further credit enjoying lower seniority than the previous ones, a risk-neutral marginal creditor would calculate his expected returns from high-risk credit as:

$$\begin{aligned} E(f_2^{RISK}) &= p(D) \frac{f_2^{RISK}}{1+i} + 0 \cdot p(Y) \\ &= p(D) \left[ \frac{f_2}{1+i} - \frac{f_2^{SAFE}}{1+i} \right] \\ &= p(D) \left[ \frac{f_2}{1+i} - \frac{f_2^*}{1+i} + \frac{s}{1+i} \right] \end{aligned} \quad (15)$$

As from (10),  $f_2 > f_2^{SAFE} \Rightarrow f_2 = f_2^*$ , equation (15) simplifies to:

$$E(f_2^{RISK}) = p(D) \frac{s}{1+i} \quad (16)$$

Thus, the maximum high-risk credit would exhaust the capacity to pay of the second period. The debtor country would however have to pay a risk premium equivalent to  $\eta = (1+i)(p(D)^{-1} - 1)$ . Obviously, this risk premium emerges from the hazard that transfer protection be repudiated: as long as the probability  $p(D)$  of transfer protection continuing through the second period is lower than unity the risk premium is positive.

However, this implies that reparation creditors turn a blind eye on borrowing behavior in the first period: Once they observe that the Germans start borrowing at risk premia, they should press for an immediate revision of the Dawes Plan, as they would otherwise end up in the same situation as under the Dawes Plan, where all of Germany's capacity to pay is absorbed by commercial debt service, thus making default inevitable. In game-



theoretic terms, borrowing at risk premia would reveal that Germany's policy maker is a default type. Thus, whenever the reparation regime is the only source of risk, no high-risk borrowing will occur, and the lower credit limit  $-f_1^{SAFE} = \frac{f_2^* - s_2^Y}{1+i}$  will be binding.

(iv) Transition to First-Charge Reparations, II: Credit Limit Stochastic

Now consider a more general case in which good and bad states of the world,  $g$  and  $b$ , may occur. These states of the world are common knowledge. Good states  $g$  leave output unaffected, while bad states reduce it by the amount  $\tilde{b}$ , i.e.  $y_b = f(k) - \tilde{b}$ . Let bad states also affect the amount of debt service to which the debtor country can commit herself:

$f_b^* = f^* - b$ . Other things equal, a competitive credit market would provide loans to Germany at the world market rate of interest up to the generalized safety limit

$-f_1^{SAFE} = \frac{f_{2,b}^* - s^Y}{1+i}$ . Further credit  $-f_1^{RISK}$  would be made available at risk premia, just as in the previous section.

Will such credit be obtained? Before, it was argued that if states of the world are distinguished by reparation regimes only, borrowing at risk premia will reveal the debtor's type and thus be self-defeating. This is no longer the case when there are good and bad states of the world (in game-theoretic parlance, there might exist a pooling equilibrium). Borrowing at a risk premium can now occur under benevolent policy making as well, being motivated by the desire to insure domestic consumption against bad business cycle risk. Specifically, the policy maker will set:

$$\frac{\partial U_2}{\partial f_2} = \begin{cases} -\beta(p_g \cdot c_{2,g}^{-\sigma} + p_b \cdot c_{2,b}^{-\sigma}) < 0, & f_2 < f_b^* - s \\ -\beta p_g c_{2,g}^{-\sigma} < 0, & f_b^* - s \leq f_2 < f_g^* - s \\ 0, & f_2 \geq f_g^* - s \end{cases} \quad (17)$$

which in the second line has an interior solution also if there is risk for the creditor. Here, the amount that the policy maker wishes to pay back lies between the limits of safety in the good and the bad states. If in period 2, a good state occurs, the economy will always be able

to pay out debt service and reparations in full, irrespective of the reparations regime. Should however a bad state occur, a transfer crisis becomes inevitable. In the  $D$  regime, reparations will not be served completely, while in a  $Y$  regime, reparations enjoy full seniority. As lending in the previous period exceeded the safety limit for the bad state, all those junior credits that were given in excess of this limit become now worthless, and a debt overhang occurs.

However, whether or not the debt overhang really hits international creditors depends also on the toughness of reparation creditors. If these do not prevent commercial credits from turning bad, the German transfer crisis may cause repercussions on their own national financial systems. Provoking this situation to test the toughness of reparation creditors is precisely Stresemann's reparation gamble<sup>3</sup>.

Will the debtor country suffer a depression if a bad state occurs? The answer to this depends on the relationship between the impacts of the bad state on national income,  $-\tilde{b}$ , and on the foreign debt service constraint,  $-b$ . If both are equal and the participation constraint is binding, the country is perfectly insured against her output shock, as she may pass the whole shock on to her creditors in the outside world. Domestic depression occurs if  $\tilde{b} > b$ . Then, the country suffers part of the shock herself, and depression is the price she pays for provoking a transfer crisis.

#### (v) Looking into the Great Depression

Assuming that in period 2, the bad state has realized along with unprotected reparations, we may extend the time horizon for a moment and model further events. The only assumption we need to change concerns the term structure of credits, assuming now that credit granted in period 1 runs through terminal period 3 instead of terminal period 2. Imagine that in period 2, Germany proposes a credit project to someone (they would have loved to do so). If there were a positive probability that this credit be granted, analysis would either have to stop or everything be recalculated from scratch, as the force of backward induction would alter all previous results. However, the credit constraint is binding and our assumption of only three periods made thus far innocuous. To see this, consider how a rational creditor would evaluate a German credit proposal in period 2. If it were

---

<sup>3</sup>In fact, reparation creditors face a time-consistency problem as well. Introducing this explicitly is an

known with certainty that a good state occurs in period 3, some credit would be available (the credit limit is now higher than under uncertainty). Most importantly, it would be possible to roll over the credits not serviced in period 2, i.e. there would be no debt overhang at all (suspension of debt service is known with certainty to be only temporary, which is nothing but a liquidity problem). Apparently, this is not possible if both the states of the world and reparations regimes in period 3 are stochastic, as the credit limit for that case is already exhausted.

But what if in period 2, reparation creditors announce a moratorium contingent on a bad state in period 3? One might argue that partial debt relief of this sort would open new credit lines, as even in the bad state, debt service is now possible again. However, this would be misleading. As the risk of good and bad states occurring is already fully insured, additional credit, which would be of the high-risk variety again, would again signal to reparation creditors that default is intended, inducing them to renounce the moratorium immediately. This is the rationale for successful French opposition to further credit to Germany during the depression. Therefore, whenever the participation constraint becomes binding it will continue to bind until the good state of the world has indeed materialized.

This is the main reason for Germany's continued credit crunch even after the Hoover moratorium on reparations of mid-1931. This moratorium of mid-1931 suspended reparations and all service on "political" loans, while it obliged Germany to keep current on her commercial obligations. Thus, the reversed seniority principle of the Dawes Plan was restored, albeit only temporarily. Germany therefore continued to be cut off from further credit, despite the fact that reparation payments had stopped<sup>4</sup>. Only after the conference of Lausanne, when reparations were finally forgiven, could fresh money have been taken in; this was precisely the program of the Bruening administration for credit expansion. Before, the choice was only between renegotiation of Germany's obligations with her creditors and outright, unilateral default.

---

obvious generalization.

<sup>4</sup>Attempts have been made to interpret the situation after the Hoover moratorium as a debt overhang (Klug, 1993). However, this does not square well with the fact that Germany was not in default on her commercial debt and debt service was fully maintained.

## VI. So was Schacht Right? Conclusions and Implications

In this paper I have reexamined the incentive effects of reparation policies on German foreign borrowing during the late 1920s. The results suggest that the switching reparation regimes may indeed have had strong effects on German macroeconomic performance. Borrowing during the Dawes Plan period was possibly motivated, not just by intertemporal consumption smoothing but also the attempt to drive out reparations. I argued that the transfer protection clause of the Dawes Plan gave commercial credit de-facto seniority over reparations, thus giving Germany an incentive to over-borrow in order to default on reparations. It was shown that if aggregate shocks exist, such over-borrowing could not necessarily be detected by reparation creditors. Thus, switching to the Young Plan in 1929 entailed the risk of exposing Germany to a debt overhang. Assuming that there may exist leverage effects of reversing the balance of payments on national income, this situation was shown to be likely to perpetuate itself as a protracted austerity crisis.

This bears resemblance to the scenario warned against by Schacht in 1929, when Germany contemplated accepting the Young Plan proposal. Schacht had argued that in the event of an economic downturn, Germany might be caught in a debt crisis that would not resolve itself easily and lead to severe depression and political turmoil. Given Germany's traumatic experience during the Great Depression and its political aftermath, the conclusion suggests itself that Schacht's warnings were right and that Germany should not have accepted the Young Plan. Indeed, in the context of Section IV above, it would always have been superior for Germany to reject the Young Plan if possible. Then, German debt service on commercial credit would have been insured against business cycle risks. Therefore, the implication that Germany should not have accepted the Young Plan is straightforward.

So Schacht's view of the pure economics of the problem was probably right. But the history of the debts-and-reparations game (as well as its later continuation to the point in 1944 where Schacht found himself transferred to the concentration camp) shows that as far as the political economy of the problem was concerned, his views were actually naive. A different, less benign strategy would consist in agreeing on a reparation settlement that was feasible only under good contingencies. If reparation annuities were only high enough, bad states of the world would inevitably provoke conflicts among German creditors, with reparations being likely to lose out against commercial credit. This rather sinister calculation was based on what Stresemann had called taking international lenders as hostages to the reparation problem.

Stresemann died in late 1929 before the effects of this policy came to be seen. It produced conditions under which Germany could neither borrow nor default at reasonable cost but had to wait until the conflict among her creditors had burned out. As predicted by Stresemann, reparations, not debt service were suspended in 1931 when the Austro-German banking crisis signaled the advent of a debt overhang. And indeed, reparations were abandoned altogether at the conference of Lausanne one year later, at a time when Germany was still current on her commercial debt. The price paid for the Young Plan consisted in the economic slump accompanying the passage to Lausanne, and more importantly, in the rise of German fascism to power.

It remains to be considered how an incentive compatible reparation policy could have been implemented. Clearly, maintaining reparations under transfer protection is not a good candidate. Indeed, adopting the transfer protection clause in 1924 lay the foundations of the credit pyramid of the late 1920s. Without it, the reparation gamble would hardly have been feasible. Fixing reparations at extreme amounts can also be ruled out, for these gave Germany an incentive to default. This was the mistake made in 1921, when reparations had been set so high that they affected Germany's capacity to pay, not to speak of her willingness to pay.

Clearly, a feasible reparations policy would have kept the total to a level that could easily have been borne by Germany, not because the Germans could not pay more but rather because they would not pay more. Subsequent borrowing under the unfortunate Dawes plan regime had allowed Germany to reduce this amount even further, as debt service on existing credit would always have to come first in order to avoid disruptions in the international credit system. Therefore, even the Young Plan with its far lower reparation total violated the feasibility constraint. By borrowing during the Dawes Plan, Germany had won the reparations gamble even before the Young Plan was implemented, however at an intolerably high political price.

## References:

- Balderston, Th. (1993) *The Origins and Course of the German Economic Crisis, 1923-1932*, Berlin: Haude & Spener.
- Bordo, M., F. Kydland (1995) "The Gold Standard As a Rule: An Essay in Exploration", *Explorations in Economic History* 32, 423-64.
- Borchardt, K. (1991) *Perspectives on Modern German Economic History and Policy*, Cambridge: Cambridge University Press.
- Broadberry, S.N. (1993) "Manufacturing and the Convergence Hypothesis: what the Long Run Data Show", *Journal of Economic History* 53, 772-95.
- Bulow, J. and Rogoff, K. (1989) "A Constant Recontracting Model of Sovereign Debt", *Journal of Political Economy*, 97, pp.155-78.
- Eichengreen, B., R. Portes (1989) "After the Deluge: Default, Renegotiation, and Readjustment during the Interwar Years", in: B. Eichengreen and P. Lindert (eds.) *The International Debt Crisis in Historical Perspective*, Cambridge, MIT Press.
- Feldman, G. (1993) *The Great Disorder. Politics, Economics, and Society in the German Inflation, 1914-1924*, Oxford: Oxford University Press.
- Grossman, H. and J. Van Huyck (1988) "Sovereign Debt as a Contingent Claim: Excusable Default, Repudiation, and Reputation", *American Economic Review* 78, 1088-97.
- James, H. (1985), *The Reichsbank and Public Finances in Germany, 1924-1933*, Frankfurt, M.: Knapp.
- (1986), *The German Slump : Politics and Economics, 1924-1936*, Oxford: Oxford University Press.
- Karlsch, R. (1993) *Allein bezahlt? Die Reparationsleistungen der SBZ/DDR 1945-53*, Berlin: Ch. Links.
- Keynes, J.M. (1919) *The Economic Consequences of the Peace*, London: Macmillan.
- Klug, A. (1993) *The German Buybacks, 1932-1939: A Cure for Overhang?*, Princeton: Princeton University Press.
- Kydland, F., E. Prescott, (1980) "Dynamic Optimal Taxation, Rational Expectations and Optimal Control", *Journal of Economic Dynamics and Optimal Control* 2, 79-91.
- Link, W. (1970) *Die amerikanische Stabilisierungspolitik in Deutschland 1921-32*, Duesseldorf: Droste.
- Marcet, A., R. Marimon (1992) "Communication, Commitment, and Growth", *Journal of Economic Theory* 58, 219-49.

--- (1994) *Recursive Contracts*, mimeo, Universitat Pompeu Fabra.

Manz, M. (1968) [1985] *Stagnation und Aufschwung im französischen Besatzungsgebiet 1945-1948*, Ostfildern: Scripta Mercaturae.

McNeil, W.C. (1986), *American Money and the Weimar Republic*, New York: Columbia University Press.

Rogoff, K. (1990) "Symposium on New Institutions for Developing Country Debt", *Journal of Economic Perspectives* 4, 1-6.

Schuker, S. (1988), *American Reparations to Germany, 1924-1933*, Princeton: Princeton University Press.

Temin, P. (1971) "The Beginning of the Great Depression in Germany", *Economic History Review* 24, 240-48.