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NEW NARRATIVE EVIDENCE FROM INTERWAR BRITAIN

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ABSTRACT

The impact of fiscal policy on economic activity is still a matter of great debate. And, ever since Keynes first commented on it, interwar Britain, 1918- 1939, has remained a particularly contentious case |not least because of its high debt environment and turbulent business cycle. This debate has often focused on the effects of government spending, but little is known about the effects of tax changes. In fact, a number of tax reforms in the period focused on long-term and social objectives, often reflecting the personality of British Chancellors. Based on extensive historiographical research, we apply a narrative approach to the interwar period in Britain and isolate a new series of exogenous tax changes. We find that tax changes have a sizable effect on GDP, with multipliers around 0.5 on impact and exceeding 2 within two years. Our estimates contribute to the historical debate about fiscal policy in the interwar period and are remarkably similar to the sizable tax multipliers found after WWII.

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1 Introduction

There is still surprisingly little agreement on the consequences of fiscal policy on economic activity in the developed world. Theoretical arguments both for and against fiscal stimuli abound.[1] As a result, many have turned to empirical methods to assess its role. Interestingly, interwar Britain stands out as a particularly relevant case. Indeed, with its high overhanging debt, turbulent business cycle, and low interest rates, interwar Britain resembles many economies today.[2] Whether fiscal measures had any impact at the time remains a highly relevant question for today's policymakers.

Despite its relevance, the debate on interwar Britain is lively and ongoing. In the 1920s and 1930s, Britain stuck to budgetary orthodoxy — a doctrine favouring a low-tax, low-spending ideal — and delivered austere budgets in most years until rearmament. This has led some (most notably Keynes (1933)) to advocate a fiscal stimulus to combat rising unemployment.[3] While later scholarship often agreed that such a stimulus would have been beneficial, especially in the low-interest environment of the 1930s, others eventually suggested that there was no missed opportunity.[4]

Much of this debate, however, has focused on the role of government spending (defense expenditure in particular — see Crafts & Mills (2013, 2015)) and recent works have tended to find government spending "multipliers" below one for the rearmament era, well below Keynes (1933)'s own calculations.[5,6] In the postwar years,

[1]Examples include Aghion et al. (2009), Alesina & Ardagna (2010), Alesina & Giavazzi (2012), Auerbach & Gorodnichenko (2010), Christiano et al. (2011), Corsetti et al. (2010), DeLong & Summers (2012), Friedman (1957).

[2]This point is discussed further by Crafts & Mills (2013, 2015).

[3]Henderson & Keynes (1929) did not explicitly refer to a "multiplier." The concept was worked out for employment by Kahn (1931), and was first taken up by Keynes in *The Means to Prosperity* (1933) and the *General Theory (1936)*.

[4]Papers supportive of a sizable spending multiplier include (Thomas, 1981, 1983, Broadberry, 1986, Hatton, 1987, Dimsdale & Horsewood, 1995).

[5]By "fiscal multiplier" we follow the literature and use this term of mean the £ effect on GDP for a £1 change in government spending or tax revenue. We will define this more precisely below. A key part of this debate is whether this number is smaller or greater than 1. Larger multipliers imply the government can generate a more than one-for-one rise in economic activity.

[6]Ramey (2011), Barro & Redlick (2011) and Ramey & Zubairy (2018) make important contributions to estimating the effects of defense expenditure focusing on the post-WWII era or using long-run historical data for the United States. While not focusing solely on Britain, Almunia et al.

changes in tax rates became an important part of demand management policy (Dow, 1964, Cairncross & Watts, 1989)[7] but, to our knowledge, no papers have studied the ability of tax policy to stimulate economic activity in the interwar period.[8] The economic circumstances of the interwar years also make this question particularly interesting. Low interest rates and a sizable degree of slack could imply higher fiscal multipliers. On the other hand, tax cuts in a high-debt environment might put pressure on government bond yields. The proceeds of any tax cut might also be saved by consumers.[9] New empirical evidence will therefore be particularly informative.

The lack of empirical agreement on the effects of fiscal policy reflects the sizable challenge that economists and historians frequently have to confront when trying to isolate the causal impact of fiscal policy on the economic activity. While fiscal policy may affect the economy, the state of the economy also influences fiscal choices: it is hard to establish cause and effect from observational data.

In this paper, we apply a narrative approach to tackle this problem. Specifically, we follow Romer & Romer (2010) by looking at historical evidence in order to examine policymakers' motivations behind each individual tax change.[10] The objective is to isolate policy reforms that were directly influenced by contemporary fluctuations in the economy from those that can be seen as more independent, and use the latter to estimate the impact of fiscal policy on growth. This methodology has already been applied by a number of authors for the postwar era (for example Cloyne (2013), Mertens & Ravn (2013), Cloyne & Surico (2016), Guajardo et al. (2014) and Hayo &

(2010) also make a significant contribution to the interwar debate on the impact of government expenditure by estimating defense-spending multipliers for 27 countries over 1925-1939. They find a large multiplier of about 2.5 on impact.

[7] This is despite the fact that Keynes was not a supporter of stimulus via taxes. When James Meade suggested to him that changes in taxes (direct and indirect) would be more appropriate, Keynes firmly disagreed (Dimsdale, 1987, p. 225), citing their short duration as a limiting factor. This explains why most of the interwar debate focused on public works, not on a fiscal stimulus via taxes.

[8] One exception is Romer & Romer (2014) who examine the incentive effects of changes in marginal tax rates on taxable income during the Interwar period in the United States.

[9] Alternatively, given the sizable tax burden following WWI, tax cuts might alleviate distortions and generate larger effects.

[10] Romer & Romer (2010) focus on postwar US.

Uhl (2014)).[11]

Our main result is that a one percentage point cut in taxes as a percentage of GDP increases GDP by around 0.5-1 percent on impact, exceeding 2 after one year. These effects are remarkably similar to narrative-based estimates for the post-WWII period found by some of the papers mentioned above.[12] Our findings are also remarkably stable across a range of specification and robustness checks. In addition, we show that tax cuts reduce unemployment and lead to an increase in interest rates. The evidence for an effect on prices is relatively weak. Although the implied tax multiplier estimates are lower than Keynes suggested in his *Means to Prosperity* (1933) (for expenditure), they still suggest that greater stimuli to the economy may have been achievable by cutting taxes.

Interwar Britain is particularly well-suited to this kind of analysis and our rich historical analysis is a further contribution of this paper. As is still the case today (see Cloyne (2013)), tax changes were clearly announced in the government's spring Budget each year. Thus, by using each Budget's *Financial Statement* and related official publications, we are able to construct an extensive dataset of nearly 300 individual tax policy changes during the 1920s and 1930s. In addition, the reasons for these decisions were detailed in the annual Chancellor's Budget speech. The speeches provide abundant information about the nature of changes and their motives. We therefore retrieve the transcripts from Hansard (1919-1939) and analyse them in depth.

In the postwar period, demand management measures tended to be easily identifiable under separate sections in the speech (Cloyne (2013)). This was not the case in the interwar period, where decisions tended to be more idiosyncratic. Consequently, we also make extensive use of the historiography surrounding Budget decisions (Alesina, 1988, Daunton, 2007, Matthew, 1986, Middleton, 1985, 1996, Mog-

[11] Barro & Redlick (2011) develop a new series of average marginal tax rates for the post-WWII United States and also make use of the Romer & Romer (2010) tax shocks.

[12] This contrasts with somewhat smaller tax multipliers found using structural VAR approaches such as Blanchard & Perotti (2002). Mertens & Ravn (2014) reconcile the largest estimates in Romer & Romer (2010) with the Blanchard & Perotti (2002) approach using a proxy-VAR/external instruments approach.

gridge, 1972, Peden, 1987, Pollard, 1970, Short, 1985, Tomlinson, 1990, for instance).

Interwar British fiscal policy is often said to be pre-Keynesian. The fact that, as a rule, neither spending nor taxes were used for stabilisation purposes until the postwar era already suggests some potentially useful variation. And, indeed, many tax changes were related to longer-term goals. By documenting Chancellors' motives, we are able to show, for instance, that Chancellor Philip Snowden's 1924 tax cuts were partly aimed at reducing the tax burden on the poor, following his long-standing will to make society less unequal. Likewise, Imperial Preference was a trade-related principle favoured generation after generation in the Chamberlain family, and thus put forward by both Austen Chamberlain in the 1920s and Neville Chamberlain in the 1930s. Although we will isolate some tax changes that were clearly the product of current economic developments, many discretionary tax policy decisions over this period can be seen as either ideological (following, for instance, an ideal of fairness), or aimed at long-term performance (for instance supply-side measures aimed at increasing productivity).

While policymakers did not, generally, use fiscal policy counter-cyclically, the high overhanging debt in the period potentially generates some additional challenges. There was much discussion tackling the persistent level of indebtedness and, naturally, the conduct of tax policy needs to be carefully analyzed in light of this. That said, we find that debt repayment was often isolated from discretionary tax changes. One institutional feature of this period is that Chancellors sought to make regular — indeed almost mechanical — payments into a sinking fund. As a result, budget surpluses, on the basis of existing tax rates, were often used to pay down debt. This approach to fiscal consolidation was deeply rooted in the budgetary orthodoxy followed by the British Treasury since the Victorian era.

Some discretionary tax changes were still designed to deal with alarming, contemporaneous movements in the deficit and, as we dicuss below, these will be regarded as endogenous. Other discretionary changes sought to reduce a long-standing and stable fiscal imbalance (which did not warrant emergency treatment). These decisions can

be seen as a product of the Treasury's long-standing support for budgetary orthodoxy and fit more closely with the Romer & Romer (2010) concept of an inherited deficit. We therefore include these types of tax changes in our new dataset.[13]

After a careful reading of these contextual aspects of tax policy, we are therefore able to make confident choices about the classification of tax changes. A companion paper (Cloyne et al., 2018b) provides readers with the detailed narrative and supporting evidence. This also provides interesting insights into the fiscal policy framework in interwar Britain. We therefore believe our historical analysis — and the new interwar dataset — is a further contribution of this paper that will be of independent interest to economists and historians alike.

The remainder of the paper is structured as follows. In the next section, Section 2, we provide more detail on the empirical approach and data sources. Section 3 then sets out the narrative analysis for interwar Britain. We first examine the fiscal orthodoxy of the time and its implications for our classification of tax changes. We then provide a more detailed summary of the narrative approach for this period. Section 4 explores the properties of our new series of exogenous tax changes. Section 5 presents our baseline results. Section 6 deals with a range of robustness checks. Section 7 concludes.

2 Empirical Strategy and Data Sources

2.1 Empirical Challenges

Isolating the causal effect of tax changes on macroeconomic activity is notoriously difficult. Policymakers respond to economic conditions and, in turn, tax policy may have economic consequences. The co-movement of taxes and macroeconomic outcomes observed in the data has no clear causal interpretation and disentangling cause and effect is one of the most important challenges to address. In addition, studying the effects of tax changes in the interwar period poses a further challenge not usually

[13] In the robustness section we also show that our multiplier estimates are robust to excluding these types of tax changes.

faced by those using post-WWII data. To our knowledge, fiscal data — and tax data in particular — are not available at a quarterly frequency pre-WWII.[14]

Our empirical strategy needs to tackle both the issue of causality and the lack of data for this period. To do so, we employ a narrative approach following Romer & Romer (2010) for the United States and Cloyne (2013) for the United Kingdom for the period after WWII. The idea behind this strategy is simple: tax changes are not always motivated by changing economic conditions. Although we see clear evidence of tax policy responding to macroeconomic conditions in the United Kingdom, many tax changes in interwar Britain were taken for other reasons, and often reflected the priorities of particular politicians.

Using detailed historical documents, we first collect an extensive new dataset of all the legislated tax changes in Britain between 1918 and 1938. There were nearly 300 individual tax changes over these twenty years, providing a fascinating degree of variation in fiscal policy. To establish a causal relationship, we need to isolate the variation in tax policy that was not responding to economic fluctuations.[15] In the language of econometrics, we need some exogenous variation in tax policy to achieve identification. Following Romer & Romer (2010), we isolate these 'exogenous' changes in tax policy by examining policymakers' motivations for each tax reform. As we discuss below, interwar Britain provides a range of interesting quasi-natural experiments. Not only is there a considerable number of tax reforms, we believe that a sizable proportion can be regarded as exogenous. We discuss this is in more detail in Section 3. Having isolated a set of exogenous tax reforms, we then use these data

[14]For other macroeconomic data such as GDP, inflation and unemployment, we will draw heavily on the excellent datasets created by Mitchell et al. (2012) and Hills et al. (2017). But fiscal information at a quarterly frequency is not available.

[15]The most important concept of exogeneity is whether the tax reform was responding to current economic conditions. This is a form of "weak exogeneity" and tackles the within-quarter reverse-causality problem. Even if the reform had been influenced by past economic fluctuations, we can still identify the effects of tax changes if we control for historical movements in macroeconomics variables. Ideally, however, we are looking for tax changes which are exogenous with respect to the entire history of economic shocks (which are then referred to as "strictly exogenous") and, for this reason, we study the historical evidence very carefully and focus on isolating these types of intervention. That said, later we will conduct Granger causality tests and include lagged controls in our regression analysis to show that our results are not biased by past economic fluctuations.

to examine the effect of tax changes on the macroeconomy.

2.2 Data Sources

The main event of the U.K. fiscal year is the annual Budget. Two key elements of the Budget are the annual Financial Statement — which outlines the state of the public finances and announces any new changes in taxation — and the Chancellor of the Exchequer's (the U.K.'s Finance Minister) speech to the U.K. Parliament. The Budget speech outlines the economic situation, the government's fiscal priorities for the coming year and then runs through all the individual tax measures and the motivations. To construct our new dataset of tax policy changes, our primary source is therefore the U.K. government's *Financial Statements* (Stationary Office, 1919-1939). Not only does the Financial Statement outline each individual tax change, it (usually) reports the precise implementation date and provides an estimate of the projected impact on revenue.[16] The revenue estimate is computed for each tax change and is based on the assumption of an unchanged tax base. This is useful because the projection can then be seen as the effect of the tax holding all else constant. The revenue estimate is also given for a "Full Year" which is an estimate of the on-going change in tax liabilities associated with the reform. These features of the data side-step common problems with ex-post tax revenue data, which are a function the tax reform, the macroeconomic effect of the tax reform and the other economic fluctuations.

Table 1 provides an example of the tax data available from the April 1920 Budget. There are 17 tax changes in this one Budget alone. The reforms are distributed across a range of tax categories and the budget features both tax cuts and tax increases, with a range of implementation dates. By collecting this information for all Budgets between 1918 and 1938 we therefore construct a new dataset of all interwar tax reforms.

[16]Sometimes the precise implementation date is given in the Budget speech or the U.K. Finance Act which enacts the Budget measures. Occasionally we therefore have to cross-reference the Financial Statement with the Budget speech or the relevant Act of Parliament.

Table 1: Tax changes announced by Chancellor Chamberlain, April 1920 Budget

Tax item	Implementation date	Cost/Yield in a Full Year (£m)
Postage	04.08.1920	9.5
Motor spirit	01.01.1921	-3.2
Motor car	01.01.1921	-1.2
Spirits (Customs)	20.04.1920	6.4
Spirits (Excise)	20.04.1920	18.1
Beer (Customs)	20.04.1920	0.02
Beer (Excise)	20.04.1920	29.98
Wine	20.04.1920	4.1
Tobacco	20.04.1920	0.53
Total stamps	04.08.1920	6.3
Income tax (Graduation, differentiation)	06.04.1920	-29.2
Abolition of temporary war reliefs	06.04.1920	3.9
Relief for double income tax	06.04.1920	-2
Super tax	06.04.1920	11
Excess profits duty	01.01.1920	100
Corporations profits	01.01.1920	35
Motor Vehicle Duties	01.01.1920	9

Source: Stationary Office (1919-1939)

The next step is to split these tax changes into a group of 'exogenous' and 'endogeous' changes based on the reasons for the policy change. To do this, we first carefully study the Chancellor's speech to the U.K. Parliament (recorded in the Official Parliamentary Record, Hansard (1919-1939)). The speech allows us to examine the overall policy objectives and the statements made about the specific policy measures. This provides a very useful point of departure and a sizable proportion of our narrative evidence is drawn directly from the Budget speech. However, it is hard to interpret the speeches, and to assign motives, without a fuller understanding of the period and the different influences that might have affected the Chancellor's decisions. As a result, the underlying motivations are not always obvious from the Budget speech. We therefore use a range of historical sources to understand both the economic orthodoxy of the time, the key economic developments during the period and the various influences that might have affected each Chancellor. In the next section, Section 3, we provide an overview of the key themes that characterize fiscal policy during the interwar years in Britain. We then use this as a basis for our precise categorization.

3 A Narrative Approach for Interwar Britain

From the perspective of post-WWII macroeconomic policy, the conduct of fiscal policy in the 1920s and 1930s was quite different and heavily influenced by Victorian attitudes to debt and sound budget management. Macroeconomics as a separate discipline had yet to fully emerge, and fiscal policy was not used for countercyclical purposes. Many of the tax changes in Romer & Romer (2010) and Cloyne (2013) were countercyclical and clearly responding to the state of the economy in the decades after WWII. In contrast, interwar attitudes to the conduct of fiscal policy are quite different and our first challenge is to understand the policy objectives, the possible sources of endogeneity and whether we can find some tax reforms that can be used for identification.

On the one hand, macroeconomic policy was "pre-Keynesian". The idea that aggregate demand could be steered using tax policy was not the prevailing orthodoxy and many tax changes focused on more longer-term and social objectives, often reflecting the personality of each Chancellor. These aspects of the policy environment make the interwar period particularly well-suited for a narrative analysis. Many tax decisions were made for purely ideological reasons. For instance, many reflected support or disdain for Imperial Preference.[17] Likewise, some measures were passed with a view of making society less unequal. Others had to do with long-run productivity performance in certain sectors.

On the other hand, although countercyclical fiscal policy was not the norm, this is not a sufficient condition for identification. For example, policymakers were still concerned with fiscal deficits and the national debt. In fact, this was a key part of the economic orthodoxy of the period. Attempts to balance the budget *in response to economic fluctuations* are still likely to be endogenous for our purposes. Understanding the prevailing attitudes to the conduct of fiscal policy is important for understanding the motivations of each Chancellor, and for establishing whether their tax policy decisions were motivated by cyclical or pressing economic factors. Given that this

[17] Imperial Preference was a policy favouring imports from the British Empire.

period is quite different to the years after WWII, a careful examination of this period is required.

In the next section we analyse the prevailing fiscal orthodoxy in interwar Britain, summarising our classification criteria in Section 3.2. In the following sections we then provide the narrative history, highlighting the types of tax changes we categorise as exogenous. A fuller discussion and supporting evidence is then provided in the narrative appendix Cloyne et al. (2018b).

3.1 Budgetary orthodoxy in interwar Britain

We first examine the prevailing British orthodoxy in fiscal policy during the interwar period, and explain what we believe it implies for our classification of tax changes. Budgetary orthodoxy recommended not only that budget balance be achieved in most circumstances except war time, but also that the budget be small, so that both expenditure and taxes remain as low as possible. The literature is unanimous in describing budgetary orthodoxy as a strong, pervasive, and long-standing principle of fiscal policymaking in Britain. Indeed, it is widely agreed that it underlay the British Treasury's fiscal stance for decades since the Victorian era, at least until the rearmament phase.

As a commitment to this policy, the UK Treasury, and successive Chancellors, sought to isolate the repayments of debt from fluctuations in the economy — by, for instance, providing for regular (indeed almost automatic) payments into a sinking fund. Likewise, expenditure and taxes were aimed at remaining small, and thus independent from common fluctuations in the economy. Middleton deems this general principle so pervasive in British budget-making history that he refers to it as the minimal balanced budget rule (MBBR) (Middleton, 1996, p. 181). Nevertheless, the term "rule" here may be somewhat of a misnomer — while it illustrates its ideological power, the MBBR reflects more a long-term objective than anything set into law.[18]

[18]While today's 3% budget deficit rule laid out in European Union treaties is more akin to a rule (which, if broken, can trigger legal actions such as the Excessive Deficit Procedure and fines – see European Union (2009)), this one was much more informal. It was, in fact, broken a significant

An appreciation of the historical setting in which this principle evolved is essential in understanding its "strength and diuturnity" (Middleton, 1985, p. 84). The British defense of minimal taxes and expenditure has its origins in the *laissez-faire* view of the economy (starting with Locke (1689) and Hume (1987)) and a critique of eighteenth-century mercantilism, with the idea that government can too easily yield to specific interest groups (Middleton, 1996, p.53). Adam Smith himself had a deep mistrust of government: "always, and without any exception, the greatest spendthrifts in the society" (ibid.). Tied to this suspicion of big government was the idea that government spending and taxes crowded out private investment (ibid., p. 181).

This principle gathered strength, until it came to form the basis of economic policymaking in nineteenth-century Victorian Britain, especially under the Chancellorship of William Gladstone, famous for his judgement that "money should be best left to fructify in the pocket of the people" (Peden, 1987, p. 27) (see also Buchanan (1985)). As Hicks (1953) emphasised: "Gladstonian budgeting is inextricably bound up with the theory of the ever-balanced (or even over-balanced) budget and with a perpetual desire for economy in public outlay."

Chancellor Gladstone, himself inspired by Scottish evangelical thinker Thomas Chalmers, spread his minimal budget ethos to all areas of government, with long-lasting institutional effects (Matthew, 1986, pp. 57, 73, 112). Spending plans, for instance, could not be allowed to automatically run from year to year, which is when the annual Budget became the centrepiece of the political year (see Daunton (2007, p. 463) and Middleton (1985, p. 85)). In 1866, he passed the Exchequer and Audit Act, which asserted Treasury control over all other departments (Matthew, 1986, pp. 106), thereby imposing his minimal balanced budget to most areas of policymaking.

The First World War led to society's acceptance of a higher threshold of taxation, shifting upwards the "minimal" part of the MBBR. Democratisation, together with the broadening of both taxable income and national insurance coverage, meant that both taxation and public sector expenditure moved to a permanently higher level after

number of times, as we shall see below. Even at the EU level, the binding character of the rule may be debated.

WWI, relative to the prewar period (see Peacock & Wiseman (1961) and Middleton (1996, pp. 92, 98)).

However, "the ultimate discipline imposed by balanced budgets had lost none of its appeal" (Middleton, 1996, p.315).[19] Indeed, the Treasury concentrated its efforts on getting back to a so-called "normal year." The normal year was referred to by policymakers as a pre-war economic standard in which taxes and government expenditure were both low. With few exceptions (Churchill and the Liberals in particular), this ideal would permeate policymaking across the political spectrum throughout the interwar era (Short, 1985, pp. xvii, 27-28). This explains why some tax reductions can be seen as ideological (exogenous), as opposed to demand management measures. By and large, Keynesian demand management was not adopted until the rearmament phase. Even then, there is some debate as to the strength of the Keynesian impetus (Middleton, 1996, pp. 111, 360).[20]

The most striking example of this is Labour Chancellor Philip Snowden's sweeping tax cuts of 1924, which despite the UK's recovery from the 1920-22 recession were aimed at keeping the tax burden as small as possible.

And yet, the aim of low taxes sometimes conflicted with that of budget balance, also an underlying principle of budgetary orthodoxy (see Tomlinson (1990, p. 67), Middleton (1985, pp. 83-5) and Middleton (1996, p. 184)). Victorian Britain sustained a deep aversion towards debt, and the Treasury view recommended that debt should be reduced at all costs and in most circumstances except war time. This "whole political culture of 'safety first"' explains cases where taxes were increased even when the deficit was not worsening (see Tomlinson (1990, p. 67) and Middleton (1985, pp. 83-5)).

Britain, indeed, was more particular about its overhanging debt (nearly 1.3 GDP)

[19]Interwar support for the MBBR was based on a more complex view of crowding-out than the standard, full-employment, Ricardian one. It was based on the idea that crowing-out could occur even at low employment levels because any deficit spending would lower confidence in the government's ability to repay its debt, eventually harming the private sector (Middleton, 1996, p. 323).

[20]In 1944, Beveridge still accused the Treasury of being "still far too prohibited in regard to central finance, too fearful of increasing national debt" (Middleton, 1985, p. 89).

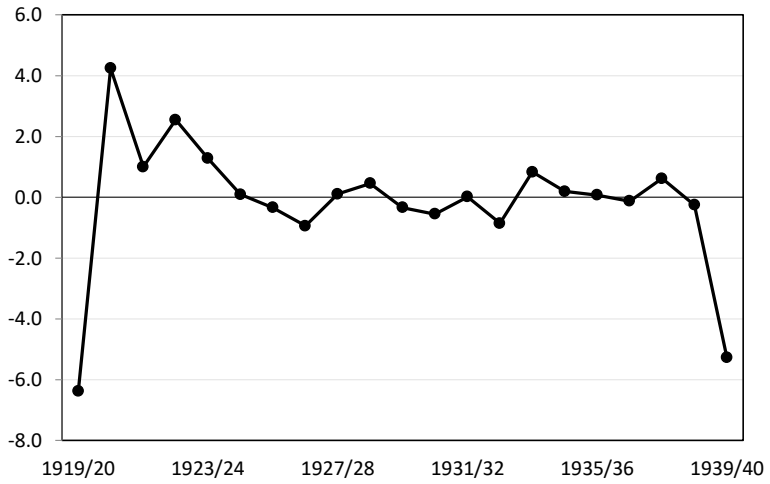


Figure 1: Central government budget surplus (% GDP), 1919-1939

Notes: Central government budget surplus figures are from Mitchell (1988). They include sinking fund payments and exclude the social insurance funds, which was how Chancellors at the time evaluated the Budget in their speeches. Modern budget surplus definitions would exclude the sinking fund but include the social insurance funds, as Middleton (1985, pp. 78-81) showed. Even under this modern definition, though, budget deficits would still look remarkably low relative to other countries and relative to today (see Table 6.1 in Middleton (1985, p. 96). GDP figures are from Mitchell et al. (2012).

than any other war-ravaged country (Alesina, 1988). As Middleton (1996, p. 340) makes clear, "the higher taxation relative to France and Germany was a clear consequence of the earlier imposition of strict budgetary control in Britain in the immediate postwar years" (see also (Alford, 1972, p. 65), Alesina (1988, p. 64) and Ritschl (1996)). Edwin Montagu indeed asked Lloyd George in 1921: "Is it conceivable that England should prostitute itself to the level of France and budget for a deficit?" (Short, 1985, p. 177). Thanks to her strict fiscal stance, Britain's deficit remained minimal relative to that of her neighbours, and relative to postwar standards. This was true even in the depth of the depression, as Figure 1 shows, since British deficits never exceeded 0.9 percent of GDP (deficits of 3 percent of GDP would become routine in the postwar period) (Middleton, 2010, p. 431).

Support for the Gold Standard also arguably played in favour of high taxation. In order to stay on the Gold Standard and resist inflationary tendencies, Britain had to repay its debt in an orderly manner. Staying on the Gold Standard was a long-term goal which mattered to Britain because of its importance for trade and the City, as reaffirmed by the Cunliffe Committee (1918) just after the war (see Brown (1929, p.63), Pollard (1970, p. 17), Moggridge (1972), Dimsdale (1981), Peden (1987, p.17) and Accominotti (2012)).[21]

Finally, many have argued that the policy of debt-repayment and deflation was partly designed to support the rentier class. Alesina (1988, p. 66-7) suggests that despite (and perhaps as a result of) tax increases, the policy of deflation and high interest rates mainly served debt holders to the detriment of taxpayers. The debt to GDP ratio actually increased and remained well above 150% throughout the 1920s. Such intentions were famously denounced by Keynes and Churchill (ibid.).

Although there were some instances in which the fiscal situation seemed to quickly deteriorate and demand immediate action (such as 1920 or 1931), in many other instances there was no such sense of emergency, and it was clear that policymakers sought to steadily reduce the national debt burden for one or several of the aforementioned reasons.

To summarise, the fiscal orthodoxy of this period has two important implications for our purposes. First, while governments focused on fiscal prudence, the sustained debt-redemption policy was not always executed with additional discretionary tax increases. Budget surpluses, on the basis of existing tax rates, were often used for debt-redemption. And, although we identify a range of Budgets where the fiscal position motivated additional discretionary tax changes, many tax reforms were somewhat detached from discussions of debt-redemption. Second, a low tax-low spending environment was favoured in order to support long-run economic performance. These

[21]The Gold Standard was not just an end in itself. Some agreed that adherence to it was a means to constrain the Budget. At the infamous dinner party attended by Bradbury, Niemeyer, McKenna and Keynes, Grigg reports that "Bradbury made a great point of the fact that the Gold Standard was knave-proof. It could not be rigged for political or even unworthy reasons" (cited in Moggridge (1969, p. 61)).

features of the budgetary framework are useful for our narrative identification strategy. Fiscal policy was not naturally countercyclical. That said, given the prevailing aversion to government budget deficits, we need to be careful about tax reforms that sought to offset a deteriorating fiscal position.

3.2 Summary of Motives

Having outlined the general objectives of fiscal policy during this period, we can now describe the categories we use to assign motives to individual policy changes. The primary distinction is whether the tax change was endogenous — responding to fluctuations in economic conditions such as GDP or the deficit — or whether the tax change was taken for other reasons, possibly related to ideological objectives. Table 2 summarises our classification system. The two main categories are the split between endogenous (N) and Exogenous (X). But we also provide six sub-categories.

First, consider the different types of endogenous tax changes. As noted above, although policy was pre-Keynesian, there do appear to be some tax changes aimed at stimulating the economy. Following Romer & Romer (2010), we refer to these as countercyclical measures. As we mention later, many were aimed at improving the economic conditions for firms (an attempt to stimulate supply capacity (SS)) but some, from a modern perspective, even look like attempts to stimulate demand (SD). In addition, given the focus on balanced budgets and the aversion of government debt, it is also possible that tax policy was responding indirectly to economic conditions. It is clear that at least some tax changes followed from a desire to maintain a sound budgetary position in response to sudden deteriorations in the fiscal outlook. We refer to these changes as urgent deficit reduction measures (DR). Finally, some tax changes were specifically ear-marked to fund spending changes. Although we can include government spending in our regressions, the contemporaneous correlation between taxes and spending could bias our results. We therefore also exclude tax measures directly related to spending changes (SD).

Turning to the exogenous tax changes, various reforms were taken to meet social

objectives, reflected a particularly ideology (for example Imperial Preference) or reflected personal priorities of the Chancellor (for example Churchill's Betting Duty – see Cloyne et al. (2018b)). These types of changes we refer to as socially or ideologically motivated (IL). The fiscal orthodoxy of the period also generates two further categories. First, there was often a desire to keep taxes as low as possible to stimulate long-run growth. Following Romer & Romer (2010), we refer to these as long-run tax reforms (LR). Second, the government engaged in steady fiscal consolidation to lower the average level of government debt over time. This was influenced by debt inherited from the past, rather than year-to-year movements in the deficit. Although this may be a function of past economic events, these policy changes do not reflect immediate economic conditions. Rather, they reflect the budget orthodoxy of attempting to move back towards to low-debt, low-tax and low-spending "normal year." Again, following Romer & Romer (2010), we refer to these as long-run fiscal consolidation measures (FC).

Table 2: Categories of tax changes

Group	Sub-category
Endogenous (N)	1. Countercyclical measures: stimulate demand (DM) and supply (SS) 2. Urgent deficit reduction measures (DR) 3. Spending-driven changes (SD)
Exogenous (X)	1. Long-run performance (LR) 2. Social/ideological objectives (IL) 3. Long-run fiscal consolidation (FC)

We are now in a position to provide an overview of our narrative account. There were, of course many small tax changes, which for simplicity are overlooked in the analysis below, but which are detailed in Cloyne et al. (2018b). In what follows, we focus on the general thrust of each Budget. Our narrative is divided into four distinct

periods: Postwar Policy(1919-1924), Churchill and the Gold Standard (1925-1930), Crisis and Recovery (1931-1935) and Rearmament (1935-1938).

3.3 Postwar Policy: 1919-1924

From 1919 to 1924 Britain first went into postwar recession and soon emerged in a relatively swift recovery. This era was marked by both endogenous and exogenous tax measures. The most striking ones are Austen Chamberlain's endogenous deficit reduction measure in 1920 and Snowden's exogenous tax cuts in 1924.

Budgetary orthodoxy was an important pillar of Austen Chamberlain's policy-making (Short, 1985, p. xvii) and was followed just coming out of the war despite the absence of perceptible warning signals, which only came in the summer. The Chancellor may not have felt any strong sense of emergency due to his having grossly underestimated expenditure which he had assumed to be close to its pre-war basis (ibid., p. 11). And as he emphasised himself in his Budget speech, "Death Duties are not a suitable instrument for meeting a temporary emergency" (Hansard, 1919-1939, HC Deb 30 April 1919 vol 115 cc206-7). The rise in estate duties is thus better seen within the fiscal consolidation framework. Some custom duties were lowered due to his long-running attachment to Imperial Preference. Another exogenous movement was the increase in beer revenue which simply resulted from relaxed war restrictions on alcohol. Nevertheless, the increase in revenue from both spirits and the excess profits duty can be seen as endogenous: the former followed a rise in profits, while the latter was aimed at compensating some continuing war expenditures.

After the underevaluation of expenditure became evident in the summer of 1919, Austen Chamberlain was pressed by the Treasury and even *The Times* to pay more attention to the size of the national debt (Short, 1985, pp. 15-7).[22] A strong sense of emergency therefore emanates from the 1920 Budget. Despite this, Chamberlain still sought to reduce some income tax items for reasons of fairness, following the recommendations of the Royal Commission on Income Tax which had deliberated in

[22]Rothemere actively campaigned against government spending (the "Anti-Waste" campaign) and used *The Times* as his main medium of expression.

1919-20.

Horne was the only other Chancellor along Churchill who did not strictly adhere to the prevailing orthodoxy (see Peden (1987, p. 147-9) and Short (1985, p. 152, 166). With Britain having entered a full-blown recession in 1921, he preferred to leave taxes broadly unchanged in his 1922 Budget and accept some kind of deficit budgeting, giving the appearance of a balanced Budget by temporarily suspending sinking fund payments (ibid., p. 180). Any small tax reductions can be seen as endogenous.

On the other hand, the normal year concept was fully embraced by Baldwin and Snowden. Both Chancellors enjoyed a fairly swift economic recovery. Despite this, they sought to significantly reduce taxation. However surprising given his support for Labour, Snowden deeply believed in the importance of a limited state for Britain (Snowden, 1920). As Boothby noted:

> To every outworn shibboleth of nineteenth century economics he clung with fanatical tenacity. Economy, Free Trade, Gold – these were the key-notes of his political philosophy; and deflation the path he trod with almost ghoulish enthusiasm. (...) To every plea for expansion – and many were made from both sides of the House of Commons – he remained totally deaf" (cited in Middleton (1996, p. 320)).[23]

He differed from his Conservative counterparts only in his insistence that tax policy should be used to increase fairness and redistribution.

3.4 Churchill and the Gold Standard: 1925-1930

With Britain back on gold in 1925 under Churchill, one could only expect further policies to keep her safely on this path. However, neither low taxes for everyone nor a balanced budget were really Churchill's cup of tea.[24] While he was at the helm,

[23] Baldwin's philosophy, which was similar to Snowden's, emanated from a fear of big government in the face of influences from communism and fascism (Middleton, 1996, p. 317).

[24] Although it was Churchill who led Britain back to gold, he eventually thought it had been "the greatest mistake of [his] life (Capie & Wood, 2012, p.187).

for most of the second half of the 1920s, the economy was actually stimulated several times in 1928 to give a boost to dwindling demand and production following the General Strike. To preserve an appearance of integrity in such situations, he resorted to what he himself called "my adventitious resources" by, for example, raiding the Road Fund (see Hicks (1938, p. 7) and Hancock (1970)). Indeed Churchill often sought to flow against the stream, fuelled in particular by lengthy conversations with Keynes (Pollard, 1970). Deficit reduction was only resorted to when he perceived a dangerously widening gap in the state's finances – for example, in the 1926 and 1927 budgets. Stimulus and deficit reduction measures alike are classified as endogenous.

Churchill also shared with Keynes the view that "gigantic taxation" and deflation mainly served rentiers at the expense of the average taxpayer, and sought to restore the balance by relieving the middle class while unnerving the elite (see Daunton (2002, p. 124) and Short (1985, p. 211, 223)).[25] Tempted by the capital levy as examined by the Colwyn Committee on the National Debt and Taxation, he eventually backed down. But his 1925 Budget greatly reduced the standard rate of income tax while substantially raising the estate duty. Both moves can be treated as exogenous as they were in accordance with his ideology, rather than a response to changing economic conditions.

The Liberal Democrats' pamphlet *We Can Conquer Unemployment* did not manage to garner sufficient political support, however, opening the way for Labour to return to power. With Snowden back at the Exchequer, Churchill's "relative profligacy" (Tomlinson, 1990, p. 77) could only meet with contempt. In 1930 Snowden reasserted his will to balance the budget and raised all major tax items substantially. Though several economic indicators were starting to fall around that time, the general tone of the Budget is not one of emergency.[26] As Middleton (1996, p. 321) points out, Snowden's return to the Treasury "was welcome by officials who had been only

[25] He said: "There is more to the life of a nation than the development of an immense rentier class quartered in perpetuity upon the struggling producer of new wealth" (Daunton, 2002, p. 123).

[26] Churchill eventually accused Snowden and the Treasury to be like-minded spirits who "embraced themselves with all the fervour of two long-separated kindred lizards" (Daunton, 2002, p. 144).

too conscious of expenditure growth during the second Baldwin administration and Churchill's propensity to be distracted from the path of strict orthodoxy." These measures can thus be seen as exogenous as well.

3.5 Crisis and Recovery: 1931-1935

Snowden had remained quite hopeful throughout most of 1930, and his 1930 Budget had promised that no new taxes would be imposed in the next Budget. However, Britain's economy substantially deteriorated over the winter of 1930-1931. Although up to 1931 the Unemployment Insurance Fund had remained broadly outside the central government budget (Peden, 2000, p. 238), unemployment rose to 12% and financing the fund through the usual channels (employer and employee contributions) became very difficult.[27] Snowden kept his promise in his April 1931 Budget, but appointed the May Committee to look for ways to economise. Although a prospective deficit of £120m, or 3.1 % of 1931/2 GDP, would become common in the postwar era, it was widely viewed as alarmingly high (Middleton, 2010, p. 431). Labour could not, however, agree on cuts to unemployment benefits, leading to the formation of a new National coalition government in August, which precipitated the fall in the pound (Alford, 1972, Tomlinson, 1990, Capie & Wood, 2012).

The tone of the supplementary Budget speech delivered in September 1931 by Snowden, who had remained Chancellor in the new National government, is thus one of emergency. In a significant departure from his habitual policy goals, Snowden not only substantially increased taxes but did not even refrain from placing some of the burden on the middle class and the poor (Short, 1985, p.293) (see also Daunton (2002, p. 159)). The supplementary budget of 1931 is therefore a clear example of an urgent, and endogenous, increase in taxes for deficit reduction purposes.

[27]Note that before 1931 social insurance payments did not come entirely from employer and employee contributions. Some Exchequer payments went into those funds. For example, in the early 1920s Exchequer contributions to the Unemployment Insurance Fund accounted for a fifth to a quarter the Fund's expenses, but were not officially included in the central government Budget (Stationary Office, 1997, Table 80, p. 106), and thus not discussed by Chancellors in their Budgets until September 1931.

In the following year the debt continued to be threateningly high. In October 1931 the National government was reelected, this time with Neville Chamberlain as Chancellor, who seized the opportunity to realise his long-standing wish of protection through tariffs.[28] Although it is possible to view such a move as ideological, the seriousness of the situation still does not warrant an exogenous treatment.

With Britain off gold, the Budget under control and a successful conversion operation in the summer of 1932, interest rates could be brought down from 5 to 3.5%, and some supply and demand stimulus measures could be introduced. Neville Chamberlain's 1933 and 1934 Budgets are thus also mainly endogenous (Middleton, 2010), except for some small measures related to anomalies in the tax system.

With the economy facing more normal conditions in the mid-1930s, Neville Chamberlain turned his attention to cutting income tax. For example, in his 1935 Budget he announced that he would cut income tax for the poorer part of the population. Many of these we classify as exogenous measures based on ideological and long-run motives.

3.6 Rearmament: 1936-1938

Preparation for war against Germany dominated the rest of the period. Budgets between 1936 and 1938 all refer to rearmament as the main priority, and are therefore mostly endogenous. The only exception are fairly important tax cuts in 1936 introduced by Chamberlain, which he explicitly justifies as provisions against tax avoidance.

4 The new tax shock series

4.1 Aggregation to Quarterly Data

Our new dataset contains around 300 individual tax changes, 140 of which we regard as exogenous. We then assign these tax changes to the implementation dates given in the Budget documents and aggregate the tax changes into a quarterly time series

[28] Neville, like his father Joseph, had always worked against free trade (Self, 2006).

for economic analysis. Following Romer & Romer (2010), a tax change implemented in the final half of any quarter is assigned to the next quarter but, in Appendix E, we show that this timing choice makes virtually no difference to our results. The choice to assign a tax change to the implementation date (rather than the announcement date) also raises the issue of anticipation effects. If a tax change is implemented several quarters after it is announced, the economic effects could be realized before the measure is implemented. In Section 6.1 we show that most tax changes are implemented without a lag and show that our baseline results are very similar when we restrict attention to tax changes that were implemented in the same quarter that they were announced.

We therefore take our new set of tax changes, assign them to quarters, aggregate and scale by nominal GDP.[29] Figure 2 shows the resulting aggregate series for exogenous and endogenous tax changes.

[29]In the baseline specification we use nominal GDP in the previous quarter, but the results are not sensitive to this. Quarterly nominal GDP is also not directly available so we construct a nominal GDP series by multiplying the real GDP series from Hills et al. (2017) by a price deflator. Our price deflator is a weighted average of consumer and export prices. The weights are chosen by matching our new series with annual nominal GDP data that is available for this period. The results are similar using lagged annual nominal GDP data to scale the tax changes.

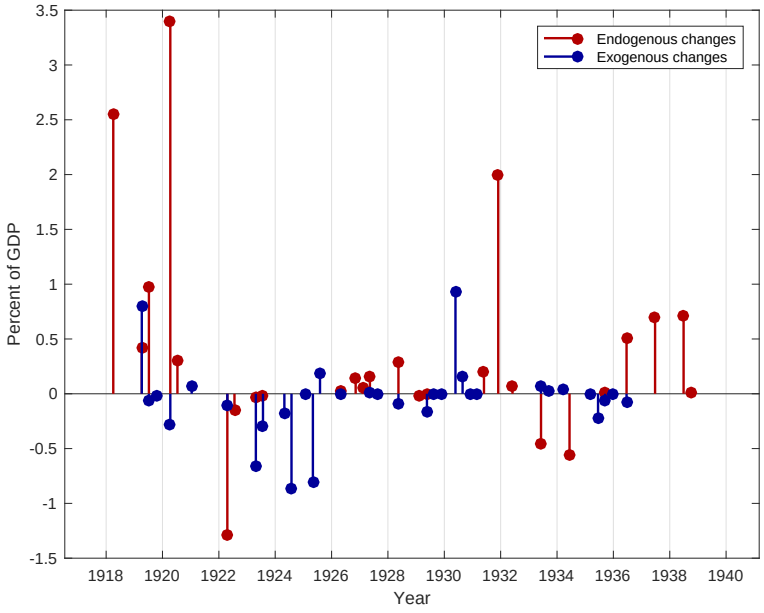


Figure 2: Tax shocks in interwar Britain

Sources: Stationary Office (1919-1939) and authors' calculations

There is considerable variation throughout the sample, and many of the tax changes are sizable. This reinforces the suitability of this period of U.K. history for our analysis. Some of the key reforms outlined in Section 3 are also clearly visible. In 1919, the blue upward spike corresponds to Chamberlain's exogenous tax rise. However, the large endogenous increases in the early 1920s come from his emergency measures to tackle the large deficits following the economic downturn. Horne's downward spike in 1922 is easily recognizable. The sizable exogenous tax cuts in the mid-1920s reflect ideological beliefs held by both Baldwin and Snowden that the tax burden should be made permanently lower. Over the second half of the 1920s, Churchill's complex character resulted in many little changes, but few sizable ones.

The year 1930 sees Snowden back to power and the effect of his long-standing desire to balance the budget following Churchill's long-term inaction. In accordance with his optimistic economic outlook, he promises no further tax increases over the next few years. The unfolding crisis in 1931 however leads him to break his own promise, with taxes even falling on the poor – a clear endogenous response to con-

temporary economic troubles. Notwithstanding some smaller exogenous tax changes, the following years see mainly endogenous responses to the fiscal crisis. Rearmament, likewise, provides the impetus for most spending-driven commitments.

4.2 Predictability

The narrative approach isolates exogenous tax changes based on the motivations given by policymakers. These are *identification assumptions* and we cannot test the *contemporaneous* exogeneity of our tax changes. We can, however, explore whether tax changes classified as exogenous are predictable based on past macroeconomic variables. To do this, we conduct a range of Granger causality tests.

Table 3 shows the Granger causality test results. We attempt to predict our new series of tax changes using information on past quarterly GDP growth, the change in the unemployment rate, consumer prices and Bank rate, the Bank of England's policy interest rate. The results are striking. While lagged GDP growth, unemployment, prices and Bank rate strongly predict our endogenous tax series, as expected, they do not predict the exogenous series. The null hypothesis is that lags of these variables do not Granger cause the exogenous series and this hypothesis is clearly not rejected, with very high p-values.

Table 3: Granger causality tests

Series	Test statistic	p-value
Exogenous series		
GDP	0.47	0.98
Unemployment	1.62	0.81
Bank rate	3.41	0.49
Consumer prices	1.98	0.74
Countercyclical series		
GDP	11.66	0.02
Unemployment	11.62	0.02
Bank rate	34.83	0.00
Consumer prices	8.89	0.06

Note: This table shows the test statistics and p-values associated with the Granger causality tests. A high p-value implies that it is not possible to reject the hypothesis that each variable does not predict the tax shock series. Each row shows the results of regressing our tax shocks (exogenous and endogenous) on four lags of GDP growth, the change in the unemployment rate, the log change in prices and the change in the Bank of England policy rate (Bank Rate). Similar results are obtained using a different number of lags.

5 The Macroeconomic Effects of Tax Changes

With our new series of exogenous tax changes, we can now explore the link between tax reforms and economic outcomes. Tax changes are likely to have contemporaneous and dynamics effects: policy changes may affect the economy gradually over time and changes in tax rates may also persist for a number of years. We are therefore interested in the *dynamic* causal effects of changes in taxation. In particular, we will estimate impulse response functions (IRFs) — the percentage change in the variable of interest, e.g. GDP, over time following a 1 per cent of GDP reduction in taxes.

To estimate the IRFs, we use the local projection technique of Jordà (2005).[30] Specifically, we estimate the following sequence of regressions:

$$y_{t+h} - y_{t-1} = \alpha^h + \beta^h \Delta\tau_t + \Gamma^h(L)X_{t-1} + u_{t+h} \tag{1}$$

[30]The local projections approach here can be seen as a flexible way of estimating the same auto-regressive distributed lag model as in Romer & Romer (2010).

where y_{t+h} is the variable of interest, for example log real GDP, at horizon h, and $\Delta\tau_t$ is our new series of exogenous tax changes. Identification of the causal effect requires that the tax changes $\Delta\tau$ are uncorrelated with the other macroeconomic disturbances contained in the error term u. Our narrative identification strategy ensures this requirement is satisfied. The X vector includes the lags of the tax shocks, real GDP growth, Bank rate, unemployment and prices. As we show in Section 6.4, adding controls makes very little difference to our results (as should be the case if our narrative identification strategy has been successful). The number of lags for the shocks is denoted Q and the lag length for the other controls is P. To remain parsimonious, for the baseline results, we use $P = 1$ and $Q = 1$. Appendix C shows that the results are remarkably stable across P, Q pairs (which is to be expected if $\Delta\tau$ are exogenous). The variables of interest will be the log of quarterly real GDP, the unemployment rate, Bank Rate and the log consumer price index. All these data are available from Hills et al. (2017) and the precise data definitions and sources are given in Appendix B.

By running a sequence of regressions for different horizons h, we can directly estimate the impulse response function for the variable of interest: the effect on y, h periods after the tax change is given by the coefficient β^h. Given that the tax shock is in differences, the simulation can be thought of as a shock which persistently lowers the tax-to-GDP ratio ($\Delta\tau_t = -1$ in the first period and zero afterwards).

We first study the response of real GDP for 2 years following a cut in taxes.[31] It is common to report the GDP response as a "fiscal multiplier". This is often defined as the £ increase in GDP given a £1 decrease in tax revenue. As in Romer & Romer (2010), the impulse response function (the collection of β^h coefficients in our case) already provides this statistic for a given initial impulse of 1% of GDP. But, given that the tax cut is persistent, it is helpful convert the impulse response function into a *present value multiplier* and plot this over time. This statistic is the *total* £ change in GDP up to period h, divided by the total tax remission, in £, over the same period.

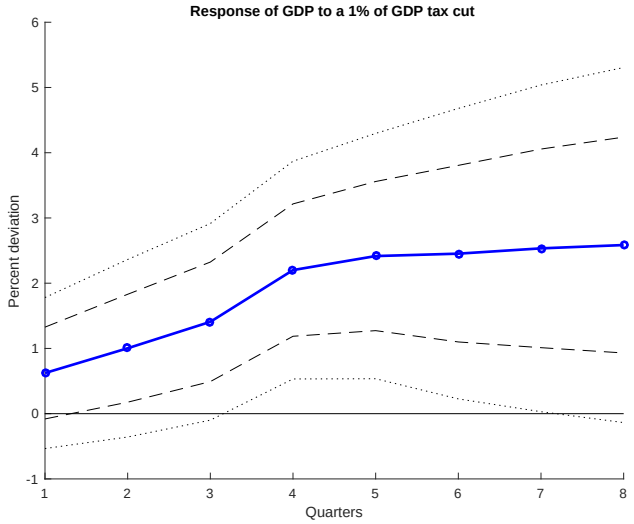
[31] Our full sample only spans 1919-1938. As a result we prefer not to estimate the IRF at longer horizons.

To be precise, the present value cumulative GDP tax multiplier is defined as follows:

$$\frac{\sum_{j=0}^{h}(1+r)^{-j}\Delta GDP_{t+j}}{\sum_{j=0}^{h}(1+r)^{-j}\Delta T_{t+j}} \tag{2}$$

Where ΔGDP and ΔT are the £ change in GDP and tax revenue relative to the case where taxes are not adjusted and r is the sample average real interest rate, constructed from Hills et al. (2017). Given the discussion above, we assume that our shocks lower taxes to GDP by 1% for the period of the IRF. Ideally we would like to estimate the effect on tax revenues directly and use this for the denominator. Unfortunately, official quarterly tax revenues data are not available over this period, but we will investigate this issue using a newly collected dataset on tax cash receipts from Lennard (2018) in Section 6.5. We show that we obtain very similar estimates for the present value multiplier.

Figure 3: Response of GDP to a 1% of GDP change in taxes



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap.

Figure 3 plots the present value multiplier over time. The present value multiplier is 0.6 on impact and rising to 2.3 over two years. The figure also shows the 68 and 90 percent standard error bands, so this effect is also statistically significant over

the period.[32] Narrative evidence for the post-war period typically reported impulse response functions rather than present value multipliers (Romer & Romer (2010), Cloyne (2013) and Mertens & Ravn (2013)). The impact effect is still comparable, but the peak effects in those papers do not take account of the persistence of the tax change. For consistency, Appendix D shows the actual impulse response function for GDP (rather than the present value multiplier shown in Figure 3). By definition, the impact effect (the impact multiplier) is the same as in Figure 3, at 0.6. The peak effect on GDP is 3.5% after 5 quarters.[33] These numbers are comparable to the post-war magnitudes in Romer & Romer (2010) (where the peak is just above 3) and Cloyne (2013) (where the peak is around 2.5).

Several things are worth noting. First, unlike the spending multipliers found by Crafts & Mills (2013, 2015), these GDP tax multipliers are well above 1.[34] Second, these findings are similar to the sizable GDP tax multipliers found in post-WWII narrative evidence, for example by Romer & Romer (2010), Cloyne (2013) and Mertens & Ravn (2013). This suggests that tax cuts do indeed have sizable effects on the economy and that these results are also applicable to the inter-war period.

We now examine the impact of our exogenous tax changes on other variables. Figure 4 shows the percentage point change in the unemployment rate and Bank Rate and the percentage response of the consumer price index. Unlike Figure 3, these figures show the impulse response functions as these variables are naturally expressed in percent, not £.[35] Given the expansionary effects on GDP, it is unsurprising that the unemployment rate declines persistently following a tax cut. Interestingly, the effect on prices seems very weak. Eventually prices rise, although the IRF is very

[32] u_{t+h} could be serially correlated, so it is common to use the Newey-West approach to computing standard errors. In our context, however, the present value multiplier at period h is a transformation of the original β coefficients. We therefore compute the standard error bands using the block bootstrap approach from Tenreyro & Thwaites (2016).

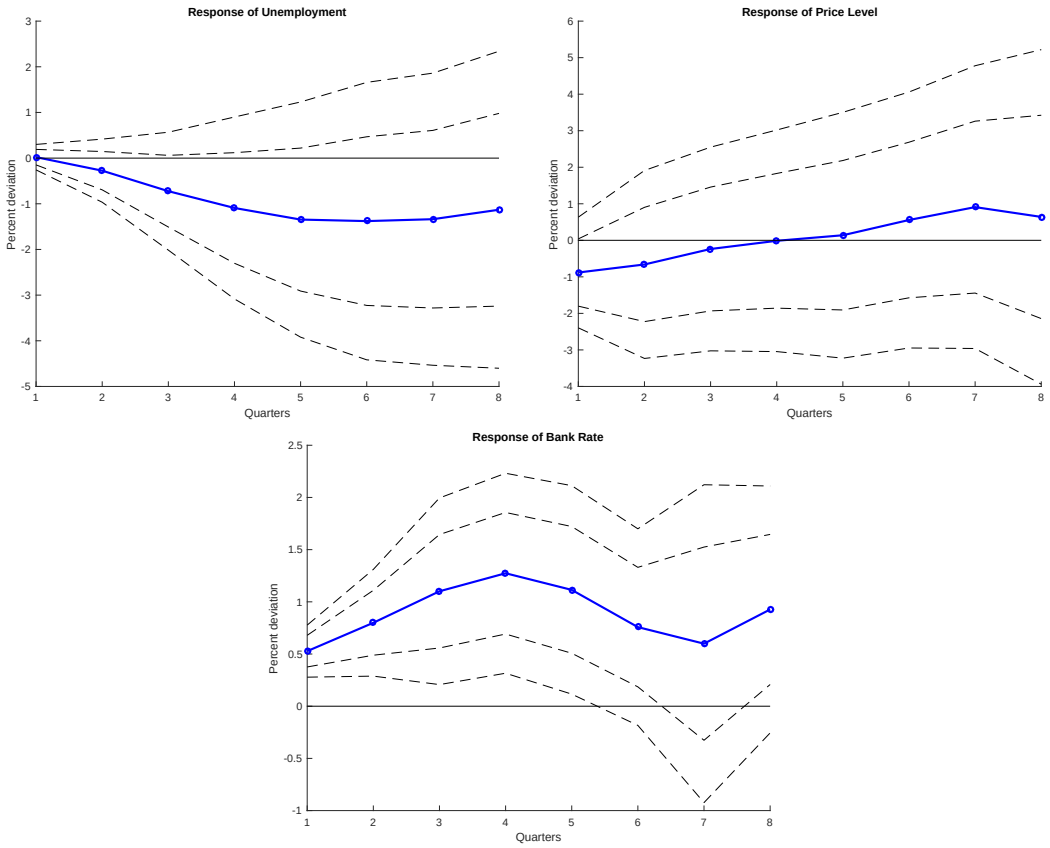
[33] The present value multiplier is, of course, essentially the integral of this chart divided by the integral of the effect on taxes.

[34] This does not necessarily imply that spending multipliers are always lower than tax multipliers. These papers focus on rearmament and study the effects using a different econometric approach.

[35] In the figures IRFs are smoothed as in Tenreyro & Thwaites (2016) using quarters t, $t-1$ and $t+1$ except at the end-points.

imprecisely estimated. The muted effect on prices might reflect the supply-side nature of many of the tax cuts.[36] The policy interest rate — Bank Rate — also increases over the period.

Figure 4: Response of the unemployment rate, the price level and Bank rate



Notes: The figure shows the impulse response functions for the response of the unemployment rate (in pp), the percentage change in the price level, and the response of Bank Rate (in pp) for 8 quarters following a 1% cut in taxes as a share of GDP. Dotted and dashed lines represent 68 and 90 percent standard error bands.

6 Robustness

In this section we explore the robustness of our baseline results. Here, we focus on the most important issues but further robustness exercises are conducted in the

[36] Some papers even find that tax cuts can lower prices, for example, see Mountford & Uhlig (2009).

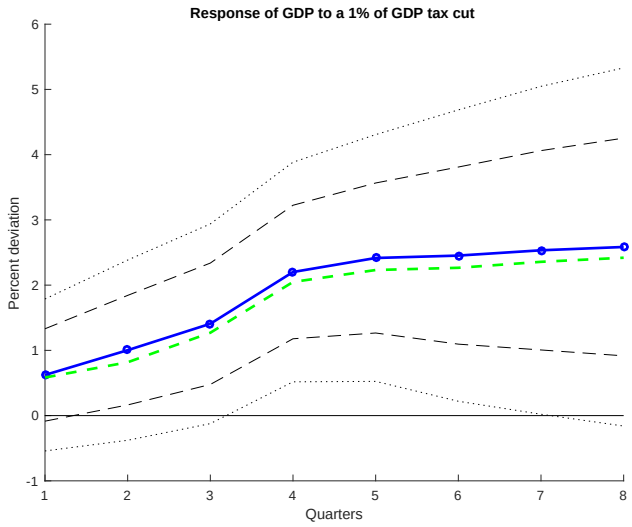
Appendix. In this section we consider: whether the implementation dates of some of tax reforms were anticipated; how to handle tax reforms with retroactive elements; excluding fiscal consolidation measures; the sensitivity of our results to a larger and smaller set of control variables; using our tax reforms as external instruments rather than a direct measure of the shock; and how the results change when we use the endogenous tax reforms rather than our exogenous tax series.

6.1 Anticipation

Some tax changes were announced during the Budget speech but were implemented later in the fiscal year. A concern is that these types of tax changes were anticipated from the date of the speech. As a result, the impact of these particular reforms might have been felt *before* they were implemented. To tackle this possibility, we construct a new version of our tax change series where "anticipated" tax changes are excluded. Following Mertens & Ravn (2012) we define an unanticipated tax reform as one that was implemented within the same quarter (90 days) as the announcement.[37] In Appendix E, we show that the majority of tax reforms were actually "unanticipated" on this definition. But, to explore the robustness of our findings, we exclude anticipated changes from our baseline series. The effect of this exercise is shown in Figure 5. The figure repeats the baseline results from above, but also includes the effects using the new series (the green dashed line). The green dashed line is extremely close to the baseline results, suggesting anticipation is not a major concern in this context.

[37]Note that, while the announcements might also have been anticipated, if this was a significant issue the tax series would then be predictable which, in Section 4.2, was not the case.

Figure 5: Cumulative GDP multiplier excluding anticipated tax changes

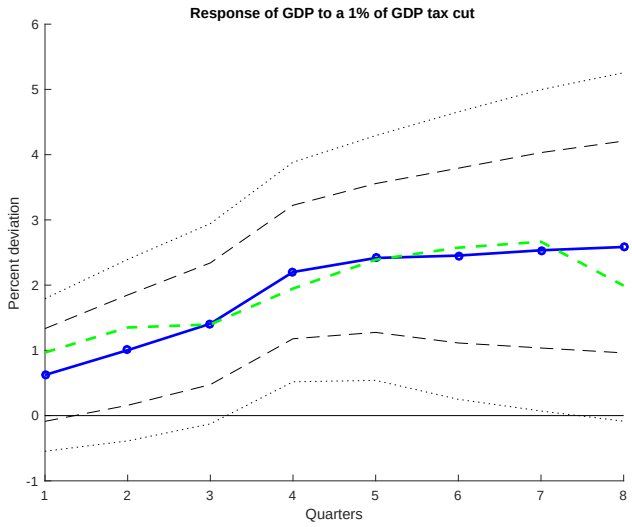


Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The green line shows results using a series excluding anticipated tax changes (defined as measures implemented more than 90 days after the announcement).

6.2 Retroactive changes and the timing of the shocks

One issue that faces post-WWII narrative approaches is that some tax changes include retroactive components. This means that the change in tax liabilities is back-dated, so that the effective implementation date is prior to the announcement date. In the baseline specification we followed Romer & Romer (2010) and used the announcement date as the implementation date for retroactive changes. In this section, we now remove retroactive measures from our data. Figure 6 shows the results of this exercise. The baseline result is again reported, with the results from the new series overlaid (the green dashed line). These lines are very similar, again suggesting that the inclusion of retroactive tax reforms is not biasing our results. An additional timing issue is how to assign implementation dates to tax reforms that occur late in a quarter. As discussed above, we follow Romer & Romer (2010) and assign tax changes that occur in the second half of a quarter to the next calendar quarter. In Appendix F we show that using the current quarter as the implementation date for all tax changes produces almost identical results.

Figure 6: Cumulative GDP multiplier: excluding retroactive tax changes

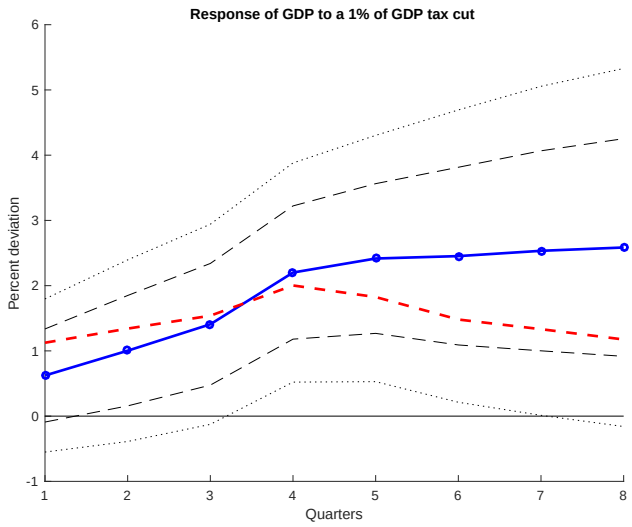


Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The green line shows the results excluding tax changes with retroactive components from the data set.

6.3 Excluding fiscal consolidation measures

As discussed above, we carefully categorise all tax reforms based on their given motives. In this section we consider a more conservative definition of exogeneity which excludes all the fiscal consolidation measures. Our regressions already contain lagged controls so, to the extent fiscal consolidations are a function of lagged shocks, our results should be robust to excluding these changes entirely. Figure 7 shows that the main findings are not overturned. The multiplier is still around 1 on impact and rises to between 2 and 3 over the first year. The effects do seem to be somewhat less persistent, although the multiplier remains above 1 for the whole period and the effect is not statistically different from the baseline results.

Figure 7: Cumulative GDP multiplier: exclude fiscal consolidation measures



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The red dashed line shows the effects excluding the fiscal consolidation measures.

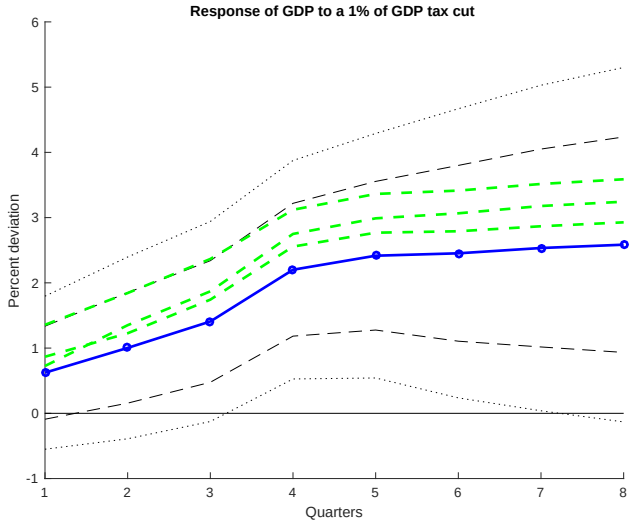
6.4 Additional controls

If our narrative identification strategy has been successful, changing the control set X in our regressions should not affect the baseline results. In smaller samples, there is, of course, still the possibility of chance correlations between variables, which is one reason for including the vector X. In this section we explore the robustness of our findings to varying the variables included in X. Figure 8 considers a smaller specification with only the lags of GDP and tax shocks as controls, a medium sized specification with GDP, Bank rate and unemployment and a larger specification that includes wages. The size of X therefore makes very little difference to our findings.

Lennard (2018) constructs a new dataset of quarterly government expenditure and cash receipts and we also now include these variables as additional controls. The results are shown in Appendix G. First we include total log (real) government spending. The second chart adds the deficit to GDP ratio (defined as receipts minus expenditure divided by GDP, which closely tracks the annual series in the Appendix). If our re-

sults were biased by the inclusion of other fiscal variables, this exercise should produce different results. The multiplier effects are, however, very close to the baseline.

Figure 8: Cumulative GDP multiplier: controlling for other variables



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The figure shows the baseline results as the solid blue line with standard error bands. The two green dashed lines show the model re-estimated (a) only with lagged real GDP and tax shocks; (b) including as controls: GDP, unemployment, and Bank Rate and c) including wages in addition to all other controls.

6.5 Direct estimation and external instruments

As discussed above, ideally we would like to compute the present value multiplier (equation 2) using the actual response of tax revenues to GDP. The approach would be to estimate two versions of equation (1): one sequence of local projections for GDP and another set of local projections for tax revenues as a share of GDP. Specifically:

$$\ln GDP_{t+h} - \ln GDP_{t-1} = \alpha^{y,h} + \beta^{y,h}\Delta\tau_t + \Gamma^{y,h}(L)X_{t-1} + u^{y}_{t+h} \tag{3}$$

$$(T_{t+h} - T_{t-1})/GDP_{t-1} = \alpha^{T,h} + \beta^{T,h}\Delta\tau_t + \Gamma^{T,h}(L)X_{t-1} + u^{T}_{t+h} \tag{4}$$

As discussed in Ramey (2016) and Ramey & Zubairy (2018)), integrating (with discounting) these IRFs and dividing the response of GDP by the response of revenues (as a share of GDP) yields the present value multiplier over time. Because we are

comparing the response of GDP and the response of revenue, this approach is closely related to using the narrative shock as an external instrument.[38] Furthermore, if there is measurement error in the narrative shock (as discussed in Mertens & Ravn (2013)), this computation of the present value multiplier can already address this concern. We now implement this method as a robustness check.

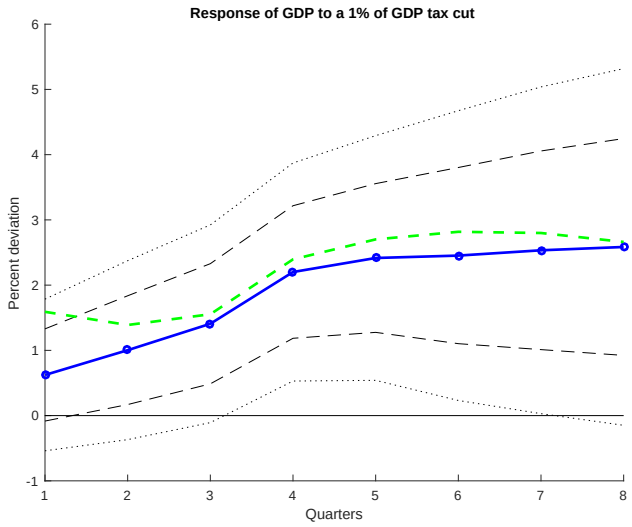
The challenge we face is the lack of official tax revenue data. Luckily, we can make use of a new series of government cash receipts collected by Lennard (2018). Cash receipts data tend to exhibit very large spikes at the end of the U.K. tax year and such seasonality can affect the computation of the multiplier. To try and address this issue, we seasonally adjust the data using the US Census Bureau X13ARIMA method, include quarter dummies in the regression and add the fourth lag of tax receipts in X.[39]

Figure 9 shows our original results and the new estimate of the present value multiplier computed using the ratio of the discounted integrals of the IRFs from the two equations above. The result is very similar to the baseline results. The reason for this is that our tax shock does indeed move tax revenues as a share of GDP by around 1% over 8 quarters (see Appendix H). This also validates the assumptions used to compute the baseline results in Section 5. The impact effect is higher than 1, but the peak effect remains very similar to the baseline at 2.8 after 6 quarters.

[38] Ramey (2016) and Ramey & Zubairy (2018)) also provide a one-step method of estimating the same present value multiplier using the narrative shock as an instrument for the cumulative change in revenues as a share of GDP.

[39] Our shock is a measure of the change in tax liabilities from the start of the tax year. The receipts series spikes at the end of the tax year. As a result, the effect on measured cash receipts in the first quarter can be quite small, even if a revenues series measured on an accrual basis would record a positive change. Because the multiplier is a ratio where the revenue impact is the demonimator, these subtle data measurement issues can artificially "blow-up" the multiplier on impact.

Figure 9: Present value GDP multiplier using tax receipts data

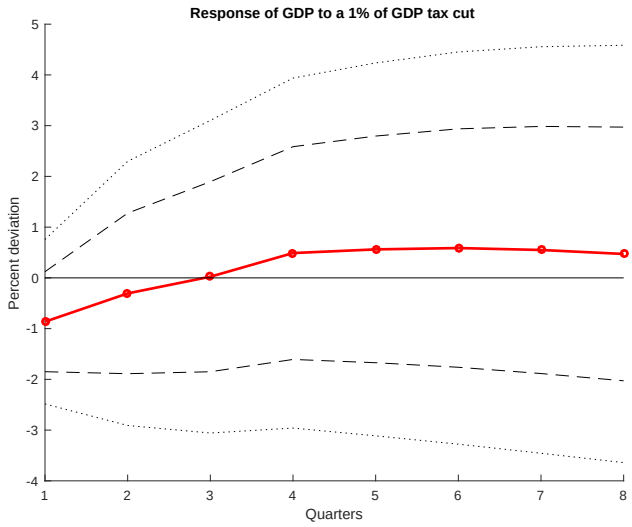


Notes: Cumulative GDP multiplier over 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using the appraoch of Newey-West. Estimates are computed using the LPIV strategy with interpolated annual revenues data as outlined in the text.

6.6 Endogenous tax changes

An interesting question is whether the narrative strategy of isolating exogenous tax changes makes a material difference to estimates of the tax multiplier. Figure 10 shows that we obtain very different results using the endogenous tax change series. Estimated multipliers are now low and not statistically significant. This suggests the narrative approach has been highly successful in isolating meaningful exogenous variation.

Figure 10: Cumulative GDP multiplier: endogenous tax changes



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The figure shows the estimated multipliers using the *endogenous* tax change series.

7 Summary and conclusion

There has been much debate about whether changes in fiscal policy can affect the macroeconomy. Interwar Britain has always been a particularly contentious case and, given the high-debt, low interest rate environment, it remains a particularly relevant case today.

Keynes argued persistently from 1924 onwards in favour of fiscal expansion through increased public expenditure, most notably in *Can Lloyd George Do It?* a pamphlet written jointly with Hubert Henderson. His argument for fiscal expansion through a programme of public works was strengthened by Kahn (1931)'s development of the employment multiplier, which enabled the impact of public expenditure on employment to be quantified. As a result, much of the debate focused on the "spending multipler". But, to our knowledge, there is no evidence on the effects of tax changes in the interwar period. This is all the more remarkable given that tax policy formed a key part of the demand management toolkit after the Second World War.

Using extensive histographical research — an effort that we hope provides an interesting contribution in its own right — we construct a new measure of tax changes for interwar Britain. Following the Romer & Romer (2010) approach, we believe these can reasonably be regarded as exogeonous and are strong candidates for evaluating the dynamic causal effect of tax changes on economic activity. In fact, with macroeconomic policy distinctly "pre-Keynesian" interwar Britain is particularly well-suited for this exercise.

Tax changes have large effects on GDP: a one percent of GDP cut in taxes raises GDP by around 0.5-1 percent on impact. This effect reaches around 2.5 percent over 2 years. Although these numbers are still lower than Keynes' original multipliers, these are large relative to subsequent estimates of the expenditure multiplier for the interwar years. Our findings for taxes are, however, very consistent with the magnitudes found by narrative-based studies for the post-WWII period.

Our results suggest that tax changes had an important macroeconomic impact in interwar Britain, and that tax changes have the potential to generate sizable multipliers. Finally, we have provided a rich new dataset, and an extensive historical account of British interwar fiscal policy that should, we hope, provide a useful resource for future research.

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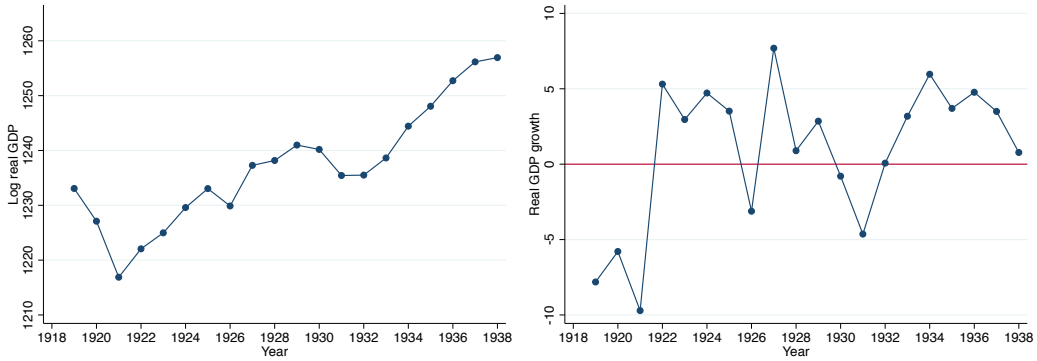
Appendix

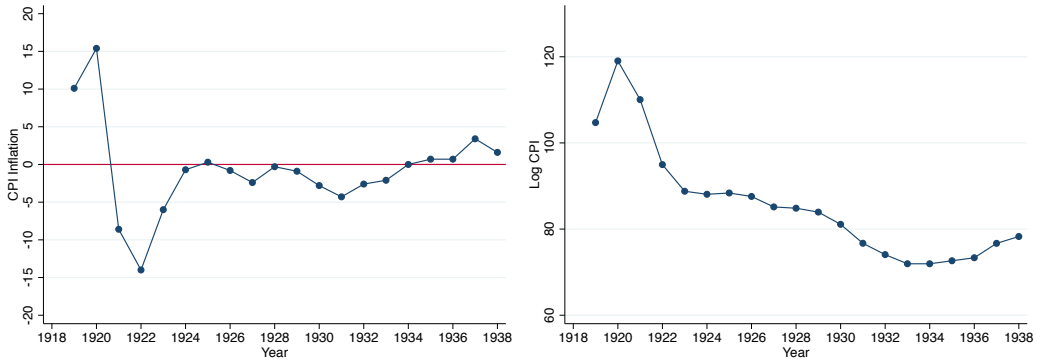
A Macro trends 1919-1940

Figure 11: Gross Domestic Product



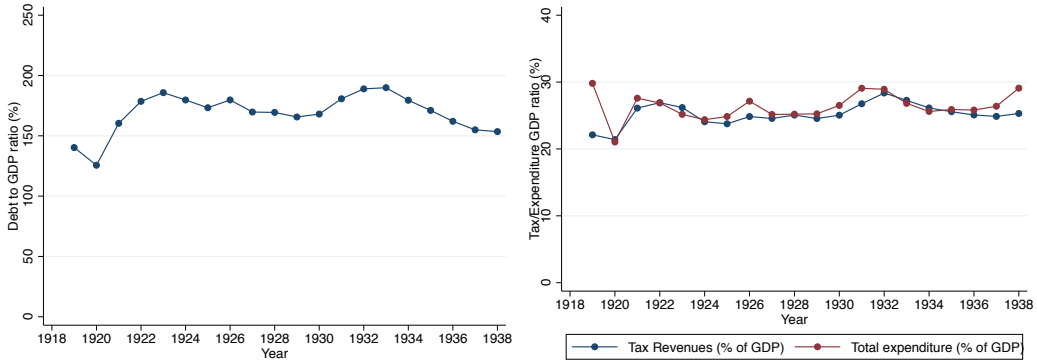
Notes: Panel A: log GDP, Panel B: GDP growth

Figure 12: Consumer Prices Index



Notes: Panel A: CPI Inflation, Panel B: log CPI

Figure 13: Debt, taxes and spending as a share of GDP



Notes: Panel A: Debt to GDP ratio, Panel B: Taxes and government spending as a share of GDP

Figure 14: Unemployment Rate and Bank Rate (percent)

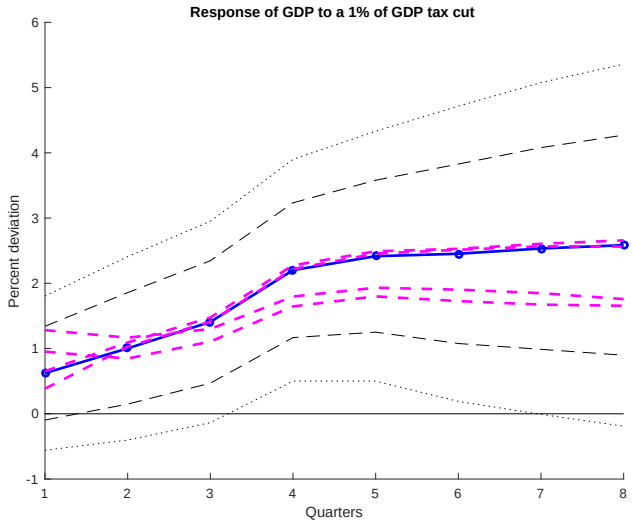
Notes: Panel A: Unemployment Rate, Panel B: Bank Rate

B Macro data sources

Data	Source
Tax changes and revenue effects	Stationary Office (1919-1939) and Hansard (1919-1939).
Quarterly real GDP	Mitchell et al. (2012).
Annual nominal GDP	Mitchell et al. (2012).
Annual tax receipts	series ANBV from Hills et al. (2017)
Annual total government expenditure	ANLP-ANNS+NSRN from Hills et al. (2017)
Annual GDP deflator	GDP deflator at market prices from Hills et al. (2017)
Bank Rate:	Hills et al. (2017)
Unemployment:	Monthly unemployment rate based on administrative data from Hills et al. (2017), quarterly average.
Prices:	Consumer Price Index from Hills et al. (2017), seasonally adjusted.
Quarterly government expenditure and receipts data	Lennard (2018)

C Lag length sensitivity

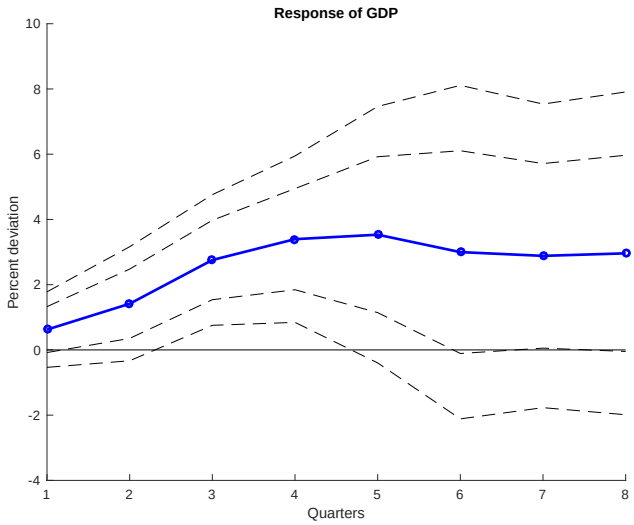
Figure 15: Sensitivity of the GDP response to different choices of lag length



Notes: Sensitivity of our present value multiplier estimates to different choices of P and Q. This chart shows the P, Q pairs $(1, 2)$, $(2, 2)$, $(1, 4)$, $(4, 4)$ (note that our baseline, in blue, is $1, 1$).

D Impulse response function for GDP

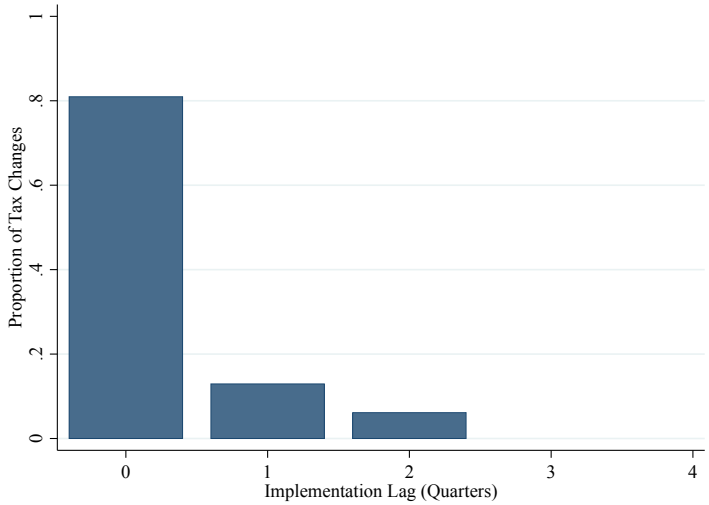
Figure 16: Response of GDP to a 1% of GDP cut in taxes



Notes: The chart shows the impulse response function for the response of the percentage change in GDP over 8 quarters following a 1% cut in taxes as a share of GDP. Dotted and dashed lines represent 68 and 90 percent standard error bands.

E Implementation lags

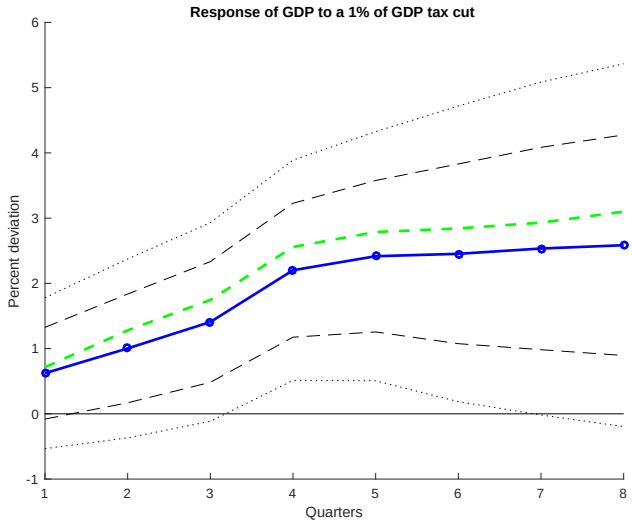
Figure 17: Proportion of tax changes by implementation lag



Notes: This figure shows the proportion of tax changes by quarters since the announcement dates. Most tax changes are implemented within 90 days of the announcement.

F Sensitivity to the timing of the shocks

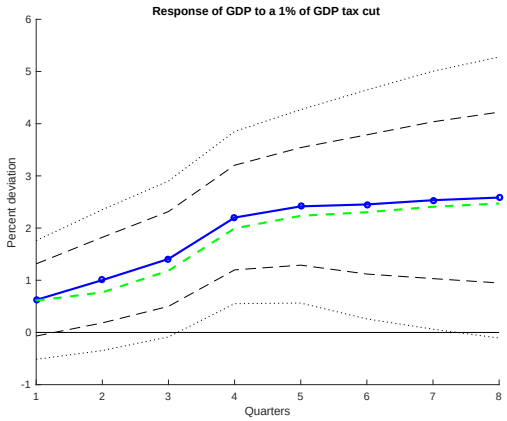
Figure 18: Cumulative GDP multiplier: different implementation dates



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The blue line and error bands refer to the baseline specification reported in the paper. The green dashed line are based on the results where tax shocks are assigned to the calendar quarter based on their precise implementation date.

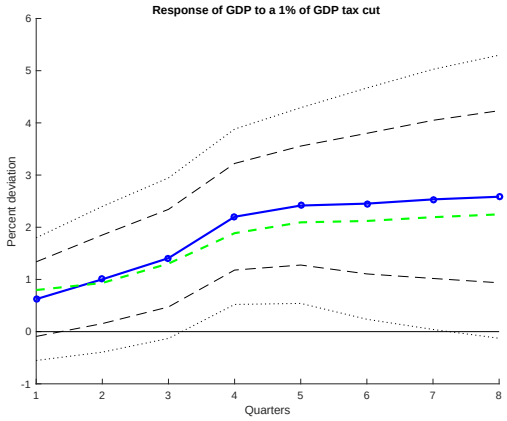
G Controlling for fiscal variables

Figure 19: Cumulative GDP multiplier: adding total government spending



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The blue line and error bands refer to the baseline specification reported in the paper. The green dashed line is based on equation 1 including (lagged) annual interpolated real total government expenditure in the vector of controls X.

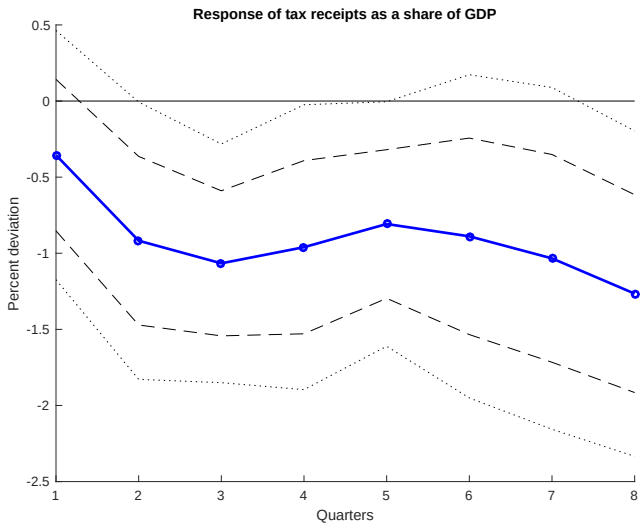
Figure 20: Cumulative GDP multiplier: adding the deficit to GDP ratio



Notes: Cumulative (present value) GDP multiplier assuming taxes are reduced by 1% of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap. The blue line and error bands refer to the baseline specification reported in the paper. The green dashed line is based on equation 1 including (lagged) annual interpolated fiscal deficit to GDP ratio in the vector of controls X.

H Response of tax receipts as a share of GDP

Figure 21: Response of tax receipts as a share GDP to our 1% of GDP shock to taxes



Notes: Effect on tax receipts as a share of GDP for 8 quarters. Dotted and dashed lines represent 68 and 90 percent standard error bands computed using a block-bootstrap.