FATAL AUSTERITY:

THE ECONOMIC CONSEQUENCES OF HEINRICH BRÜNING[*]

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Abstract

This paper studies the most fateful austerity episode in history: Chancellor Brüning's budget cuts and tax increases in Germany between 1930 and 1932. We introduce a new dataset on German government finances and macroeconomic variables and employ narrative records to identify the causal effects of austerity. We show that Brüning's belt-tightening aggravated the Great Depression. Without austerity, GDP would have been higher by 4.5 percent and unemployment down by 3.3 million people in 1932, a year with two crucial elections that eventually paved the way for Hitler.

JEL classification: C32, E62, E65, N14

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1 Introduction

Faced with crushing reparation obligations from World War I, alongside rising unemployment and dwindling GDP due to the Great Depression, as well as the need to stay on the gold standard, Heinrich Brüning, Germany's Chancellor from March 30, 1930, to May 30, 1932, opted for deflation and implemented, via presidential decrees, one of modern history's most extreme series of tax increases and cuts in government spending and transfers. Although economic hardship spurred political radicalization in the already conflict-laden Weimar Republic, politically isolated Brüning was determined to implement his harsh belt-tightening policies. When Brüning was forced to resign in July 1932, the German Nazi party, who had campaigned heavily against Brüning's austerity course and exploited mass frustration, had already gathered enough momentum to consolidate and even enhance their widely unexpected election result of 18.3 percent in September 1930: In the parliamentary elections of July 1932 the Nazi party scored strongest. From then, it was only half a year before Adolf Hitler was sworn in as Germany's new chancellor in January 1933.

Surprisingly, even today, the macroeconomic consequences of Brüning's austerity measures at this momentous turning point in history rests merely on anecdotal evidence, otherwise overlooked by economists. This paper aims to close this gap and quantifies, for the first time, the macroeconomic effects of Brüning's austerity measures. The backbone of our empirical approach is the narrative identification of the austerity shock instrument variable and a newly constructed monthly dataset on historical government finances and macroeconomic time series. With these ingredients, we determine, in a vector autoregressive model (VAR), the causal effects of Brüning's belt-tightening policy.

We use the vast historical record of Brüning's fiscal policy decisions to derive an austerity shock instrument, extending the narrative line of austerity research started by Guajardo et al. (2014) and Alesina et al. (2018, 2019). Primary and secondary sources uniformly delineate Brüning's budget cuts and tax increases as exogenous policy actions, driven either by his political aspiration to end Germany's reparation payments (Holtfrerich, 1982; Büttner, 1989; Evans, 2003, among others), or by his intent to please Germany's debtors to ensure the country's access to foreign credits (Borchardt, 1979; James, 1986; Ritschl, 2002b, 2016). The five austerity decrees issued between July 1930 and December 1931 by Brüning provide us a quasi-experiment for an exogenous austerity intervention during a period when Germany's economy was in a recession state. We exploit the knowledge on the direction and the timing of these shocks to construct an austerity shock instrument variable in the spirit of Romer and Romer (1989), Ramey and Shapiro (1998), Budnik and Rünstler (2020), and Boer and Lütkepohl (2021). As we take into account the announcement and implementation date of each austerity decree, our shock instrument safeguards our identification against any econometric concerns related to fiscal foresight effects (Ramey, 2011; Mertens and Ravn, 2012; Leeper et al., 2013).

For the period April 1927 to February 1935, we construct a granular, monthly dataset of German federal government spending and tax revenues. We employ a range of statistical publications to decompose the total budget numbers into consistent categories over time. The expenditure side is disaggregated into nine categories, among them social transfers, transfers to federal states, spending related to debt, or reparation payments. The revenue side consists of four categories, among them capital income, taxes, duties, and levies. A data contribution in itself, the monthly frequency of our dataset and the budget decomposition constitute a crucial prerequisite for a clean identification of the causal effects of Brüning's austerity. In an economic turbulent time, like during Brüning's term of office, in which fiscal policy did not follow the regular budgeting process, but implemented impulsively by emergency decrees, only monthly data allow us to set the austerity shock observations' timing precisely. The granular structure of our dataset enables us to construct government spending and tax revenue variables free of budget items moving with the business cycle, thus strengthening the relevance of our austerity shock instrument.

Monthly macroeconomic data, like prices or interest rates for Germany's interwar period, is published in Wagemann (1935). We digitized the entire compendium, including more than 500 time series, releasing this source together with the detailed budget accounts for future research that goes beyond the contribution of our study.

Our findings speak a clear language in the sense that the estimates suggest that austerity aggravated the Great Depression. We show that Brüning's austerity policy decreased German GDP per capita by 4.46 percent relative to total GDP in 1932, a loss that corresponds to 239 percent of all reparations Germany paid in 1930. As 1930 is the year in which Germany paid the highest amount of reparations during the interwar period, our results confirm what economic historians have assumed for decades without empirical evidence - Brüning's austerity policy was indeed detrimental for the German economy and gave the already crisis-shaken economic system an additional blow. Quantifying the effects of the austerity measures' in terms of unemployment paints the same grim picture. Between March 1930 and May 1932, 3.31 million people, or nine percent of Germany's average monthly labor force of 1932, lost their jobs due to Brüning's belt-tightening.

Research on fiscal policy, is a highly active field and our paper relates to a large literature. Unlike Alesina et al. (2012), Fetzer (2019), Galofré-Vilà et al. (2021), or Ponticelli and Voth (2020), who study the political costs of austerity, or Bianchi et al. (2019), and Born et al. (2020), who examine the relation between austerity and sovereign risk, we focus on the effects of austerity on macroeconomic outcomes like GDP and unemployment. Our study of Brüning's belt-tightening during the Great Depression also relates to the literature that investigates the state-dependent effects of fiscal policy and can be seen as an empirical case study on the effects of fiscal consolidations in a recession state. Barro and Redlick (2011) allow for the

possibility that fiscal policy has different effects during times of high unemployment, but find no significant differences between high and low unemployment states. Owyang et al. (2013) and Ramey and Zubairy (2018), using a military news variable for the U.S. to identify fiscal policy shocks, also find no systematically different fiscal multipliers during normal times versus times of economic slack. On the other hand, Auerbach and Gorodnichenko (2012) and Auerbach and Gorodnichenko (2013) find evidence for larger multipliers during recessions than expansions. Similarly, Jordà and Taylor (2016) investigate whether fiscal consolidations have larger effects on aggregate output if undertaken during boom or slump periods in an annual panel of OECD countries. Their findings suggest that when the economy is in a slump, fiscal consolidations lead to significantly larger output losses.

Empirical investigations on the role of fiscal policy during the Weimar Republic have a long tradition. Cohn (1992), by using annual budget data, show that between 1929 and 1932 fiscal policy became more restrictive with every year. Borchardt (1979) argues prominently that Brüning lacked the means and political backing to effectively combat the economic slump. His hypothesis is complemented by the conclusions drawn in Borchardt and Ritschl (1992), who build their empirical analysis on annual data. Fisher and Hornstein (2002) investigate fiscal policy during the Great Depression in a neoclassical growth model. Their analysis gives fiscal policy an important role inc causing Germany's economic downturn. Ritschl (2013) evaluates Germany's macroeconomic performance between 1924 and 1938 in a time-varying VAR model framework and focuses on the transfer problem. Our study contributes not only a new monthly data source for the Weimar Republic, but is also the first to quantify the economic consequences of Brüning's drastic austerity policy.

The remainder of this paper is structured as follows. Section 2 delineates the historical background. Section 3 describes our new data and our empirical strategy. The results are presented in Section 4. Section 5 concludes.

2 Historical setting: Brüning's chancellorship

> *Wait a while and just you'll see,*
> *And Brüning will come up to you*
> *With the ninth emergency decree*
> *And make mincemeat out of you.*
> (German nursery rhyme, cited in Evans (2003))

Political and economic realities were gloomy when Brüning, a conservative, patriotic veteran of World War I and member of the Catholic Centre Party, was appointed chancellor of Weimar Republic on March 30,

1930. Instability and gridlock had already brought down 16 governments in the 12 years of the young German democracy. Hitler and his Nazi Party had become acceptable and was fueling the political radicalization in the country. Soon, in the parliamentary elections of September 1930, they would poll in second place and rise to become the strongest party within two years. Further, even from the inside, the constitutional system was threatened by President Hindenburg's tense relation to the parliament and his aspiration to restore Germany's standing in Europe after World War I.

Additionally, in terms of economic conditions, Brüning faced some difficult headwinds. The 1919 Treaty of Versailles required Germany to accept full responsibility for causing the war. In later negotiations, the allies set Germany's reparation debt to 132 billion Goldmark. Although Germany's reparation payments were eased in 1924 by the Dawes Plan, and even reduced in 1929 by the Young Plan to 114 billion Reichsmark to be paid till 1988, reparations were limiting Germany's financial scope (Borchardt, 1979; Feldman, 2005; Ritschl, 2013).[1]

Already in 1928, one year before the stock market crash in New York, German economic activity had lost momentum. Concerned by the ever rising US stock market, the Federal Reserve shifted to a tighter monetary policy, with consequences for Germany. US investors, who provided since 1924 an important fraction of capital to Germany's large-scale enterprises and public sector, reacted to the increase in US interest rates and reduced foreign lending (Eichengreen, 2015). Only four years after the hyperinflation, raising capital by issuing bonds denominated in Reichsmark was still difficult due to the lacking confidence in the currency and could not completely substitute the ceased foreign credit. As a consequence, economic activity in Germany slowed and unemployment rose (Figure 1, panel a). During the winter season 1928/29, two million Germans were already out of work. When Brüning finally took office in March 1930, the German economy was shaken by the turmoil of the Great Depression. It certainly did not help that German monetary policy was by any means capable of taking an accommodative stance to boost the economy. Constrained by the gold standard, the fear of further international capital withdrawals and depleting reserves forced the Reichsbank regularly to raise the discount rate.

During his term in office, from March 30, 1930, to May 30, 1932, Brüning was head of two minority governments comprising mostly conservative ministers. The previous government, the grand coalition under Herrmann Müller, already broke up due to economic policy disagreements. In the first days of Brüning's chancellorship, economic topics set the agenda, creating disaccord in parliament. Not even 48 hours in office, in his first government declaration on April 1, 1930, Brüning signaled the parliament that he was willing to exploit all constitutional means to push through his vision of an adequate economic policy.[2] Affirmed

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[1]In comparison, Germany's GNP in 1929 was at 88.448 billion Reichsmark (Ritschl, 2002b).
[2]cf. Reichstagsprotokolle, 1928/30, p. 4730
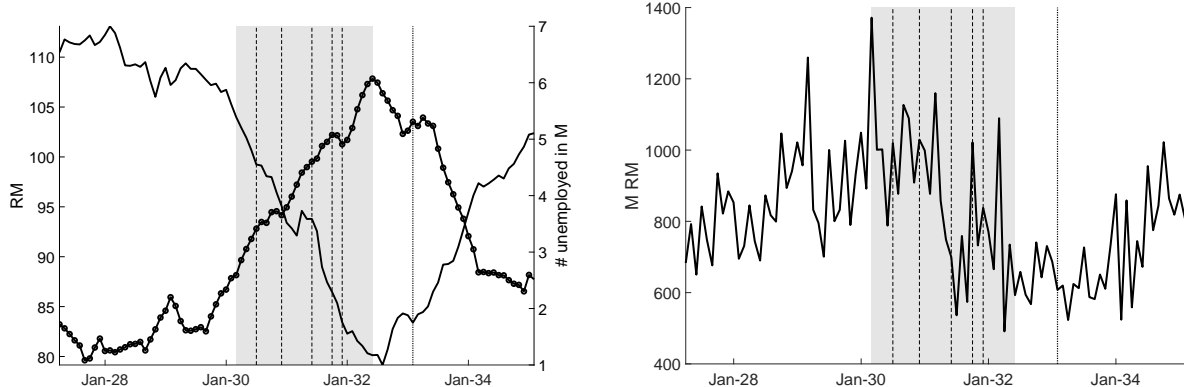
(a) German real GDP per capita in Reichsmark (RM)(left y-axis, bold line) and seasonal-adjusted unemployment in million (right y-axis, bold line with circles). Data sources: GDP: Albers (2018); unemployment: Humann (2011).

(b) German total budget expenditures in million Reichsmark. Data source: Authors' series.

Figure 1: GDP, unemployment, and total budget expenditures between April 1927 and February 1935. The grey-shaded area marks Brüning's term in office. The announcement of Brüning's austerity decrees (July and December of 1930, and June, October, and December of 1931) is indicated by the dashed lines. The dotted line marks January 1933, when Hitler became Chancellor.

by President Hindenburg's support, Brüning routinely circumvented finding parliamentary majorities, by basing his governance on presidential emergency decrees. Further, as his harsh austerity policy at the height of the Great Depression in Germany was extremely unpopular, facing major pushback from both the general public and the parliament, they were implemented exclusively by emergency decree.

Brüning's austerity decrees   Brüning implemented his austerity course through a total of five emergency decrees. Panel b of Figure 1 shows the timing of the austerity decrees and the decline in government expenditures during Brüning's term in office. Total expenditures in fiscal year 1931/1932 were, on average, 22 percent lower than in the previous fiscal year:[3]

July 26, 1930: The emergency decree announced in late July 1930 was the first in a series of extreme spending cuts and tax rises. It introduced, among others, an additional income tax on workers in the public sector (the so-called Reichshilfe - "federal support") and established stricter entitlement criteria for social benefits. In addition, contributions to unemployment insurance were raised.[4]

Four additional emergency decrees followed:[5]

December 1, 1930: The decree imposed further salary and pension cuts on civil servants, and reduced unemployment and health insurance benefits. Additionally, rates of existing taxes were increased, including

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[3]A fiscal year extends from April 1 to March 31 the following year. For instance, the fiscal year 1930/1931 goes from April 1930 to March 1931.

[4]James (1986) and Winkler (2018), among others, include a comprehensive treatment of the emergency decrees' content.

[5]These are called *Verordnung des Reichspräsidenten zur Sicherung von Wirtschaft und Finanzen* and numbered consecutively.

income tax, and new taxes, like a beer tax or the so-called citizen tax ("Bürgersteuer"), introduced.

June 5, 1931: The decree raised a crisis tax. In addition, the decree introduced a salary cut for public sector employees and reduced unemployment insurance benefits and crisis support by 5 percent. It also increased the time span until eligibility for unemployment insurance payments and cut back on child supplements.

October 6, 1931: The decree further cut salaries, increased unemployment insurance contributions, lowered the eligibility period, increased the eligibility age for social benefits, and announced a stop for constructing public buildings. Moreover, extensive pension cuts for public sector employees were inaugurated.

December 8, 1931: The final austerity decree, again, cut back on public wages, and forced price, wage, and interest rate drops. All wages and salaries were cut to their prevailing level in 1927. Additionally, the period of unemployment insurance eligibility was lowered to a maximum of 20 weeks.

There is a long-running debate about potential alternatives to Brüning's deflationary policy. In an influential essay, Borchardt (1979) challenges the postwar consensus that Brüning's failed economic policy was the main reason for the decline of the Weimar Republic (Kroll, 1958; Kindleberger, 1973). He argued that Brüning, facing a crushing public debt, had no room to maneuver and, consequently, could only opt for austerity. Borchardt's reasoning is firmly rebutted by Holtfrerich (1982), who particularly disputes the thesis that the debt burden originated, to some extent, from excessive wages and social transfers prior to 1929. The extensive discussion that developed among international scholars, the so-called Borchardt Debate, was declared to be over by Ritschl (2001). Ritschl saw most of Borchardt's theses confirmed, arguing that Germany's high foreign private debt service and obligatory reparation payments imposed by the Young Plan put an extra strain on the country's balance of payments and made reflationary economic policies impossible (Ritschl, 2002b). The recent revival of the debate suggests that a definitive interpretation of the economic problems of the Weimar Republic and Brüning's role is still a work in progress (Köppen, 2014; Müller, 2014; Borchardt, 2015; Kailitz, 2015; Köster, 2015, amongst others). What is lacking from the more than 40-years-long discussion of Brüning's constraints and economic alternatives are quantitative estimates on the macroeconomic effects of Brüning's austerity measures. Our analysis closes this longstanding gap.

3   Empirical strategy

In this section, we describe how we combine the historical knowledge on the austerity decrees with newly collected data sources to quantify, for the first time, the macroeconomic effects of Brüning's austerity policy.

3.1 New data

We bring our narrative identification strategy to bear on a new, detailed monthly dataset of the German federal government budget and macroeconomic and financial variables collected from Wagemann (1935). Two features make this newly collected data essential for quantifying the effects of Brüning's austerity policy. First, the data's *monthly* frequency. In an economically turbulent time, like during Brüning's term of office, during which fiscal policy did not follow the regular budgeting process, but implemented impulsively by emergency decrees, only monthly data allows us to set the austerity shock observations' timing precisely enough. Second, our data sources enable us to decompose the total budget numbers into consistent categories over time. We use this decomposition and construct government spending and tax revenue variables free of components that move with the business cycle directly, thereby strengthening the mapping between our fiscal variables and the austerity shock instrument.

Germany's monthly federal government budget Up to now, in terms of data, the gold standard to study questions related to the public sector in the Weimar Republic are the quarterly budget figures compiled by Ritschl (2002b). Building on this information, we extend the existing time series evidence on the German budget and construct a monthly dataset on federal revenues and expenditures.[6]

The starting point for our dataset constitute the aggregated monthly series of revenues and expenditures in Wagemann (1935).[7] They comprise the regular and the extraordinary budget and are organized in fiscal years. However, as the aggregated budget data also includes reparations and debt service, as well as cyclical components like social transfers and transfer payments to states and municipalities, we have to correct for these positions. Starting from April 1927, we are able to decompose the total budget numbers into explicit items of the federal government budget and adjust the spending and revenue data accordingly. To decompose the aggregated series, we use the detailed accounts of the German federal government budget as published from April 1927 to 1931 in the *Statistisches Jahrbuch für das Deutsche Reich*. From 1932 on, we gather this information in various editions of *Wirtschaft und Statistik*.[8] Appendix B shows an extract from the primary sources.

As the item's declarations and compositions change over time in the statistical publications, we summarize them consistently in broader categories. Government expenditures splits up in nine categories and tax revenues in four. Table 1 provides an overview and Appendix C contains more details on the categories and the spending and tax revenue variables' composition.

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[6]As a consistency check, in Appendix A, we aggregate our monthly budget data to quarterly frequency and find that it corresponds well with the series in Ritschl (2002b).

[7]In particular, "Monatliche Einnahmen und Ausgaben des Reich", section XVIII. Öffentliche Finanzwirtschaft; A.

[8]After February 1935, detailed budget accounts are no longer reported.

Table 1: Federal budget: categories

Government expenditures	Tax revenues
1E. Transfers to federal states	1R. Taxes, duties, levies
2E. Social transfers	2R. Capital income
3E. Remuneration of civil servants and employees	3R. Extraordinary taxes
4E. Housing, assets	4R. Other revenue
5E. Military, police, transportation	
6E. Debt and coverage of public deficit	
7E. War burdens	
8E. Reparations	
9E. Other expenditure	

Crucial and new to the literature, this budget decomposition finally allows us to construct a revenue and spending measure free of cyclical components suitable for the empirical analysis: The tax revenue measure consists of taxes, duties, and levies (1R) minus the sum of tax transfers to federal states (1E), social transfers (2E), and interest and debt repayments (item of 6E). Our government spending measure includes remuneration of civil servants and employees (3E; 61 percent of spending variable), outlays on housing and assets (4E; 2.5 percent), expenditures for military, police, and transportation (5E; 23.7 percent), and outlays summarized as other expenditure (9E; 12.8 percent). With our revenue and expenditure measures, we capture 43 and 41 percent of the total budget numbers.[9]

Wagemann's handbook   Monthly data on economic activity, prices, and interest rates for the last years of the Weimar Republic comes from a new statistical database that we compiled by digitizing the *Konjunkturstatistische Handbuch* of Wagemann (1935). The database contains well over 500 monthly time series on macroeconomic and financial variables of the German economy between 1925 and 1935: in particular, general statistical indicators on Germany's public sector, labor market, investment, traffic, trade, wages and income, prices, credit system, and interest rates and yields, but also industry-specific time series. From this database we have assembled a ready-to-use monthly dataset that is accessible to the public.

3.2   The austerity shock instrument

Nearly 90 years after Brüning stepped down as chancellor, the economic effects of his deflationary policy still are opaque and quantitative empirical evidence is missing. However, Brüning's extreme fiscal policy actions in the 25 months of his chancellorship have been extensively researched and documented by historians and

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[9]In Appendix D, we show that federal and local government entities were similarly affected by Brüning's austerity measures. Hence, budget cuts at the federal level could not be compensated for by Germany's local governments.

other experts. We use this narrative record describing the history and motivation of Brüning's austerity course to construct a new austerity shock instrument (IV, also known as proxy variable), thereby building on the approach pioneered by Ramey and Shapiro (1998), Romer and Romer (2010), and Ramey (2011).

The first step in the analysis is to identify all major legislated austerity measures during Brüning's term of office between March 1930 and May 1932. As Brüning's austerity packages were exclusively issued by the five emergency decrees discussed in Section 2, this step is straightforward.

The second step in the analysis is to determine the austerity packages' size. The spending cuts and tax increases of Brüning's austerity decrees were considered as devastating and extremely cruel by the German public and foreign observers. For instance, *The Economist* comments in an article on December 12, 1931, only four days after the announcement of the last decree:

> "Coming on top of three[10] previous Emergency Decrees, which have already reduced terribly the German standard of life, and imposed, as it is, in the middle of a crisis in which Germany has five million unemployed, her stock markets closed, her tale of bankruptcies mounting to catastrophic figures, and her whole economic system 'frozen' by credit restrictions and standstill agreements, this latest 'turn of the screw' will undoubtedly place a dangerous strain on the psychology of the German people."

Surprisingly, the actual size of the government spending cuts and tax increases implied by each emergency decree received only little attention in the public discourse. The *Vossische Zeitung*, one of Germany's leading national dailies, reports authoritative forecasts for spending reductions and revenue increases only for the decrees announced in July 1930 and June 1931. However, the presented figures remain inconclusive to a large extent and do not cover the full set of regulations. For instance, the evening edition of June 4, 1931, quantifies the reduction in civil servants' salaries of 160 million Reichsmark without specifying the time horizon. The evening edition of June 6, 1931, states that 100 million Reichsmark in civil servants' salaries are going to be saved within the next nine months, hence through the end of the fiscal year. However, the decree itself states that the reduction in civil servants' salaries stays in effect until January 1934. Thus, given this conflicting evidence, the figures remain hard to interpret. Consulting governmental statements also does not lead to quantitative data. Neither the government declaration accompanying the emergency decree of June 1931, the famous Tributaufruf, nor Büning himself, in his radio address on the occasion of the December 1931 decree, refers to concrete amounts and sums, but stresses the measures' severity only generally.

Additionally, deriving the implied reduction in government spending and tax increases *ex-post* from the

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[10]The article refers to *Verordnungen des Reichspräsidenten zur Sicherung von Wirtschaft und Finanzen* 1–3.

law texts is impossible due to the emergency decrees' complexity. For instance, the size of a civil servant's salary or pension reduction implemented in the emergency decree of summer 1931 depended on her employer, income category, family status, and the place of residence, among others. Quantifying these cuts would require detailed micro-level data that is not available for the Weimar Republic. To address this data gap, we use qualitative information on the date and sign of the shock to construct the austerity shock instrument, thereby building on the works of Romer and Romer (1989), Ramey and Shapiro (1998), and Budnik and Rünstler (2020). A theoretical justification for the qualitative identification is given by Boer and Lütkepohl (2021), who shows that proxies relying on qualitative information can lead to impulse response estimates of the impact effects of the structural shock of interest that are nearly as efficient as, or even more efficient than, estimators based on more sophisticated quantitative proxies that also take into account the size of the shock.

In particular, we use our historical knowledge of the austerity packages and set the proxy variable to minus one on the announcement dates of Brüning's emergency decrees (July 1930, December 1930, June 1931, October 1931, and December 1931), and zero otherwise. This variable has a reasonable amount of predictive power for the government budget. A regression of spending on the austerity instrument and ten of its lags has an R-squared of 0.26.

Some words concerning the timing of the dummy events are in order. The consensus in modern macroeconomics is that expectations of economic agents play a pivotal role in the working of fiscal policy (Perotti, 1999; Ramey, 2011; Corsetti et al., 2012; Kriwoluzky, 2012; Leeper et al., 2013, among others). According to this view, Brüning's austerity measures influenced agents' economic decisions already at the moment they were announced, and not when they were implemented and realized. By combining our narrative identification scheme with our monthly dataset, we can address this issue: setting the dummy events precisely in the month of the decrees' announcement eliminates any econometric concerns related to fiscal foresight effects.

Historical evidence supports the view that Brüning's austerity measures were not taken in response to factors likely to affect the economy in the near future and, hence, can be considered exogenous. In the last step of the analysis, we summarize the historical debate about Brüning's motives. Appendix E contains an extensive list of further historical references providing evidence that Brüning's austerity decrees were motivated by reasons exogenous to the business cycle.

Two perspectives on Brüning's motivation for his deflationary policy course have shaped the historical debate. Both support the view that Brüning's austerity decrees can be used to study the macroeconomic effects of austerity measures because they were not systematically correlated with developments affecting the economy in the short- or medium-terms. According to the first view, Brüning's political agenda was essentially defined by his aspiration to end Germany's reparation payments and achieve a revision of the

Treaty of Versailles to reintegrate Germany in the world economy. Thus, the harsh austerity measures Brüning inflicted on the German economy were deliberately chosen to deepen Germany's recession. Brüning's intention was to demonstrate to the allies that Germany was already at its economic limits and had to be relieved from its reparation burden. Once reparations were abandoned, Brüning's plan was to devalue the currency considerably to restore Germany's competitiveness (Holtfrerich, 1982; Büttner, 1989; Evans, 2003; Ferguson and Temin, 2003; Winkler, 2018, among others). Proponents of the second view argue that Brüning already realized at the beginning of his chancellorship that spending cuts would not bring the necessary relief to stabilize Germany's depression economy. Instead, Brüning was convinced that the only remedy to break the deflationary spiral was to enable Germany to access foreign credit markets, which made a revision of the Young Plan inevitable in long-term. Thus, according to this view, deflation was the self-inflicted scourge to maintain Germany's participation in the international economic order (Borchardt, 1979; James, 1986; Ritschl, 2002b, 2016).

Both perspectives support the reasoning that Brüning's austerity cuts were not an endogenous response to stabilize the business cycle in short- or medium-term: while, according to the first view, the austerity measures were purely motivated by Brüning's political preferences, the second view sees them as an result of Germany's reparation debt and, hence, to outside forces. Even though Brüning was convinced that ending reparations and renewed access to foreign credits would jump-start Germany's shattered economy, this business cycle motive is clearly long-term oriented. One of the Weimar Republic's tragedies is that Brüning was no longer chancellor when Germany's reparation payments were finally suspended during the Lausanne Conference in the summer of 1932.

3.3 Estimation

To identify the effect of Brüning's austerity on the German economy, we order the qualitative IV first in a VAR model, a strategy pioneered by Kilian (2006) and Ramey (2011), and theoretically discussed in Plagborg-Møller and Wolf (2021). Generally, the VAR model with n endogenous variables expresses the observables y_t as projection on its past values and a reduced-form innovation:

$$y_t = B_0 + B(L)y_{t-1} + u_t, \quad u_t \sim \mathcal{N}(0, \Sigma_u), \tag{1}$$

where $B(L)$ denotes the reduced form VAR model coefficients, and B_0 the intercept term. u_t denotes the $n \times 1$ vector of reduced form errors with the corresponding variance-covariance matrix Σ_u. The reduced form errors u_t are related to the structural errors ϵ_t as follows:

$$u_t = A\epsilon_t, \quad \epsilon_t \sim \mathcal{N}(0, I_n). \tag{2}$$

The $n \times 1$ vector y_t collects the observables:

$$y_t = \begin{bmatrix} IV_t & g_t & tax_t & gdp_t|ue_t & p_t & i_t \end{bmatrix}. \tag{3}$$

IV_t denotes the qualitative austerity proxy variable with value minus one at the announcement dates of Brüning's emergency decrees; g_t denotes the logarithm of real government consumption and, tax_t the logarithm of real tax revenues. We rotate the fourth variable in the system and estimate the VAR model sequentially with (i) the logarithm of GDP per capita (gdp_t) or (ii) the unemployment rate (ue_t). p_t is the logarithm of a wholesale price index (WPI) and i_t denotes the Reichsbank discount rate.[11] To account for the peculiarities of the German budgeting process, we seasonally adjust the spending and tax data by regressing the variables on a dummy variable that takes the value of one in March of each year.[12] Our budget data covers the sample 1927:M4 to 1935:M2. Because of the relatively short sample size, we adopt a Bayesian estimation. We employ a lag order of twelve and use the procedure with dummy observations suggested by Bańbura et al. (2010) to implement the modified Minnesota prior of Kadiyala and Karlsson (1997). Appendix G outlines the details of the prior distribution. For inference, we use stationary draws from the posterior simulation.[13]

We compute the dynamic responses of the austerity shock and evaluate the effect of Brüning's austerity policy on the German economy by analyzing the size and timing of the decrease in economic activity and the increase in unemployment associated with the emergency decrees. Representing the VAR model estimates in the form of counterfactuals allows us to examine how much change of GDP per capita and the unemployment rate can be attributed to positive or negative fiscal shocks at a given point in our sample. We follow Kilian and Lee (2014) and, in a first step, compute the historical decomposition during Brüning's term of office

$$y_t = \sum_{s=0}^{t-1} \Phi_s \epsilon_{t-s} + \sum_{s=t}^{\infty} \Phi_s \epsilon_{t-s} \tag{4}$$

where Φ_s denotes the 6×6 matrix of structural impulse responses at lag $s = 0, 1, 2, ...$ We estimate Φ_s and ϵ_t from the data and express the fitted value of the structural VAR model as:

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[11]Appendix F includes a detailed account on the data sources.

[12]March constitutes the last month in the fiscal year in which all still open items were posted. Each March, we observe spikes in the revenue and expenditure data. By seasonally adjusting the budget data, we avoid, because of these spikes, overestimating the effects of fiscal policy.

[13]In Appendix H, we show that our estimation results are robust to various specifications, including varying lag length and alternative variables for economic activity and the price level.

$$\hat{y}_t \approx \sum_{s=0}^{t-1} \hat{\Phi}_s \hat{\epsilon}_{t-s}. \tag{5}$$

We are interested in the fourth element of y_t, denoted by $y_{gdp,t|ue,t}$, which corresponds to GDP per capita or the unemployment rate. Let $y^s_{gdp,t|ue,t}$ denote the contribution of structural shock s to GDP per capita or unemployment at date t. Then, the counterfactual is defined as $y_{gdp,t|ue,t} - \hat{y}^s_{gdp,t|ue,t}$, where $\hat{y}^s_{gdp,t|ue,t}$ denotes the fitted value of GDP (unemployment) associated with shock s. For our analysis, we are interested in the effect of the first shock, the shock to the austerity proxy. The counterfactual series then indicates how GDP per capita or the unemployment rate would have evolved, had one been able to replace all realizations of the austerity shock in our sample with zeros, while keeping the remaining five structural shocks in the VAR model. If the counterfactual exceeds the observed time series, the austerity shock lowered the time series in this period. If it lies below the actual series, the austerity shock increased that series. The distance between the observed series and the counterfactual series tells us by how much austerity affected GDP or the unemployment rate at this point in time.

4 Results

4.1 Transmission mechanism

How does the austerity shock we identify propagate to the macroeconomy? We find that it is in line with theory.
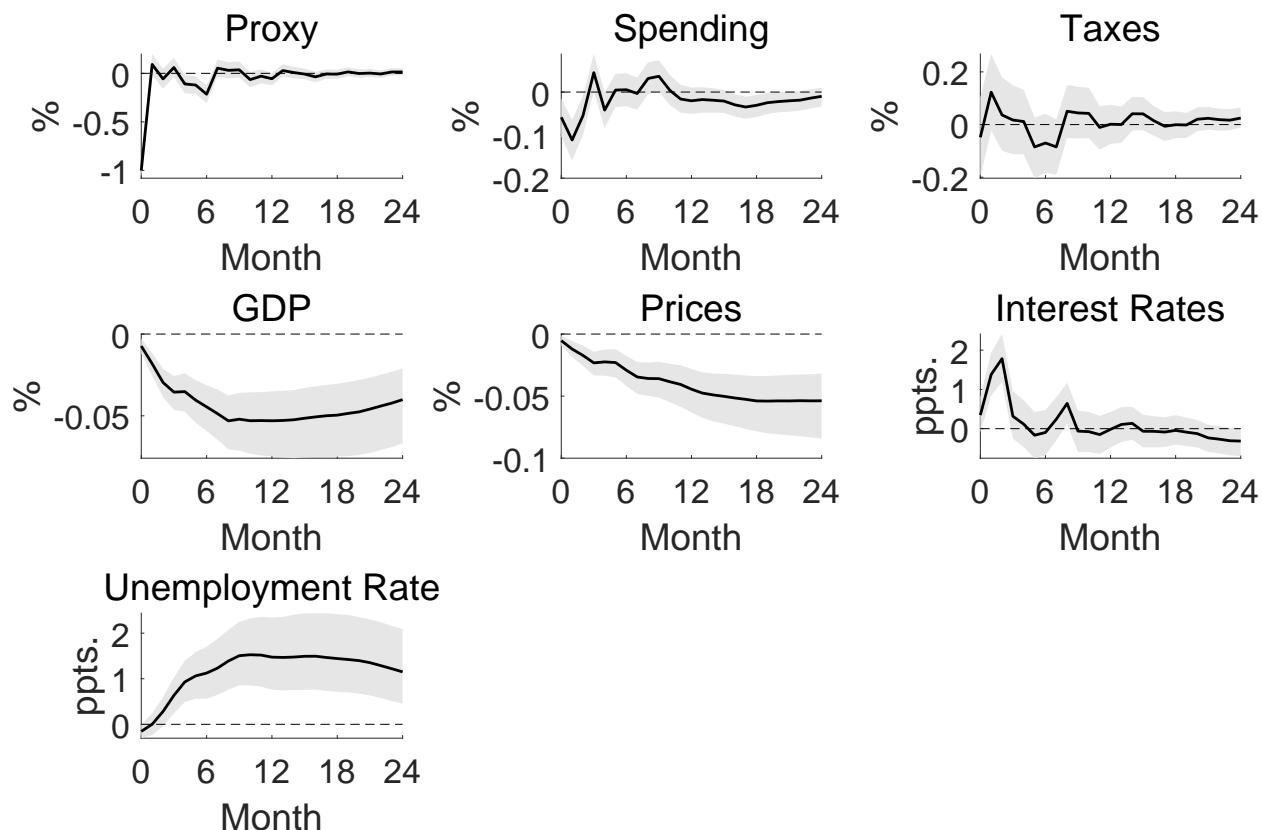
Figure 2: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one percent austerity shock. Shaded bands denote the 68 percent credible sets.

Figure 2 shows impulse responses to a one percent austerity shock. The bold line depicts the posterior median response, the grey-shaded area shows the 68 percent credible intervals. Consistent with theory, the austerity shock identified with the qualitative proxy variable decreases government spending statistically significantly, increases taxes, and has recessionary effects. GDP per capita experiences a sharp decrease in the first eight months and does not convert back to its initial level within two years. Austerity has increasing and long-lasting statistically significant effects on the unemployment rate. After ten months, the increase in unemployment reaches its maximum at 1.5 percentage points, but the rate stays above its initial level for more than two years. Prices decrease on impact. Consistent with price rigidities, the decline in prices is rather slow at the beginning, but steady and long-lasting. Interest rates increase on impact, but the response is essentially insignificant and fluctuates around zero. From a contemporary perspective, with the implementation of a Taylor rule on the side of the central bank and price rigidities, we would expect interest rates to decrease in response to austerity to match the deflationary effects. The German Reichsbank in the 1920s and 1930s, however, was not relying on Taylor-type rules for conducting monetary policy - and our identification scheme correctly picks this up.

4.2 Counterfactual GDP and unemployment

What would have been the state of Germany's economy in summer 1932 without Brüning's austerity measures? This section presents the answer provided by our counterfactual exercise.
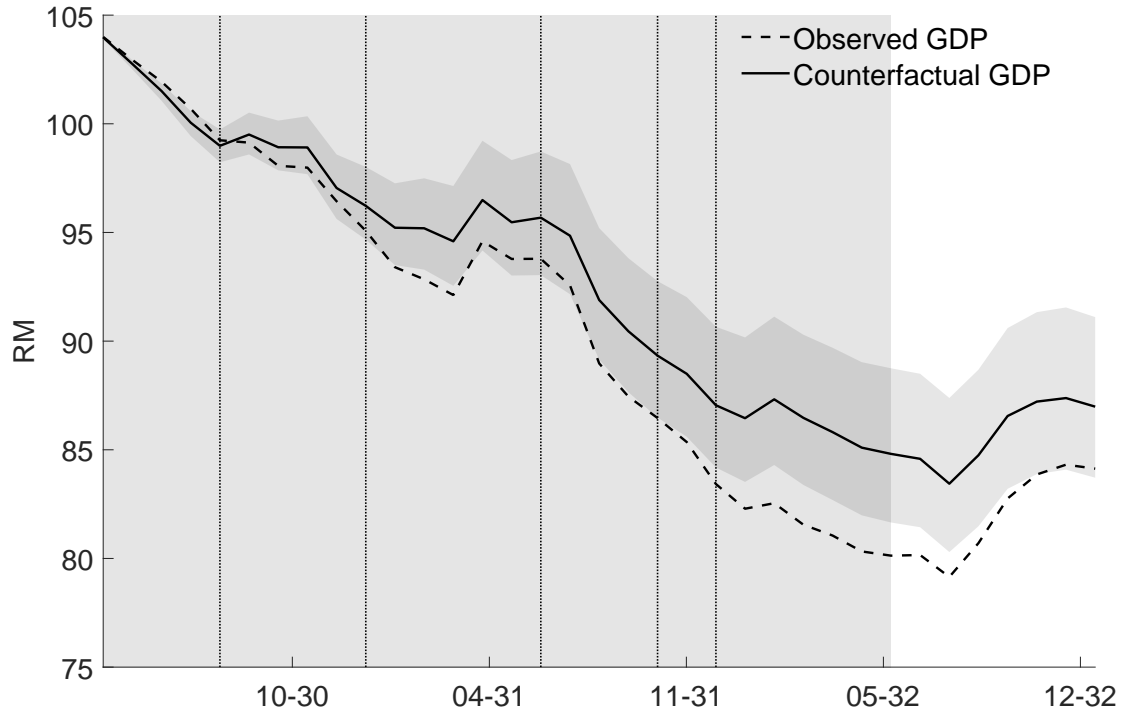

Figure 3: Counterfactual for GDP per capita between March 1930 and January 1933. The bold line depicts median counterfactual GDP in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates observed GDP. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.

Figure 3 shows counterfactual GDP per capita (bold line: median estimate; dark-grey shades: 68 percent credible sets) and observed GDP per capita (dashed line) between Brüning's term of office (light-grey background) and Hitler's appointment as chancellor in January 1933. For the first months of the sample, the two lines coincide almost perfectly, meaning that austerity barely had an impact on the evolution of GDP. Then, starting with the first emergency decree in summer 1930 until the end of the sample, counterfactual GDP exceeds observed GDP. Hence, for the lion's share of Brüning's chancellorship, austerity shocks had an decreasing effect on economic activity. The difference between counterfactual and observed GDP becomes statistically significant from August 1931 onward, coinciding with the implementation of the second emergency decree in the midst of the German banking crisis. Summing up the significantly estimated loss in GDP during Brüning's term of office, hence foregone GDP between August 1931 and June 1932, yields a loss equivalent to 4.46 percent of total GDP in 1932; or, put differently, because of Brüning's austerity policy, Germany suffered a loss in GDP amounting to 239 percent of all reparations paid by Germany in 1930 -

with 1930 being the year in which Germany paid the highest amount of reparations before the Lausanne Conference.
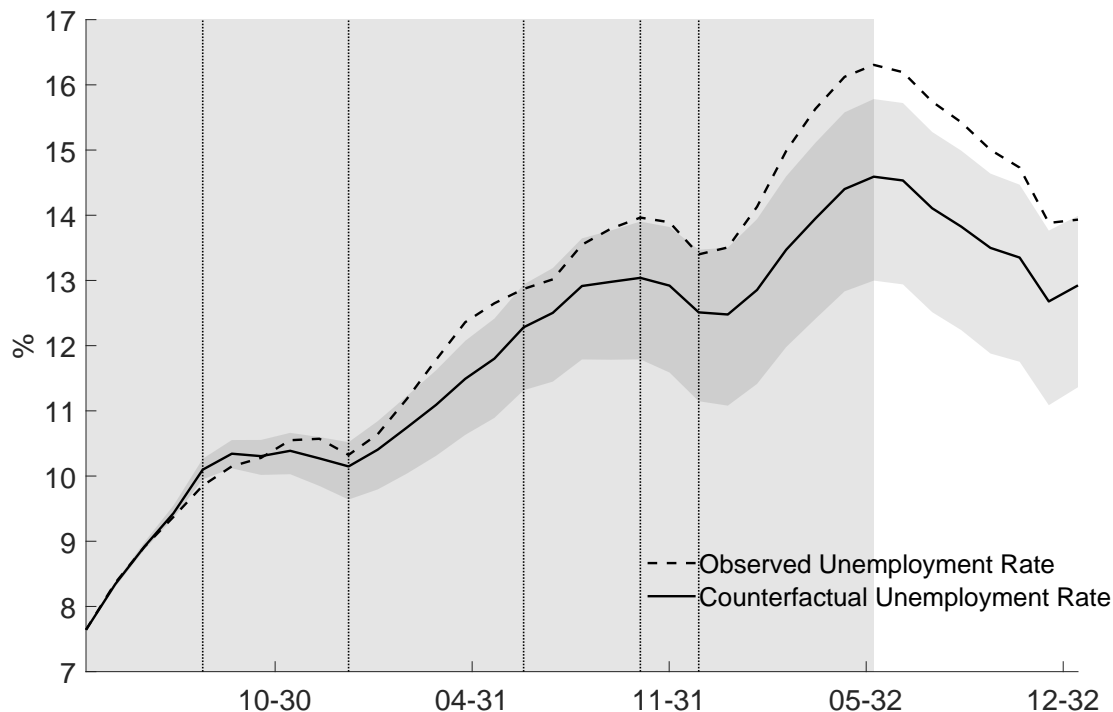

Figure 4: Counterfactual for the unemployment rate between March 1930 and January 1933. The bold line depicts the median counterfactual unemployment rate in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates the observed unemployment rate. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.

For the labor market, the picture looks equally bleak. Figure 4 shows the counterfactual and realised unemployment rate between March 1930 and January 1933. Over spring 1930, the two lines are congruent; thus, austerity shocks were not driving the unemployment rate in the first months of Brüning's term of office. Starting from October 1930, counterfactual unemployment falls short of the observed rate and remains below the realised value through the end of the sample. Hence, without Brüning, German unemployment would have been lower in the last years of the Weimar Republic. In addition, the gap between the observed and counterfactual unemployment rate widens over time, meaning that Brüning's fiscal policy increasingly drove up unemployment. With the implementation date of the fourth emergency decree in January 1932, the difference between the counterfactual and observed unemployment rate becomes statistically significant. Considering again only the significantly estimated unemployment effects between January and June 1932, we find that Brüning's austerity policy brought 3.31 million people in Germany into unemployment, or nine percent of the monthly average labor force of 1932.

Was Brüning really a "Hunger Chancellor"? The outcomes of the counterfactual analysis speak a clear

language. We find that Brüning's austerity course made matters worse and put an additional drag on Germany's crisis-shaken economy. The five emergency decrees issued between July 1930 and December 1931 account for a loss in GDP of 4.5 percent and cost 3.3 million people their jobs. Looking at the sheer macroeconomic losses, despite their dimension, however, underestimates the true damage caused by Brüning's budget cuts. The extreme economic circumstances in the last years of the Weimar Republic made the German electorate turn away from Weimar's ruling parties and vote for opponents that promised an economic reboot (Kaltefleiter, 1968; King et al., 2008; Galofré-Vilà et al., 2021). Fatally enough, the Nazis were the party that capitalized most on this insight.

5   Conclusion

Was Brüning's cost cutting policy an appropriate crisis remedy or did it aggravate Germany's economic situation? In this paper, we provide answers on a long-standing and unresolved question in economic history and quantify modern history's most consequential austerity intervention: Chancellor Brüning's budget cuts and tax increases in Germany between 1930 and 1932. Our findings lend support to the concern that fiscal consolidations aggravated the Great Depression. Brüning's imposed belt-tightening brought 3.31 million people into unemployment and lowered Germany's GDP per capita by 4.5 percent, exactly at a time in which the country was already hit hard by the Great Depression and a banking crisis. These sizeable macroeconomic numbers even obscure the psychological effects of Brüning's austerity policy on the German electorate. Years of extreme economic hardship made the people turn away from the established democratic ruling parties and seek political movements that promised economic alternatives. Fatally enough, the Nazis were the party that capitalized most on this insight. Under these circumstances, Brüning's austerity policy can be marked as a fatal fire accelerant.

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Appendix A Comparison to Ritschl's federal government spending data

In Figure 5, we aggregate our monthly budget data to quarterly frequency and find that it corresponds well with the series in Ritschl (2002b).[14] During the late 1920s, we underestimate total Reich expenditures; however, both series move closely together.
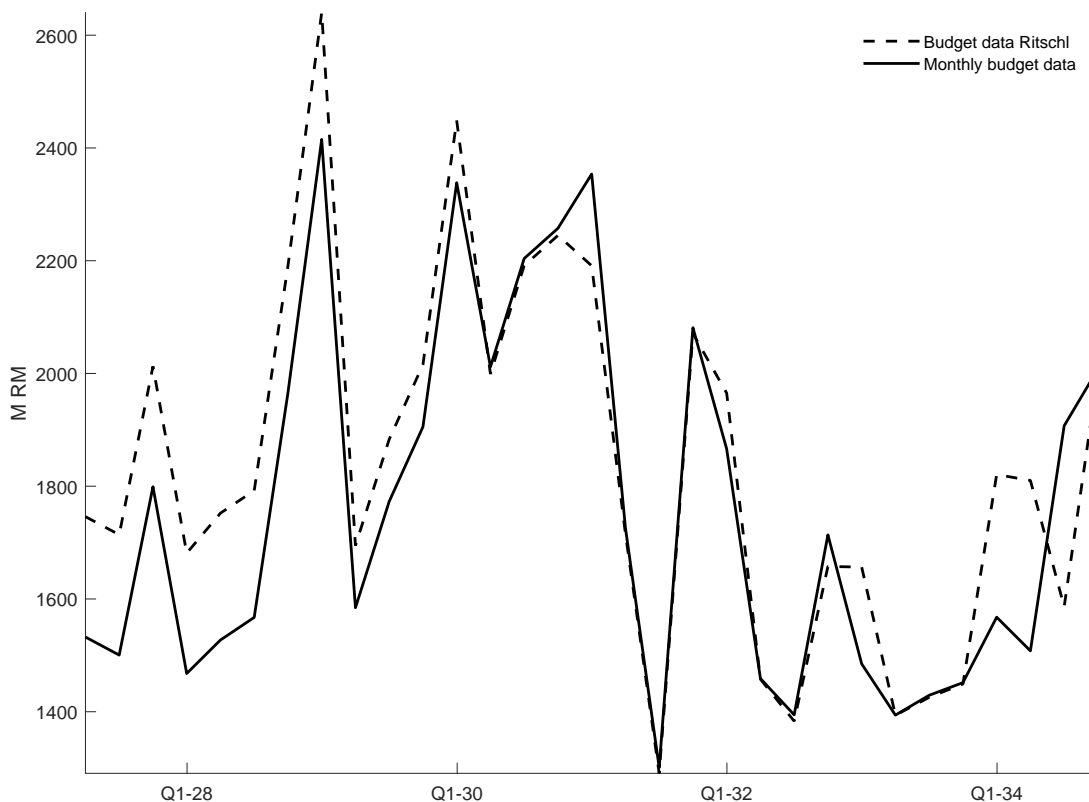

Figure 5: The dashed lines shows quarterly total federal expenditures as compiled by Ritschl (2002b). The bold line shows our monthly measure of total expenditures aggregated to quarterly frequency.

As Ritschl (2002a) notes, the official budgeting process somewhat masks the true extend of public finances because the German government tried to hide some of its outlays from international monitors. During the early 1930s and, hence, during Brüning's term of office, the series coincide almost perfectly. This comparison shows that the monthly data provides a very good account of federal government expenditures. If anything, the fact that we do not account for the hidden spending positions places a higher bar for our results.

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[14]The benchmark series in Ritschl (2002b) consists of total expenditures by the federal government net of transfer payments to local governments and municipalities (Table A.6, "Reiner Finanzbedarf", A.6.35).

Appendix B Federal budget decomposition: extract from primary sources

Einnahmen und Ausgaben des Reichs	Juli	Sept.	Oktober	April/Okt.
A. Ordentlicher Haushalt.				
I. Einnahmen	Mill. ℛℳ			
1. Steuern				
Steuern, Zölle usw. (Reichsanteil)[1]..	673,7	324,4	676,7	3 376,0
Reparationssteuer der Reichsbahn..	—	—	—	165,0
2. Erwerbsvermögen				
Aus den Vorzugsaktien der Reichsbahn	—	—	—	28,7
Überschuß v. Post u. Reichsdruckerei	14,6	19,9	19,8	129,5
Aus der Münzprägung[2]	— 0,1	— 4,3	— 3,0	— 13,7
3. Verwaltungseinnahmen	12,9	14,9	16,8	103,8
Summe der Einnahmen	701,1	354,9	710,3	3 789,3
II. Ausgaben				
1. Bezüge d. Beamten u. Angestellten[3])	59,6	60,9	61,5	433,2
2. Versorgung u. Ruhegehälter (einschl. Kriegsbeschädigtenrenten)	127,0	119,0	119,7	909,2
3. An die Länder für Schutzpolizei ...	15,8	15,8	16,1	111,1
4. Soziale Ausgaben				
Sozialversicherung	46,7	34,5	35,4	260,4
Zuweisung an die knappschaftliche Pensionsversicherung	—	—	26,3	28,0
Kleinrentnerfürsorge	8,0	—	10,0	18,0
Krisenunterstützung für Arbeitslose	54,6	49,6	61,6	357,5
Wertschaffende Arbeitslosenfürsorge	3,2	0,7	0,2	6,3
An Reichsanstalt f. Arbeitsvermittl.	2,7	2,4	3,1	17,7
Schaffung von Arbeitsmöglichkeiten u. Verstärkung der Krisenfürsorge	[6]) .	[6]) .	22,0	[6]) 46,0
Zur Erleichterung der Wohlfahrtslasten der Gemeinden (GdeVbde)	—	—	32,0	32,0
5. Reichsschuld				
Verzinsung und Tilgung...........	24,2	5,0	12,9	104,4
Außerordentliche Tilgung der schwebenden Schuld	—	—	245,0	245,0
Anleiheablösung	2,4	2,1	5,3	48,2
6. Sächliche und sonstige Ausgaben (außer Kriegslasten)				
Heer	19,9	20,1	24,9	138,7
Marine	9,6	12,4	12,0	69,4
Verkehrswesen....................	14,6	11,6	10,5	75,1
Übrige Reichsverwaltung	[6]) 22,2	[6]) 40,9	[6]) 24,7	[6]) 162,2
7. Innere Kriegslasten[4])..............	16,3	22,4	53,3	196,9
8. Äußere Kriegslasten				
Reparationszahlungen[5])...........	6,1	6,0	6,8	428,6
Sonstige äußere Kriegslasten.......	9,1	8,3	8,3	62,5
Summe der Ausgaben	442,0	411,7	791,6	3 750,4
Ergibt Mehreinnahme (+), Mehrausgabe (—)	+259,1	—56,8	—81,3	+ 38,9
B. Außerordentlicher Haushalt.				
I. Einnahmen				
1. Verwaltungseinnahmen	0,5	0,3	0,8	10,6
2. Aus Anleihen	—	—	—	—
3. Aus dem Verkauf von Vorzugsaktien der Deutschen Reichsbahn-Gesellsch.	—	—	1,2	15,9
Summe der Einnahmen	0,5	0,3	2,0	26,5
II. Ausgaben				
1. Wohnungs- und Siedlungswesen....	2,0	1,4	0,5	9,0
2. Verkehrswesen...................	8,4	7,4	7,5	46,8
3. Rückkauf v. Schuldverschreibungen usw. des Reichs	0,7	1,9	—	2,6
4. Innere Kriegslasten	1,3	0,9	5,0	11,3
5. Übrige Reichsverwaltung	2,0	— 2,1	0,1	11,7
Summe der Ausgaben	14,4	9,5	13,1	81,4
Ergibt Mehreinnahme (+), Mehrausgabe (—)	—13,9	— 9,2	—11,1	— 54,9

Figure 6: Detailed federal budget decomposition for selected months in the fiscal year 1931/1932, published in *Wirtschaft und Statistik* from January 1932.

Appendix C Constructing a monthly dataset of the German federal government

In this appendix, we not only specify how we group the various budget items on the expenditure and revenue sides but also outline how we construct the nominal government spending and tax revenues variables for estimating the macroeconomic effects of austerity. The grouping becomes necessary because the budget item's declarations and compositions change over time in the statistical publications (April 1927 - December 1931: Statistisches Jahrbuch für das Deutsche Reich; January 1932 - February 1935: Wirtschaft und Statistik). The budget items are listed by its original German term. The abbreviation "EO" in parenthesis behind selected items indicates that the item is part of the extraordinary budget.

Appendix C.1 Total expenditures

Total federal revenues are split into nine broad categories. The monthly nominal government spending variable corresponds to the sum of "Remuneration of civil servants and employees" (3E), "Housing, assets "(4E), "Military, police, transportation"(5E), and "Other expenditure" (9E).

1E Transfers to federal states

      Steuerüberweisungen an die Länder

      Überweisungen an die Länder

2E Social transfers

      Sozialversicherung

      Zuweisung an die knappschaftliche Pensionsversicherung

      Für die Befreiung der Untertagearbeiter von der Arbeitslosenversicherung

      Erwerbslosenfürsorge (unterstützende)

      Kleinrentnerfürsorge

      Krisenunterstützung für Arbeitslose

      Arbeitslosenhilfe und Arbeitsbeschaffung

      Schaffung von Arbeitsmöglichkeiten und Verstärkung der Krisenfürsorge

      Wertschaffende Arbeitslosenfürsorge

      Arbeitslosenversicherung

      An Reichsanstalt für Arbeitsvermittlung und Arbeitslosenversicherung

      Freiwilliger Arbeitsdienst usw.

      Fettverbilligung

      Zur Erleichterung der Wohlfahrtslasten der Gemeinden

      Arbeitslosenversicherung (EO)

      Wertschaffende Arbeitslosenfürsorge (EO)

Erwerbslosenfürsorge (produktive) (EO)

3E Remuneration of civil servants and employees

Besoldungen

Pensionen

Bezüge der Beamten und Angestellten (ausschl. Ruhegehälter)

Versorgung und Ruhegehälter einschl. der Kriegsbeschädigtenrenten

4E Housing, assets

Vorstädtische Kleinsiedlung für Erwerbslose

Wohnungs- und Siedlungswesen

Beteiligung an der Dresdner Bank

Beteiligung an der Akzept-Bank

Stützung der Landesbank der Rheinprovinz

Erwerb von Gelsenkirchen-Aktien

Wohnungs- und Siedlungswesen (EO)

5E Military, police, transportation

Heer - sächliche Ausgaben

Marine - sächliche Ausgaben

Verkehrswesen

Schutzpolizei

Verkehrswesen (EO)

6E Debt and coverage of public deficit

Reichsschuld: Verzinsung und Tilgung

Reichsschuld: Anleiheablösung

Ausserordentliche Tilgung der schwebenden Schuld

Tilgung in Ausführung des Gesetzes vom 23.10.1930

Rücklauf von Schuldverschreibungen

Zur Deckung der Fehlbeträge früherer Jahre

Rücklauf von Schuldverschreibungen usw. des Reiches (EO)

Einlösung von Schatzanweisungen usw. (EO)

7E War burdens

Innere Kriegslasten

Sonstige äußere Kriegslasten

Innere Kriegslasten (EO)

8E Reparations

Reparationszahlungen

Reparationszahlungen (EO)

9E Other expenditure

Münzprägung

Sonstiges

An die Bank für internationalen Zahlungsabgleich (Sondereinlage) (EO)

Zuschuß an den ordentlichen Haushalt (EO)

Sonstiges (EO)

Appendix C.2   Total revenues

Total federal revenues are split into four broad categories. The monthly nominal tax revenues variable is constructed as "Taxes, duties, levies" (1R) minus the sum of "Transfers to federal states" (1E), "Social transfers" (2E), and "Reichsschuld: Verzinsung und Tilgung"[15] in category 6E.

1R Taxes, duties, levies

      Aus Steuern, Zöllen und Abgaben

2R Capital income

      Aus der Münzprägung

      Aus Anleihe

      Anteil des Reichs am Reingewinn der Reichsbank

      Überschuss der Post und Reichsdruckerei

      Vorzugsdividende aus den Vorzugsaktien der Deutschen Reichsbahn-Gesellschaft

      Verzinsung aus den Vorzugsaktien der Deutschen Reichsbahn-Gesellschaft

      Einnahmen aus Verkauf von Vorzugsaktien der Deutschen Reichsbahn-Gesellschaft

      Erlös aus der 5 % Anleihe von 1927 (EO)

      Aus Anleihen und Betriebsmitteln (EO)

      Aus dem Verkauf von Vorzugsaktien der Deutschen Reichsbahn-Gesellschaft (EO)

3R Extraordinary taxes

      Reparationssteuer der Deutschen Reichsbahn-Gesellschaft

4R Other revenue

      Sonstige Verwaltungseinnahmen

      Verwaltungseinnahmen (EO)

      Sonstiges (EO)

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[15]Translation: *Reich debt: interest and debt repayments*

Appendix D   Federal versus local government spending

In this appendix, we discuss how government spending in the Weimar Republic was divided between the federal government and local governments. We show that Brüning's austerity measures affected not only the federal government budget, but, in the same manner, the finances of states and municipalities. Hence, budget cuts at the federal level were not compensated by the local government.

In a first step, we use data from Ritschl (2002b) to examine the relative importance of federal and local authorities in total government expenditures. Table 2 provides an overview of how total expenditures were distributed across federal and local governments. Until 1933 the shares are remarkably constant, with the Reich accounting for about 40 % of total expenditures, while states and municipalities accounted for the remaining 60 %. Only in the last year of the sample does this pattern reverse.

Table 2: Share in spending (%) by Reich and local government

Year	Reich	Local
1925	37.19	62.81
1926	37.59	62.41
1927	36.78	63.22
1928	36.3	63.7
1929	38.21	61.79
1930	39.47	60.53
1931	38.16	61.84
1932	39.03	60.97
1933	42.54	57.46
1934	52.03	47.97

Notes: Ratios of government spending by Reich and local government. Data comes from Ritschl (2002b).

The fact that spending at both governmental levels was similarly affected by Brüning's austerity measures is illustrated in Figure 7, which plots nominal expenditures for the federal government as well as for all states and municipalities over time. Both series show drastic cutbacks in spending after 1930, which is consistent with the discussion in Galofré-Vilà et al. (2021) that the austerity policies trickled down from federal to local government. Between 1930 and 1932, Reich expenditures decreased by 28 %, while the corresponding drop at the local level was similarly high at 26 %. The data clearly does not support the idea that spending cuts at the Reich level were offset by expansionary fiscal policy at the local level. What is equally interesting from Figure 7 is that expenditures by states and municipalities did not revert back to their pre-crisis levels, but remained low. Hence, given these considerations, investigating the economic impact of austerity with federal government data is ideal for two reasons. First, federal government data is available at the monthly frequency, while local government data exists only at annual basis. Second, federal budget data is not

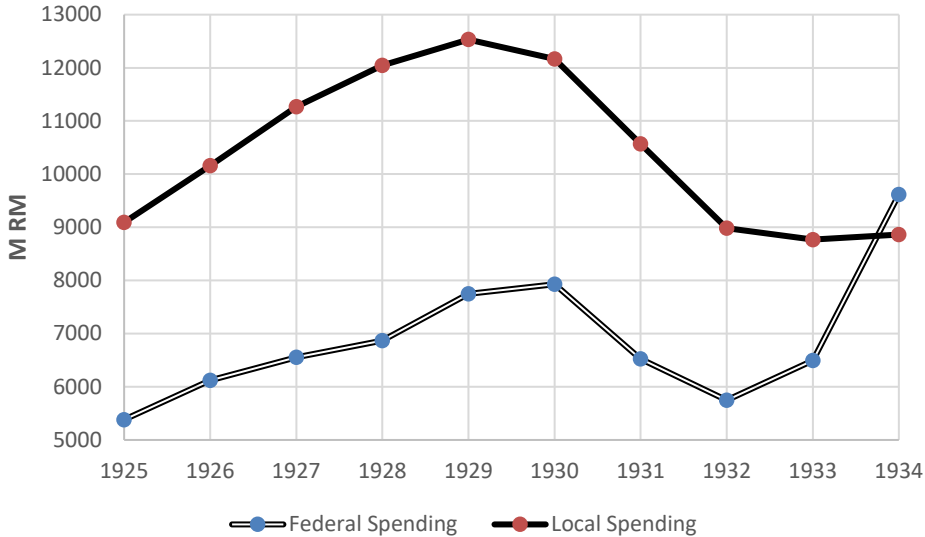confounded by offsetting trends at the local government level.

Figure 7: Nominal expenditures by the federal government and local authorities in million Reichsmark. Data comes from Ritschl (2002b).

Appendix E   Brüning's motivation for his austerity policy - historical evidence

In this appendix, we provide further historical evidence that Brüning's austerity decrees were not related to developments affecting the economy in short or medium-term.

1. Brüning's personal statements:

   - Brüning himself supports the view that ending reparations ranked high among his political preferences when he reflects in his memoirs his time as chancellor, that "(...) from the disease we could create our weapon" (cite, p. 309).[16]

   - At a meeting with state secretary von Bülow and the ambassadors to Germany representing France, Italy, and UK in January 1932, the earlier Brüning already shared this view when stating that "(...) the catastrophic world economic crisis has also positive effects for us in terms of reparations" (Winkler, 2018, p. 438).[17]

   - While members of Brüning's cabinet, like the minister of interior Joseph Wirth, pushed in negotiations with the allies for interim solutions, which would have waived some of Germany's reparation obligations, Brüning insisted on a complete solution to the reparation problem (Büttner, 1989; Winkler, 2018, p. 405).

2. The stabilizing effects of expansionary fiscal policy were well-known during Brüning's term of office:

   - At least since the banking crisis in summer 1931, reflationary economic policies were openly discussed in Germany as an alternative to Brüning's austerity mandate. Some proposals came directly from Brüning's cabinet and political confidants, like the plan of Hans Schäffer, secretary of state in the Finance Ministry and one of Brüning's policy advisers, to counter the deflation by state-financed investment programs, or the plan of Wilhelm Laudenbach, civil servant in the Ministry of Economics, to jump-start the economy by expanding credit. Other proposals were submitted by political actors close to the government, like the one of Ernst Wagemann, founder of the Institute for Business Cycle Research and president of the Statistical Reich Agency, to give up partially the gold parity of the Reichsmark (Holtfrerich, 1982).[18] The fact that Brüning did not invest energy to find political majorities for these widely-discussed reflationary proposals,

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[16] Own translation. German original text: "Aus der Krankheit konnten wir unsere Waffe machen."

[17] Own translation. German original text: "die katastrophale Weltwirtschaftskrise reparationspolitisch für uns auch ihr Gutes habe."

[18] Holtfrerich (1982) contains a comprehensive summary of the alternative policy proposals, and Holtfrerich (2016), among others, contains a more detailed presentation of the Laudenbach and Wagemann proposal.

as well as his commitment to the deflationary policy in the second half of 1931, supports the view that fostering Germany's economic growth ranked very low in Brüning's political priorities. citeFeldman1994 points out that Brüning was implementing a variety of small-scale work creation programs that were paid for by savings from social expenditures to cushion the decline of the German economy.

- Holtfrerich (2016) points out that in spring 1932, after the economic situation in Germany deteriorated again, even Brüning was considering large-scale work creation programs financed by the Reichsbank under the condition they did not interfere with Germany's foreign affairs. The plan, however, never went into effect because Reichsbank President Luther opposed the idea.

3. Brüning's symbolic rhetoric and political actions:

- The emergency decree of June 5, 1931 was announced right before Brüning's departure to an English-German meeting in Chequers, taking place between June 6 and 7. According to Winkler (2018, p. 404), the intention of Brüning's careful timing was to demonstrate to England the severity of Germany's economic situation. The announcement was accompanied by an official statement of Brüning on the reparation question in which he stressed the importance of a revision of Germany's reparation obligations and the dangers of a German default (Ritschl, 2002b, p. 146f).

- Germany's financial relief through the Hoover Moratorium of June 20, 1931 was downplayed by Brüning. In a radio speech on June 23, Brüning declared, that the Germans "should not think, after accepting President Hoover's proposal, that all hardship in Germany would be relieved (...). (...) President Hoover's sign of confidence can only bear fruits, if the German people is determined to continue on her own strength the path of austerity in all areas."(Winkler, 2018, p. 415).[19] Then, in the morning edition of the *Vossische Zeitung* on July 7, 1931, the government made once again clear that the saved reparation payments could not be made available to ease the suffering endured by the people, and that Germany "(...) must not wane in its efforts to save. The entire relief must and will be used to consolidate public finances."[20]

- Brüning ordered officials to downplay and understate the positive outcomes for Germany at a conference in London in July 1931 in which seven nations participated and Germany's reparation

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[19]Own translation. German original text: "Zu glauben, daß nach Annahme des Vorschlags des Präsidenten Hoover alle Nöte in Deutschland beseitigt wären, wäre die gefährlichste Illusion, in der sich das deutsche Volk wiegen könnte (...). (...) Der Vertrauensbeweis, der in dem weltgeschichtlichen Schritt des Präsidenten Hoover liegt, kann nur Früchte tragen, wenn das deutsche Volk fest entschlossen ist, aus eigener Kraft den Weg der grössten Sparsamkeit auf allen Gebieten weiterzugehen."

[20]Own translation. German original text: "Es [Deutschland] darf nicht in seinen äußeren Antstrengungen zu Sparen nachlassen. Die gesamten Erleichterungen, die der Hoover-Plan Deutschland bringen wird, werden zur Konsolidierung der öffentlichen Finanzen benötigt und verwendet werden.

situation was debated (Winkler, 2018, p. 419f).

Appendix F   Data description

In this appendix, we describe the variables that we use to estimate the VAR model. The frequency of all data is monthly.

Consumer prices: The CPI comes from Wagemann (1935), p. 107, "Reichsindexziffern der Lebenshaltungskosten", "Lebenshaltung insgesamt" (1913/14 = 100).

Industrial production: Industrial production is taken from Wagemann (1935), p. 52. The index is chained to 1928 and seasonally-adjusted for estimation.

Interest rate: The Reichsbank discount rate (Reichsbankdiskontsatz) is retrieved from Wagemann (1935), p. 109.

Government spending: Government spending is constructed from our newly assembled dataset on the German government budget. Appendix C contains the details. For estimation, the time series is seasonally adjusted and deflated by dividing through the arithmetic mean of the consumer price index (CPI) (Wagemann, p. 107) and the wholesale price index (WPI) (Wagemann, p. 99) to capture prices' demand and supply side.

GDP per capita: Monthly GDP per capita comes from Albers (2018), who constructs time series of real economic activity for a large panel of countries during the Great Depression. For details, we refer to his description of the estimation process. The basic idea is to estimate a common latent factor from a large number of monthly time series from Wagemann (1935) and use the estimated factor loadings to assign weights to the individual series.

Unemployment rate: The unemployment rate is computed as the ratio of unemployed over the labor force. Unemployment data comes from Humann (2011). The labor force is computed as the sum of unemployment and employment. Historical employment data for Germany is given in Pierenkemper (2015) on p. 145.

Tax revenues: Tax revenues are constructed from our newly assembled dataset on the German government budget. Appendix C contains the details. For estimation, the time series is seasonally adjusted and deflated by dividing through the arithmetic mean of the CPI and the WPI.

Wholesale prices: The WPI comes from Wagemann (1935), p. 99, "Indexziffern der Großhandelspreise", "Großhandelspreise insgesamt" (1913 = 100).

Appendix G   Prior distribution

Bayesian estimation of the reduced-form VAR is based on the description in Bańbura et al. (2010), who show how to implement a natural-conjugate prior using dummy observations. We start by writing the reduced-form VAR model in matrix from as

$$Y = ZB + U$$

where $Y = \begin{bmatrix} y_1 & \ldots & y_T \end{bmatrix}'$, $B = \begin{bmatrix} c & B_1 & \ldots & B_p \end{bmatrix}'$, $Z = \begin{bmatrix} z_1 & \ldots & z_T \end{bmatrix}'$, $z_t = \begin{bmatrix} 1 & y'_{t-1} & \ldots & y'_{t-p} \end{bmatrix}'$, $U = \begin{bmatrix} u_1 & \ldots & u_T \end{bmatrix}'$ and $u_t \sim \mathcal{N}(0, \Sigma_u)$. For the prior distributions we specify that the residual covariance matrix follows an inverse Wishart distribution and that, conditional on the covariance matrix, the remaining parameters have a normal distribution:

$$\Sigma_u \sim \mathcal{IW}(\underline{S}, Np + 1)$$

$$vec(B)|\Sigma_u \sim \mathcal{N}(vec(\underline{B}), \Sigma_u \otimes \underline{\Omega})$$

where N is the number of variables in the VAR model and p denotes the lag length. The matrix $\underline{S}$ is diagonal with the prior residual variances of each variable on the diagonals, scaled by the hyperparameter λ that determines the overall tightness of the prior (see below). The matrix $\underline{\Omega}$ is also diagonal and determines the prior variances of the VAR parameters, which are shrunk with the lag length. As discussed below, our prior specifies the individual variables as independent random walks, so the matrix $\underline{B}$ has zeros everywhere except at entries that correspond to first lags of own variables in each equation, at which the entry is one.

As shown in Bańbura et al. (2010), this prior can be implemented by adding dummy observations to the data. Specifically, the following dummy observations are added:

$$Y_d = \begin{bmatrix} 0_{1 \times N} \\ diag(\delta_1 \sigma_1, \ldots, \delta_N \sigma_N)/\lambda \\ 0_{N(p-1) \times N} \\ diag(\sigma_1, \ldots, \sigma_N) \end{bmatrix} \quad X_d = \begin{bmatrix} \nu_0 & 0_{1 \times Np} \\ 0_{Np \times 1} & J_p \otimes diag(\sigma_1, \ldots, \sigma_N)/\lambda \\ 0_{N \times 1} & 0_{N \times Np} \end{bmatrix}$$

where the number of elements in Y_d is denoted by T_d. Note that these are the same elements, just with a different ordering compared to Bańbura et al. (2010) because we order the deterministic terms first in the

VAR. Defining $Y_o = \begin{bmatrix} Y' & Y'_d \end{bmatrix}'$ and $Z_o = \begin{bmatrix} Z' & Z'_d \end{bmatrix}'$, the posterior distributions are then given by:

$$\Sigma_u | Y \sim \mathcal{IW}(\overline{S}, T_d + T + 2 - (Np + 1))$$

$$vec(B) | \Sigma_u, Y \sim \mathcal{N}(vec(\overline{B}), \Sigma_u \otimes (Z'_o Z_o)^{-1})$$

$$\overline{B} = (Z'_o Z_o)^{-1} Z'_o Y_o$$

$$\overline{S} = (Y_o - Z_o \overline{B})'(Y_o - Z_o \overline{B})$$

Lastly, it remains to specify the parameters that make up the prior distributions. As is standard in the literature, we replace σ_j with the residual standard deviation from an OLS regression of variable y_j on a constant and p of its own lags. As mentioned in the main text, we set the lag length to $p = 10$. The prior coefficients on the first lag for each variable are set to $\delta_j = 1$, reflecting the prior belief that the individual series follow a random walk. The parameter λ denotes the overall tightness of the prior and is set to $\lambda = 0.5$. The prior becomes uninformative for $\lambda \to \infty$. Lastly, the prior on the constant is controlled by ν_0, to which we assign a small value of $\nu_0 = 0.01$, reflecting an uninformative prior for the vector of constants.

Appendix H   Robustness

In this appendix, we show that our main results are robust to various alternatively plausible specifications, like lag length selected by an information criterion, as well as alternative variables for economic activity and the price level.

Appendix H.1   Robustness results: VAR model with GDP

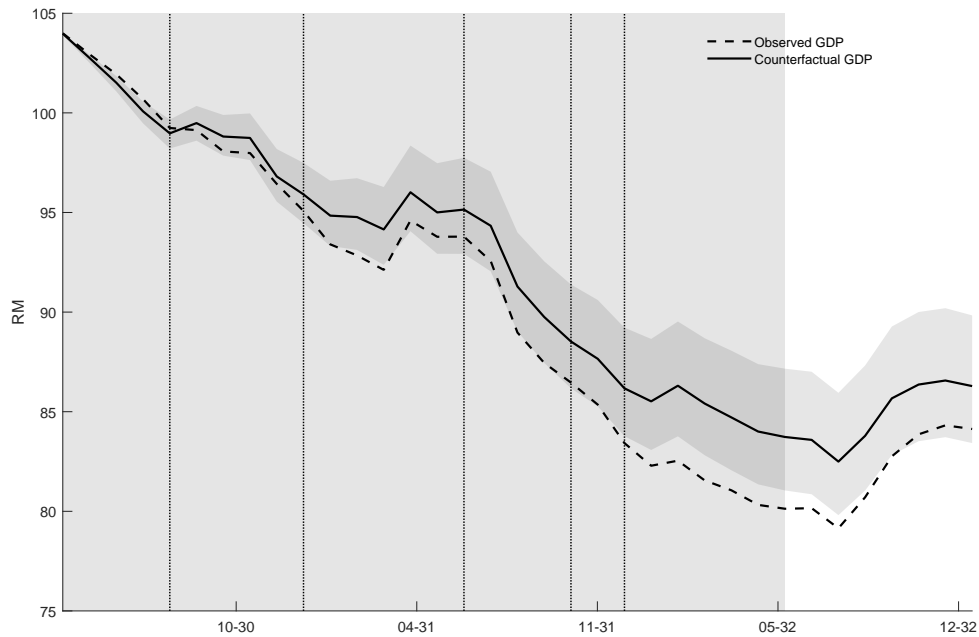### Appendix H.1.1   Lag length of 12 selected by information criterion (Akaike)

Figure 8: Counterfactual for GDP per capita between March 1930 and January 1933. The bold line depicts median counterfactual GDP in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates observed GDP. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.
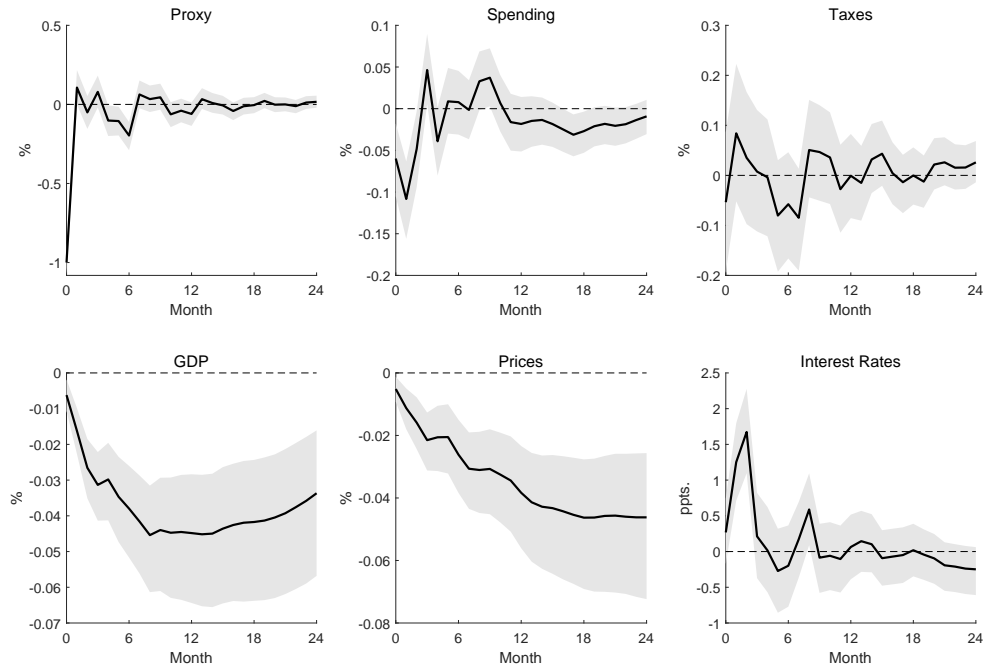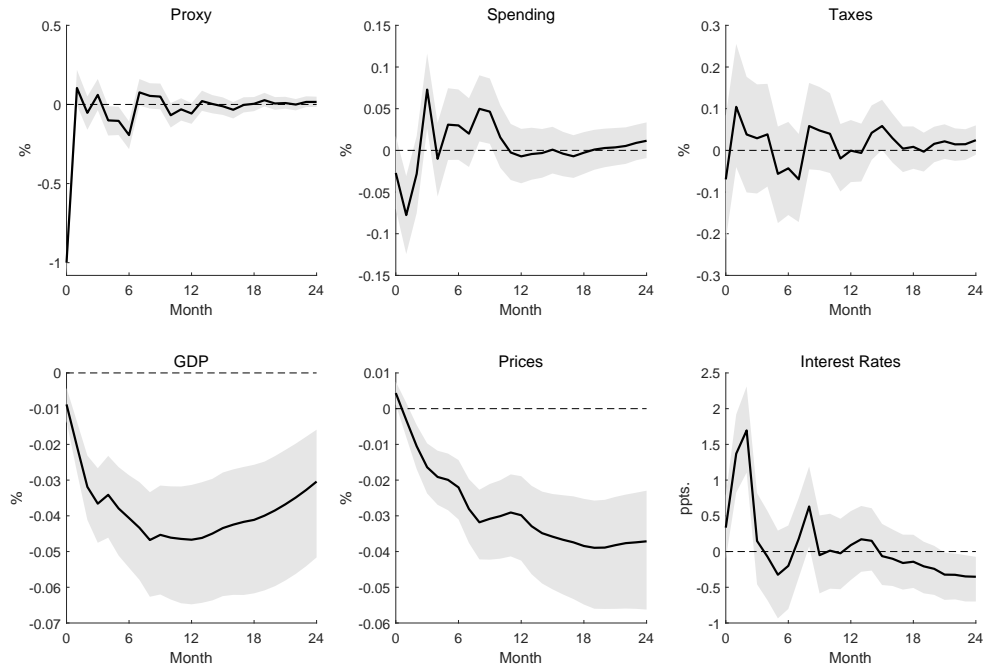
Figure 9: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one percent austerity shock identified in the VAR model with GDP per capita. Shaded bands denote the 68 percent credible sets.

Appendix H.1.2 CPI, instead of WPI, as price indicator
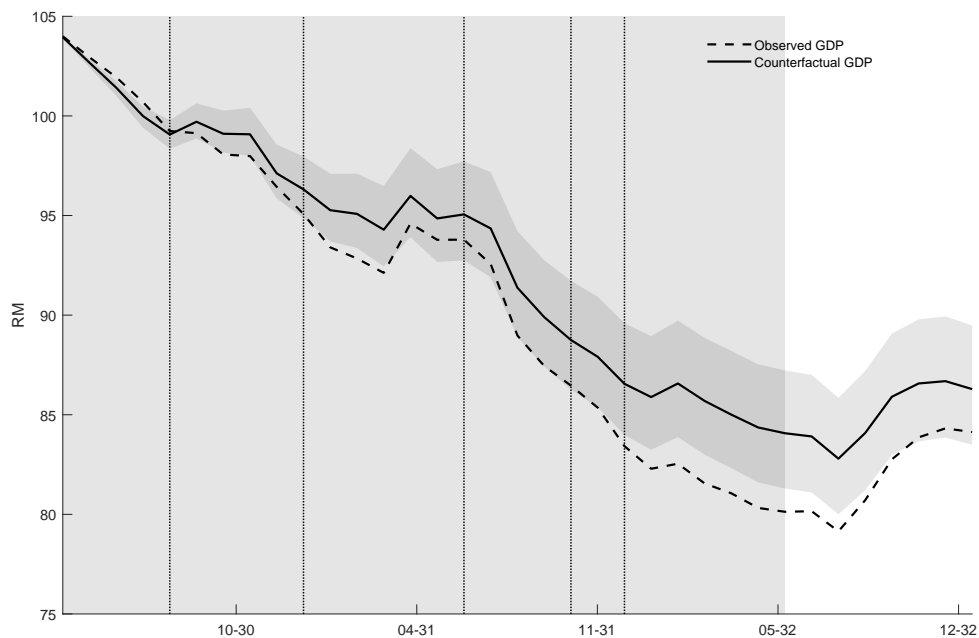
Figure 10: Counterfactual for GDP per capita between March 1930 and January 1933. The bold line depicts median counterfactual GDP in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates observed GDP. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.

Figure 11: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one percent austerity shock identified in the VAR model with GDP per capita. Shaded bands denote the 68 percent credible sets.

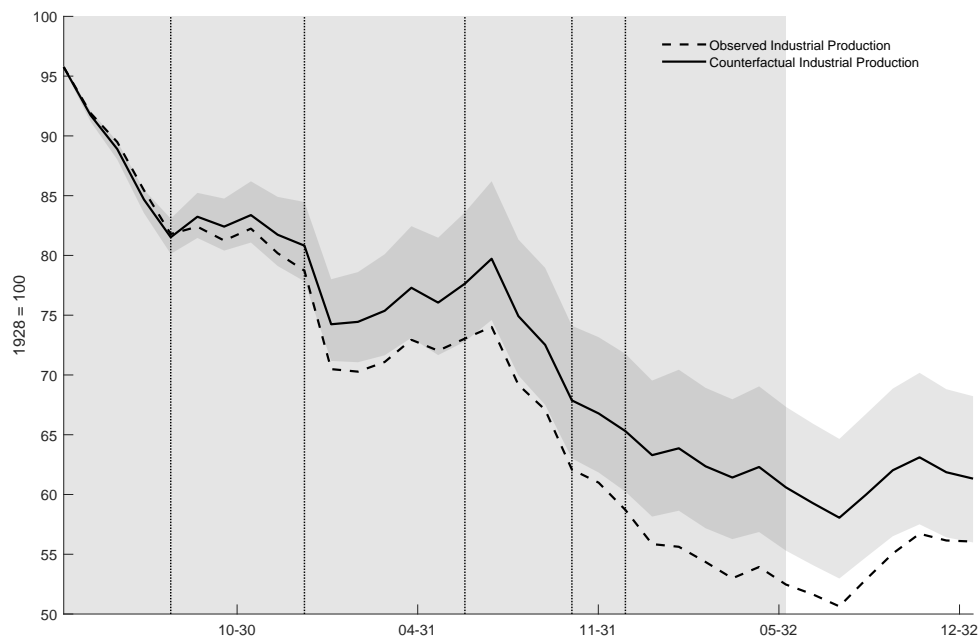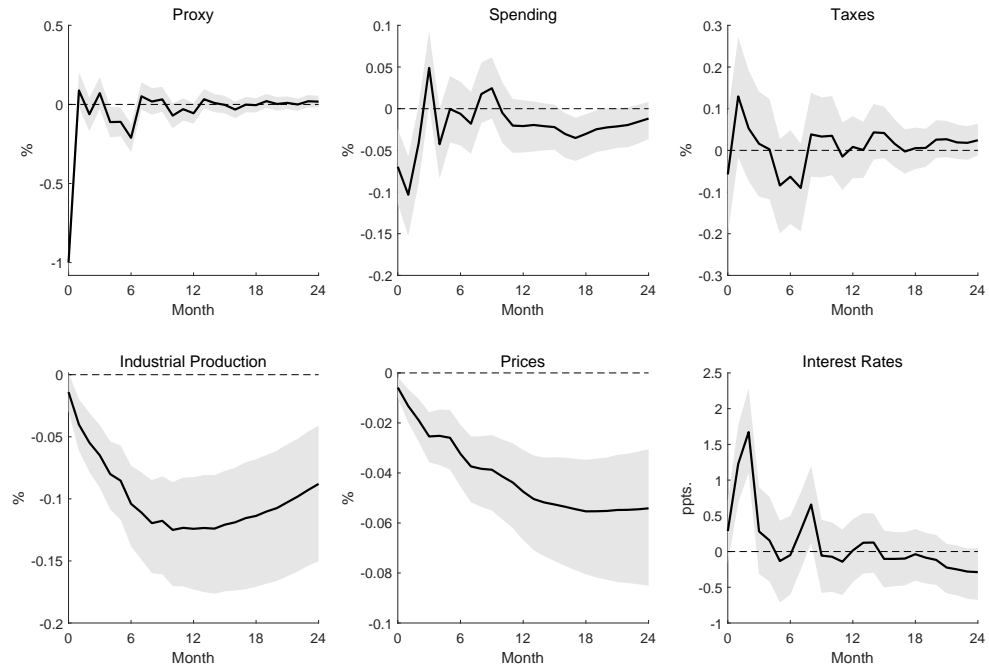## Appendix H.1.3   Industrial production instead of GDP per capita

Figure 12: Counterfactual for industrial production between March 1930 and January 1933. The bold line depicts median counterfactual industrial production in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates observed industrial production. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.

Figure 13: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one percent austerity shock identified in the VAR model with industrial production. Shaded bands denote the 68 percent credible sets.

Appendix H.2   Robustness results: VAR model with unemployment

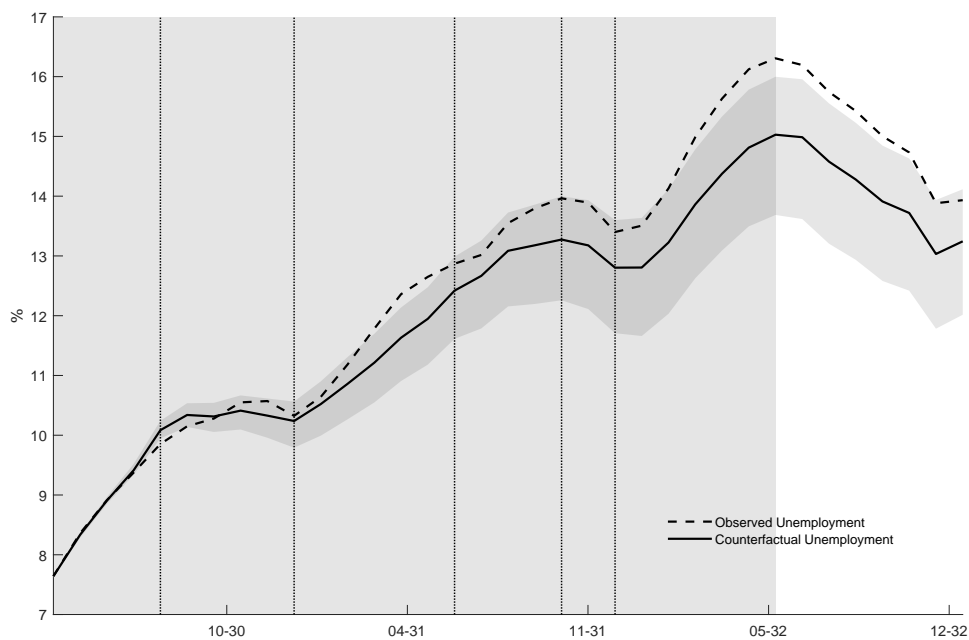**Appendix H.2.1   Lag length of 12 selected by information criterion**

Figure 14: Counterfactual for the unemployment rate between March 1930 and January 1933. The bold line depicts the median counterfactual unemployment rate in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates the observed unemployment rate. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.
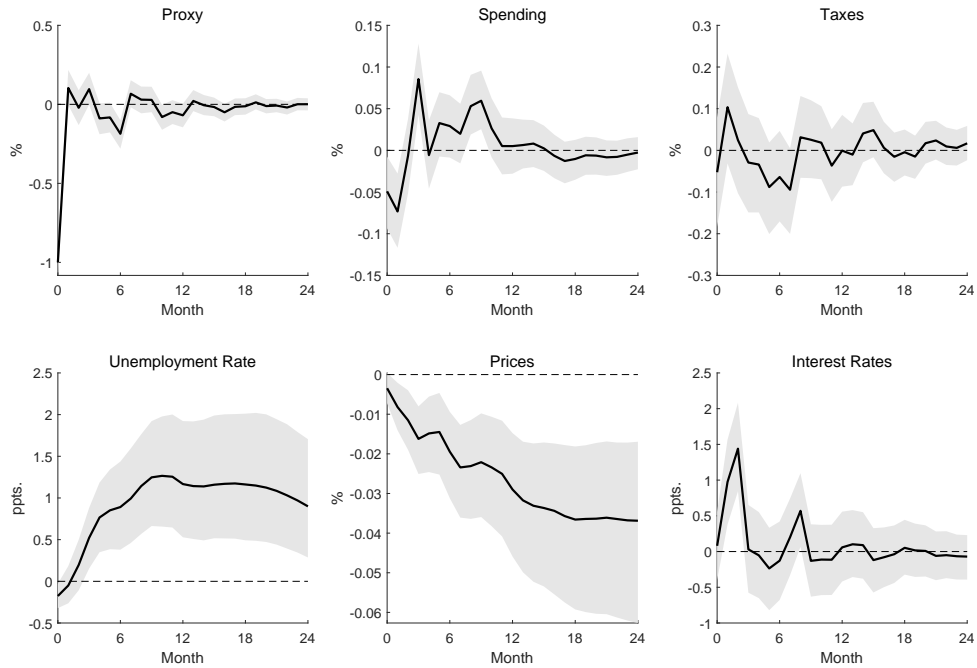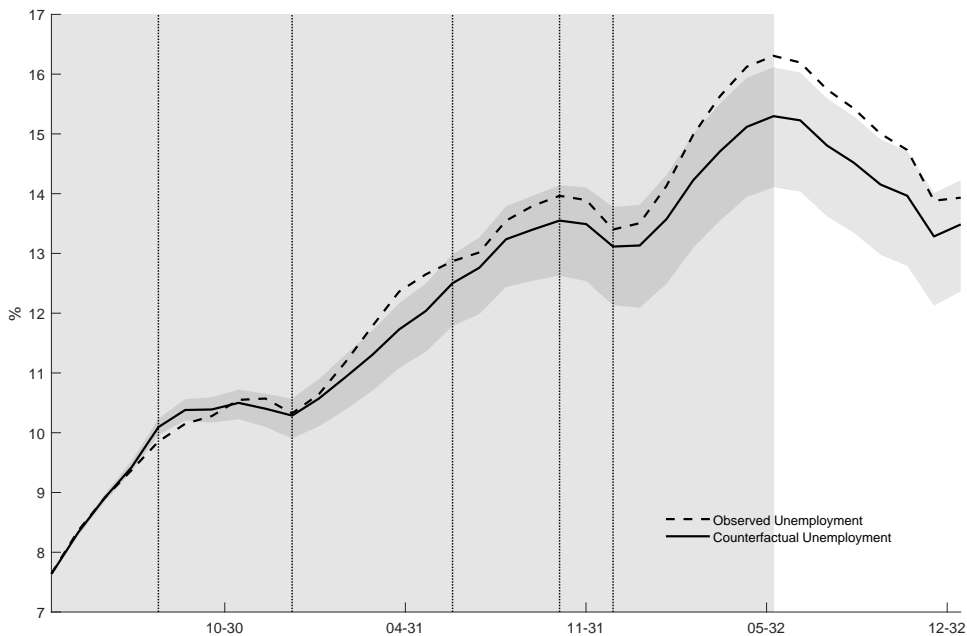
Figure 15: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one percent austerity shock identified in the VAR model with unemployment. Shaded bands denote the 68 percent credible sets.

Appendix H.2.2   CPI, instead of WPI, as price indicator

Figure 16: Counterfactual for the unemployment rate between March 1930 and January 1933. The bold line depicts the median counterfactual unemployment rate in the absence of austerity shocks and the dark-grey shaded area shows 68 percent credible bands. The dashed line illustrates the observed unemployment rate. The light-grey shaded area marks Brüning's term of office. The dotted lines indicate the emergency decrees' announcement dates.
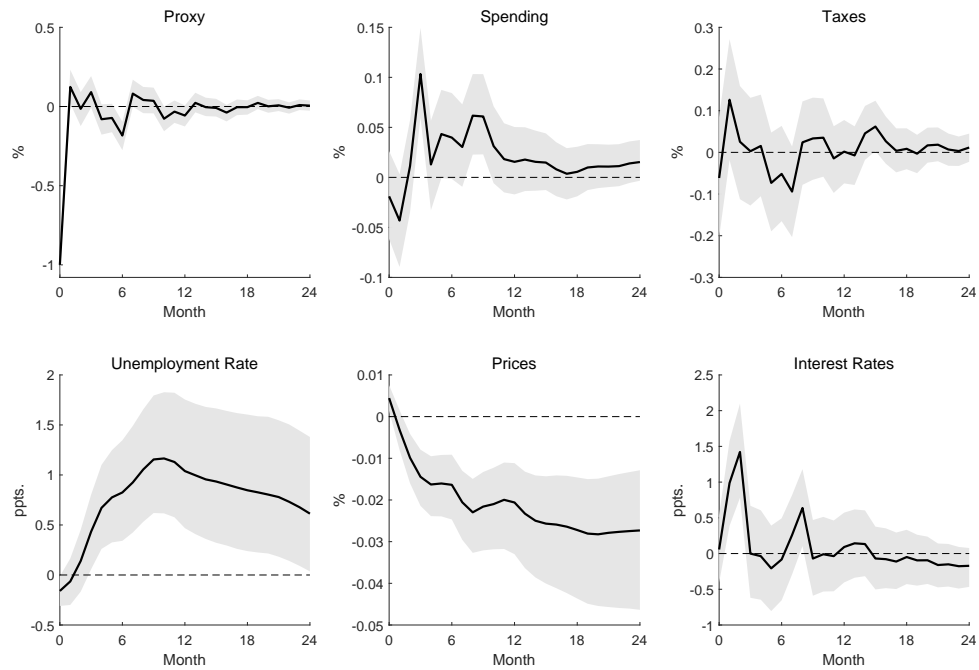
Figure 17: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one percent austerity shock identified in the VAR model with unemployment. Shaded bands denote the 68 percent credible sets.