

How Occupied France Financed Its Own Exploitation in World War II

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Can a vanquished country deliver significant resources to its occupier? Based on the failure of Germany to pay its post–World War I reparations, conventional wisdom generally doubts the possibility. Yet, German reparations represent the exception rather than the rule. Perhaps, the most successful case was the transfer of resources that Germany obtained from France during World War II. Although they imposed huge payments, the victors left the French to decide how to raise the funds. After comparing the magnitude of France’s payment to other episodes, we employ a neoclassical growth model to assess both wartime and postwar policies. The burden imposed on the French economy caused it to shrink at a rapid pace, curtailing consumption and yielding large debt and money overhangs. Although Vichy France, intended to manage the postwar debt burden with higher tax rates, the governments, following liberation, allowed inflation to slash the debt, redistributing the adjustment cost. Higher taxes did not fund the debt but instead paid for expenditures associated with the rise of the welfare state.

I. Occupation Payments

During World War II, the French economy became a vital part of the German war machine. Even though measures of gross domestic product (GDP) are fragile and underestimated because of the substantial black market (20 percent to 30 percent of GDP), the total occupation payments extracted by the Nazis are stunning, rising from 20 percent to 50 percent of GDP between 1940 and 1943 (Alan S. Milward 1970; Occhino, Oosterlinck, and White 2006). Their magnitude can be assessed by a comparison to

other war reparations. Following both Napoleon’s defeat in 1815 and the Franco-Prussian War in 1871, France paid 20 to 25 percent of GDP. If France had managed to wholly finance these burdens with foreign loans, thus minimizing the burden, the debt service would have approximated 1 percent of GDP. The post World War I German reparations represented 83 percent of GDP, or a debt service of 2.5 percent of GDP. In contrast, Vichy paid occupation expenses totaling 111 percent of prewar GDP. France did not have the option to borrow, as foreign capital markets were closed. Had France secured foreign loans, the debt service would have reached nearly 3 percent of GDP.

Occupation payments were conceded when blitzkrieg against France ended with the armistice of June 22, 1940 and the installation of Marshal Philippe Pétain as head of the government. France lost territory to Germany, Italy, and Belgium. The remainder of the country was divided into the Occupied Zone, under German control, and the Free Zone, ruled by Pétain’s government in Vichy. Allied successes in 1942 led the Germans to seize the Free Zone, but Vichy still retained control of economic policy for the whole country.

International trade between France and the Third Reich was restructured with a bilateral clearing agreement that overvalued the reichsmark by approximately 50 percent, rendering French goods cheap for the German army. While this agreement produced a transfer to Germany of 120 billion francs, it was modest relative to the occupation indemnity. The Banque de France was compelled to credit the account of occupation authorities with 20 million reichsmarks, or 400 million francs per day, yielding a rapid monetary expansion. After continued German victories, daily credits were cut to 15 million reichsmarks, or 300 million francs. This moderation ended when blitzkrieg failed to deliver the Soviet Union to the Reich, forcing a complete mobilization of Germany and its satellites for war.

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The occupation costs, including bilateral trade credits, produced inflationary pressure as the German authorities purchased weapons and other goods. Although allowed considerable policy discretion, Vichy's finance ministers did not seek to undermine the German exactions and believed that an accommodating French government would be less onerous than direct German administration. To reduce the growing stock of currency, the Vichy government introduced a policy (the *politique de circuit*) to "close the circuit" by selling bonds to repay the Banque de France. Bonds were promoted with public campaigns. Banks were forced to buy the bonds, and the capital markets were squeezed. To keep the cost of financing low, the Banque de France pegged the price of long-term bonds to have an approximate yield of 3 percent. In addition, taxes were raised and collection procedures were improved. Wage and price controls, introduced in 1939, were strengthened, and real wages fell far below their prewar level. Controls led to shortages, rationing, and a thriving black market.

France's capacity to pay was weakened by the forced extraction of labor from France to work in German industry which reduced the pre-war labor force of 16.4 million people. After the armistice, Germany retained half of its two million French prisoners of war (POWs). When Germany moved to full-scale mobilization in mid-1942, Hitler ordered the conscription of French labor. Vichy offered a program to exchange three workers for each POW, but when it failed, a labor draft was instituted. By the end of 1943, The number of French POWs and civilian workers in Germany reached 1.4 million.

II. A Model of Occupation Payments

To assess Vichy's strategy to pay for occupation, we extend Lee E. Ohanian's (1997) and Ellen R. McGrattan and Ohanian's (2003) basic neo-classical model of a wartime economy to include money, wages and price controls, and a stabilization program. In the model, identical, infinitely lived households own competitive firms that produce a single nondurable good. Households are endowed with one unit of time per period, which can be spent for leisure l_t or labor n_t . The household lifetime utility function is

$$(1) \quad V = \sum_{t=0}^{\infty} \beta^t u(c_t, M_{t+1}/P_t, l_t) \quad 0 < \beta < 1,$$

which depends on consumption c_t , real cash balances M_{t+1}/P_t , and leisure l_t . For the period utility function u , we adopt the functional form

$$(2) \quad u = a \ln(c_t) + (1 - a) \ln(m_t) + \Psi l_t^{1-\eta} / (1 - \eta) \quad 0 < a < 1, \Psi > 0, \eta > 0, \eta \neq 1.$$

The last term becomes $\Psi \ln(l_t)$ when the inverse of the labor supply elasticity η takes the value of one.

Households begin period t with k_t units of capital, B_t units of government bonds, and M_t units of money. They rent out labor and capital at the wage and rental rates W_t and Q_t , and receive profits Z_t and the bond revenue $(1 + r_t) B_t$. They pay taxes, purchase goods, invest in capital and new government bonds, and modify their cash balances. They have a budget constraint

$$(3) \quad (1 - \tau_{nl}) W_t n_t + (1 - \tau_{kt}) Q_t k_t + Z_t + [1 + r_t (1 - \tau_{bt})] B_t = P_t c_t + P_t [k_{t+1} - (1 - \delta) k_t] + P_t n x_t + T_t + B_{t+1} + M_{t+1} - M_t,$$

where τ_{nl} , τ_{kt} , τ_{bt} , $n x_t$ and T_t are tax rates on labor, capital and bonds, net exports and lump-sum taxes.

Firms rent labor and capital, and produce consumption and investment goods with the Cobb-Douglas production function

$$(4) \quad y_t = k_t^\theta (A_t n_t)^{1-\theta} \quad 0 < \theta < 1,$$

where the labor-augmenting technology A_t grows at a constant rate. Firms act competitively to maximize profits $Z_t = P_t y_t - W_t n_t - Q_t k_t$.

The government budget constraint is

$$(5) \quad P_t g_t + (1 + r_t) B_t = \tau_{nl} W_t n_t + \tau_{kt} Q_t k_t + \tau_{bt} r_t B_t + T_t + B_{t+1} + M_{t+1} - M_t.$$

A competitive equilibrium is a set of sequences of quantities and prices such that, given prices,

households and firms solve their optimization problems; the government's period budget constraints are satisfied; and the labor, capital, goods, and bonds markets clear. By setting wage and price controls, the government determined the real wage, leaving households to decide on how much labor to supply. To model the wage controls imposed during the war, we consider an alternative equilibrium, characterized by the share, λ , of the economy subject to wage and price controls. In each war year, the real wage is set equal to a weighted average of the exogenously controlled wage and the competitive market wage. While labor supply is determined by the households, labor demand is set by firms subject to a wartime rationing constraint, requiring their labor demand not be larger than average (per firm) labor supply.

To solve the model, we use the shooting algorithm (Lars Ljungqvist and Thomas J. Sargent 2004). The steady state of the model approximates the pre-World War I averages of a 2 percent real GDP growth rate, a 4 percent real interest rate, a 10 percent ratio of government expenditures to GDP, 11 percent tax rates, an 80 percent debt-to-GDP ratio, and a 40 percent M2-to-GDP ratio (See Occhino, Oosterlinck, and White 2006 for the data sources.) Although not explicitly modeled, the steady-state exchange rate regime should be a gold standard. We approximate it by setting net exports (exogenously controlled by the Nazis) and inflation equal to zero. The values for the labor drafted to Germany, tax rates, lump-sum taxes, government expenditure, net exports, and money supply are treated as exogenously determined and matched with data during the war, as are the initial values for capital, bonds, and money.

An explicit stabilization policy is required by our model; otherwise an immediate return to steady-state policies would cause the debt to grow explosively because the surplus is insufficient to cover war-generated interest payments. To measure the size of the stabilization package required to move the economy back to its steady-state path, we assume that lump-sum taxes are levied and money is withdrawn so that debt and money return to their steady-state levels at the end of a five-year period, which approximates the post-World War I stabilization plans for Britain and France.

III. An Assessment of Wartime Finance

Figure 1 shows the behavior of output, consumption, debt, and money in our model, normalizing so that the steady-state output in 1939 is one. Other variables are presented relative to this benchmark. The dotted lines represent the steady-state growth path for each variable, and the starred lines represent the path of the observed variable, where it was available. The dashed line shows behavior of the real sector with a competitive labor market, and the solid line represents a labor market subject to wage and price controls. It should be noted that the collapse of output is less than the decline officially recorded, as the data do not include black market activity.

Debt and money begin at their sustainable steady-state ratios of 0.864 and 0.40. During the war, the debt-to-income ratio and real money climbed as part of the Vichy government's efforts to finance the war. The closeness of our estimates is surprising since our model has a nondistortionary stabilization program in contrast to the postwar inflationary policies. The calibrated real money, velocity, and debt track the realized values though inflation is below the observed rate. Given the large accumulated occupation debt, the five-year stabilization program of lump-sum taxes that was needed to bring the end-of-war debt down to the sustainable debt-to-GDP level was equal to 97 percent of steady-state GDP. No such tax scheme was introduced, and instead inflation surged, reducing the real value of the debt to 53 percent of GDP in 1950, well below the steady-state level.

Welfare cost is measured as the additional permanent, annual consumption that would make up the difference between the wartime consumption and the steady-state economy over a 20-year period. The total annual cost of the wartime policies would have been 19.96 percent of consumption with a nondistortionary stabilization program. Setting all other variables at their steady-state levels and imposing a single distortion gives a measure of the independent effects. Retention of POWs and the labor draft reduced consumption by 3.1 percent and wage and price controls by 2.5 percent. Occupation payments accounted for 16.3 percent, with small costs from taxation and money growth. Additional calibrations show that Vichy could

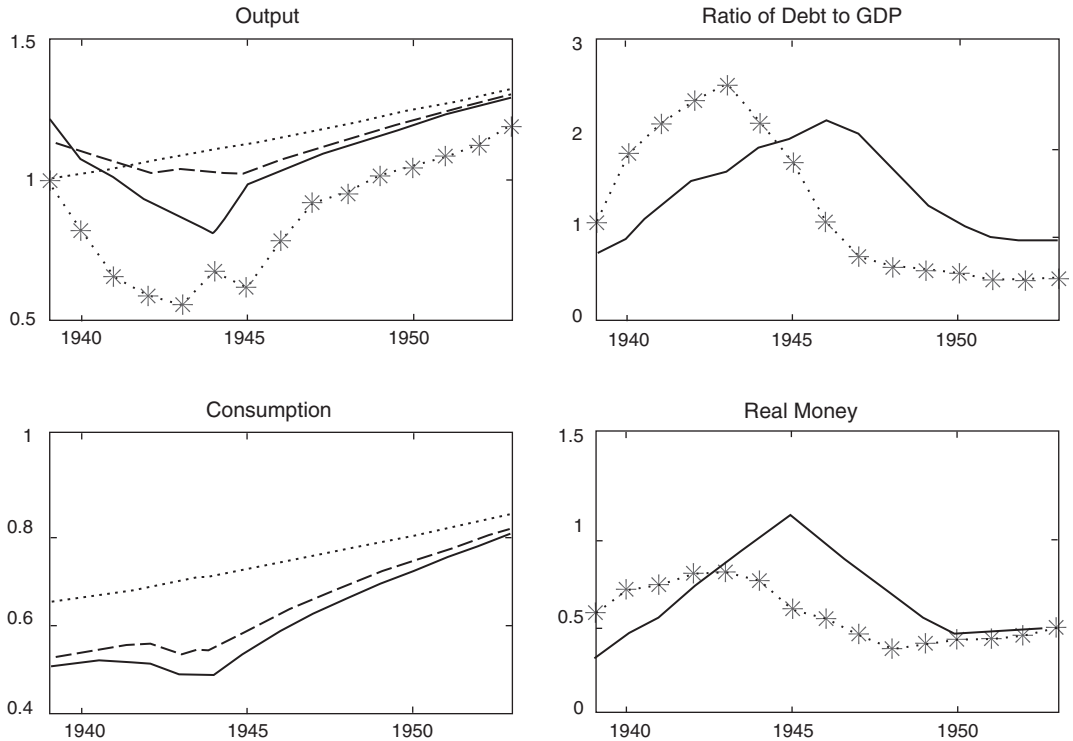


FIGURE 1.

not have raised tax rates high enough to eliminate the need for a stabilization program because of Laffer curve effects.

Given the huge debt and money overhangs, how could Vichy have managed in a postwar world dominated by Nazi Germany? At the war's conclusion in 1944, occupation payments would have ceased; trade would have been limited; and the debt would have been managed without access to world capital markets, requiring large budget surpluses. In essence, we assume that Vichy would have raised taxes to pay down the debt to its steady-state level. Increasing tax rates to 30 percent for 20 years would have been necessary, imposing an additional welfare cost of 7.0 percent, which should be added to the wartime cost of 19.9 percent for a total reduction in consumption of 26.9 percent.

In fact, post-World War II tax rates on labor (31 percent) and capital (27 percent) would have been sufficient to finance the accumulated debt. The government expenditures on the postwar welfare state increased, however, to absorb this

revenue. The stabilization policies adopted by liberated France rested, instead, on inflationary finance. Inflation rose to over 50 percent before falling to 1.4 percent in 1949. This inflation default cut the debt overhang from 181 percent of GDP in 1944 to 51 of GDP percent in 1950. The Marshall Plan, developed by the United States to rebuild Europe and combat communism after World War II, made only a modest contribution to this adjustment, lowering the consumption loss by roughly 1 percent. The burden of the inflation-led adjustment was borne heavily by bond holders, especially the banks and other financial institutions.

IV. Conclusion

Occupied France managed an unprecedented transfer of resources. In our calibrations, we assume that the war ended in 1944, but even if the Vichy government made its policy choices under the most optimistic scenario, with the war ending in 1942, the occupation would have

imposed a 12.6 percent reduction of consumption for 20 years plus the cost of financing a debt overhang equal to 88 percent of steady-state GDP. These costs are only moderately lower than our benchmark occupation cost of a 19.9 percent reduction in consumption and debt overhang of 97 percent of GDP.

If the Vichy government had retained power, it could have eliminated the debt overhang in 20 years by raising taxes at an additional annual cost of 7 percent of consumption. Tax rates rose to the requisite levels, but the surplus needed to pay down the debt never appeared because of reconstruction and welfare-state expenditures. A repressive Vichy regime might have managed a tax-based debt reduction if there had been a German victory in 1942, but the divisive democracy that emerged after 1944 could not. The rapid and probably unexpected inflation of 1946–1948 reduced the debt below its steady-state level. This inflation default was not selective but hit all who had willingly or otherwise propped up the collaborationist government. Reconstruction and stabilization were further aided when France

regained access to international capital markets and intergovernmental loans.

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