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Turning in the widening gyre: monetary and fiscal policy in interwar Britain

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David Ronicle⁽¹⁾

Abstract

This paper brings together modern empirical techniques, a sign-restricted structural vector autoregression, with contemporary high frequency data to answer an old question – what role did macroeconomic policy play in Britain’s high unemployment and deflation in the years 1919 to 1938. Its specific innovation is to draw on a previously little-used weekly publication of public finance statistics, allowing the roles of taxation, public spending and monetary policy to be assessed side-by-side in a coherent framework. In a period of particularly unsettled policy the paper finds that policy shocks, both monetary and fiscal, made a material contribution to variation in prices and unemployment – and these played a central role in the two great recessions of the period, modern Britain’s most severe. Other policy choices could have delivered better outcomes for prices and unemployment – but these would have required making different choices in the face of conflicting objectives and some sharp trade-offs.

Key words: Monetary policy, fiscal Policy, economic history, Great Depression.

JEL classification: E3, E52, E62, N14.

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*“Turning and turning in the widening gyre
The falcon cannot hear the falconer;
Things fall apart; the centre cannot hold;
Mere anarchy is loosed upon the world”*
W.B. Yeats (1920)

1 Introduction

This paper addresses a relatively straightforward question, from both an empirical and economic history perspective — did macroeconomic policies, specifically monetary and fiscal policy, matter to macroeconomic developments in Interwar Britain? This is not a new question, but it remains a fascinating one, for at least two reasons. First, macroeconomic outcomes were terrible. The period witnessed startling extremes of inflation, deflation and unemployment, and two of the largest recessions in modern British history. Second, policymaking was no less dramatic. Policymakers were pulled in different directions, with debt sustainability, price stability, financial stability and elevated unemployment all generating sharp trade-offs. All this amounts to an extraordinary amount of variation for the researcher to exploit.

Since this is not an original topic, it begs the question of why it is worth revisiting. There are essentially two shortcomings in the current literature. First, the most recent comprehensive treatment dates all the way back to Dimsdale and Horsewood (1995) and employs what would now be considered dated methods. Second, there have been a number of excellent recent papers deploying contemporary approaches — Crafts and Mills (2013) and Cloyne et al. (2018) examined defence spending and tax policies respectively, while Ellison et al. (2020) addressed the broader question of how a range of countries, including Britain, exited from the Great Depression — but each of these addresses the period from a relatively narrow angle.

This paper makes two principal contributions to the literature. First, it exploits a neglected source of high frequency fiscal data from the period, which was hand-collected, in combination with a range of other contemporary data sources. That allows tax and government spending measures to be compared on a consistent basis. Second, it exploits the extensive variation in the data with modern empirical techniques, namely a structural vector autoregression identified with sign restrictions. This set up allows the effects of fiscal and monetary policies to be compared in a coherent framework.

Answering the research question from an empirical perspective, monetary and fiscal policy mattered, with significant effects on both unemployment and prices. The results here suggest that changes in fiscal policies could have material effects on unemployment, but that these effects dissipated relatively quickly — so while counter-cyclical (or just less pro-cyclical) policy would have improved outcomes,

a sustained fiscal loosening would probably not have solved the problem of interwar unemployment. A GDP-based variant of the baseline specification allows the results to be compared against the wider literature: the effects of policy, both monetary and fiscal, on the forecast error variance of output are within the range of empirical results reported elsewhere, albeit towards the upper end. Similarly, while estimated fiscal multipliers are large, they are within the ranges typically reported and, in line with the most recent research, the effects of tax shocks are materially larger than those from government spending shocks.

From an economic history perspective, macroeconomic policies did play a material role in key developments. Monetary policy exacerbated both recessions of the period, but also supported recoveries, especially in the 1930s. The large fiscal deficit overheated the economy in the early 1920s and the following sharp consolidation drove it into recession — but rearmament spending seems to have played only a limited role in the recovery of the later 1930s. The implication of this is that better outcomes might have been achieved — a slower fiscal consolidation in the 1920s, a later return to gold (perhaps at a devalued parity) and a less aggressive defence of sterling in 1931 could all have kept unemployment lower and prices higher. But doing this would have required agreement on pursuing different objectives, something that would have been challenging, given the centrality of the gold standard in policymakers' understanding of Britain's economic stability and global role (Moggridge, 1972).

1.1 Related Literature

The literature advances three broad hypotheses for macroeconomic developments in this period. First is the argument that this was a period of chronically deficient demand, in which policy loosening could have materially improved outcomes. These arguments are most famously associated with John Maynard Keynes who, amongst other things, advocated looser monetary policy in the mid-1920s (through a depreciation of sterling, rather than a return to the “barbarous relic” of the gold standard at the pre-War parity) and counter-cyclical fiscal policy from the late 1920s and into the 1930s (Keynes, 1931; Keynes and Henderson, 1929; Keynes, 1933, 1936; Skidelsky, 2003). For much of the post-World War II period the Keynesian interpretation of events prevailed.

Ranged against these demand-side arguments are a number of supply-side arguments. These were put forward in the period by, for example, Arthur Pigou (Pigou, 1927) and saw a revival in the 1980s as Britain went through another period of persistently heightened unemployment. These arguments were largely centred on the labour market and its rigidities: a rise in unionisation and collective bargaining; a shock to unit labour costs, with a shortened working week at unchanged wages, and; an expanded system of unemployment insurance. These were variously argued to have pushed down the level of employment for a given wage and to have reduced the ability of the economy to adjust to shocks

(Benjamin and Kochin, 1979; Eichengreen, 1987; Garside, 1990; Hatton and Thomas, 2010).

A third set of arguments centre around the idea that recovery from the Depression was only achieved through a “policy regime change”, motivated in part by the observation that countries departing the gold standard earlier had earlier and stronger recoveries (eg. see Bernanke (1995) or Eichengreen (1992)). Essentially, policy changes in the early 1930s were so dramatic, and involved such a wholesale repudiation of the prior policy regime (eg. see Daunton (2007)), that agents’ expectations were reset. Specifically, inflation expectations rose, forcing down *ex-ante* real interest rates and providing additional stimulus for a given nominal interest rate. Chouliarakis and Gwiazdowski (2016) make this argument for Britain, while Ellison et al. (2020) find the evidence to be less strong for Britain than many of the other 29 countries in their sample and Lennard et al. (2021) find a positive effect from inflation expectations on GDP largely confined to 1933.

As an empirical approach, an SVAR is well-tailored to the first set of hypotheses above, and in principle to the second set (not least since the specification employed here explicitly identifies supply shocks). That said, it needs to be acknowledged that these hypotheses to some extent all seek to explain why interwar unemployment was high *relative to pre-War unemployment* — this period is outside the sample available and is not a question this approach can address. An SVAR is also not ideal for assessing the third set of hypotheses, at least not when inflation expectations are not endogenous to the model, since it estimates a single model to describe the sample. That said, estimating the model across sub-samples does allow some assessment of whether there are notable breaks, something done here as a robustness test.

Finally, a word on methodology. Again, the field is rich — Ramey (2016) provides a useful overview of macroeconomic policy identification generally, while Ramey (2019) focuses on the particularly significant developments in identifying fiscal shocks over the past decade. This paper, using sign restrictions to structurally identify a vector autoregression, is very much in the spirit of the pioneering work of Uhlig (2005) and Mountford and Uhlig (2009), which looked at the effects of monetary and fiscal policies respectively in the post-World War II USA. A lively debate has emerged around estimation and inference in sign-restricted SVARs (eg. Baumeister and Hamilton (2015, 2018); Inoue and Kilian (2020)) — innovations in this area are beyond the scope of the current work, though like Arias et al. (2019) it aims to respond to the critiques of Arias et al. (2018) and Caldara and Kamps (2017), who demonstrate that the use of a so-called “penalty function” in Mountford and Uhlig (2009) both imposes unintended additional restrictions and undermines the claim to an “agnostic” approach to identifying the role of policy.

The paper proceeds as follows. Section 2 provides a narrative account of policy-making through the period, emphasising the tensions between competing policy objectives. Section 3 sets out the empirical

strategy and data. Results are examined in Section 4, both from an empirical and economic history perspective, before concluding in Section 5. Finally, Appendix A provides details of the fiscal data employed, while Appendix B details a range of extensions and robustness tests.

2 Twenty Turbulent Years

Before turning to the details of the empirical strategy, it is worth dwelling briefly on the economic context of the period, both to elaborate on the motivation for this paper and to underpin the identification approach taken. As noted at the outset, this was an extraordinary period both in terms of macroeconomic outcomes and in terms of policy settings — providing valuable variation for empirical work¹.

Britain’s interwar experience didn’t include the booms enjoyed by France (“*les années folles*”) or the United States of America (“The Roaring Twenties”), but nor did it include the chaos of hyperinflation experienced in Germany and Central Europe. Instead, it witnessed two decades of chronically high unemployment and repeated negative shocks, which generated pressures that ultimately led to the crumbling of the 19th century economic consensus — of free trade, capital flows and balanced budgets, all underpinned by the gold standard — the consensus that was credited with having propelled Britain to global pre-eminence in the period before the Great War (Daunton, 2007).

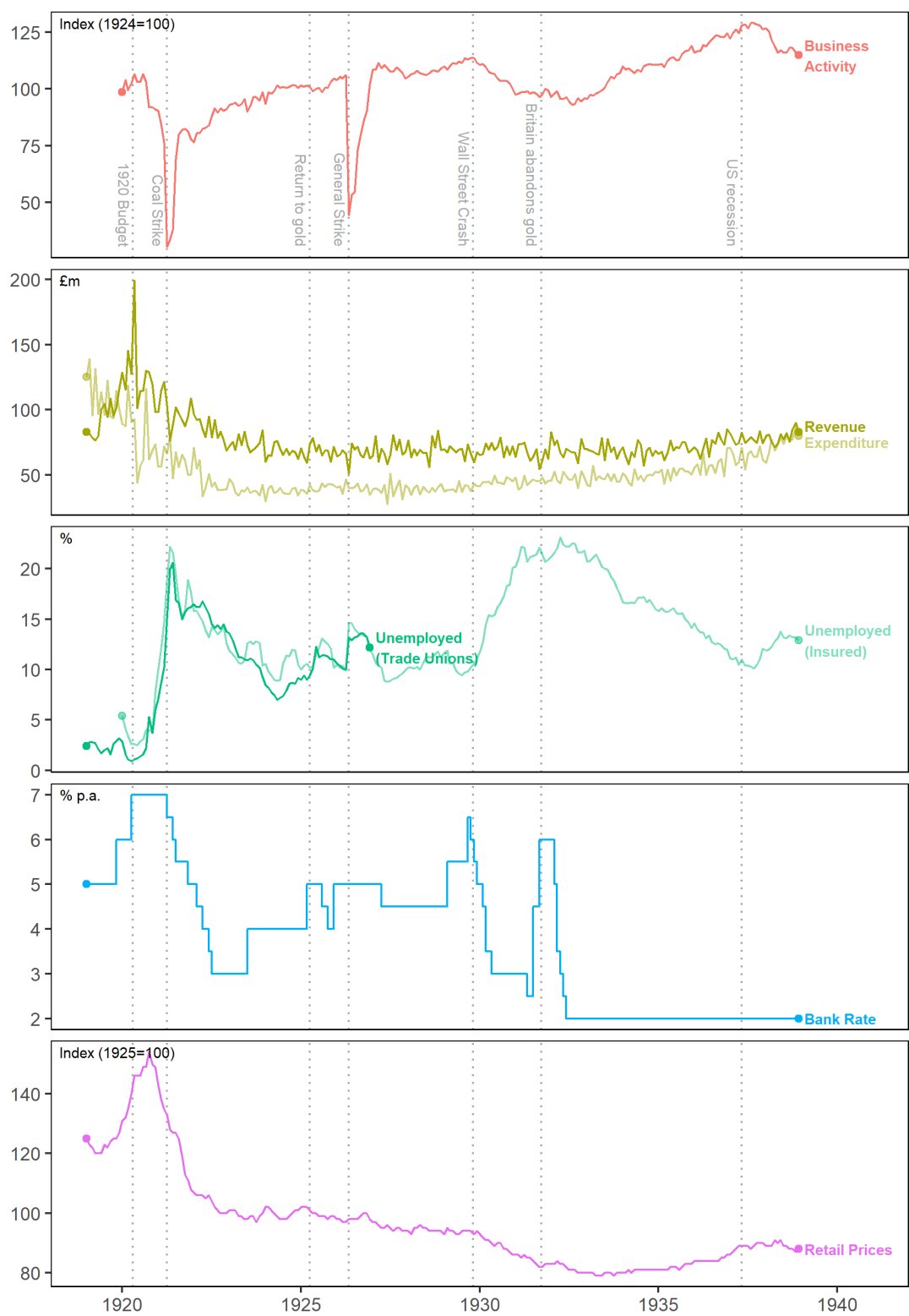
Figure 1 plots a range of macroeconomic variables for the period, alongside key political and economic events. The twenty years from 1919 to 1938 saw two of Britain’s largest recessions of the modern era, that of the early 1920s and “The Slump” (as the Great Depression has traditionally been termed in the UK) of the early 1930s. In addition, there was the immediate post-War boom, the steady expansions of the later 1920s and 1930s and two very large strikes, in 1921 and 1926. All of that was against a backdrop of historically high levels of public debt, which averaged more than 150% of GDP over the period.

These twenty years can be characterised by five broad episodes, aligning roughly with the business cycle turning points identified in Mitchell et al. (2012). Taking each in turn, the **Post-War Boom** saw low unemployment and rising prices as troops were demobilised and price controls lifted. Asset prices soared, while sterling, only officially unpegged at the end of the war, fell sharply, hitting \$3.38 in February 1920, its then lowest ever level against the dollar; by October prices were up 27% on a year earlier (Howson, 1975).

Policy was only gradually adjusted from its wartime stance. The objective for fiscal policy was a return

¹Many fuller accounts of the period exist: Eichengreen (2004) provides a very accessible introduction, Howson (1975) and Sayers (1976) provide detailed archival accounts, with a Treasury and Bank of England focus respectively, while Eichengreen (1992) and Boyce (2009) cover developments in a broader international context.

Figure 1: Key Macroeconomic Series & Events



Notes: Data from Capie and Collins (1983) and The Gazette (var). See Section 3 for further detail.

to balanced budgets and falling debt levels, requiring three actions: reducing overall expenditures, to allow taxes to come down; raising taxes to fund still substantial expenditures; reducing dependence on short-term debt by reducing borrowing and through “funding”². Progress was made on each of these through 1920 and 1921: military spending was brought down successively from 1918 onwards; “funding operations” began in 1919, while; Austen Chamberlain’s budget of 1920 raised taxes to achieve a balanced budget (Cloyne et al., 2018; Hicks, 1938)³.

Normalisation was also the objective of monetary policy, officially endorsed in December 1919 (Howson, 1975). This was stated in terms of returning to the pre-War dollar parity of \$4.86⁴ — hence the core policy challenge was to undo the rise in the price level relative to the US that had occurred during the war years (Accominotti, 2020), implying a sharp rises in interest rates. However, policymakers were constrained by debt management concerns; the large stock of “unfunded” debt⁵, driven by the large fiscal deficit, made raising Bank Rate (as the UK’s discount rate is known) impracticable (Eichengreen, 1992; Hicks, 1938). As funding operations and fiscal consolidation took place, the Bank acted, raising Bank Rate by a full 200 basis points in two equal steps, first in November 1919 and then in April 1920 (Eichengreen, 1992; Hicks, 1938), a move endorsed at the time by both Keynes and Pigou, among others (Howson, 1975).

What followed, in the **1920s recession**, was described by one contemporary as “a period of deflation the intensity of which it would be hard to match from the economic history of the past two centuries” (Hawtrey 1919, cited in Hicks (1938)). Prices peaked and started to fall strongly, while unemployment rose 18 percentage points to surge beyond 20%. Further efforts at fiscal consolidation were put on hold, though the large primary surplus achieved by 1920 was maintained and Bank Rate was kept at 7%.

From the deep trough of 1921, the economy entered a long and lacklustre recovery, characterised by Pigou as “**The Doldrums**” (Pigou, 1947). Unemployment declined steadily, though settled around an elevated 10% in the middle of the decade. The pace of disinflation slowed and sterling rose steadily from mid-1921 to reach 97% of parity by early 1923. The overall stance of fiscal policy was largely unchanged through this period, though the distribution of taxation and spending were adjusted, aided by some artful accounting by Winston Churchill⁶. The real action in this period was in monetary policy, which was eased steadily from April 1921 to a trough of 3% in mid-1922. With the economy seen to have stabilised and sterling near parity, Bank Rate was increased by 200 basis points, again in two equal steps, in July 1923 and March 1925, and again facilitated by “funding” operations (Eichengreen, 1992). Finally, with the price-level adjustment largely complete, Winston Churchill took the decision

²That is, the issuance of bonds to replace expiring short-term debt.

³The fiscal material in this section draws heavily on the excellent budget-by-budget narrative appendix of (Cloyne et al., 2018).

⁴And not stated relative to gold, recognising that following the War the US effectively controlled the global market in gold (Morrison, 2021).

⁵That is, short-term debt (Treasury bills) and advances from the central bank (“ways and means advances”)

⁶Who was then Chancellor of the Exchequer, the UK’s finance minister.

to return to the pre-War gold parity in April 1925. That done, and with gold reserves rising, Bank Rate was cut 100 basis points in two steps in mid-1925 (August and October), only to be rapidly reversed in December in the face of capital outflows. A second attempt at bringing Bank Rate down from 5% was made with more success in April 1927, when it was taken down 50 basis points to $4\frac{1}{2}\%$, where it stayed until 1929 (Sayers, 1976).

The precise motivations behind individual monetary policy actions over this period are opaque, and policy decisions were rarely explained⁷. But there is evidence that concerns beyond the exigencies of the gold standard and debt management impinged on decision-making, an approach made public in the Bank's testimony to the Macmillan Committee over 1929 to 1931. While Bank of England officials insisted on the primacy of adhering to the gold standard, they allowed that domestic conditions might be taken into consideration in setting Bank Rate, conditional on maintaining convertibility (Sayers, 1976). Empirical work bears out the influence of domestic economic conditions (Bordo and MacDonald, 2003; Eichengreen et al., 1985), while modern archival research points to domestic pressures driving the urge to ease policy in 1921, 1925 and 1927 (Howson, 1975; Sayers, 1976).

The tensions between competing policy objectives came to the fore as Britain was hit by the **Great Depression**. Less severe in the UK than the recession of the 1920s, at least in terms of the impact on output, it nevertheless saw unemployment once again climb above 20% and initiated another extended phase of depreciation. There was no fiscal policy reaction in 1929, with a general election looming. Then in 1930, newly installed Chancellor of the Exchequer Phillip Snowden used his first budget to address what he saw as the shortcomings of his predecessor's balancing of the books — to that end he tightened policy, raising a number of major taxes, though did nothing to stem rapidly growing National Insurance spending (Cloyne et al., 2018; Hicks, 1938). On the monetary policy side, in February 1929, and again in September, Bank Rate was raised by 100 basis points, shadowing rises in New York and driven by exchange rate concerns (Dimsdale, 1981). Then, as US policy loosened following the Wall Street Crash, so did Bank Rate, which had fallen 350 basis points by April 1930.

But a second shock hit Britain in 1931 as the “sudden stop” in capital flows from the US that followed the Wall Street Crash generated a financial crisis in Austria and Germany. London banks were heavily exposed, generating reserve outflows from the UK and putting pressure on sterling (Accominotti, 2012; Eichengreen, 1992). On the fiscal side, mounting spending on unemployment insurance sapped Snowden's enthusiasm for orthodox balancing of the books and his first budget of 1931 did little to offset the deterioration in the public finances. Subsequent revelations of the scale of the deficit, in the report of the May Committee, prompted further alarm and ratcheted up the pressure on sterling. The government collapsed, though Snowden returned in the new “National” (coalition) government. His

⁷The Bank's official position, as communicated to the Macmillan Committee, was “to leave our actions to explain our policy”, while Montagu Norman, governor throughout the interwar years, has (perhaps unfairly) been associated with the motto “never explain, never excuse” (Sayers, 1976).

second budget of the year saw tax increases and cuts to unemployment benefits and public sector wages (Cloyne et al., 2018; Eichengreen, 1992; Hicks, 1938). On the monetary side, Bank Rate was raised to 6%, and support sought from the New York Fed and the Banque de France — but the Bank was very reluctant to push rates high enough to defend sterling, given the already difficult domestic circumstances (Eichengreen and Jeanne, 2000). With the British authorities essentially choosing a currency crisis over a financial crisis (Morys, 2014; Accominotti, 2012), in September 1931 gold convertibility was suspended, followed by an immediate depreciation in sterling. A wave of countries followed the UK's lead and the international monetary system buckled (Accominotti, 2020; Hallwood and Marsh, 2004).

Although exiting the gold standard ultimately led to a robust economic recovery, the end of convertibility did not lead to an immediate policy focus on supporting domestic demand; Bank Rate was held at 6% for five months to allow the Bank to rebuild reserves. By early 1932 a mix of concerns led to a sequence of rate cuts; a diminishing fear that depreciation would generate runaway inflation, a reluctance to see sterling appreciate and an opportunity to refinance war debts at a lower rate (with the Treasury particularly keen on the latter) (Dimsdale, 1981; Eichengreen, 1992; Hicks, 1938). Bank Rate accordingly fell 400 basis points from January to June — the beginning of the “**cheap money**” policy that was to persist right through to the end of this period (and indeed, into the 1950s). The core elements of cheap money were low interest rates, a managed float of sterling and tight fiscal policy — the result was a steady expansion of activity, with robust investment (particularly in housing), rising prices and falling unemployment (Crafts, 2013; Dimsdale, 1981). Cheap money allowed the government to refinance the 5% War Loan at $3\frac{1}{2}\%$, yielding a substantial saving on debt service. Two other fiscal actions stand out in the Cheap Money era — 1932 also saw the introduction of Britain's first comprehensive set of trade restrictions after a century of championing free trade, the “General Tariff”, while the late 1930s saw a substantial expansion of spending on rearmament (Cloyne et al., 2018; Hicks, 1938; Middleton, 2010).

What does all this amount to? There are common features to both monetary and fiscal policymaking over this period: there was initially a strong desire to return to the pre-War policy-making orthodoxy — balanced budgets and the gold standard — but both were repeatedly knocked off course by the shocks the economy faced and policymakers needed to take constant remedial action to attain their objectives. That said, there are clear differences. For fiscal policy, the return to orthodoxy (and a single objective) was essentially achieved, and achieved relatively quickly — although policymakers had to constantly recalibrate taxes and spending, including through procyclical policy actions, the primary balance (as measured here) remained positive throughout the period and moved within relatively narrow bounds. The same cannot be said for monetary policy. Despite continuity in personnel (not least Montagu Norman, still the longest serving Governor of the Bank of England), the conflicting objectives of monetary policy caused constant difficulties. Fiscal constraints kept policy loose in the immediate

post-War years; overheating required a monetary response; the desire to return to the gold standard required deflation in the mid-1920s, leading to higher unemployment and an increased real burden of debt; the difficult domestic situation led to constant pressure for easier policy, slowed the return to gold, and ultimately led Britain off gold again in 1931 — only in the “cheap money” era from 1932 did exchange rate and fiscal concerns move firmly outside the immediate focus of monetary policy. Fundamentally, throughout the period neither monetary policy nor fiscal policy were set primarily with immediate developments in output and prices in mind; monetary policy had to contend with conflicting objectives, while fiscal policy’s principal objective was a primary surplus.

3 Empirical Strategy

3.1 Identification

The complexity of objectives noted above begs the question of how best to achieve identification. The recursive identification central to Blanchard and Perotti (2002) is inappropriate in a model that also encompasses monetary policy, given the capacity of monetary policymakers to react to economic developments within any particular month⁸. The narrative approach of Romer and Romer (2010) has more obvious appeal — and indeed, has been successfully applied in this period to tax policy by Cloyne et al. (2018). However, for the purposes here, there are a number of drawbacks. First, the narrative recounted above has only become clear with the benefit of hindsight, and in particular with access to archives; there is no contemporary public narrative in this period that could be drawn on to identify the motivations for individual changes in monetary policy. Second, defining changes in expenditure policy this way is notoriously hard and, to the author’s knowledge, the narrative approach is not a strategy that has been successfully applied to government spending, outside some narrow areas (for example, defence spending in Barro and Redlick (2011) and Ramey (2011), and Crafts and Mills (2013) in this period).

As a consequence, the inspiration for this paper’s empirical strategy is the approach of Mountford and Uhlig (2009), who use a sign-restricted structural vector autoregression to identify business cycle, monetary policy, tax and spending shocks in the US economy over 1955 to 2000, with a primary focus on “agnostically” identifying the effects of government revenue and spending shocks. As an identification strategy, sign-restrictions offer a number of appealing features suited to this research question. First, they can allow for contemporaneous policy responses to shocks, making them less restrictive and more plausible than recursive identification. Second, in the absence of a clear narrative record, sign restrictions offer a flexible approach to defining shocks and teasing them from the data,

⁸The Bank of England’s Court of Directors, its policy committee at the time, met every Thursday to review and potentially change policy rates. The Governor also had the power to change rates between meetings, for later validation by the committee, a so-called “Governor’s rise” (Sayers, 1976).

rather than requiring the author to form a definitive view on every single change in policy and its motivation.

Nevertheless, the approach taken here deviates from the approach of Mountford and Uhlig (2009) to accommodate two important critiques from Arias et al. (2018) and Caldara and Kamps (2017). As Arias et al. (2018) demonstrate, the “penalty function” approach used in Mountford and Uhlig (2009) has the undesirable effect of imposing unintended (and opaque) additional restrictions. Meanwhile Caldara and Kamps (2017) argue that using the penalty function actually constrains the impact multipliers for fiscal and spending policies to be positive, undermining the objective of “agnostic” identification. As a result, the approach here is to estimate a sign-restricted SVAR with the algorithm proposed in Arias et al. (2018)⁹, rather than using the penalty function. And, in the absence of the penalty function, to uniquely identify all shocks in the model — that has the virtue of making explicit the unintended restrictions identified by Caldara and Kamps (2017) and replaces the single “business cycle” shock with separate generic demand and supply shocks. Full identification also mitigates the “multiple shocks problem” identified in Fry and Pagan (2011).

Two business cycle shocks (demand and supply) and three policy shocks (tax, spending, monetary) are identified, each normalised to imply an increase in unemployment on impact, summarised in table 1. Zero restrictions are applied for a single month; sign restrictions are applied for 3 months¹⁰:

Table 1: Shock Identification

	Demand	Supply	Monetary Policy	Tax	Spending
Unemployment	+	+	+	+	+
Prices	-	+	-	-	-
Bank Rate	-		+	0	0
Revenues	-			+	0
Expenditure					-

A demand shock: raises unemployment and lowers prices & tax revenues. The effect on revenues captures the “automatic stabiliser” of tax policy, with receipts falling as activity does. Since Bank Rate was set weekly, it is assumed to be able to react within the period to any demand shock, consistent with the mixed objectives for monetary policy set out above.

A supply shock: raises unemployment and prices.

A monetary policy shock: increases Bank Rate and unemployment and lowers prices. No judgement is made about the direct effect of monetary policy on revenues or spending.

A tax shock: involves an increase in revenues and unemployment and a fall in prices. It has no contemporary effect on Bank Rate; this is somewhat restrictive, but not inconsistent with the (short)

⁹As implemented in Dieppe et al. (2016)

¹⁰A range of alternative durations are tested in Appendix B.

lags in data and the lack of evidence linking monetary policy decisions to fluctuations in taxes. No judgement is made about the effect of tax shocks on spending, which is left unrestricted.

A spending shock sees spending and prices fall and unemployment rise. As with tax shocks, there is no initial impact on Bank Rate, for similar reasons. Revenues are assumed not to react contemporaneously to spending shocks¹¹.

The VAR is estimated with a constant and all five variables (unemployment, price level, Bank Rate, revenues and expenditure) in levels. Revenue and expenditure data are deflated using the price index; revenue, expenditure and the price level are logged; all variables are seasonally adjusted, with the exception of Bank Rate and the price level. The sample period runs from January 1919 to March 1939, at monthly frequency. Following Uhlig (2005) and Arias et al. (2018) Bayesian methods are employed, with a normal inverse-Wishart prior distribution for the reduced form parameters.

The model is estimated with only two lags of each variable, somewhat shorter than the 12 months (or four quarters) typically adopted in the wider literature. This shorter lag order primarily reflects the interest here in accounting for developments early in the sample period, something that would be impossible with the use of more lags. The robustness of results to lag order choice is examined in Appendix B; results are found to be broadly insensitive to the choice of lag order.

One issue that has become prominent in the literature on estimating the empirical effects of monetary and fiscal policies is that of anticipation (eg. see Ramey (2016)). There are no easy ways to address this issue here, with none of the common approaches being feasible: as noted above, the narrative approach is ill-suited in this context; higher frequency (eg. hourly) data are not readily available for identifying “news”, and; nor are there contemporary forecasts to draw on to isolate “news”. Nevertheless, two sources offer comfort that anticipation may not be a material issue here: first, Cloyne et al. (2018) find their baseline results to be robust to controlling for potentially anticipated tax policy changes; second, as reported in Appendix B, replacing Bank Rate with a market rate (which would be expected to be somewhat forward-looking) yields very little change relative to the baseline results.

3.2 Data

Contemporary data sources are surprisingly rich, allowing use of a dataset that: covers key macroeconomic variables of interest; runs for the full period of interest at high (monthly) frequency; and draws on contemporary sources, reflecting the information set available to policy-makers in real time à la Orphanides (2001). Capie and Collins (1983) provides the principal data source for this paper, supplemented by additional hand-collected contemporary data on the public finances, as reported in The

¹¹A variant of this is tested in Appendix B, where instead the response of revenues to spending shocks is initially set to zero.

Gazette (var).

Activity: This paper takes unemployment as its principal measure of economic activity. Two contemporary sources of administrative data on unemployment are used, both reported in the Ministry of Labour Gazette, as recorded in Capie and Collins (1983). The first series measures unemployment amongst trade union members, from 1919 to 1926. The second covers unemployment amongst “insured” workers, that is, those covered by the joint government-industry unemployment insurance scheme — these data run from 1920 to the end of the sample period. The single series used here is created by splicing the insurance series onto the trade union one from 1927 onwards — as fig. 1 illustrates, the two are closely correlated. The focus on unemployment (rather than GDP) primarily reflects the focus of contemporaries, who framed the policy challenge as being one of unemployment, not output¹². But there are other drawbacks to using GDP; GDP as a concept had yet to be defined (even if this period would see the first attempts at pulling together national accounts) and alternatives such as industrial production or retail sales suffer various limitations — partial coverage of activity, short sample periods and/or lower frequency. While monthly estimates of GDP for the period have been constructed more recently by Mitchell et al. (2012), drawing on contemporary sources¹³, this series has two drawbacks for the purposes here: first, it starts in 1920 and so misses an important year at the beginning of the period of interest; second, such data were not available to contemporaries and so are inconsistent with the criteria above. Nevertheless, to draw comparisons against the wider modern literature on macroeconomic policy shocks an extension of the paper estimates the model using GDP data in the place of unemployment, detailed in Appendix B.

Prices: The price series, the “cost of living” index, also comes from the Ministry of Labour Gazette and runs for the full sample. The series was introduced at the beginning of the Great War to track the evolution of living standards amongst the working population. It is constructed from retail prices using weights based on “typical” working class consumption habits in 1904 (Capie and Collins, 1983). As such, it is perhaps not an ideal guide to price developments, though it follows contemporary series on wholesale prices and wages reasonably closely and was the measure tracked by contemporaries, who recognised its drawbacks.

Monetary policy: The monetary policy series is based on the Bank of England’s primary policy tool of the period, the discount rate, known as “Bank Rate”, as at month end. Although Bank Rate was the primary tool of monetary policy, open market operations were also used. However, early in the period, the “tap rate” on short-term government debt was more influential in determining short-term market rates, and the spread between market rates and Bank Rate varied somewhat over time — the robustness of the model to using a short-term market rate is tested in Appendix B.

¹²Most obviously, Keynes framed his General Theory in terms of employment, interest rates and money.

¹³Including those underpinning the business activity index in fig. 1

Public finances: From at least 1870 onwards the UK government published weekly public finance statistics in its official bulletin, *The Gazette* (and reproduced elsewhere, eg. in *The Economist*¹⁴). The data cover what are known as “Receipts into and Issues out of the Exchequer”; that is, they are a detailed description of the weekly financing of the central government, covering the taxes, spending and debt interest payments of primary interest here, as well financial transactions, such as receipts from debt issuance and the repaying of advances. The data are on a “cash basis”, recording the receipt of tax payments or the point at which cash is paid out, rather than, for example, reflecting tax liabilities as they arise (the convention in modern national accounting and public finance statistics). While the tax data is fairly comprehensive, the spending data covers only the modern concepts of government consumption and government investment — coverage of transfers is patchy, given these were partly or wholly funded from separate sources in the period. As is the convention when looking at the effects of fiscal policy, debt interest payments are removed from the spending series. Appendix A offers a detailed account of these data and their preparation for use here.

4 Results

4.1 Did policy matter?

The question of whether policy materially affected prices and unemployment can be addressed through classic SVAR diagnostic tools — impulse response functions and forecast error variance decompositions, plotted in figs. 2 & 3, respectively. For the impulse response functions, the columns represent shocks and the rows the response of each variable over a 36 month period. The solid lines represent the pointwise median for each impulse response, while the shaded areas correspond to the 68% credible set¹⁵.

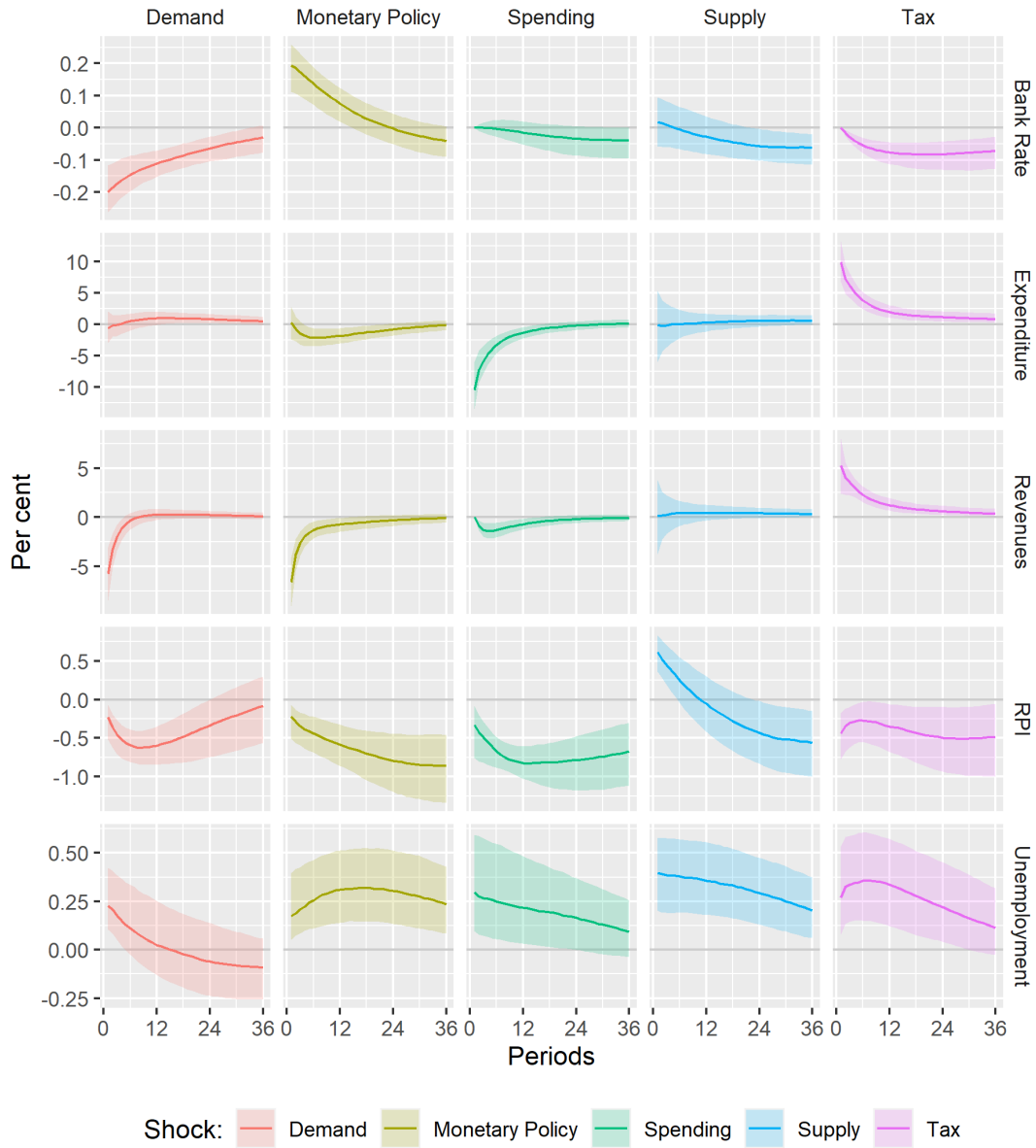
Starting with the impulse responses, as fig. 2 makes clear, monetary policy appears to have had persistent effects on both prices and unemployment in the period. Monetary tightenings were also associated with initial, though short-lived, falls in both tax revenues and to a lesser extent public spending.

The two fiscal shocks had strikingly similar effects, though increases in taxes had a somewhat larger effect on unemployment than cuts in spending, and a somewhat smaller impact on prices. The effects on unemployment were also of a similar magnitude to those of a standardised monetary policy shock, albeit less persistent; the initial impact on inflation was marginally larger, though was somewhat smaller

¹⁴To the author’s knowledge, Lennard (2020) is the only other paper to exploit these data, having collected them independently from *The Economist* as part of assessing the role of uncertainty during The Slump.

¹⁵Baumeister and Hamilton (2018) set out a Bayesian justification for such an approach to impulse response functions, forecast error variance decompositions and historical decompositions under set identification, in response to the critique of Fry and Pagan (2011).

Figure 2: Impulse Response Functions



Notes: Solid lines represent the median estimated response, while shaded areas represent the 68% credible set. Units are percentage points for Bank Rate and the unemployment rate.

at the three-year point. Bank rate responded negatively to both shocks, though the effect was larger for tax cuts. Both taxes and spending tended to move together — increased revenues were matched by higher spending; lower spending was matched by lower taxes (despite a zero restriction on impact). This mutual responsiveness of tax and spending series is consistent with the discussion of Crafts and Mills (2013), who point to both the strength of the balanced-budget orthodoxy of the period, but also the role high debt levels in the period played in the desire to avoid deficits. These joint movements may help explain why the effects of fiscal shocks are short-lived and raise a question as to how distinct these two fiscal shocks are.

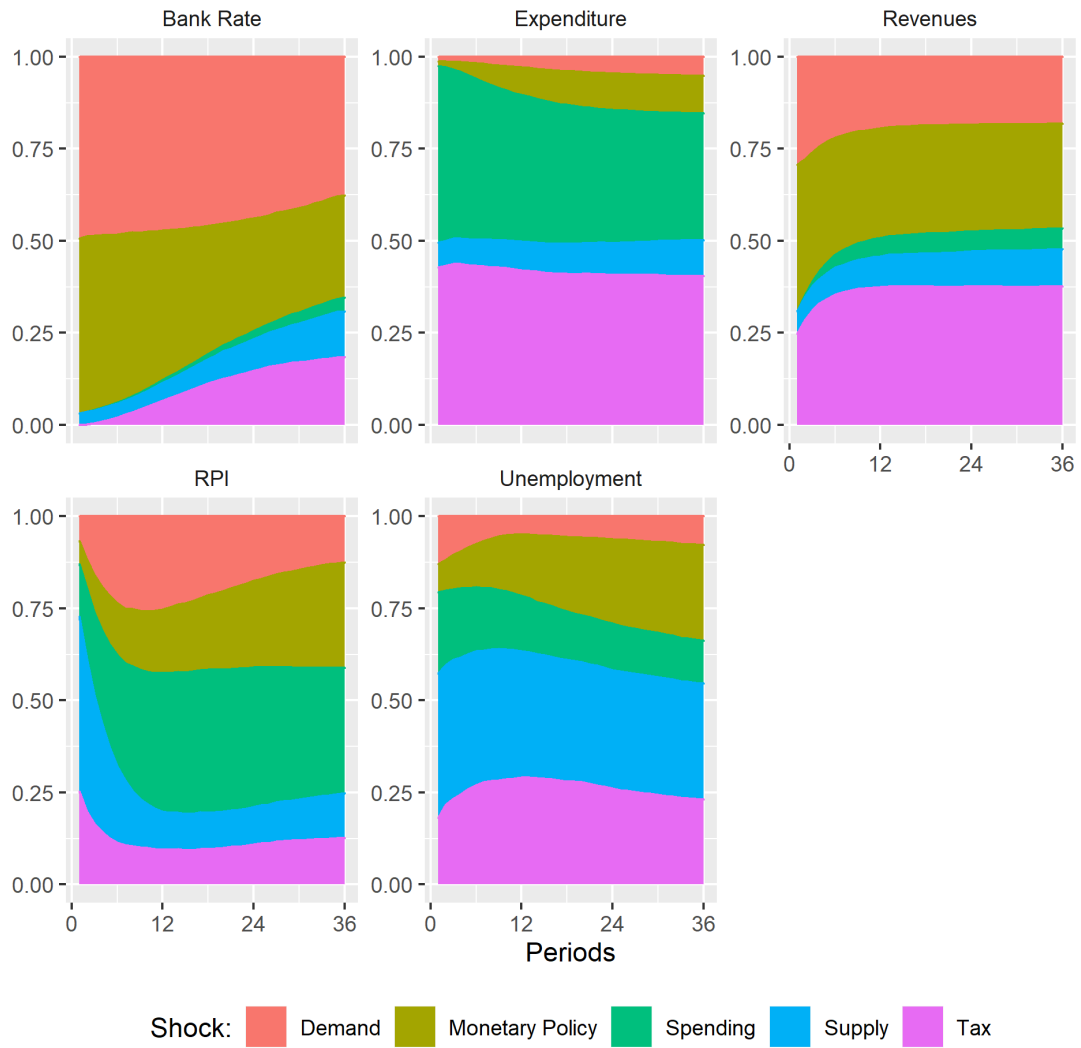
Turning to the identified business cycle shocks, demand shocks appear to have somewhat short-lived effects on unemployment, with much of the initial increase from a shock made up within a year. The effect is somewhat more persistent on prices, with the peak effect at around 9 months, unwinding steadily by the three-year point. Shocks to demand have a strongly negative initial effect on tax receipts, but this quickly dissipates, while the effect on government spending is neutral — consistent with the fact that the spending data here covers only government consumption and investment, and not more cyclical items like unemployment insurance. Interestingly, monetary policy tends to react sharply and persistently in the face of shocks, with a 1 standard deviation demand shock leading to a nearly 20 basis point cut in Bank Rate.

Supply shocks tend to have a large and persistent effect on unemployment, with somewhat less than half of the effect dissipating over the course of three years. The price level rises in the near-term, but the effect turns negative after 12 months. Supply shocks appear to have neutral effects on both real revenues and real public spending. And while they have no initial effect on monetary policy, they seem to lead to a somewhat delayed and modest tightening two-to-three years later. The persistent effect on unemployment is the most striking result here; it's consistent with the arguments that supply shocks in the labour market played an important role in the persistently high unemployment over this period.

In fig. 3, each panel of the forecast error variance decomposition corresponds to a variable, with the share of the forecast error variance accounted for by each shock at each monthly horizon captured in the colour-coded areas.

The drivers of variation in the two macroeconomic time series differ quite strikingly. While monetary policy had a small initial impact that rose quite quickly, accounting for around $\frac{1}{4}$ of variation in both variables at the three year mark, there is more variation in the role of other shocks. Spending shocks had a pronounced effect on prices, particularly at longer horizons, while tax shocks were more material for unemployment variation. Supply shocks played a material role in the variation in unemployment at all horizons, consistent with the persistence of effects noted above; although they played an important initial role in prices, this effect faded quickly. Demand shocks had an important effect on prices at the

Figure 3: Forecast Error Variance Decompositions



Notes: Charts are based on pointwise median estimates, rescaled to sum to one (by construction, forecast error variance decompositions don't necessarily sum to one in the case of sign restrictions).

12-month mark, though this faded over time, while their influence on unemployment was limited.

Turning to drivers of the policy variables, Bank Rate was determined almost exclusively by demand and monetary policy shocks in the near-term, with the role for other shocks, particularly tax, rising somewhat over subsequent months. Primary expenditure was driven primarily by tax and spending shocks, with other shocks playing a minor role at later horizons. Revenues were somewhat more affected by wider economic developments than expenditure, with demand and monetary policy shocks driving around half of variation in revenues in the near-term, while tax shocks generated around $\frac{1}{3}$. These patterns are consistent with the measure of spending not covering cyclical items like unemployment insurance.

Overall, all three policy shocks had material effects on unemployment and prices, and often of similar magnitudes. However, there were important differences in timing and persistence, with the result that monetary policy was material for both prices and unemployment, while spending mattered particularly for the former and taxes for the latter. For both macroeconomic variables, the combined share of the forecast error variance accounted for by policy shocks, at 60% for unemployment and 75% for prices, outweighed that of business cycle shocks over the period.

4.2 Comparisons against the wider literature

Three approaches can be taken to assessing these results against the wider literature. The simplest approach is to compare the impulse responses and estimated effects of fiscal shocks on unemployment reported here against other relevant papers, most obviously the recent estimates of Cloyne et al. (2018) and Crafts and Mills (2013), as well as contemporary estimates from Keynes and Henderson (1929). This has the advantage of being both simple and most directly relevant to this paper's focus. However, much of the wider empirical literature on the effects of macroeconomic policy (usefully summarised in Ramey (2016)) considers the effects on GDP, rather than prices or unemployment. To draw wider comparisons, the baseline model is re-estimated with GDP in the place of unemployment (see Appendix B for full details). This allows comparisons to be drawn with the forecast error variance of output explained by policy variables across different studies, and for fiscal policy it allows the calculation of multipliers.

The effects of the tax shocks here can be compared against those estimated by Cloyne et al. (2018), with some rescaling¹⁶. The revenue shocks have quite different profiles — while in Cloyne, a 1% of GDP tax shock leads to a persistent reduction in revenues of a similar scale, here there is a somewhat

¹⁶Since the shocks in Cloyne et al. (2018) are calibrated to be 1% of GDP, here we calculate the £-value of 1% of the sample average of GDP and use that to estimate the £-equivalent percentage increase in average taxes and spending, which is 16% and 23% respectively, and scale our impulse responses accordingly.

smaller initial effect which fades quite quickly. The unemployment rate falls gradually in Cloyne et al. (2018), by around 1 percentage point after 8 quarters — results here suggest an immediate fall of 1 percentage point, fading to $\frac{2}{3}$ at the end of 8 quarters. Tax cuts here raise the price level by about 1% initially, an effect that grows over the following 7 quarters — unlike in Cloyne et al. (2018), where a similar initial effect turns positive after 6 quarters, though the confidence interval around this result is large. Bank Rate tightens by around 1 percentage point after 4 quarters in Cloyne et al. (2018), whereas here Bank Rate tightens by a more modest 25 basis points.

One last observation stands out; the tax shocks in Cloyne et al. (2018) are more cleanly distinguished from other fiscal shocks than those here, with government spending remaining flat in response to tax cuts and the deficit rising — whereas here, expenditure and receipts are quite responsive to tax and spending shocks respectively. Cloyne et al. (2018) attribute this cleaner distinction to their use of the narrative approach, which allows them to filter out tax changes motivated by spending objectives. That has been difficult to replicate here. As noted earlier, to test how distinct the two fiscal shocks identified in this paper are, one of the robustness tests reported in Appendix B considers an alternative identification scheme, with the initial response of expenditure to tax shocks set to zero, instead of that of revenues to spending shocks. This alternative specification does change the role of spending shocks, in particular reducing the spending shock share of the forecast error variance for unemployment, while boosting that of tax and monetary policy.

Table 2: Change in unemployment for a £1,000,000 fiscal loosening

Variable	Shock	Impact	Months			Peak [month]
			12	24	36	
Rate (bps)	Tax	0.072	0.091	0.060	0.031	0.096 [7]
	Spending	0.058	0.043	0.032	0.019	0.058 [1]
Unemployed	Tax	10,248	12,742	8,335	4,324	13,524 [7]
	Spending	8,175	6,012	4,359	2,607	8,175 [1]

Turning to estimates of the effect of government spending on unemployment, in their assessment of Lloyd George’s proposed 1929 stimulus plan, Keynes and Henderson (1929) quote the reduction in unemployment they might expect for £1,000,000 of stimulus, with an estimated 5,000 employed per annum for each million spent — or 500,000 for a programme of £100,000,000 per year. To compute a similar statistic, the impulse responses here are rescaled such that the initial impulse corresponds to a £1,000,000 change in the relevant fiscal variable (similar to the exercise above). The results are reported in table 2 — the results suggest that Keynes and Henderson (1929) may have under-estimated the effect, with fiscal loosening having peak effects on unemployment in the region of 8,000-13,500 unemployed. These estimates appear to contrast with more recent estimates in the literature, which offer much lower figures of around 200,000-330,000 jobs from a £300,000,000 public works programme executed over three years (Crafts and Mills, 2013), against a 500,000 lower bound estimate in Keynes

and Henderson (1929). However, a second feature stands out in the table above — as noted earlier, the reductions in unemployment generated by fiscal loosening dissipate quite quickly. A fiscal loosening of £300,000,000 over three years could have materially reduced unemployment in the near-term, but these results suggest that the effect would have unwound relatively rapidly once the loosening ended.

A GDP-based variant of the model is reported in Appendix B, whose results can be used to draw comparisons against the wider literature looking at the effects of macroeconomic policy shocks. Ramey (2016) reports a range of estimates of the contributions to the forecast error variance of output from monetary, tax and government spending shocks. For monetary policy, these figures at the 24-month horizon range from 0.5% to 8.8%, with the latter very close to the 8.6% estimate here from the GDP variant of the model (compared to 16% of unemployment in the baseline specification). She reports a range of 0.5% to 4.8% for tax shocks at 8 quarters, compared to 12% here (and 18% for unemployment in the baseline specification). Finally, for government spending her range covers 2.9% to 12.6% against 9.2% here (and 8.1% for unemployment in the baseline model).

In surveying the most recent literature on the effects of fiscal policy, Ramey (2019) reports a broad range of tax and government spending multipliers. The GDP variant of this paper's model yields a cumulative present value tax multiplier of $4\frac{3}{4}$ over a two year period, compared to the range of 1 to 5 that Ramey (2019) reports (where the upper bound comes from Mountford and Uhlig (2009)) and the 2.3 over 8 quarters estimated in Cloyne et al. (2018). Consistent with the wider literature and the results for unemployment, the equivalent multiplier estimated here for government spending is lower, at $1\frac{1}{2}$ over two years. Ramey (2019) quotes a range of 0.2 to 2, though argues that the most robust results tend to be 1 or below, while Crafts and Mills (2013) report a defence spending multiplier between 0.3 and 0.8.

Across all these sources of comparison, the results presented here stand towards to the upper end of the ranges in the wider literature. That may reflect the fact that policy adjustments were more extreme and less predictable in this period than in the post-War samples typically used in the wider literature — Ramey (2016), for example, speculates that the common result that monetary shocks are harder to identify in the post-Volcker era reflects more predictable (and successful) policymaking. It may also reflect specific features of the UK in this period — as Ramey (2019) notes, more granular studies, such as Ilzetzki et al. (2013) find significant variation in multipliers based on the policy regime and income level. Specifically, they find spending multipliers to be much larger in fixed exchange rate regimes (a reasonable characterisation of the UK for much of this period), though they also find multipliers are smaller in open and heavily indebted economies (both of which would also apply here). More generally, the results are consistent with the finding in the literature that tax multipliers tend to be larger than spending multipliers — implying that for a given fiscal balance, a shift towards lower taxes, matched by reduced spending, would have been expansionary.

4.3 How did policy affect macroeconomic outcomes?

Fig. 4 illustrates the identified shocks over the sample. The largest identified business cycle shocks occur broadly when they might be expected — around the two great strikes of the period and the two major recessions. As expected, none of the labour market shocks that might account for differences in outcomes with the pre-War years are detected early in the sample. As with the identified business cycle shocks, policy shocks largely occur where they might be expected. There are two pronounced episodes of monetary tightening, during 1919's boom and to defend the gold parity in 1931, and five sustained episodes of loosening; two following each major tightening episode, one in the mid-to-late 1920s, one following the Wall Street Crash in 1929 and one in the mid-to-late 1930s.

The tax shocks are broadly consistent with those identified using the narrative approach by Cloyne et al. (2018): 1921 and 1922 see in aggregate large positive and negative shocks respectively, which in Cloyne et al. (2018) are classed as endogenous (and so excluded from their empirical estimates)¹⁷; the next few years see persistently negative shocks, consistent with the exogenously-classed shocks identified in Cloyne et al. (2018); a large positive shock is detected in 1930 and a somewhat smaller one in 1932, which Cloyne et al. (2018) treat as exogenous and endogenous respectively; finally, a series of positive shocks are identified in the late 1930s, which Cloyne et al. (2018) treat as endogenous. The corresponding pattern on the expenditure side is striking — 1919 and 1920 see large negative shocks; 1921 sees a positive shock, with expenditure tightening alongside tax policy; as taxes are eased in the first half of the 1920s, spending remains tight; shocks are then small until a sharp tightening in 1930, matching the tightening of tax policy; finally, in the late 1930s, spending is eased in a series of negative shocks, though to a lesser degree than the tightening in taxes.

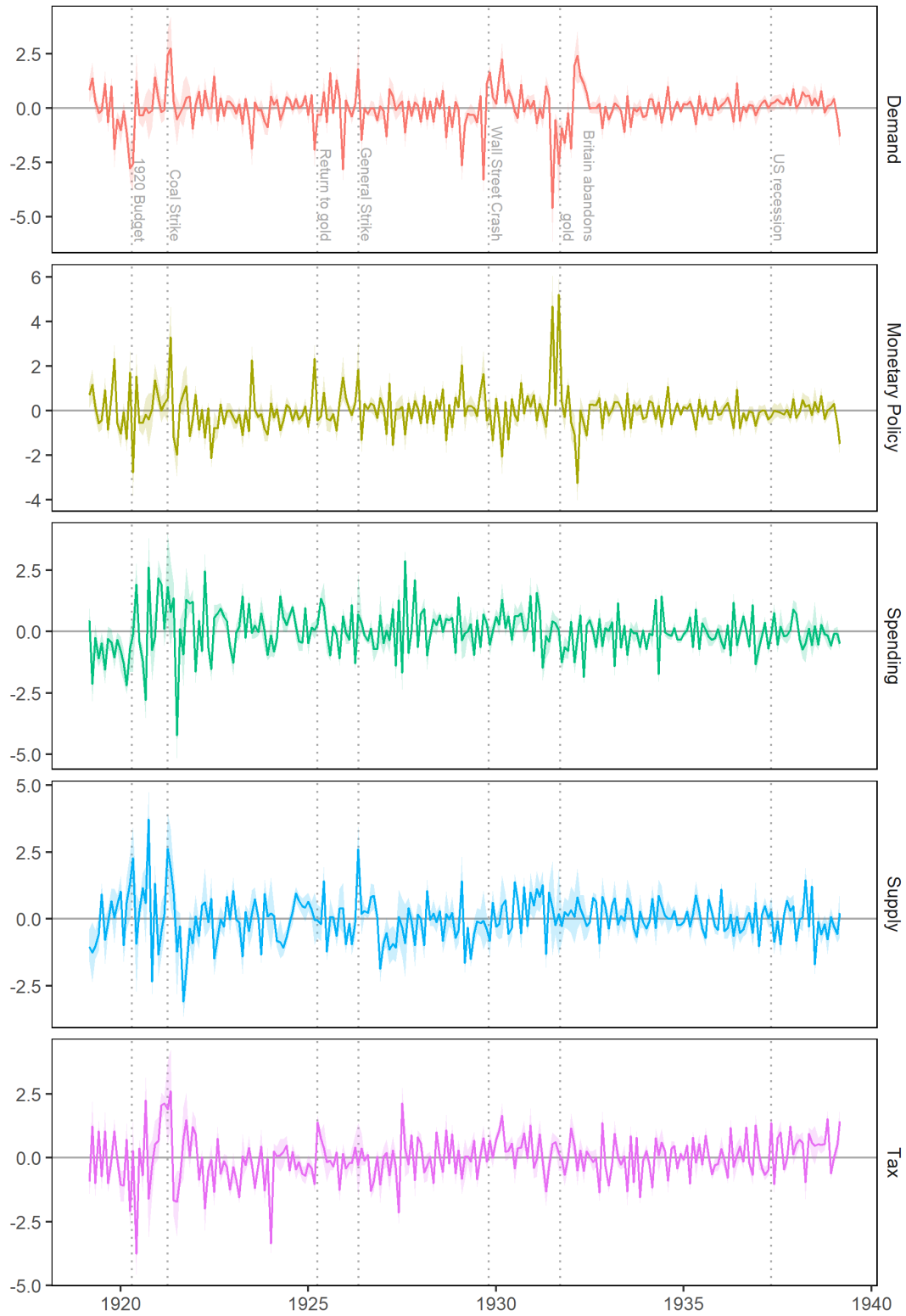
Figure 5 plots the historical decomposition for the price level and unemployment, which brings together the estimated shocks and the estimated structural impulse responses to account for actual developments. The interwar years are decomposed into the five episodes discussed earlier — the post-War boom, the subsequent bust, the Doldrums, the Slump and the Cheap Money era.

The post-War boom saw the price level rise by some 20% relative to the start of the period, while identified shocks pushed down on unemployment¹⁸. The largest driver was the continuation of wartime levels of spending, reinforced for unemployment by tax shocks. Business cycle shocks (demand and supply) also pushed up somewhat on inflation, though had largely offsetting effects on unemployment. The limited contribution from monetary policy is consistent with Howson (1975), who took the view

¹⁷The timing of shocks in Cloyne et al. (2018) don't always align perfectly with those here — the difference is likely to reflect the fact that their narrative approach is based on the estimated revenue effect of a policy change, attributed to the date of implementation, rather than through the observed effect of policy change on revenues, which is what matters in the approach here.

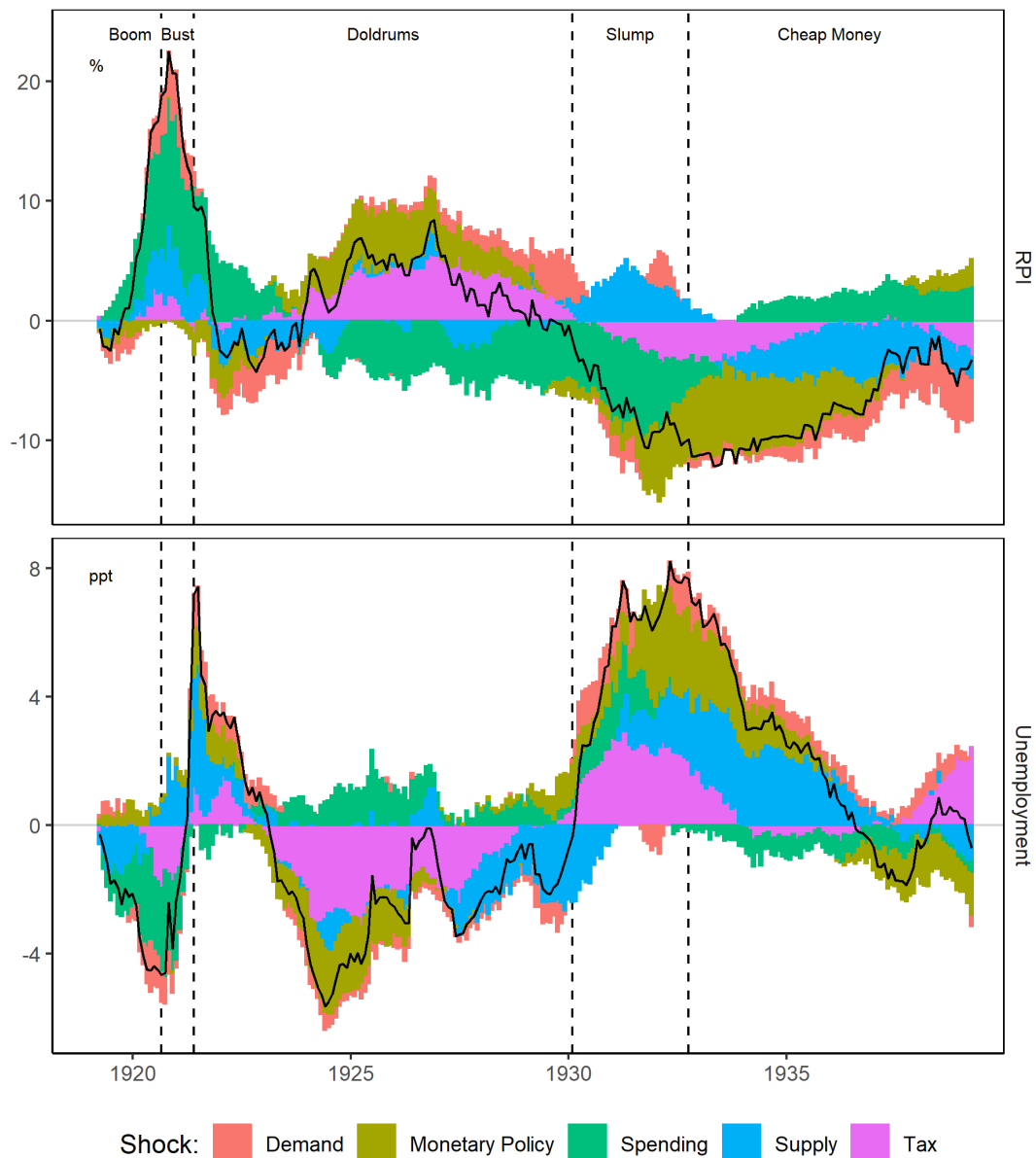
¹⁸Though overall the model's initial conditions offset the fall implied by the effect of shocks alone, reflecting the fact that the starting level of unemployment is lower than the model steady-state.

Figure 4: Identified Shocks



Notes: Shocks are expressed in standard deviations. As per table 1, shocks are normalised such that a positive shock corresponds to higher unemployment. Solid lines represent the median estimated shock, while shaded areas represent the 68% credible set.

Figure 5: Historical Decomposition of Prices & Unemployment Over Five Periods



Notes: Solid black lines indicate the total contribution of shocks to the deviation of the variable from the model steady-state at each point in time, with coloured areas denoting the contribution from each shock. The price level is expressed as the percentage deviation, while unemployment is the percentage point deviation. Initial conditions are not reflected in the chart. Estimates are based on pointwise medians. Episodes are based on the turning points identified in Mitchell et al. (2012)

that monetary policy played a smaller role in the post-War boom than it had traditionally been accused of, while the relatively muted role of demand contrasts with the emphasis on pent-up wartime demand in Eichengreen (1992).

The economy swung sharply into recession over the next 12 months — unemployment shot up and prices collapsed. All shocks bar supply contributed to the decline in prices, while every shock contributed to raise unemployment, with fiscal shocks adding nearly 6 percentage points and business cycle shocks nearly 5 — add in monetary policy, and policy was overwhelmingly the principal driver of developments. The sharpest and most short-lived peak in unemployment, over May and June 1921 (which coincides with a stalling in the decline in prices), reflects the coal miners' strike of these months, captured in a sharply larger supply shock.

Between mid-1921 and mid-1929 the economy entered a long period of weak expansion, “the Doldrums”, as the recession unwound, a period which includes 1925's restoration of the gold standard. Over this period, unemployment gradually fell, to trough at around 10%, while deflation continued (albeit the effect on prices from identified shocks was neutral overall, once the post-War peak had unwound¹⁹). Spending was the principal source of downward pressure on prices across the period. And although neutral across this period as a whole, tax and monetary policy shocks played an important role in sustaining the recovery, driving down unemployment and holding up prices through the middle years of this period — the effect from monetary policy unwinds following the rate raises ahead of the return to gold. Towards the end of this period, supply shocks became the principal source of downward pressure on unemployment.

Turning to “The Slump”, higher taxes and tighter monetary policy push up unemployment and push down on prices, which look to be clear negative consequences (at least for the domestic economy) of the attempt to defend sterling. Business cycle shocks are also interesting. The Great Depression is usually thought of as an externally-originating demand shock in the UK — while it is the case that demand shocks raise unemployment and play a pronounced role in depressing prices, what stands out here is the role of supply shocks in raising unemployment. It is clear in both fig. 1 and fig. 5 that prices were less responsive to a given level of unemployment later in the sample. To test whether this might be linked to the supply-side labour market hypotheses advanced for this period, a split sample exercise is reported in Appendix B — the results there suggest a similar contribution from supply shocks even when the earlier more flexible period is excluded, suggesting that the source of this change lies outside the usual immediate post-War labour market changes that are cited.

Finally, the Cheap Money era sees monetary policy come to the fore, acting as the principal driver of declining unemployment and rising prices as a sustained recovery takes hold. The effect on unem-

¹⁹Although the effect of identified shocks is neutral, there is a large drag on prices from initial conditions in this period, reflecting the fact that the starting level of prices was higher than the model's steady state

ployment is further reinforced by an unwind of the supply shocks that hit during the Great Depression. Strikingly, government spending plays an important role in raising the price level, but a very small one in reducing unemployment, consistent with the limited role for rearmament found in Crafts and Mills (2013).

4.4 Discussion

Returning to the original research question, did policy matter for macroeconomic outcomes and what role did it play in driving developments? The results here suggest that policy did matter, with policy shocks having material impacts on prices and unemployment and accounting for an important share of variation — the results in this paper are generally towards the upper end of the range of estimates in the wider literature, across both monetary and fiscal policy (Ramey, 2016).

Furthermore, policy decisions had a material effect on outcomes in key periods. While monetary policy played only a limited role in the post-War boom, its subsequent tightening worsened the 1920s recession, while the tightening during the Slump also exacerbated the Great Depression. Conversely, the easing in policy from 1921 supported the recovery of the mid-1920s, while the easing of the Cheap Money era played an even more prominent role in the recovery of the 1930s.

Government spending also played an important role across multiple phases. Loose post-War policy generated much of the post-War inflation, while the subsequent cuts to spending brought prices down and pushed up unemployment. Spending played a limited role in the Great Depression, while the main contribution of rearmament in the later 1930s seems to have been to raise prices. The most material role for tax occurred in the middle of the period, first with lower taxes supporting recovery in the mid-1920s and then with higher taxes exacerbating the Great Depression. That said, given the sensitivity of the relative roles of tax and spending shocks to the precise restrictions employed (as noted above and in Appendix B), it is probably better not to place too much weight on the precise roles here of tax shocks versus spending shocks, but rather to think about the role of the overall stance of fiscal policy — exacerbating both the boom and bust of the 1920s then broadly neutral throughout the mid-to late-1920s, before exacerbating the Great Depression in the early 1930s.

Business cycle shocks are somewhat less prominent — demand shocks did contribute to both recessions, and supply shocks materially so during the Great Depression. But the consistently pro-cyclical deployment of policy meant that in many ways policy choices were key drivers of fluctuations in this period, even if the shocks policymakers were responding to (mostly) originated from other sources. Of course, this procyclicality of policy action was no accident — achieving balanced budgets meant tightening fiscal policy in response to negative shocks, while achieving and preserving dollar parity reg-

ularly required raising rates when the economy was weak (most obviously in 1931), to prevent capital outflows and offset downward pressure on sterling.

Of course, in hindsight it is easy to argue that domestically focused monetary policy and less procyclical fiscal policy would have delivered better domestic outcomes — but that was far from clear to contemporaries, who faced a range of competing objectives and uncertainties. One key uncertainty was inflation — watching hyperinflation unfold in central Europe, or even just elevated inflation in France and Belgium, deterred British policymakers from debating more seriously the possibility of pegging sterling to gold or the dollar at a devalued level (as France and Belgium did — the UK debate focused on when to return to gold, not at what level (Moggridge, 1972)). Relatedly, some have argued that Britain was able to abandon gold first in the 1930s partly because it had not had a period of very high inflation in the 1920s — France was the last major country to abandon its gold peg, in part because the experience of high inflation in the 1920s made them reluctant to unpeg from gold (Solomou, 1996). Perhaps even more constraining than the risk of inflation was the broader set of beliefs that underpinned the pre-War policy orthodoxy. In this world, the gold standard was a commitment to honour liabilities in their original value, a commitment not to inflate them away, and it was widely believed that the gold standard was the foundation of Britain’s central role in the global economic and financial system, alongside the commitment to free capital flows and trade — it took the trials of these decades and the crisis of 1931 to overcome this orthodoxy, and even then the process of accommodation with the new possibilities was only gradual.

5 Conclusion

Policymakers in the interwar years had an unenviable task — in the face of multiple shocks, they had to balance competing objectives and manage sharp trade-offs. By bringing a flexible framework to contemporary data, we can answer questions that contemporaries grappled with — what was the role of policy choices and objectives in driving unemployment and price dynamics.

The results here suggest that the post-War boom could have been avoided had fiscal policy tightened earlier. But that seems like an unrealistic prescription; ongoing security concerns, amongst other factors, kept spending necessarily high, while fiscal dominance would have prevented the Bank of England from unilaterally tightening monetary policy. There is a stronger case for a different policy course once policy was free to tighten in the early 1920s; while concerns about debt sustainability might still have warranted a fiscal tightening, a slower adjustment to gold — or even the choice of a lower parity — would have freed up monetary policy to do more to support the domestic economy. Nevertheless, policymakers could have been forgiven for thinking that prices and wages would have adjusted by enough

to make the \$4.86 parity sustainable without mass unemployment, given the degree of flexibility in prices observed in the immediate post-War years.

The situation in the 1930s is quite different. The ultimate shock was external rather than policy, transmitted to the UK through weaker external demand and, especially, through financial channels. Although fiscal policy was tightened in 1930 and loosened thereafter (most notably through rearmament), the most material contributions from policy came from monetary policy, both the sharp tightening in 1931 and the subsequent easing and adoption of “cheap money”. An earlier exit from gold, avoiding the monetary and fiscal tightenings of 1930 and 1931, might have been doubly beneficial, both avoiding the damage done by the policy tightening and removing the external constraint, allowing policy to be set in response to domestic developments.

As noted at the outset, this paper cannot fully answer the question of why unemployment in interwar Britain was so much higher than in the pre-War period, at least to the extent that this results from structural changes that occurred before or at the beginning of the sample period. But it does demonstrate that unemployment was much worse than it could have been, had different policy objectives been pursued. Nor is this paper aimed at addressing the question of whether a “policy regime change” was at the root of the recovery of the 1930s recovery, though the split-sample robustness exercise here offers lukewarm support for this idea at best, consistent with the ambiguous UK-specific results found elsewhere (particularly Ellison et al. (2020)).

One broader objective of this paper is to demonstrate the value of applying modern techniques to the often rich and high frequency contemporary data that is available (although in some cases still in need of digitisation). This paper draws on a broad dataset of generally monthly data for the UK, but higher frequency data exist (the underlying fiscal data here is weekly), as does a broad cross-section of data for other countries (eg. as exploited in Albers (2018); Ellison et al. (2020); Lopez and Mitchener (2020)).

This paper suggests at least two areas that would benefit from further exploration. First, much energy has been devoted in recent years to better understanding developments in the Phillips Curve²⁰. Given the changed relationship between prices and unemployment between the 1920s and 1930s, and the fact this isn’t obviously attributable to the regularly cited changes in the labour market at the start of this period, there is potentially much to learn from this earlier episode of Phillips Curve flattening — that might shed further light on both the role of structural labour market changes in persistently high unemployment and on developments in inflation expectations and the extent of “policy regime change”. Relatedly, a second interesting question that warrants the application of modern methods is the return to gold in the 1920s, particularly in a comparative perspective — building on the seminal paper of Sargent (1982). Much like the exit from gold in the 1930s, countries returned to gold at different times and in

²⁰See, for example Del Negro et al. (2020), Galí and Gambetti (2019), Hazell et al. (2020) and McLeay and Tenreyro (2019)

different ways — pegging at different levels and with wide variation in the implications for inflation, as well as the options available during the Great Depression (as argued, eg. in Solomou (1996)). Lopez and Mitchener (2020) is a nice example of what is possible, exploiting daily markets data to look at the role policy uncertainty played in launching post-War hyperinflation in Austria, Germany, Hungary and Poland.

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A Preparing Public Finance Data for Use

Overview. The weekly *Receipts into and Issues out of the Exchequer* is a rich but little known or used source of data on the UK's central government finances. Although documentation is scarce, the data run from at least 1870 through to the 1960s. The data were published in the British government's official journal, *The Gazette*, reporting cumulative fiscal year totals for a large number of line items to the close of the previous week. The data were picked up in various media outlets, including *The Economist* and a number of newspapers. As well as cumulative totals for the current fiscal year, the data include cumulative totals for the corresponding period of the previous fiscal year and, where in scope, full year forecasts for a particular item from the annual budget.

Coverage and Structure. The data were issued in two tables, the first covering receipts, the second "issues" (ie. payments out of the Exchequer). Each table was split into an "Ordinary" and an "Other" category. The former category is approximately what we might think of as "above the line" in modern fiscal accounting, and corresponds to the scope of annual budgets. The full-year annual totals for Ordinary Revenues and Ordinary Expenditure also correspond to commonly used annual fiscal data found elsewhere (for example Mitchell (1988)).

The *Receipts* data is relatively straightforward. Ordinary Revenue primarily comprises tax-by-tax detail on revenues raised, though it also covers other sources of current income, such as from land holdings, interest income, income from public services (such as the Post Office) and some sales of government property (including war surplus). "Other Receipts" covers roughly three categories: i) repayments on temporary advances (which includes some elements of unemployment insurance, amongst other things); ii) debt issuance; iii) dividends, repayments and some sources of interest income.

The *Issues* data is substantially more complex than the receipts data. By far the largest components of Ordinary Expenditure are "supply services", which cover the civil service & defence spending, and debt service. It includes payments to "sinking funds", pots of money for debt redemption. And this category also includes some spending on roads and payments to local & regional authorities. "Other Issues" encompasses a broad range of items. Most material is debt redemption and repayment of ways and means advances. Of more interest are issues for capital expenditure. Also covered are temporary advances and again some elements of unemployment insurance.

Mapping to modern concepts. Modern national accounting draws a much sharper distinction between on the one hand transactions in the income and capital accounts (essentially taxes, transfers, government consumption and government investment, or "above the line" activities) and on the other hand the financial transactions which are a counterpart to these activities (such as debt issuance, ie. "below the line"). But the granularity of our data, with each table comprising 30-40 line-items for each of receipts and issues, allows us to create aggregates that are closer to modern concepts (and the concepts typically employed when assessing the effects of fiscal policy). We do this by classifying each line of the table to one of six categories: revenue; government consumption; government investment; transfers; debt service; financial transactions — the latter of which are excluded from our aggregates. This also allows us to deal with the "window dressing" that occurs in some periods (Hicks, 1938; Middleton, 1981), since these mostly correspond to what we classify as financial transactions.

This is relatively straightforward on the receipts side, where Ordinary Revenues correspond to the concept of interest, with Other Receipts corresponding to "below the line" activities. It is more complex

on the expenditure side. Studies of fiscal policy typically focus on primary expenditure, so we remove debt service from Ordinary Expenditure. In modern treatment, the sinking fund is just one element of the financial account counterpart to revenues outstripping spending — it can be thought of as a hypothecation of a part of the government surplus — so we exclude it from spending. Beyond Ordinary Expenditure, we treat issues for capital expenditure as government investment, including rearmament spending in the late 1930s; the remaining elements of other issues largely correspond to financial account transactions and are excluded. The one item of interest missing here is unemployment insurance — although the tables include some spending on this, in practice the bulk of unemployment insurance spending happened off the central government balance sheet and the data we have do not accurately reflect actual spending patterns — hence this is also excluded from our spending measure.

Overall, this set of adjustments is very similar to that made in Middleton (1981) on fiscal year data, with one important exception — because our data source does not include complete data on the funding or spending of unemployment insurance (which was largely accounted for and reported elsewhere), our revenue and spending aggregates are slightly lower than his.

Periodicity and Seasonality. To convert the data to monthly flows (from weekly cumulative totals) we take the difference between the latest published dataset for a particular month and the latest published dataset for the month prior. In a small number of instances this can generate changes in the number of weeks covered in a particular month, which becomes particularly problematic following seasonal adjustment. To accommodate this, we either manually reallocate the choice of final week for a month or apportion a particular week across two months. We seasonally adjust the data with X-13ARIMA-SEATS.

Revisions and Consistency. Because each release contains data both on the current fiscal year and for the corresponding period of the previous year we essentially have two records for each month of the sample period. Comparison of these reveals that data were not revised. More practically, this doubling of observations turns out to be a very helpful cross-check when line-items are reclassified or aggregated differently from year to year, or where month-ends don't align.

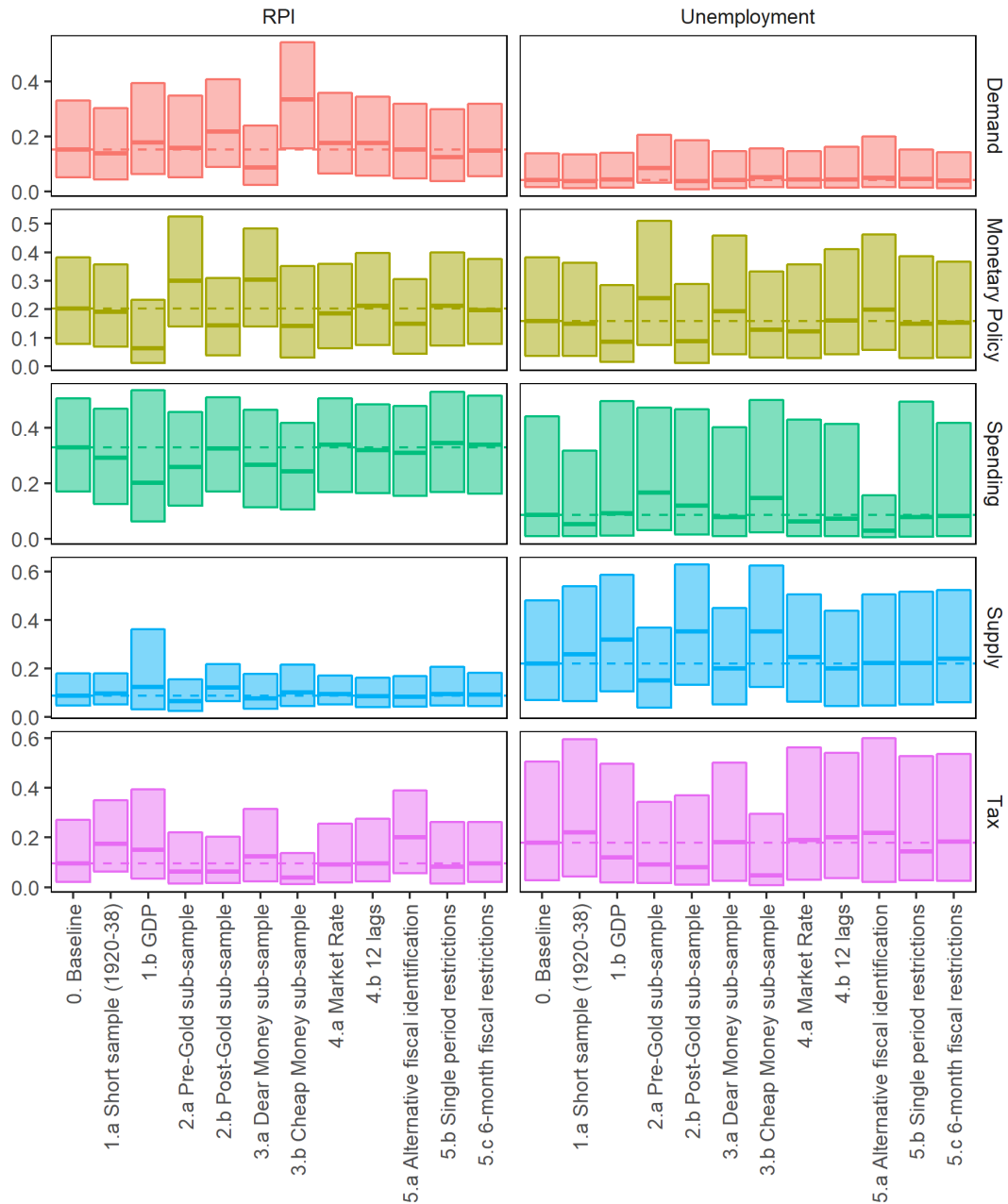
B Extensions & Robustness

This appendix reports a number of extensions and robustness tests, which also help address some ancillary questions about the period. First, a variant of the model using GDP in the place of unemployment is estimated to facilitate comparisons against the wider literature. Second, the possibility of structural breaks is examined, at two key points in the interwar decades, 1925 and 1931. Third, a range of alternative model specifications or sign restrictions are considered. All these different variants are compared in Figure 6.

B.1 A GDP-based model variant

As noted earlier, the focus of this paper is that of contemporaries, whether macroeconomic policies resulted in worse outcomes for unemployment and prices. But much of the modern literature on the effects of macroeconomic policies, especially fiscal policy, concentrates on the effect on GDP. To fa-

Figure 6: Forecast Error Variance Decomposition at 24 months - model variants



Notes: Each box shows the median estimated contribution (centre) and 68% credible set (upper and lower bounds) at the 24-month horizon. The horizontal dashed line represents the median in the baseline specification, extended across the plot for ease of comparison. The “unemployment” share for variant 1.b GDP is actually the contribution to the forecast error variance of GDP per capita.

cilitate comparison with the wider literature, a variant of the model employing GDP in the place of unemployment was estimated. This involved a number of changes to the baseline specification. Unemployment was replaced with GDP per capita (as per Mountford and Uhlig (2009)); the GDP estimates are taken from Mitchell et al. (2012) while the population figures were obtained via a linear interpolation of the annual figures for Great Britain and Northern Ireland reported in Broadberry et al. (2015). Similarly, the revenue and expenditure measures were employed in per capita terms. Sign restrictions were normalised to correspond to a decrease in GDP (as opposed to an increase in unemployment). As per the advice of Ramey (2019), these variables are not logged, to facilitate the calculation of more accurate multipliers. Because GDP estimates are only available for the period 1920-1938, the sample here is truncated relative to the baseline specification (given the important events of 1919 and 1920, this is another reason to prefer the baseline specification, at least from an economic history perspective).

Fiscal multipliers are calculated as the cumulated present discounted change in GDP relative to the cumulated present discounted change in the relevant fiscal variable, as set out in, eg. Leeper et al. (2017). The discount rate applied is the sample average real ex-post market discount rate on Treasury bills, reported in nominal terms in Capie and Webber (1985) and adjusted by the author using 12-month on 12-month inflation rates calculated from the Cost of Living index employed in the paper.

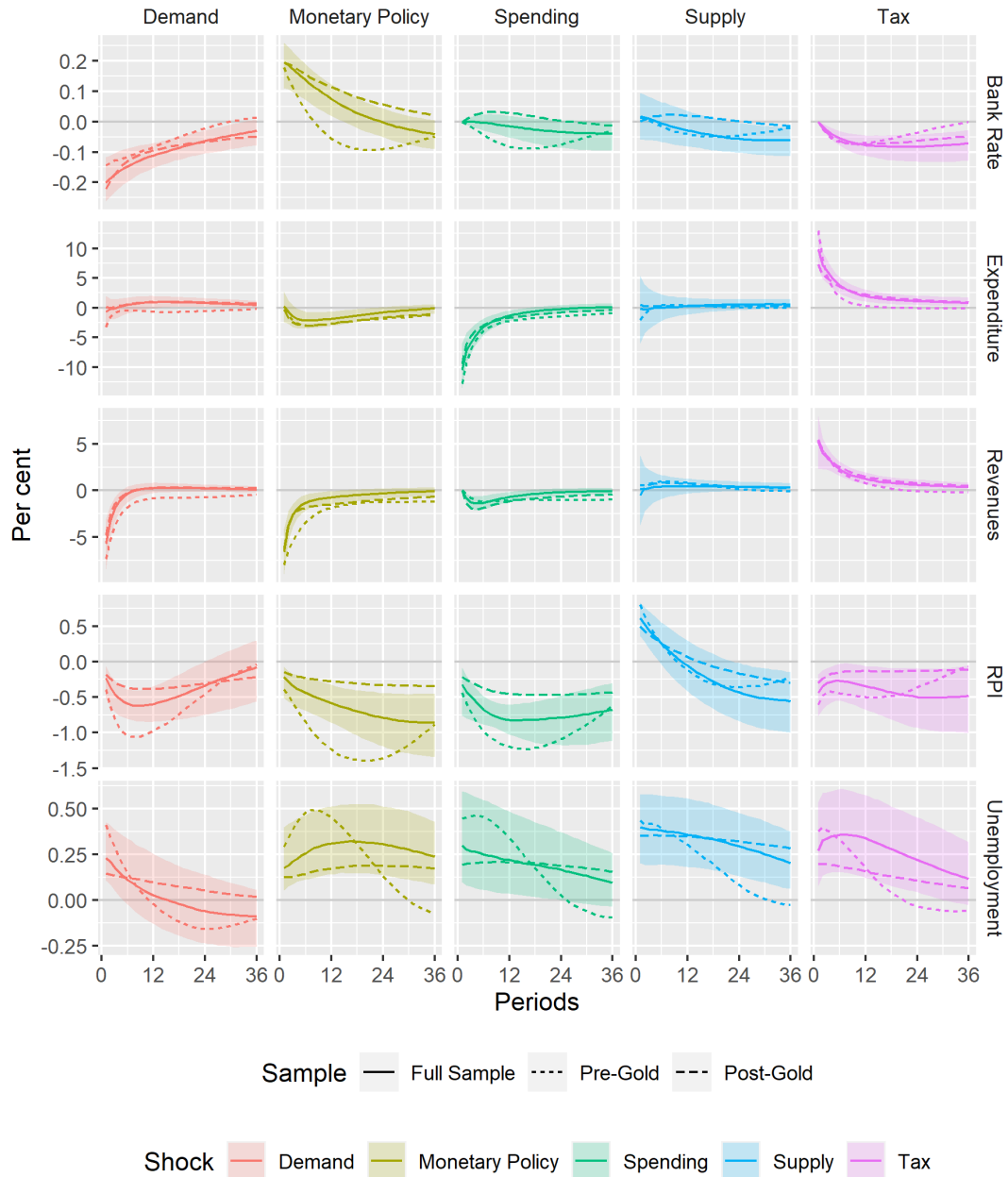
As can be seen in Figure 6, truncating the sample and shifting from logged revenue and expenditure to per capita measures (but still employing unemployment, variant 1.a) has only a modest effect on the forecast error variance decomposition — the effect of tax changes is somewhat larger than in the baseline, the effect of spending somewhat smaller, for both prices and unemployment. Variant 1.b is the same model, but with GDP per capita replacing unemployment. In this specification, the effect of monetary and spending shocks on prices is quite a bit smaller than in the baseline, while for taxes, supply and demand it is somewhat larger. The shares of the forecast error variance reported in the “unemployment” column for this variant are actually those for GDP per capita.

B.2 Potential breaks in 1925 and 1931

There are obvious reasons to test the sample for important differences either side of 1925 and 1931, given the former marks the (formal) transition to the new gold peg and the latter the departure from that peg — indeed, as noted in the literature review, that latter date has been seen as potentially marking a “policy regime change” responsible for exiting the Great Depression. Nevertheless, there are challenges in conducting such an exercise. First, sample sizes are substantially shorter — rather than a full 20 years of data (243 observations), the shorter segments in each pair contain only 6 and 7 years of data respectively. The small sample issue is further exacerbated by the fact that some of the most significant events in the data (such as the boom of the 1920s and the subsequent fiscal consolidation) are located in one half of the sample. The second issue we face is the choice of break point. The choices here correspond to those widely identified in the literature — the return to gold and the exit from gold respectively. The former choice is a little problematic since it will be unclear whether any difference between periods is a result of the return to gold or the delayed influence of changes in the labour market (eg. Hatton and Thomas (2010) locate the structural change in the labour market in the period from 1921 to 1929) — though for the purposes here, the question of interest is whether there was a material change, more than what drove it.

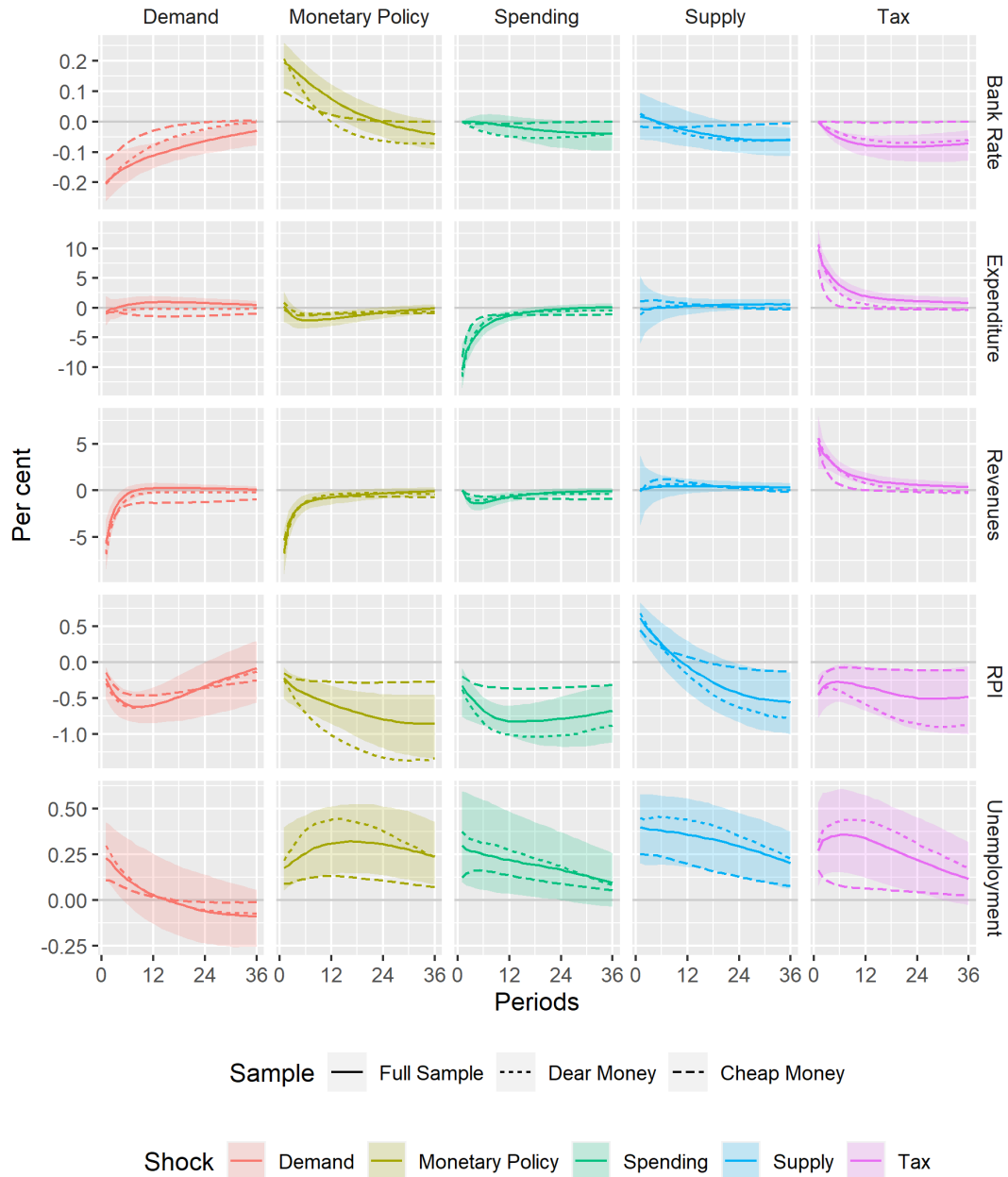
Figure 7 shows median impulse responses for sub-samples either side of the return to gold, against

Figure 7: Impulse Responses — Before & after the 1925 return to gold



Notes: Solid lines represent the median estimated response, while shaded areas represent the 68% credible set, in both cases for the full sample period. Dotted and dashed lines represent median responses for two sub-samples. Units are percentage points for Bank Rate and the unemployment rate.

Figure 8: Impulse Responses — Before & after the 1931 exit from gold



Notes: Solid lines represent the median estimated response, while shaded areas represent the 68% credible set, in both cases for the full sample period. Dotted and dashed lines represent median responses for two sub-samples. Units are percentage points for Bank Rate and the unemployment rate.

the baseline results (the forecast error variance decomposition at the 24 month horizon can be seen in Figure 6, variants 2.a and 2.b). The two rows illustrating the responses of inflation and unemployment are striking. In response to virtually all shocks, the response of inflation is much more muted in the post-gold sample than in the pre-gold sample, while the effects on unemployment are much more persistent. Addressing this issue in detail is beyond the scope of the current paper, though one candidate hypothesis would be that this is consistent with a flattening in the Phillips Curve, something observable in the data even in reduced form — that would suggest some role for supply side arguments, the argument that labour market reforms may have played an important role in the elevated unemployment of the interwar years, though is not consistent with those routinely identified, all of which occur early in the sample. One obvious implication of these differences between periods is that the baseline results may understate the initial impact of monetary and fiscal policies during the 1920s recession but overstate their persistence, though this wouldn't undermine the broad conclusions we draw for this period.

Figure 8 compares median impulse responses for the sub-samples either side of the 1931 exit from gold (the forecast error variance decomposition at the 24 month horizon can be seen in Figure 6, variants 3.a and 3.b). These results are somewhat harder to interpret, perhaps as a result of there being relatively little variation in some of the policy variables in this sub-sample (eg. Bank Rate remains at 2% for all but the first 6 months of the sample, from June 1932 onwards). As with the previous example, inflation is less sensitive to shocks in the period following the exit from gold than in the sample overall. In this case, unemployment is also less responsive. It's difficult to know what to make of these differences, though first order they don't lend much intuitive support to the "policy regime change" hypothesis, perhaps consistent with the finding of Ellison et al. (2020) of a weaker effect in the UK.

B.3 Alternative specifications and identifying restrictions

A range of further robustness tests are conducted around model specification and identification. By and large, these variants yield only minor changes and none provided a preferred specification (see further commentary in the main text). Variant 4.a replaces Bank Rate with a market rate, the discount rate on best 3-month bills, as reported in Capie and Collins (1983). Variant 4.b increases the lag order from 2 to 12. Variant 5.a Tests an alternative identification of fiscal shocks, with the zero initial response of revenues to spending shocks removed and a zero initial response of expenditure to tax shocks applied. Variant 5.b limits the sign restrictions to the initial period, while variant 5.c extends the length of fiscal sign restrictions to 6 months.