

Original citation:

Crafts, N. F. R. and Mills, T. C.. (2015) Self-defeating austerity? Evidence from 1930s' Britain. European Review of Economic History, 19 (2). pp. 109-127

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Self-Defeating Austerity? Evidence from 1930s' Britain

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June 2014

Abstract

Self-defeating austerity entails 'perverse effects' of fiscal consolidation such that fiscal indicators deteriorate. Inter alia, this depends on the size of the fiscal multiplier as Keynes (1933) underlined. We find that the government-expenditure multiplier was less than 1 in 1930s' Britain. Austerity was not self defeating in the long run and even its initial impact probably did not raise the public debt to GDP ratio. In the later 1930s, there was a 'fiscal free lunch' in that deficit-financed government spending would have improved public finances enough to pay for the interest on the extra debt.

Keywords: fiscal consolidation; multiplier; public debt; self-defeating austerity

JEL Classification: E62; N14

An earlier version of this paper was presented at the First CEPR Economic History Symposium at Perugia where we received very helpful comments. We are also grateful to Mark Harrison, Tim Hatton, Michael McMahon, Roger Middleton, George Peden, Valerie Ramey and Ken Wallis for advice and feedback. Alexandra Paun provided excellent research assistance. Two anonymous referees made useful suggestions. The usual disclaimer applies.

1. Introduction

The turn to austerity in the aftermath of the recent economic crisis has been controversial, not least in Britain. Some have argued on the basis of historical evidence that fiscal consolidation is counter-productive in that it makes the public finances worse not better (Chick and Pettifor, 2010). A similar point was made by Keynes (1933) in urging the British government to raise government spending to tackle unemployment. Keynes was writing when Britain was a 'depressed economy' and at a time when the multiplier had just been 'discovered'.¹ *Ceteris paribus*, self-defeating austerity is more likely the higher is the multiplier and it is frequently predicted that multipliers will be large when interest rates are low and unemployment is high as in 1930s' Britain. A very high profile statement of this position was made recently by DeLong and Summers: "policies of austerity may well be counter-productive even by the yardstick of reducing the burden of financing the national debt in the future. Austerity in a depressed economy can erode the long-run fiscal balance. Stimulus can improve it" (2012, p. 234).

There was a good deal of variation in fiscal policy in Britain during the 1930s. There were successive phases in which, first, expenditure cuts and tax increases were imposed in an attempt to return to budget balance in the face of adverse shocks from the world economic crisis and, second, rearmament accompanied by deficit finance comprised a large expansionary fiscal shock in the context of facing up to the threat from Nazi Germany. Interestingly, the public debt to GDP ratio rose during the former and fell during the latter phase. An outline of the fiscal landscape is provided in Table 1. *Prima facie*, it may seem that the claim of self-defeating austerity is plausible given that the debt ratio fell when the policy of fiscal consolidation was reversed and this is indeed an episode that Chick and Pettifor (2010) cite in support of their argument.

In fact, there is no serious analysis of the claim of self-defeating austerity as applied to the depressed economy of 1930s' Britain; this paper aims to fill that gap. We proceed as follows. In section 2, various concepts of self-defeating austerity are reviewed and the conditions under which they would obtain are outlined. In section 3, we consider econometric estimates of the government-expenditure multiplier and conclude that it was much lower than has traditionally been believed. Informed by these estimates, in section 4 we review the evidence for self-defeating austerity. In section 5, we extend the analysis to examine the possibility that there was a 'fiscal free lunch' in the sense of DeLong and Summers (2012). Section 6 concludes.

2. Self-Defeating Austerity: Concepts

In discussing 'self-defeating austerity' it is important to be clear on the definition and time horizon of the concept. Thus, we can distinguish between the implications of deficit-financed expenditure for the absolute size of the public debt or, as is more common, for the public debt to GDP ratio. In the context of the latter, it is also important to consider the likely difference between the short- and long-run impacts of deficit finance.

It is well known that the condition for deficit-financed government expenditure to be self-financing, in the sense that the total stock of government debt does not increase, is that $\mu > 1/\tau$, where μ is the government expenditure multiplier and τ is the marginal tax and transfer rate. In this case the

¹ Kahn (1931) is the paper which famously explained the idea of the multiplier.

additional tax revenue and lower transfer payments will cover the extra borrowing. This is the topic of the discussion in Keynes (1933) which shows that he was well aware of this condition and that he did not really believe it to be satisfied at the time because the multiplier was probably not large enough. Keynes provided a lower bound calculation based in effect on $\mu = 1.5$ and $\tau = 0.43$ and an alternative which he seemed to view as more realistic based on $\mu = 2.0$ and $\tau = 0.43$ and concluded that the impact on tax and transfer payments would offset nearly half and perhaps two-thirds of the initial government borrowing.

It is also well-known that the steady-state condition for the public debt to GDP ratio to be stabilized is that $b = P(R - g)$ where b is the primary budget surplus to GDP ratio, P is the public debt to GDP ratio, R is the real rate of interest on government debt (which equals i , the nominal interest rate on government debt, minus π , the rate of inflation) and g is the growth rate of real GDP. The required primary budget surplus increases with the debt to GDP ratio and with the excess of the real interest rate on government debt minus the growth rate of real GDP. Of course, if the interest rate/growth rate differential is negative it is possible to stabilize the debt ratio while running a primary budget deficit. An analogous expression can be obtained to permit ex-post accounting for changes in the public debt to GDP ratio over a period of time, from, say, $t = 0$ to $t = T$ (Ali-Abbas et al., 2011). This is

$$\nabla P_t = \sum_{t=1}^T ((R_t - g_t)/(1 + \pi_t + g_t))P_{t-1} - \sum_{t=1}^T b_t + \sum_{t=1}^T sfa_t \quad (1)$$

This decomposes the change in P , $\nabla P_T = P_T - P_0$, into a term which is the cumulative effect of the interest rate/growth rate differential, a term which is the cumulative primary deficit and a cumulative residual term which will reflect valuation effects, 'below-the-line' fiscal operations such as privatizations, and errors in the data. Fiscal consolidation will have implications for b but may also affect $R - g$. In the short term g will decrease if the fiscal multiplier is positive and it is possible that R will change in response to fiscal adjustment. Moreover, the impact on b will reflect both the discretionary change in fiscal stance and, in the short run, the implications for the primary balance from repercussions of the multiplier on tax revenues and transfer payments.

Recent discussions of 'self-defeating austerity', e.g., Holland and Portes (2012), have focused on the initial impact of government borrowing on the public debt to GDP ratio. Assuming away any changes to R , the condition for this to decrease initially is that $\mu > 1/(P + \tau)$, which might be satisfied relatively easily, especially when the debt ratio is high, as was the case in the 1930s. Indeed, with P at about 1.7, by implication, Keynes would have expected the initial impact of deficit-financed expenditure in the early 1930s to be a reduction in the public debt to GDP ratio. However, this favourable outcome would be reversed once the impact on GDP of the temporary boost to government expenditure died away since the stock of debt would have been permanently increased.²

² The implications of fiscal consolidation for P are reviewed in Boussard et al. (2012). Their approach takes into account possible repercussions on the interest rate/growth rate differential and cyclical effects on the primary balance. They find that the typical time horizon for a consolidation during crisis periods to reduce the debt

A further permutation in this debate has been provided by DeLong and Summers (2012). Their criterion is that a fiscal expansion is self-financing if it generates enough future tax revenue and/or reductions in outlays to cover the interest payments on the additional stock of debt that the initial borrowing entails. This requires the following condition to be satisfied.

$$R \leq \dot{Y} + \frac{\eta\mu\tau}{(1-\mu\tau)} \quad (2)$$

where \dot{Y} is the trend rate of growth of real GDP, and η is a hysteresis parameter defined as the per cent reduction in the flow of potential future output per percentage-point-year of the present-period output gap. The idea here is that, if depressed levels of output today have large enough permanent costs in terms of GDP lost, for reasons such as reductions in labour force skills or the capital stock, then, if these costs can be avoided by deficit-financed temporary government spending, this will be self-financing – a fiscal ‘free lunch’.

Clearly, the possibility of self-defeating austerity or a fiscal free lunch turns on the size of the fiscal multiplier and advocates of these claims typically argue that they only hold in ‘depressed economy’ conditions when multipliers may be much larger than normal.³ Most estimates of fiscal multipliers for interwar Britain are quite old. The methods they employed to obtain estimates of the multiplier are open to challenge and are not those which would be used by macroeconomists today. They do, however, suggest that the multiplier may have been much higher than would be assumed nowadays in ‘normal conditions’.

Thus, estimates of the government-expenditure multiplier of 0.98 in the short-run and 1.44 in the long-run were obtained by Thomas (1981) based on a simulation of a Keynesian macro-econometric model, and estimation of an IS-LM model gave a value of 1.22 for the fiscal multiplier in Broadberry (1986). Thomas (1983) looked at the impact of rearmament using an approach based on an input-output table and a social accounting matrix which assumes no crowding out and concluded that the government expenditure multiplier was 1.64 in 1935 and 1.60 in 1938. Hatton (1987) surveyed this literature and concluded that it was appropriate to think in terms of a range of values between 1.25 and 1.75 for the multiplier. Finally, Dimsdale and Horsewood (1995), who incorporated aggregate supply with a high degree of nominal inertia as well as aggregate demand into a macro-econometric model for the interwar period, concluded that the short run multiplier was about 1.5 and the long run as much as 2.5.

3. Revisiting the Multiplier in Interwar Britain

The models that these papers rely upon basically embody Keynesian ideas in their specification with a traditional consumption function and may not adequately reflect crowding out, with the implication that the estimated multipliers are too large. None of these papers is based on models in

ratio is about 2 to 3 years depending on the time it takes for the multiplier effect to evaporate and the interest rate response in the market for government debt.

³ This matches many a priori predictions but need not be the case. Recent empirical evidence is that the level of public debt affects the multiplier and that when debt ratios are high the response of output to increased government expenditure is very small even in deep recessions (Auerbach and Gorodnichenko, 2011; Ilzetski et al., 2010), possibly because Ricardian equivalence effects are stronger when debt ratios are large (Rohn, 2010).

either the neoclassical or new-Keynesian traditions which embody optimizing behaviour by forward-looking households. These are models which typically expect consumer expenditure to fall rather than rise in response to an increase in government expenditure and envisage that the multiplier may be less than 1.⁴

This suggests that a fresh look at the size of the multiplier in 1930s' Britain using modern techniques is desirable. It is now possible to revisit the question of the size of the fiscal multiplier using time-series econometrics rather than relying on a traditional macroeconomic model, as has been the practice hitherto, thanks to the development of a quarterly series for real GDP for the interwar UK economy by Mitchell et al. (2012).⁵ In undertaking this task, we make use of the 'defence news' approach to resolving the endogeneity of government expenditure pioneered by Ramey (2011) and also adopted by Barro and Redlick (2011).

The idea of 'Defence News' is to reflect changes to planned government defence expenditure previously unanticipated by the public. This variable can be thought of as capturing exogenous shocks to a key component of government spending. Our key source is *The Economist* magazine, which was published weekly throughout the interwar period. *The Economist* gave a detailed yearly account of actual spending at the time of the annual budget in April. It also published quarterly running totals at the beginning of January, April, July and October each year. In order to construct the series for 'Defence News', we examined every issue of *The Economist* from 1919 through 1938 and compiled a complete log of all entries relating to defence expenditure. The relevant material includes reports of defense estimates, announcements of policy changes with possible spending implications, special reports such as those on air-force and naval expenditure in February 1936, commentaries on the credibility of government estimates and announcements, and predictions of future developments.

Using this log we made an estimate of the present discounted value of defense expenditure for 1920q1 and then updated it each quarter until 1938q4.⁶ In moving forward through time, for each quarter we compiled a present value figure based on the information set available in the previous quarter and one using the current information. The difference between the two estimates is 'Defence News' for the quarter. Expected values were calculated at 1938 prices for a horizon of five years using a discount rate of 5.1 per cent.⁷ It should be noted that the observations for 'Defence News' in 1935 through 1937 are abnormally large at a time when there must have been considerable uncertainty at the time both about the detail of the government's rearmament plans and the extent to which they would be implemented. This could lead to downward-biased estimates of the normal government expenditure multiplier either because the 'Defence News' numbers are outliers or if they are unreliable. Accordingly, in what follows we present results both for a full interwar sample

⁴ For a convenient summary of predictions from a variety of macroeconomic models, see Hebous (2011).

⁵ These estimates are derived using data on annual GDP, quarterly industrial production and monthly economic indicators published in *The Economist*. An econometric technique is then deployed to obtain monthly GDP from these ingredients. The approach does not provide estimates of the components of national expenditure.

⁶ Further details and discussion can be found in Crafts (2012) and Crafts and Mills (2013).

⁷ Figures in current prices have been converted to constant 1938 prices using the monthly retail price index in Capie and Collins (1983, Table 2.13) and the discount rate is 1.25% per quarter. We experimented with several other values reflecting rates on government bonds in different years and found that the 'Defence News' series and the multiplier estimates are not sensitive to this choice.

period and also for a period truncated at 1934q4, which omits the potentially problematic years at the end.

The data required for our econometric analysis are taken from well-known sources. In particular, estimates of government expenditure on a quarterly basis have been taken from *The Economist*. The sources are listed in the appendix.

3.1. Estimates by Crafts and Mills

A recent paper by Crafts and Mills (2013) suggested a different approach to estimating the government expenditure multiplier for interwar Britain using time-series econometrics and quarterly data rather than relying on a traditional macroeconomic model estimated with annual data. Their methodology also took advantage of the ‘defense-news methodology’ pioneered by Ramey (2011) to address the troublesome issue of the endogeneity of government expenditure. The resulting estimates suggested that the multiplier was considerably lower than hitherto supposed with point estimates ranging from 0.3 to 0.8 depending on the model specification and sample period.

Crafts and Mills (2013) employed an approach similar to that of Barro and Redlick (2011). This has the following general specification:

$$\nabla y_t = \alpha_0 + \sum_{i=0}^4 \beta_{1i} news_{t-i} + \sum_{i=1}^4 \beta_{2i} \nabla D_{t-i} / GDP_{t-1-i} + \text{lagged controls} + u_t \quad (3)$$

Here *news* is defense news divided by the one-quarter lagged value of real GDP, D_t is the level of defense spending and $\nabla y_t = \log(GDP_t / GDP_{t-1})$ is quarterly real GDP growth. The sample periods run from 1922q1 to 1938q4 and from 1922q1 to 1934q4. Starting in 1922 avoids the immediate aftermath of World War 1, which is known to have produced a shift in the process generating GDP.⁸ Truncating the sample period at the end of 1934 removes the period when war was imminent and when there were some announcements of very large future defense spending which are not easy to quantify.

The lag length was set at 4 to model any seasonality present in the data (seasonally unadjusted data was used throughout). The contemporaneous term of *news* was included but all other variables were lagged to avoid problems of endogeneity. The control variables included were lags of export growth, changes in the money multiplier, consol yields and the tax rate, and the unemployment rate.⁹ Growth rates and changes were used to ameliorate problems caused by the non-stationarity of many of the variables when expressed as levels. The error term u_t was specified as the ARCH(1) process $u_t^2 = \delta_0 + \delta_1 u_{t-1}^2$, which effectively models the volatility of GDP growth during 1926 and 1927 and precludes the need for lagged values of GDP growth to be included as regressors: including such lags with u_t assumed to be homoskedastic leads to a significant deterioration of fit.

Table 2 reports the Crafts and Mills (2013) estimates based on a final specification in which insignificant variables have been deleted, standard errors are robust to possible residual

⁸ See, for example, Mills (1991).

⁹ In selecting these controls we have followed Barro and Redlick (2011) in allowing for monetary conditions, other fiscal variables and the degree of slack in the economy.

autocorrelation and heteroskedasticity, and the reported equation passes a variety of standard tests for misspecification.¹⁰ The *news* variable is significantly positive at lags of one and two quarters with coefficients estimated to be, with one-standard error bounds, 0.0325 ± 0.0025 and 0.0179 ± 0.0039 .

Barro and Redlick's multiplier definition is based on using annual data with single lags of the regressors. The quarterly counterpart is $m = \sum_{i=1}^4 (16\beta_{1i} + \beta_{2i})$. Given the estimates in Table 2 the multiplier is $m = 0.45 \pm 0.13$. For the period truncated at 1934q4, the estimated multiplier is $m = 0.81 \pm 0.37$.

Two further econometric exercises in Crafts and Mills (2013) confirmed that the multiplier was probably less than 1. First, the impact of government expenditure on private expenditure was estimated using a model proposed by Ramey (2012). This showed a significant negative relationship and confirmed the existence of incomplete crowding out. The implied multipliers were 0.77 for the full sample and 0.72 for the shorter sample period. Second, a more general model specification was tried which fitted the data somewhat better but has no exact counterpart in the macroeconomics literature. This related changes in output growth, ∇y_t , again to lags of *news*_t, but now to lags of government spending growth disaggregated into defense and non-defense spending, ∇d_t and $\nabla non-d_t$, and lags of non-government spending (private expenditure on consumption, investment and net exports) growth, ∇n_t , all growth variables again being defined as one-quarter changes in the logarithms:

$$\nabla y_t = \alpha_0 + \sum_{i=1}^4 (\beta_{1i} news_{t-i} + \beta_{2i} \nabla d_{t-i} + \beta_{3i} \nabla non-d_{t-i} + \beta_{4i} \nabla n_{t-i}) + \text{lagged controls} + u_t \quad (4)$$

However, there may also be 'indirect' effects because *news* may have influence on other various categories of spending that also matter to GDP growth. Regressions of the form $\nabla z_t = \gamma_0 + \sum_{i=1}^4 (\gamma_i \nabla z_{t-i} + \theta_i news_{t-i}) + v_t$ were therefore estimated for *z* respectively defined as ∇d , $\nabla non-d$ and ∇n . These were then inserted into equation (4) to obtain a set of indirect multipliers and an overall multiplier, defined as the sum of the direct and indirect multipliers. The estimated total overall multiplier was 0.34 on an annualized basis which is fully realized after three years. For the truncated period ending at 1934q4 the estimate of the annualized total multiplier was 0.76.¹¹

We now explore the robustness of these results using the same dataset but exploring some alternative methodologies and explicitly examining the issue of whether the multiplier was higher during the period when unemployment was at its peak similarly to Owyang et al. (2013).

¹⁰ For the estimated coefficients of the control variables see Crafts and Mills (2013, Table A1)

¹¹ For both this and the previous specification, we see that the estimate of the multiplier is considerably higher if the years after 1934 are excluded. This may well reflect non-linearities associated with the high values of defence spending and announcements of future defence spending at this time.

3.2. VAR analyses

Following the framework outlined by Ramey (2012), we consider computing impulse responses, and hence multipliers, using the VAR system

$$\mathbf{x}_t = \mathbf{A}_0 \mathbf{d}_t + \sum_{i=1}^4 \mathbf{A}_i \mathbf{x}_{t-i} + \mathbf{u}_t \quad (5)$$

with $\mathbf{x}_t = (z_t, gov_t, y_t, tax_t, r_t)'$: here gov_t and y_t are the logarithms of government spending and real GDP, z_t is a variable that distinguishes the alternative systems introduced below, tax_t is the tax rate and r_t an interest rate; \mathbf{d}_t contains a quadratic trend and seasonal dummies and is thus consistent with the exercises reported in Ramey (2011, 2012). This ordering of the variables in \mathbf{x}_t is used in the Choleski decomposition leading to the calculation of impulse responses and hence multipliers from three choices of \mathbf{x}_t :

1. **Blanchard-Perotti structural VAR (SVAR)**: Blanchard and Perotti (2002) omit z_t entirely and identify the shock to government spending as the innovation to gov_t , now ordered first in the Choleski decomposition.
2. **Perotti SVAR**: Perotti (2011) sets $z_t = d_t$, the logarithm of defence spending. The government spending shock is then the innovation to d_t .
3. **Ramey News Expectational VAR (EVAR)**: Ramey (2011) sets $z_t = news_t$, which is her 'defense news' variable divided by lagged GDP. The innovation to this variable is thus identified as the government spending shock.

Figure 1 shows the sequence of multipliers up to $T = 80$ quarters obtained from the three variants of the VAR (3) computed for the sample 1922q1 to 1938q4. The Blanchard-Perotti SVAR multiplier is negative whereas the Perroti SVAR and Ramey EVAR multipliers are both in the region of 0.7. Unfortunately, the precision with which these multipliers can be estimated is rather poor, the standard error to be attached to the Ramey EVAR multiplier being in the region of 0.65 while that for the Perotti SVAR multiplier being over 2.8.

3.3. Local Projection

In contrast to estimating a fully specified VAR over a complete sample period, Owyang, Ramey and Zubairy (2013) employ Jorda's (2005) local projection technique to compute impulse responses and hence multipliers by adopting a specification which allows the sample to be separated into recessions and expansions. This approach estimates the following pair of 'growth' regressions for each horizon h :

$$\begin{aligned} \frac{Y_{t+h} - Y_{t-1}}{Y_{t-1}} = & REC_{t-1} \left(\alpha_{Y,R,h} + \beta_{Y,R,h} news_t + \sum_{i=1}^p (\gamma_{Y,R,h,i} y_{t-i} + \zeta_{Y,R,h} g_{t-i}) \right) \\ & + (1 - REC_{t-1}) \left(\alpha_{Y,E,h} + \beta_{Y,E,h} news_t + \sum_{i=1}^p (\gamma_{Y,E,h,i} y_{t-i} + \zeta_{Y,E,h} g_{t-i}) \right) + u_{Y,t} \end{aligned} \quad (6)$$

$$\frac{G_{t+h} - G_{t-1}}{Y_{t-1}} = REC_{t-1} \left(\alpha_{G,R,h} + \beta_{G,R,h} news_t + \sum_{i=1}^p (\gamma_{G,R,h,i} y_{t-i} + \zeta_{G,R,h} g_{t-i}) \right) + (1 - REC_{t-1}) \left(\alpha_{G,E,h} + \beta_{G,E,h} news_t + \sum_{i=1}^p (\gamma_{G,E,h,i} y_{t-i} + \zeta_{G,E,h} g_{t-i}) \right) + u_{G,t} \quad (7)$$

Y_t and G_t are the levels of GDP and government expenditure, so that the dependent variables in (6) and (7) are, approximately, $y_{t+h} - y_{t-1}$ and $(g_{t+h} - g_{t-1})(G_{t-1}/Y_{t-1})$, respectively. Consequently, the coefficients in the two equations are measured in the same units. REC_t is a dummy variable that takes the value unity when t is designated to be in the recessionary state R and zero when t is in the expansionary state E . The h -quarter-ahead impulse responses with respect to $news$ in the two states are given by the $\beta_{i,j,h}$ coefficients ($i=Y, G$; $j=R, E$), from which multipliers may be calculated in various ways: for example, the k -quarter 'integral' measure may be calculated as $\left(\sum_{h=1}^k \beta_{Y,i,h} \right) / \left(\sum_{h=1}^k \beta_{G,i,h} \right)$, while the 'peak' measure may be calculated as $\max \left(\sum_{h=1}^{16} \beta_{Y,i,h} \right) / \max \left(\sum_{h=1}^{16} \beta_{G,i,h} \right)$.¹²

As an example of this approach, when the recessionary state ($REC_t = 1$) is defined as the period 1930q4 to 1938q4 the 16-quarter integral multiplier measure is 0.62 while the similar multiplier for the expansionary state is -0.09.¹³ Various other choices for the recessionary state were investigated based, for example, on defining 'high' and 'low' unemployment episodes. However, the multipliers, both integral and peak, proved to be very unstable across states and our conclusion is that, for this particular data set, the local projection method fails to provide any useful and reliable multiplier estimates. It should be noted, however, that we did not obtain a multiplier greater than 0.7 for any of the periods that we experimented with as the 'recessionary state'.

We conclude that modern econometric techniques point to estimates of the multiplier for interwar Britain that are well below what has traditionally believed. The highest point estimate is about 0.8 with the preponderance of estimates being a little lower than this. There is no convincing evidence that the multiplier was higher in the period of a 'depressed economy'. It must be accepted, however, that the sample period is quite short and the properties of the sample are such that it is not amenable to some estimation techniques.

4. Self-Defeating Austerity: Evidence

We begin by accounting for the decline in the public debt to GDP ratio in the years after 1933 (Table 1) at a time when first fiscal consolidation was mildly reversed and then rearmament transformed fiscal policy. Table 3 provides the ingredients for the formula of Ali-Abbas et al. (2011) set out in equation (1).

The results from using this formula to account ex-post for changes in the debt ratio are that 22.8 of the 35.4 percentage points decline between 1933 and 1938 came from primary budget surpluses and 9.3 percentage points came from a favourable interest rate/growth rate differential leaving 3.3

¹² Equations (5) and (6) are consistently estimated by OLS although for inference HAC standard errors should be used to deal with the autocorrelation induced into the error for horizons greater than one quarter. The lag order was set at $p = 5$ on the basis of information criteria.

¹³ This choice is motivated by real GDP being below the trend growth line throughout this period.

percentage points as the residual contribution. Although fiscal policy was relaxed quite considerably in the late 1930s, Table 3 shows that primary budget surpluses, albeit smaller, continued and most of the reduction in the debt ratio came from this source. Once the differential between the real interest rate and the real growth rate had turned negative, it would have been possible to run modest primary budget deficits and still have stabilized P .¹⁴ Thus, rearmament was consistent with continuing falls in the public debt to GDP ratio.

Table 3 reflects a stark difference between the conditions prevailing in the late 1930s and the late 1920s and, in effect, the major change in the fiscal arithmetic that was occasioned by Britain's exit from the gold standard. In the context of Britain's high debt ratio, the legacy of World War I, price deflation and the interest rate policies required to defend the exchange rate made stabilizing the debt ratio an onerous task. The post gold standard era was one of 'cheap money', i.e., a policy run by HM Treasury which entailed holding nominal interest rates down with debt management as a major consideration – a form of 'financial repression' - as well as monetary stimulus (Howson, 1975).

Turning explicitly to self-defeating austerity, we can combine our estimates of the multiplier with those for τ , the marginal tax and transfer rate, provided by Middleton (1985, Table 7.3) to evaluate the formulae discussed in section 2. These are that τ averaged 0.44 in the early 1930s, very similar to the lower bound calculation in Keynes (1933). This means that for deficit-financed government expenditure not to raise the stock of government debt, which requires that $\mu > 1/\tau$, the required value of μ was 2.28. This condition surely was not met – Keynes was right, albeit much too optimistic about the size of the multiplier which was probably only about half his lower-bound estimate of 1.5. On the other hand it seems possible that the condition that fiscal consolidation raised the debt to GDP ratio initially, $\mu > 1/(P + \tau)$, was realized, in particular because P was very high. Given that $P = 1.7$ and $\tau = 0.44$, $\mu > 0.47$ would satisfy this condition.

To explore more fully the implications of the relaxation of fiscal policy for the debt ratio we need to consider its impact on the components of the accounting formula (1). This will comprise both its structural and its cyclical effects on the primary balance and on the interest rate/growth rate differential. In what follows, we assume that in the cheap money environment the authorities were able to neutralize any impact on the interest rate. The fiscal multiplier is assumed to affect both the cyclical impact on the primary balance and the growth rate.

The results reported in Tables 4 and 5 fill out the implications of removing the post-1933 fiscal expansion (including, of course, rearmament) on the structural primary balance by assuming that the constant employment surplus was maintained at the 1933 level. The impact of this change on the cyclical component of the primary balance is taken to be $\mu\tau$ x the cumulative change in fiscal stance, i.e., it is assumed that multiplier effects do not die away in the 'depressed-economy' conditions of the 1930s. The counterfactual public debt ratio under alternative assumptions about the multiplier can be compared with the actual debt ratio after adjusting for the residual component in the accounting decomposition.

¹⁴ The change in real interest rates between the early and later 1930s is well documented in Chadha and Dimsdale (1999).

In Table 4, the full value of the multiplier is assumed to be reached in year 1. For $\mu = 0.45$ (for which value $\mu < 1/(P + \tau)$) we see that maintaining the fiscal squeeze would have resulted in lower debt ratios throughout. For the other values of μ , the counterfactual debt ratio in the first year is higher, i.e., there is self-defeating austerity in the sense of Holland and Portes (2012). For $\mu = 0.75$, the 'perverse' impact on the debt ratio ends in the third year but for the higher values reported in the table continuing austerity produces a higher value of the debt ratio after five years, given that the multiplier does not fade away.

However, the econometric evidence provided in section 3 and elsewhere suggests that the short-run value of the multiplier is a good deal lower than the full value which typically is not achieved before year 3. For example, Figure 3 of Crafts and Mills (2013) shows the time paths of both the direct multiplier computed from equation (4) and an 'indirect' multiplier formed by taking into account the effect of news on private and government spending. These show that the full value of the multiplier takes up to three years to be achieved and calculations show that the multipliers from the VAR and local projection methods have similar time paths. Accordingly in Table 5, it is assumed that the first (second) year value of the multiplier is $1/3(2/3)$ of the full value, so in the column headed ' $\mu = 0.75$ ', the successive values in years 1, 2 and 3 are 0.25, 0.5 and 0.75, respectively. The other columns are compiled in similar fashion. Here we see that even with a long-run multiplier of 1.2 a policy of austerity would not be 'self-defeating' in that the predicted debt ratio is below the actual. In fact, the long-run multiplier has to be almost 1.5 for the 'self-defeating' outcome to be observed.

On the basis of earlier estimates of the multiplier such as those of Dimsdale and Horsewood (1995) or Thomas (1983) this criterion would have been met but our estimates suggest this would not have been the case. Our estimates for the government expenditure multiplier are not only considerably lower than has been believed by earlier writers but also are out of line with models which predict that the multiplier will be large in a depressed economy with interest rates at the lower bound.¹⁵ Even so, there is a plausible reason for the multiplier to have been quite modest in the 1930s, namely that the legacy of World War I meant that there was a high ratio of public debt to GDP. Between the late 1920s and the late 1930s this was never less than 140 per cent and peaked at nearly 180 per cent in 1933 (Table 1), the levels at which modern studies find very low multipliers (Auerbach and Gorodnichenko, 2011).

On balance, and notwithstanding the high initial debt ratio and substantial size of the marginal tax and transfer rate, we believe that the evidence suggests that maintaining fiscal consolidation in 1930s' Britain would have led to a larger reduction in the public debt to GDP ratio than was actually observed. It is probable that the value of the multiplier in year 1 was less than 0.47. It therefore seems unlikely that rearmament should be credited with improving this fiscal indicator but, given the favourable configuration of interest rates and growth rates, it was possible to combine rearmament with (slower) reductions in the debt to GDP ratio.

¹⁵ For example, Christiano et al. (2011). However, it should be noted that this prediction is not universal in New-Keynesian models as the parameterization in Braun et al. (2013) demonstrates.

5. A Fiscal Free Lunch

Was there a fiscal ‘free lunch’ in the sense of DeLong and Summers (2012)? In order to address this question, we also need estimates of the values of \dot{Y} , the trend rate of growth of real GDP, and of η , the hysteresis parameter. With regard to the former, our interwar quarterly data set yields an estimate of a trend growth rate with $\dot{Y} = 1.93$ per cent per year.¹⁶ This is, in fact, the same as the trend-stationary rate that was estimated for the pre-World War I period by Mills (1991). For the purposes of the ‘free lunch’ calculation this is unlikely to be a controversial benchmark to choose.

Obtaining an estimate of η is more difficult. Our approach is based on using IMF (2012, annex 1) as a starting point. Their methodology focuses on hysteresis effects that emerge in the form of a higher NAIRU (U^*) being generated by years when real GDP falls below its potential level (Y^*). More precisely, the empirical estimate on which IMF (2012) relies is that each 1 percentage point widening of the cumulative output gap raises U^* by 0.14 percentage points, with the implication that Y^* falls by 0.1 per cent. This is equivalent to setting $\eta = 0.1$, the central estimate of the hysteresis parameter assumed by DeLong and Summers (2012).

We can check the plausibility of assuming that a similar relationship applied in Britain in the 1930s. On the basis of trend growth at 1.93 per cent per year, the output gap in 1929 averaged -3.7 per cent. Working forward through the 1930s, the cumulative output gap sums to 27.3 per cent of GDP, which would imply that U^* is predicted to have risen by 3.82 percentage points between 1929 and 1937. The best estimates for U^* show an increase of 3.83 percentage points over these years (Dimsdale and Horsewood, 1995). The increase in U^* results from various proximate determinants but is essentially driven by the economy’s response to the exogenous demand shock of the world economic crisis. Thus, the assumption of $\eta = 0.1$ appears quite reasonable, *prima facie*.

However, this conclusion must be treated with some caution. On the one hand, there may be other contributions to η which would mean the true value exceeds 0.1. These might include the marked increase in long-term unemployment during the 1930s, which probably also contributed to a higher U^* although the magnitude of such an effect is unclear (Crafts, 1989), and also a slowdown in the rate of growth of the capital stock.¹⁷ On the other hand, the rise in U^* partly reflects policy choices, for example, with regard to the replacement rate. Moreover, it is not clear how far a fiscal stimulus could have averted the rise in U^* or the slowdown in capital stock growth and thus underpinned future tax revenues. Even if 0.1 is a reasonable assumption for the value of η , as we assume in what follows, this is no more than a best guess with quite wide margins of error. That said, it would not seem reasonable to suppose that $\eta = 0$, which means that there will be some values of the multiplier which would deliver the free lunch.

¹⁶ This comes from estimating the following trend stationary model for GDP

$$y_t = 20.54 + 0.00483t + u_t \quad u_t = 1.295u_{t-1} - 0.425u_{t-2} + \varepsilon_t$$

and annualizing the trend coefficient.

¹⁷ The rate of growth of non-residential capital stock fell from 0.8 to 0.5 per cent per year between the business cycles 1924-9 and 1929-37 (Feinstein, 1972). A growth accounting calculation suggests that if this were attributable to the cumulative output gap resulting from a demand shock, then this would add about 0.05 to η .

Table 6 uses equation (2) to calculate the critical values of the real interest rate that would permit a fiscal stimulus to have been self-financing for $\dot{Y} = 1.93$ per cent and, as before, $\tau = 0.44$. As might be expected, the outcome is quite sensitive to the value of the government-expenditure multiplier. The likelihood of the criterion being met was obviously much greater after Britain had left the gold standard and had entered financial repression, as the data in Table 3 confirm. R averaged 5.7 per cent in the late 1920s but 2.2 per cent from 1934 onwards.

Indeed, it seems likely that the free lunch was available in the mid-1930s – for example, if $\eta = 0.1$, then even with a multiplier of only 0.5, if the government could borrow at a real interest rate below 4.75, this would be the case. However, on the gold standard in the late 1920s, even if the multiplier was 0.8 the real interest rate facing the British government would have very possibly been too high to meet the criterion. This conclusion is strengthened when it is recognized that interest rates faced significant upward pressure if budgetary policy was viewed as ‘unsound’, as was demonstrated in 1931 (Middleton, 1985, p. 94).

6. Conclusions

Contrary to conventional wisdom, our results are that austerity was not self-defeating in 1930s’ Britain. In particular, we find that expansionary fiscal policies, including rearmament, meant that the public debt to GDP ratio fell more slowly than if the earlier fiscal squeeze had been maintained. The possibility of self-defeating austerity depends on the size of the multiplier; estimates of the multiplier using modern time-series econometrics show that it was considerably lower than has been believed until recently and was probably no more than 0.8 even in the long run.

There was a significant reduction in the public debt to GDP ratio between 1933 and 1938. This was compatible with rearmament because despite the relaxation in the fiscal stance the government still ran a primary budget surplus at a time when the real GDP growth rate exceeded the real interest rate at which the government could borrow. The ‘financial repression’ associated with HM Treasury’s cheap money policy was conducive to this configuration.

In the mid-1930s, given the presence of hysteresis effects in the labor market, it seems highly probable that there was a ‘fiscal free lunch’ in that deficit-financed government expenditure could improve the flows of tax revenues and transfer payments by enough to pay the interest on the extra debt. However, it is unlikely that this was also the case while Britain was on the gold standard in the late 1920s.

Appendix

The data sources for the variables used in the regressions are as follows:

Real GDP at 1938 prices: Mitchell et al. (2012, Table 2b).

Government expenditure on goods and services and on defence: as reported in *The Economist* on a quarterly basis at current prices in the first issue of January, April, July and October each year, converted into 1938 prices using the retail price index from Capie and Collins (1983, Table 2.14). Before 1921_{Q2}, defence expenditure was inferred using the annual total reported in Feinstein (1972, Table 33) allocated to quarters based on army numbers taken from BPP (1922, 1923) for years ending 30 September 1920 and 1921.

Defence News: derived as explained in Crafts (2012).

Exports: Capie and Collins (1983, Table 5.8) converted into 1938 prices.

Tax Rate: total tax revenues/GDP from Middleton (1996), Tables AI.1 and AI.2

Unemployment: Capie and Collins (1983, Table 4.5).

Money Multiplier: M1/monetary base from Capie and Webber (1985, Table I.2). Before 1922_{Q1} M1 was estimated as M3/1.33 from Howson (1975, Appendix 1, Table 1).

Yield on Consols: Capie and Webber (1985, Table III.10).

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Table 1. Fiscal Indicators , Real GDP and Unemployment in 1930s' Britain

	Government Debt	Budget Surplus	Debt Interest	Constant Employment Budget Surplus	Real GDP (1929 =100)	Unemployment (%)
1929	158.4	-0.7	7.7	0.4	100.0	8.0
1930	159.2	-1.4	7.6	1.1	99.9	12.3
1931	169.8	-2.2	7.7	2.5	94.4	16.4
1932	173.6	-0.5	7.8	3.0	95.1	17.0
1933	179.2	0.4	7.0	4.2	96.0	15.4
1934	173.1	0.5	6.2	3.2	102.8	12.9
1935	165.0	-0.3	6.0	2.0	106.6	12.0
1936	158.7	-0.7	5.7	0.8	109.9	10.2
1937	147.2	-1.5	5.4	-0.1	114.7	8.5
1938	143.8	-3.7	5.2	-1.5	118.2	10.1

Notes:

All fiscal indicators are as %GDP.

The constant employment budget surplus is for the fiscal year, i.e., the first entry is 1929/30; a bigger positive indicates that fiscal policy has been tightened.

Sources:

Fiscal data: from database for Middleton (2010) generously made available by the author.

Real GDP: Feinstein (1972).

Unemployment: Boyer and Hatton (2002).

Table 2. Barro and Redlick Specification Estimates

	1922q1 to 1938q4	1922q1 to 1934q4
	(1)	(2)
	∇y_t	∇y_t
constant	-0.0062 [4.2]	-0.0086 [4.2]
$news_{t-1}$	0.0325 [10.7]	-0.0248 [1.4]
$news_{t-2}$	0.0179 [4.6]	0.1246 [3.9]
$\nabla D_{t-2}/GDP_{t-3}$	-0.1076 [3.0]	-0.1354 [3.5]
$\nabla D_{t-3}/GDP_{t-4}$	-0.2544 [5.7]	-0.4297 [5.8]
$\nabla D_{t-3}/GDP_{t-4}$	-	-0.2221 [4.7]
R^2	0.19	0.12
SE	0.0168	0.0208

Note: Figures in parentheses are robust t-ratios. SE is the regression standard error. The estimates for the ARCH(1) error specification for the equation in column (1) are $\hat{\delta}_0 = 9.31 \times 10^{-9} [297.5]$ and $\hat{\delta}_1 = 1.7016 [4.2]$ and are $\hat{\delta}_0 = 5.98 \times 10^{-9} [241.0]$ and $\hat{\delta}_1 = 2.0891 [3.7]$ for the equation in column (2).

Table 3. Fiscal Sustainability Data, 1925-1938

	<i>b</i>	<i>i</i>	π	<i>g</i>	<i>d</i>	<i>b*</i>
1925-9 average	6.78	4.72	-0.99	2.22	1.636	5.71
1930	6.15	4.75	-0.40	-3.72	1.592	14.12
1931	5.41	4.51	-2.40	-2.37	1.698	15.76
1932	7.25	4.49	-3.58	0.65	1.736	12.88
1933	7.42	3.90	-1.40	4.74	1.792	1.00
1934	6.76	3.58	-0.68	4.78	1.731	-0.90
1935	5.68	3.64	0.87	4.26	1.650	-2.46
1936	4.95	3.59	0.55	4.15	1.587	-1.76
1937	3.89	3.67	3.73	3.17	1.472	-4.75
1938	1.56	3.62	2.77	0.42	1.438	0.62
1933-8 average	5.04	3.67	1.67	3.59	1.612	-1.38

Note:

*b** is the required primary budget surplus to GDP ratio to satisfy the condition that $\nabla P = 0$, where $\nabla P = -b + (i - \pi - g)$.

Sources:

b, primary budget surplus to GDP ratio, *i*, average nominal interest rate on government debt, and *P*, public debt to GDP ratio from Middleton (2010) database; π , rate of inflation based on GDP deflator from Feinstein (1972); *g*, 4th quarter real GDP growth rate, from Mitchell et al. (2012).

Table 4. Accounting for the Impact on the Public Debt Ratio of Not Reversing Fiscal Consolidation (Full Multiplier after 1 year)

	<i>Actual P</i>	<i>Actual P Without Residual Component</i>	<i>Counter-factual P</i>			
			$\mu = 0.45$	$\mu = 0.75$	$\mu = 1.2$	$\mu = 1.5$
1933	179.2					
1934	173.1	171.54	171.52	172.17	173.15	173.81
1935	165.0	163.41	162.51	164.04	166.35	167.90
1936	158.7	156.71	153.94	156.48	160.33	162.90
1937	147.2	148.02	142.38	145.90	151.19	154.72
1938	143.8	147.07	137.77	142.65	150.01	154.50
Total Reduction	35.4	32.13	41.43	36.55	29.19	24.70
Structural b			39.44	39.44	39.44	39.44
Cyclical b			-3.30	-5.48	-8.77	-10.95
r - g			5.29	2.59	-1.48	-3.79

Notes:

Derived using accounting formula in Ali-Abbas et al. (2011) taking into account multiplier effects on cyclical balance assuming in each case that $\tau = 0.44$ and on interest rate/growth rate differential. Structural primary balance held constant at 1933 level based on constant employment surplus reported in Table 1.

Source: own calculations, see the text.

Table 5. Accounting for the Impact on the Public Debt Ratio of Not Reversing Fiscal Consolidation (Full Multiplier after 3 years)

	<i>Actual P</i>	<i>Actual P Without Residual Component</i>	<i>Counter-factual P</i>			
			$\mu = 0.45$	$\mu = 0.75$	$\mu = 1.2$	$\mu = 1.5$
1933	179.2					
1934	173.1	171.54	170.87	171.08	171.41	171.63
1935	165.0	163.41	161.28	161.99	163.09	163.80
1936	158.7	156.71	152.42	153.96	157.85	157.85
1937	147.2	148.02	140.80	143.25	149.46	149.46
1938	143.8	147.07	135.80	139.33	148.31	148.31
Total Reduction	35.4	32.13	43.40	39.87	34.45	30.89
Structural b			39.44	39.44	39.44	39.44
Cyclical b			-2.28	-3.75	-6.03	-7.50
r - g			6.24	4.18	1.04	-1.05

Notes:

Derived using accounting formula in Ali-Abbas et al. (2011) taking into account multiplier effects on cyclical balance assuming in each case that $\tau = 0.44$ and on interest rate/growth rate differential. Structural primary balance held constant at 1933 level based on constant employment surplus reported in Table 1.

Source: own calculations, see the text.

Table 6. Critical Values of the Real Interest Rate of Government Borrowing for Fiscal Expansion to be 'Self-Financing' (%)

	$\mu = 0.25$	$\mu = 0.5$	$\mu = 0.7$	$\mu = 0.8$	$\mu = 1.2$	$\mu = 1.5$
Hysteresis η						
0.025	2.24	2.64	3.04	3.29	4.73	6.78
0.05	2.55	3.34	4.16	4.65	7.52	11.64
0.1	3.17	4.75	6.38	7.36	13.12	21.34
0.2	4.40	7.57	10.83	12.79	24.30	40.75

Notes:

This is analogous to Table 2 in DeLong and Summers (2012) but with $\dot{Y} = 1.93\%$ per year and $\tau = 0.44$.

Source: own calculations, see text.

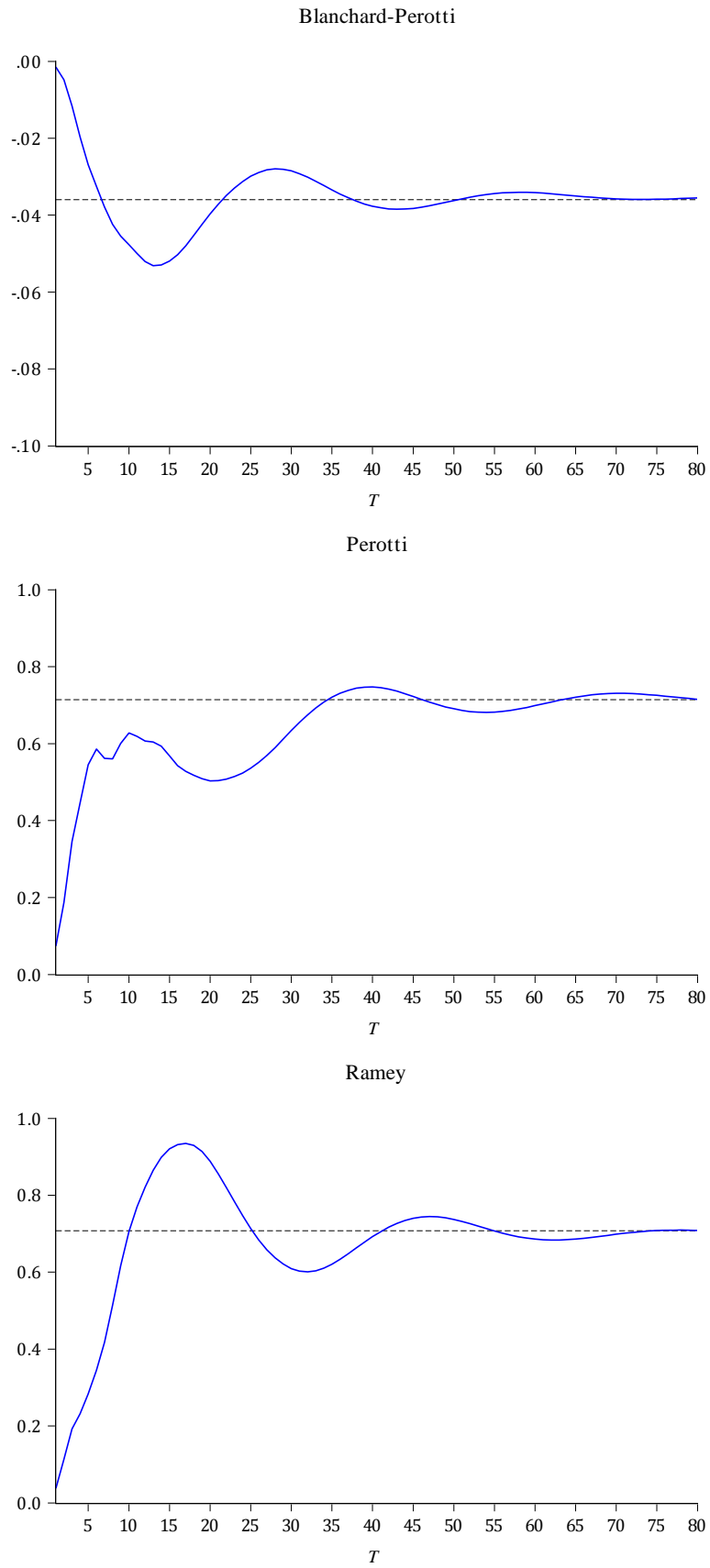


Figure 1 Multipliers computed from alternative VARs.