# FATAL AUSTERITY \*

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#### **Abstract**

This paper quantifies the macroeconomic consequences of the fiscal austerity program that preceded the power grab of the Nazi party in Germany in 1933. Between 1930 and 1932, German Chancellor Brüning enacted a series of large expenditure cuts and tax increases against the backdrop of a depressed economy and the rise of political extremism. We use a novel granular fiscal dataset to identify the macroeconomic effects of Brüning's austerity policies. We find that the austerity shocks reduced German GDP by more than four percent and caused an increase in unemployment by almost two million, paving the way for the success of extremist parties.

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## 1 Introduction

Between March 30, 1930, and May 30, 1932, Chancellor Heinrich Brüning implemented a series of tax increases and cuts in government spending in the midst of a deep recession in Germany. It is rare for macroeconomists to observe large austerity programs in depressed economies, not to mention one with such historical importance. When Brüning stepped down in May 1932, the Nazis had emerged as the dominant party, solidifying their position as the strongest political force in the July 1932 elections. Half a year later, in January 1933, Adolf Hitler was appointed Germany's new chancellor, and the darkest chapter of German history began.

Macroeconomic policies such as forced wage cuts, substantial reductions in unemployment insurance benefits, or a surprise stop to all public construction projects are rare events in the real world, not to mention during a severe recession. The German case offers an unique window into policy actions that are in many dimensions the opposite of the policy playbook in recent downturns. The Economist, writing in 1931, had little doubt as to the economic effects of Brünings policy. With respect to the austerity decree of December 8, 1931, the magazine wrote:

"Coming on top of three 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."

The historical literature has already shown that the political radicalization during Brüning's term in office was closely linked to the austerity policies (Doerr et al., 2022; King et al., 2008; Kaltefleiter, 1968; Galofré-Vilà et al., 2021, among others). A nexus between electoral successes of extremist parties and fiscal consolidation packages could also be observed in Europe in the past decade (for a recent contribution, see Duque Gabriel et al., 2023; Baccini and Sattler, 2024). Our paper studies the macroeconomic consequences of Brüning's austerity measures. The question whether there were alternatives to Brüning's policies was at the heart of a prominent debate among postwar German economic historians – the so-called Borchardt-Holtfrerich controversy. Yet Brüning's austerity measures have so far not attracted much attention from quantitative macroeconomists

using state-of-the-art methods for causal inference.

Combining new high-frequency granular fiscal and macroeconomic data with a narrative identification strategy, we estimate the output and employment effects of Brüning's austerity drive. For the period April 1927 to February 1935, we construct a monthly dataset of German federal government spending and tax revenues. We disaggregate central government spending into nine categories, among them social transfers, transfers to federal states, debt service, and reparation payments. High-frequency monthly data are needed to time the austerity shocks, while the granular structure of our spending data enables us to construct government spending and tax revenue variables free of budget items moving with the business cycle.

Did Brüning's austerity policies deepen the German economic crisis, and by how much? After the hyperinflation of 1923, the Weimar economy witnessed a short-lived boom in the mid-1920s. Tying the newly introduced currency to the gold standard bolstered confidence among international creditors, leading to significant investments in the country. The Dawes Plan, in effect from 1924 to 1929, regulated Germany's reparations from World War I. It prioritized claims of foreign creditors in the event of a currency crisis over reparation obligations, and delayed Germany's first full annual reparation payment of 2.5 million Reichsmark until 1929. However, from 1928 onward, foreign capital inflows dried up. The Young Plan of 1929, the second reparation regime, shifted priority to reparation payments over private debt, leaving Germany to grapple with the dual challenge of fulfilling reparation obligations while servicing accumulated private foreign debt in a global recession, soon to become a depression (see e.g., Feldman, 2005). At the same time, monetary policy was constrained by gold standard adherence and remained largely passive until the Nazis assumed power.

Brüning responded to the inherited budget situation with a series of tax increases and government spending cuts. Although he was familiar with proto-Keynesian countercyclical policy recommendations and recognized the stabilizing effects of work creation and public investment on the business cycle (see, e.g., Büttner, 1989; Ritschl, 2016; Winkler, 2018), he faced severe financial constraints. Consequently, he adopted a more long-term strategy, relying on austerity measures and the resultant economic hardship to further his ultimate political goal of ending Germany's reparation payments (see, e.g., Holtfrerich, 1982; Büttner, 1989; Evans, 2003). An alternative view in the literature suggests that the resulting trade surplus may have aimed to reassure external creditors

by demonstrating the priority placed on debt service payments, increasing the likelihood of revising the Young Plan (among others, Borchardt, 1979; James, 1986; Ritschl, 2002b, 2016). In both cases, the austerity programs were not designed to manage the short-run business cycle, but motivated by other objectives.

Our identification strategy builds on this premise that finds overwhelming support in the historical literature: Brüning's budget cuts and tax increases were to a large extent driven by the inherited budget situation and external factors such as the reparation regime. In the language of Romer and Romer (2004, 2010), the tax increases and expenditure cuts were not an attempt to manage the short-term economic cycle, but were largely motivated by ideological and political priorities related to the reparation regime. Furthermore, Brüning's austerity policies were influenced by inherited financial constraints and debt repayment requirements imposed on the German government by various international agreements, further limiting the scope for expansionary fiscal maneuvers.

The austerity decrees issued between 1930 and 1931 constitute a quasi-experiment for an austerity treatment in a recession. Using our knowledge about the motivation and the timing of the austerity policies, we construct a narrative austerity shock variable in the spirit of Romer and Romer (1989), Ramey and Shapiro (1998), Budnik and Rünstler (2020), and Boer and Lütkepohl (2021). It takes the value of unity at the announcement dates of the emergency decrees, specifically in the following months: 7:1930, 12:1930, 6:1931, 10:1931, and 12:1931. We estimate the dynamic effects of the austerity interventions on macroeconomic outcomes and quantify the shocks' contribution to the downturn of the German economy in a Bayesian vector autoregression model (VAR) that enables us to include a large set of macroeconomic observables commonly used in fiscal VAR models.

The narrative identification, combined with the monthly frequency of our dataset, is crucial for accurately identifying the causal impacts of austerity measures during this turbulent period of the Weimar Republic. For instance, the historical records indicate clearly that the emergency decree declared in June 1931 was not a response to the run on the German banking system in the summer of 1931 (Schnabel, 2004; Blickle et al., 2022). The decree's announcement date had already been determined in May 1931, predating the collapse of the Austrian Creditanstalt, which triggered the run on the German system.

Our analysis points to severe economic effects of the austerity policies. In our benchmark

specification, Brüning's fiscal policy shocks cumulatively decreased German GDP per capita by more than four percent and increased unemployment by almost two million. Brüning's policies earned him the nickname "Hunger Chancellor". In light of our results, this characterization appears justified. Brünings policies impoverished the nation and were the wrong macroeconomic policy, setting the stage for the surge of political extremism. Misguided and short-sighted fiscal policy, fatal austerity, stood at the beginning of the German catastrophe. As the historical literature shows, the political extremists and most importantly the Nazi party profited most from the economic and social fall-out of these policies.

Previous literature: We are not the first to study the economic consequences of fiscal policy during the Weimar Republic. Using annual budget data, Cohn (1992), shows that between 1929 and 1932 fiscal policy became more restrictive with every year. Borchardt (1979) argued 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. Ritschl (2013) evaluates Germany's macroeconomic performance between 1924 and 1938 in a time-varying VAR model framework focusing on the transfer problem, not the effects of fiscal policy. Fisher and Hornstein (2002) investigate fiscal policy during the Great Depression in a neoclassical growth model. Their analysis gives fiscal policy an important role in causing Germany's economic downturn.

Our study of Brüning's austerity policy during the German 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. 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. However, Barro and Redlick (2011) and Owyang et al. (2013) as well as Ramey and Zubairy (2018), using a military news variable for the US to identify fiscal policy shocks, find no systematically different fiscal multipliers during normal times versus times of economic slack. In the context of the Great Recession, House et al. (2020) employ a multi-country DSGE model to rationalize the varying recovery patterns observed across European countries. Their

findings suggest that nations that implemented reductions in government spending experienced lower levels of economic activity. Guajardo et al. (2014) provide empirical evidence indicating that fiscal consolidations tend to have a less contractionary impact when implemented in economies with a high perceived risk of sovereign default.

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 The historical context: 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))

Brüning, a conservative member of the Catholic Centre Party, was appointed chancellor of Weimar Republic on March 30, 1930. Instability and political gridlock had already brought down 16 governments in the twelve years of the young German democracy. The economic conditions Brüning faced were difficult. The 1919 Treaty of Versailles required Germany to pay war reparations of 132 billion Goldmark, about 150 percent of 1929 GDP. Although Germany's reparation payments were eased in 1924 by the Dawes Plan, and reduced further in 1929 by the Young Plan, reparations were limiting Germany's financial scope (Borchardt, 1979; Feldman, 2005; Ritschl, 2013).

The Great Depression hit the German economy hard. Already in 1928, one year before the stock market crash in New York, German economic activity had lost momentum. Foreign capital inflows had dried up, especially from US investors that had provided an important fraction of capital to Germany's large-scale enterprises and public sector since 1924 (Eichengreen, 2015). Investment and economic activity in Germany slowed and unemployment rose (Figure 1). During the winter of 1928/29, two million Germans were already out of work. German monetary policy was constrained by the gold standard and the fear of further international capital withdrawals.

During his term in office, from March 30, 1930, to May 30, 1932, Brüning was head of two

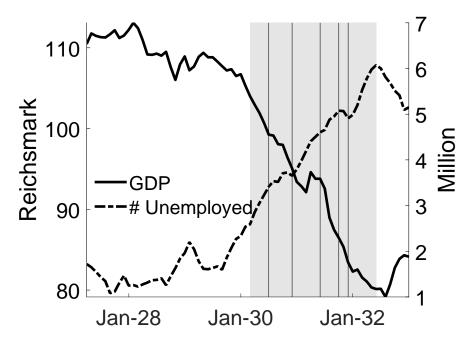


Figure 1: German real GDP per capita in Reichsmark and seasonal-adjusted unemployment in million between April 1927 and January 1933. The grey-shaded area marks Brüning's term in office. The announcement of Brüning's austerity decrees (July and December of 1930, and June, October, and December of 1931) is indicated by the vertical lines. Data sources: GDP: Albers (2018); unemployment: Humann (2011).

minority governments comprising mostly conservative ministers. Within 48 hours in office, in his first government declaration on April 1, 1930, Brüning signaled the parliament that he was willing to circumvent parliament by using presidential emergency decrees to push through his economic policy.<sup>1</sup>

## 2.1 Brüning's austerity policy

Brüning implemented his austerity policy through five emergency decrees. Figure 2 shows the timing of the austerity decrees and the decline in government expenditures during Brüning's term in office.

In nominal terms, total expenditures in the fiscal year 1931/1932 were, on average, 22 percent lower than in the previous fiscal year. In chronological order, the five decrees were the following:<sup>2</sup>

<sup>&</sup>lt;sup>1</sup>cf. Reichstagsprotokolle, 1928/30, p. 4730. Article 48 of the constitution of the Weimar Republic enabled the President to take, under certain circumstances, emergency measures without prior consultation of the parliament. In practice, the parliament had the option to repudiate the degrees by a majority. In reality, this rarely happened as Brüning made clear early that he would not shy away from asking Hindenburg to dissolve the parliament - which happened on July 18, 1930. In the reelections that took place on September 14, 1930, the NSDAP became second-strongest party behind the Social Democrats (Winkler, 2018).

<sup>&</sup>lt;sup>2</sup>A fiscal year extends from April 1 to March 31 the following year. For instance, the fiscal year 1930/1931 goes from

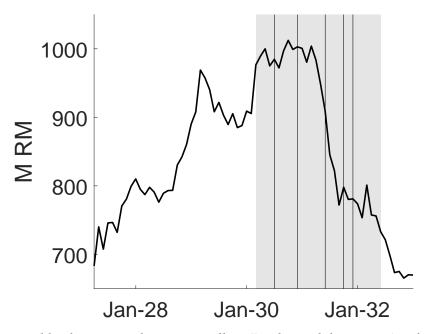


Figure 2: German total budget expenditures in million Reichsmark between April 1927 and January 1933 (12-month moving average). The grey-shaded area marks Brüning's term in office. The announcement of Brüning's austerity decrees (July and December of 1930, and June, October, and December of 1931) is indicated by the vertical lines. Authors' series.

*July 26, 1930*: The emergency decree announced in late July 1930 was the first in a series of spending cuts and tax rises. It introduced, among others, a supplementary income tax on workers in the public sector (the so-called "Reichshilfe"), increased income taxes on singles, and introduced a beer tax and the so-called citizen tax ("Bürgersteuer"). In addition, contributions to unemployment insurance were raised and stricter entitlement criteria for social benefits established.<sup>3</sup>

Four additional emergency decrees followed:4

*December 1, 1930*: The decree imposed further salary cuts on civil servants. Additionally, rates of existing taxes were increased, including beer, citizen, income, and tobacco tax.

*June 5, 1931*: The decree introduced a crisis tax as well as a salary cut for public sector employees and reduced unemployment insurance benefits and crisis support. 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, and announced a construction stop for all public buildings for two and a half years. Extensive pension cuts ranging from 5 to 75 percent for public

April 1930 to March 1931.

<sup>&</sup>lt;sup>3</sup>James (1986) and Winkler (2018), among others, include a comprehensive treatment of the emergency decrees' content. <sup>4</sup>These were called *Verordnung des Reichspräsidenten zur Sicherung von Wirtschaft und Finanzen* and numbered consecutively.

sector employees were implemented. Additionally, the decree included regulations requiring bakers to use a greater quantity of domestic potato flour to reduce the amount of imported wheat .

December 8, 1931: The final austerity decree again cut back on public salaries and enforced reductions in prices, wages, and interest rates. Rents were reduced by ten percent. Wages governed by existing wage agreements were rolled back to the nominal levels of 1927 and reduced by ten to fifteen percent. Civil servant salaries were cut by nine percent. Additionally, the sales tax was increased from 0.85 percent to two percent and capital flight was punished with a 25 percent tax on the total wealth of those involved.

#### 2.2 Motivation, constraints, alternatives

Historical evidence supports the view that Brüning's austerity measures were motivated by long-term strategic objectives and inherited budget conditions, rather than short-run business cycle management. Amidst a global recession, Brüning faced the dual challenge of meeting reparation payments from World War I and managing a burdensome foreign debt. Brüning was convinced that the only remedy was to restore Germany's access to foreign credit markets, inevitably leading to a revision of the Young Plan in the long term.

Two perspectives on Brüning's motivation for his deflationary policy course have shaped the historical debate, both supporting the view that Brüning acted with long-term orientation. One group of scholars argues that the harsh austerity measures were deliberately chosen to deepen Germany's recession and demonstrate to the allies that Germany was economically stretched to its limits, necessitating relief from its reparation burden (Holtfrerich, 1982; Büttner, 1989; Evans, 2003; Ferguson and Temin, 2003; Winkler, 2018, among others). The other group views the deflationary policy as a self-inflicted burden to demonstrate Germany's commitment to its international creditors, thereby ensuring the country's continued participation in the international economic order (Borchardt, 1979; James, 1986; Ritschl, 2002b, 2016). Both perspectives suggest that Brüning's deflationary policies were motivated by political preferences and aimed at the long-term economic goal of freeing Germany from the reparation debt and regaining trust of international creditors, rather than being driven by short-term economic considerations.

Brüning himself expressed on multiple occasions that ending reparations ranked high among his political preferences. In his memoirs, he stated, "(...) from the disease we could create our weapon"

(Brüning, 1970, p. 309).<sup>5</sup> He also shared this view in meetings, stating that the economic crisis had positive effects for Germany in terms of reparations (Winkler, 2018, p. 438). While some cabinet members pushed for interim solutions, Brüning insisted on a complete solution to the reparation problem (Büttner, 1989; Winkler, 2018, p. 405).

Brüning's symbolic rhetoric and efforts to downplay intermediate successes further support the view that the austerity measures were not intended to stabilize the business cycle in the short run. For instance, he carefully timed the announcement of the emergency decree of June 5, 1931 to demonstrate Germany's economic severity to England (Winkler, 2018, p. 404). Additionally, he downplayed the financial relief provided by the Hoover Moratorium, emphasizing the need for continued austerity. 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). Moreover, by the summer of 1931, reflationary economic policies were openly discussed as alternatives to Brüning's austerity measures, although they were not implemented. These proposals came from within Brüning's cabinet, advisers, and political figures close to the government, suggesting that Brüning's austerity measures were not driven by a lack of alternative options (Holtfrerich, 1982).

There was a consensus that defaulting on outstanding debt or leaving the gold standard and devaluing the currency, as Great Britain did in September 1931, was not a feasible option for Germany at the time. The Young Plan prohibited currency manipulations, and disregarding it would have jeopardized revising Germany's reparation obligations. Additionally, Brüning and his cabinet aimed to avoid actions that could trigger panic among the population, given the recent experience of hyperinflation (Borchardt, 1984; Büttner, 1989; Evans, 2003). Leaving the gold standard was considered too costly, especially since most of Germany's foreign debt was denominated in foreign currency or gold.

In an influential essay, Borchardt (1979) argued that Brüning, facing a crushing public debt, had

<sup>&</sup>lt;sup>5</sup>Appendix E contains the original texts in German for all translated quotes.

<sup>&</sup>lt;sup>6</sup>Holtfrerich (1982) provides a comprehensive summary of these alternative policy proposals, while Holtfrerich (2016) offers a more detailed analysis of the proposals by Wilhelm Laudenbach, a civil servant in the Ministry of Economics who suggested jump-starting the economy by expanding credit, and Ernst Wagemann, the founder of the Institute for Business Cycle Research and president of the Statistical Reich Agency.

no choice but austerity, thereby challenging the postwar consensus (Kroll, 1958; Kindleberger, 1973). However, Holtfrerich (1982) firmly rebutted this reasoning, disputing that the debt burden originated from excessive wages and social transfers before 1929. The extensive Borchardt-Holtfrerich debate was declared over by Ritschl (2001), who saw Borchardt's theses largely confirmed, arguing that Germany's high foreign debt and reparation payments made reflationary policies impossible (Ritschl, 2002b). However, recent revivals suggest an ongoing debate about the economic problems of the Weimar Republic and Brüning's role (Köppen, 2014; Müller, 2014; Borchardt, 2015; Kailitz, 2015; Köster, 2015, amongst others). Crucially, quantitative estimates on the macroeconomic effects of Brüning's austerity measures are lacking from this long-running discussion, which our analysis aims to address.

# 3 Empirical strategy

Based on the historical evidence that Brüning's austerity measures were driven by long-term strategic objectives rather than short-run countercyclical motives, our empirical strategy leverages a new dataset to provide causal estimates of the macroeconomic impacts of these policies.

## 3.1 The austerity shock instrument

Nearly 90 years after Brüning stepped down as chancellor, quantitative empirical evidence on his policies remains unconvincing or is missing. However, Brüning's fiscal policy actions in the 25 months of his chancellorship have been extensively researched and documented by historians and other experts. We use this narrative record describing the history and motivation of Brüning's austerity course to construct a new austerity shock instrument, thereby building on the approach pioneered by Ramey and Shapiro (1998), Romer and Romer (2010), Ramey (2011), and Guajardo et al. (2014).

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. In the preceding section, we established that Brüning did not view the budget cuts and tax increases as suitable policies to stimulate the economy during the downturn. Instead, they were motivated

by Germany's dilemma of balancing reparations and foreign debt payments to reintegrate the country into world trade. Consequently, they can be reasonably considered as exogenous austerity interventions.

Notwithstanding the historical evidence supporting Brüning's long-term strategic motives, the potential influence of cyclical factors cannot be entirely dismissed. If Brüning harbored a belief, even partially, that fiscal consolidation could alleviate the recession, our approach might overstate the contractionary effects by incorrectly attributing the economic downturn to the austerity measures. To address this concern, we construct fiscal variables for the federal budget that exclude components directly influenced by business cycle fluctuations.

The second step in the analysis is to determine the austerity packages' size. 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 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.

In our analysis, we therefore build on Romer and Romer (1989), Ramey and Shapiro (1998), as well as Budnik and Rünstler (2020), and use narrative information on the austerity policies' motivation and announcement date. The austerity variable takes the value of unity at the announcement dates of Brüning's emergency decrees in the *Reichs-Gesetzblatt*, the government gazette of the Weimar Republic: 7:1930, 12:1930, 6:1931, 10:1931, and 12:1931. A theoretical justification for dummy shock variables is given by Boer and Lütkepohl (2021), who show that variables 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 continuous instruments that also take into account the size of the shock.

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 for the effects 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.

#### 3.2 A new dataset

We introduce a 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 was implemented by emergency decrees, only monthly data allows us to set the austerity shock observations' timing precisely enough.

Second, the data are granular in the sense that they 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 that relate to the cyclically-adjusted federal budget. We therefore remove components like reparation payments and debt payments, transfers to federal states and

components that move with the business cycle directly, like automatic stabilizers. This ensures that the fiscal variables are free of any endogenous fluctuation that could bias our estimates in case that Brüning's austerity measures were motivated to some extent by cyclical considerations.

Germany's monthly federal government budget Until now, historical fiscal data available to study the budget trends in the late Weimar Republic were 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. 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).

The starting point for our dataset constitute the aggregated monthly series of revenues and expenditures in Wagemann (1935).<sup>7</sup> 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*.<sup>8</sup> 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. Crucial and new to the literature, this budget decomposition finally allows us to construct a revenue and spending measure that relates to the cyclically-adjusted componenent of the federal budget:

<sup>&</sup>lt;sup>7</sup>In particular, "Monatliche Einnahmen und Ausgaben des Reich", section XVIII. Öffentliche Finanzwirtschaft; A.

<sup>&</sup>lt;sup>8</sup>After February 1935, detailed budget accounts are no longer reported.

$$\tau_t^* = \tau_t - (s_t^f + s_t + b_t) 
g_t^* = w_t + a_t + d_t + o_t.$$
(1)

The tax revenue measure  $(\tau_t^*)$  consists of taxes, duties, and levies  $(\tau_t, 1R \text{ in Table 1})$  minus the sum of tax transfers to federal states  $(s_t^f, 1E)$ , social transfers  $(s_t, 2E)$ , and interest and debt repayments  $(b_t, 1E)$  item of 6E). The government spending measure  $(g_t^*)$  includes remuneration of civil servants and employees  $(w_t, 3E; 61)$  percent of spending variable), outlays on housing and assets  $(a_t, 4E; 2.5)$  percent), expenditures for military, police, and transportation  $(d_t, 5E; 23.7)$  percent), and outlays summarized as other expenditure  $(o_t, 9E; 12.8)$  percent). With our revenue and expenditure measures, we capture 43 and 41 percent of the total budget numbers.

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	

<sup>&</sup>lt;sup>9</sup>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.

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.

## 3.3 The economic effects of Brüning's austerity

To identify the effect of Brüning's austerity on the German economy, we order the austerity instrument 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:

$$y_t = B_0 + B(L)y_{t-1} + u_t, \quad u_t \sim \mathcal{N}(0, \Sigma_u), \tag{2}$$

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  $\Sigma_u$ . The reduced form errors  $u_t$  are related to the structural errors  $\varepsilon_t$  as follows:

$$u_t = A\epsilon_t, \quad \epsilon_t \sim \mathcal{N}(0, I_n).$$
 (3)

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

$$y_t = \begin{bmatrix} IV_t & g_t^* & \tau_t^* & gdp_t | u_t & p_t & i_t \end{bmatrix}. \tag{4}$$

 $IV_t$  denotes the qualitative austerity variable with value of unity at the announcement dates of Brüning's emergency decrees;  $g_t^*$  denotes the logarithm of real government consumption and,  $\tau_t^*$  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 in first-differences  $(gdp_t)$  or (ii) the unemployment rate  $(u_t)$ .  $p_t$  is the logarithm of a wholesale price index in first-differences (WPI) and  $i_t$  denotes the Reichsbank discount rate. <sup>10</sup> Additionally, we include a dummy in June 1931 to control for the banking crisis. 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. 11 Our budget data covers the sample 1927: M4 to 1935:M2. To control for a large set of observables and policy lags despite the relatively short sample size, we adopt a Bayesian estimation. We employ a lag order of six and use the commonly used version of the Minnesota prior as Normal-Inverted Wishart distribution (e.g. Kadiyala and Karlsson, 1997). We use a marginal data density to select the hyperparameters of the prior distribution in a data-driven way. Appendix G outlines the details of the Bayesian estimation. In Appendix H, we demonstrate the robustness of our estimation results to various specifications, including alternative measures of economic activity and the price level. Furthermore, to alleviate any concerns that the emergency decrees may have been influenced by short-term economic events like the German banking crisis of summer 1931, we show that our results remain qualitatively robust when excluding the emergency decree of June 1931.

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 change in economic activity and 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 the austerity shock 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,

$$y_t = \sum_{s=0}^{t-1} \Phi_s \epsilon_{t-s} + \sum_{s=t}^{\infty} \Phi_s \epsilon_{t-s} \quad , \tag{5}$$

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

<sup>&</sup>lt;sup>10</sup>Appendix F includes a detailed account on the data sources.

<sup>&</sup>lt;sup>11</sup>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.

$$\hat{y}_t \approx \sum_{s=0}^{t-1} \hat{\Phi}_s \hat{e}_{t-s}. \tag{6}$$

We are interested in the fourth element of  $y_t$ , denoted by  $y_{gdp,t|u,t}$ , which corresponds to GDP per capita or the unemployment rate. Let  $y_{gdp,t|u,t}^s$  denote the contribution of structural shock s to GDP per capita or unemployment at date t. Then, the counterfactual is defined as  $y_{gdp,t|u,t} - \hat{y}_{gdp,t|u,t}^s$  where  $\hat{y}_{gdp,t|u,t}^s$  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 instrument. 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

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.

## 4.1 Effects on GDP and unemployment: counterfactual

Figure 3 shows counterfactual GDP per capita (dashed line: median estimate; grey shades: 68 percent and 90 percent credible sets) and observed GDP per capita (bold line) between Brüning's term of office and Hitler's appointment as chancellor in January 1933. For the first few months after Brüning took office, the two lines coincide almost perfectly, indicating that the austerity measures had minimal impact on the evolution of GDP initially. However, starting with the first emergency decree in summer 1930, which implemented significant spending cuts and tax hikes, a divergence emerges. 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 the end of 1930 onward, coinciding with the implementation of the

second emergency decree in December 1930.

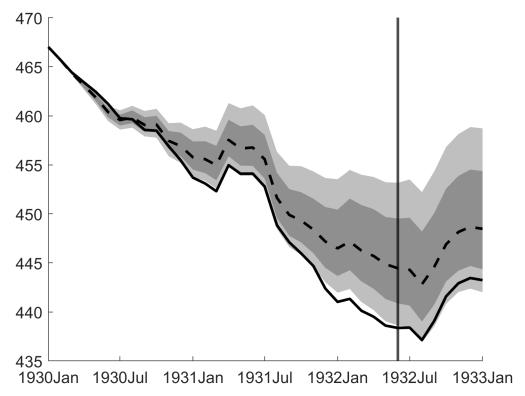


Figure 3: Counterfactual for GDP per capita (log x 100) computed between March 1930 and January 1933. The dashed line depicts median counterfactual GDP in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates observed GDP. The vertical lines indicates the end of Brüning's tenure in office.

To quantify the impact of Brüning's austerity policies on GDP, we focus on the periods where the difference between the median counterfactual GDP estimate and the observed GDP value is statistically significant at the 90 percent level. Summing up these significant differences over the duration of Brüning's term in office, we estimate a cumulative loss in GDP equivalent to 4.69 percent of the 1932 GDP level (4.23 percent of the 1931 GDP level).

Figure 4 depicts the counterfactual and realized unemployment rates between March 1930 and January 1933. During the initial months of Brüning's term in office, the two lines are closely aligned, suggesting that the austerity shocks had minimal impact on the unemployment rate in the spring of 1930. However, a divergence emerges starting from October 1930, with the counterfactual unemployment rate falling below the observed rate and remaining lower until the end of the sample period. This divergence implies that, in the absence of Brüning's austerity measures, German unemployment would have been considerably lower during the latter years of the Weimar Republic.

Notably, the gap between the observed and counterfactual unemployment rates widens progressively over time, indicating that Brüning's fiscal policies had an increasingly severe effect on exacerbating unemployment levels.

Focusing on the periods where the unemployment effects are statistically significant at the 90 percent confidence level, our estimates indicate that Brüning's austerity policies resulted in an additional 1.94 million individuals becoming unemployed in Germany. This figure represents a substantial 7.1 percent of the country's monthly average labor force in 1932, or 6.9 percent of the 1931 monthly average labor force, underscoring the severe impact of the austerity measures on employment levels during this period.

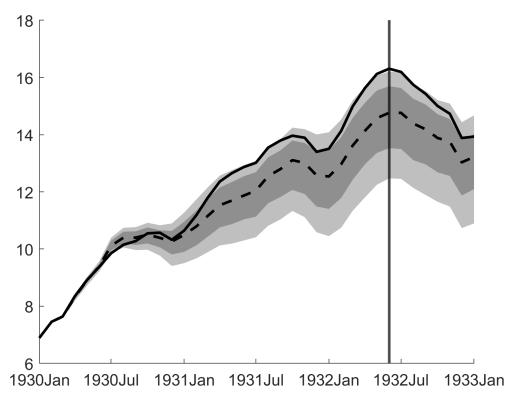


Figure 4: Counterfactual for the unemployment rate (%) computed between March 1930 and January 1933. The dashed line depicts median counterfactual unemployment in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates the observed unemployment rate. The vertical lines indicates the end of Brüning's tenure in office.

The results highlighting the significant contractionary effects of Brüning's austerity measures on GDP and employment levels provide striking empirical evidence on the dangers of implementing severe fiscal consolidation during deep economic recessions. Our findings align with the broader literature that has cautioned against pursuing austerity policies in times of economic downturns, as

they risk exacerbating recessionary pressures and prolonging the recovery process (e.g. Blanchard and Leigh, 2013; Jordà and Taylor, 2016; House et al., 2020).

While our analysis focuses on the overall impact of Brüning's austerity decrees, which encompassed a combination of spending cuts and revenue adjustments, we do not examine the differential effects of specific policy instruments, such as tax increases versus spending reductions, as explored in studies like Alesina and Ardagna (2010). Nonetheless, our results echo the conclusions drawn by Romer and Romer (2019), who argue that when confronted with high financial distress, policymakers should not allow debt burdens to unnecessarily dictate the fiscal response, as doing so can lead to much more severe and prolonged output losses in the aftermath of crises.

## 4.2 Transmission mechanism

How does the austerity shock we identify propagate to the macroeconomy? Figure 5 shows impulse responses to an austerity shock.<sup>12</sup> The bold line depicts the posterior median response, the grey-shaded area show the 68 percent and 90 percent credible intervals. Consistent with the historical context, the austerity shock identified with the qualitative proxy variable decreases government spending over a two-year period and increases tax revenues during the initial months. However, the credible bands are wide, including at 68 percent both positive and negative values.

Furthermore, the shock has long-lasting recessionary and deflationary effects. GDP per capita experiences a steady decrease in the first eight months and does not convert back to its initial level within two years. This prolonged decline in economic activity is consistent with the notion that fiscal consolidations can have significant contractionary effects, especially when implemented during periods of economic weakness. Austerity has increasing and long-lasting statistically significant effects on the unemployment rate. After thirteen months, the increase in unemployment reaches its maximum at 0.18 percentage points, but the rate stays above its initial level for more than two years. This suggests that the austerity measures had severe consequences for the labor market, potentially exacerbating the already high levels of unemployment during the Great Depression. Prices decrease on impact and stay significantly below trend for fifteen months.

Interest rates increase on impact. After one year the response is essentially insignificant and

<sup>&</sup>lt;sup>12</sup>Figure 5 shows the impulse responses for the austerity proxy, government spending, tax revenues, the wholesale price index, and the interest rate obtained from the VAR model that includes the unemployment rate, while the response for GDP was obtained from the VAR specification that includes GDP. The complete set of impulse responses for the baseline specification that includes GDP is shown in Appendix H.

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 counteract the deflationary effects. However, the German Reichsbank in the 1920s and 1930s was not relying on Taylor-type rules for conducting monetary policy.

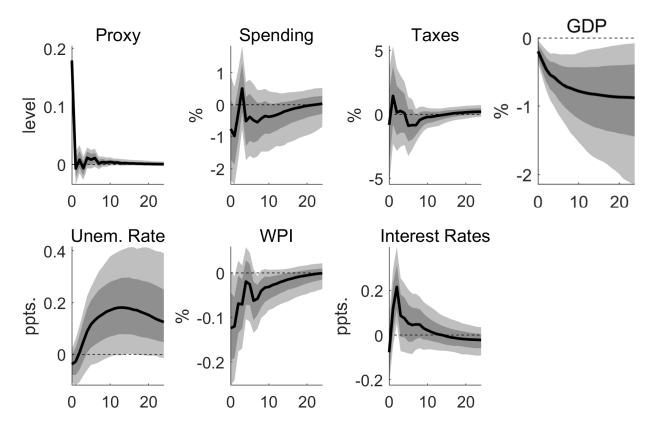


Figure 5: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

# 5 Conclusion

In this paper, we study the macroeconomic effects of Brüning's fiscal policy measures, arguably history's most consequential austerity package, enacted against the backdrop of a depressed economy and the rise of political extremism in Germany during the Great Depression. Our findings lend support to the concern that fiscal consolidations aggravated the economic downturn.

According to our estimates, Brüning's imposed austerity measures resulted in an additional 1.94 million individuals becoming unemployed and lowered Germany's GDP per capita by 4.7 percent, exacerbating the severe economic hardship the country was already enduring due to

the Great Depression and a banking crisis. These substantial macroeconomic impacts belie the psychological toll of Brüning's austerity policy on the German electorate. Years of extreme economic distress alienated the populace from the established democratic ruling parties, fueling a search for alternative political movements that promised economic relief. Tragically, the Nazis were the party that capitalized most on this disillusionment.

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# Appendix A Comparison to Ritschl's federal government spending data

In Figure 6, we aggregate our monthly budget data to quarterly frequency and find that it corresponds well with the series in Ritschl (2002b).<sup>13</sup> During the late 1920s, we underestimate total Reich expenditures; however, both series move closely together.

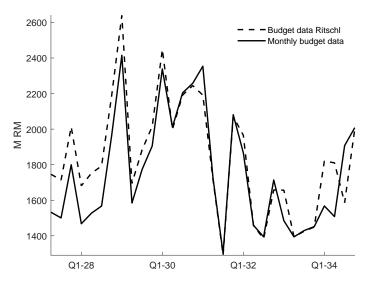


Figure 6: The dashed lines shows quarterly total federal expenditures as compiled by Ritschl (2002b). The bold line shows our monthly measure of total expenditures aggregated to quarterly frequency.

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.

<sup>&</sup>lt;sup>13</sup>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 "Die vierteljährlichen Einnahmen und Ausgaben des Reiches 1925 - 1938 (Mio. RM), A.6.35, "Reiner Finanzbedarf").

# Appendix B Federal budget decomposition: extract from primary sources

	1931			
Einnahmen und Ausgaben des Reichs	Juli	Sept.	Oktober	April/Okt.
A. Ordentlicher Haushalt.				
I. Einnahmen		Mill	. RM	
1. Steuern		l		
Steuern, Zölle usw. (Reichsanteil) <sup>1</sup> ) Reparationssteuer der Reichsbahn	673,7	324,4	676,7	3 376,0 165,0
2. Erwerbsvermögen				
Aus den Vorzugsaktien der Reichsbahn Überschuß v. Post u. Reichsdruckerei	14,6	100	19,8	28,7
Aus der Münzprägung <sup>2</sup> )	- 0,1	- 19,9 - 4,3 14,9	- 3,0	- 129,5 - 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 <sup>2</sup> )	59,6	60,9	61,5	433,2
<ol> <li>Versorgung u. Ruhegehälter (einschl. Kriegsbeschädigtenrenten)</li> </ol>	127,0	119,0	119,7	909,2
<ol> <li>An die Länder für Schutzpolizei</li> </ol>	15,8	15,8	16,1	111,1
4. Soziale Ausgaben Sozial versicherung	46,7	34,5	35,4	260,4
Sozialversicherung	10,1	0.,0		
	8,0	-	26,3 10,0	28,0 18,0
Kleinrentnerfürsorge Krisenunterstützung für Arbeitslose	54,6	49,6	61,6	357,5
wertschauende Arbeitsloseniutsorge	54,6 3,2 2,7	49,6 0,7 2,4	61,6 0,2	357,5 6,3 17,7
An Reichsanstalt f. Arbeitsvermittl. Schaffung von Arbeitsmöglichkeiten	2,7	2,4	3,1	17,7
u. Verstärkung der Krisenfürsorge Zur Erleichterung der Wohlfahrts-	6) .	6) -	22,0	46,0
lasten der Gemeinden (GdeVbde)		_	32,0	32,0
5. Reichsschuld Verzinsung und Tilgung	24,2	5,0	12,9	104,4
Verzinsung und Tilgung Außerordentliche Tilgung der schwe- benden Schuld		_	245,0	245,0
Anleiheablösung	2,4.	2,1	5,3	48,2
Anleiheablösung  6. Sächliche und sonstige Ausgaben (außer Kriegslasten)				
neer	19,9	20,1	24,9	138,7 69,4
Marine Verkebrswesen	9,6 14,6	12,4 11,6	12,0 10,5	75,1
Verkehrswesen. Übrige Reichsverwaltung	•) 22,2	9) 40,9	(°) 24,7	162,2
7. Innere Kriegslasten*) 8. Äußere Kriegslasten	16,3	22,4	53,3	196,9
Reparationszahlungen*)	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 (+), Mehr- ausgabe ()	+259,1	-56,8	81,3	+ 38,9
B. Außerordentlicher Haushalt.				
I. Einnahmen		ļ		
1. Verwaltungseinnahmen	0,5	0,3	0,8	10,6
Aus Anleihen     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				,
<ol> <li>Wohnungs- und Siedlungswesen</li> </ol>	2,0	1,4	0,5	9,0
Wohnungs- und Siedlungswesen     Verkehrswesen     Rückkauf v. Schuldverschreibungen	8,4	7,4	7,5	46,8
usw. des Reichs	0,7	1,9	-	2,6
4. Innere Kriegslasten	1,3 2,0	- 2,1	5,0	11,3 11,7
5, Übrige Reichsverwaltung			0,1	
Summe der Ausgaben Ergibt Mehreinnahme (+). Mehr-	14,4	9,5	13,1	81,4
Ergibt Mehreinnahme (+), Mehr- ausgabe ()	-13,9	- 9,2	-11,1	<b>—</b> 54,9

Figure 7: 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" 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)

<sup>&</sup>lt;sup>14</sup>Translation: Reich debt: interest and debt repayments

# 3R Extraordinary taxes

Reparationssteuer der Deutschen Reichsbahn-Gesellschaft

# 4R Other revenue

Sonstige Verwaltungseinnahmen Verwaltungseinnahmen (EO) Sonstiges (EO)

# 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), Table A.12 "Die Ausgaben und Einnahmen des öffentlichen Sektors nach Kalenderjahren 1925 - 1938 (Mio. RM), II Sachausgaben und Transfers".

The fact that spending at both governmental levels was similarly affected by Brüning's austerity measures is illustrated in Figure 8, 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 8 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.

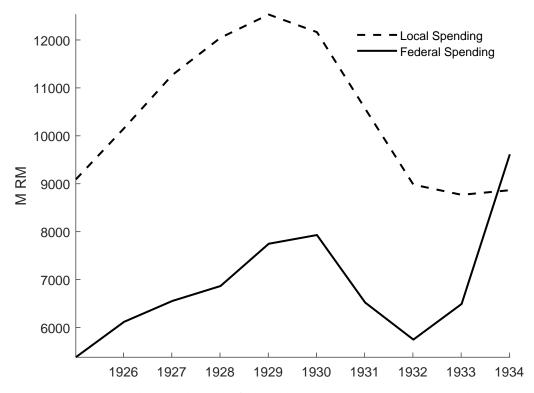


Figure 8: Nominal expenditures by the federal government and local authorities in million Reichsmark. Data comes from Ritschl (2002b), Table A.12, "Die Ausgaben und Einnahmen des öffentlichen Sektors nach Kalenderjahren 1925-1938 (Mio. RM)", "Sachausgaben und Transfers, Reich, LGH"

## Appendix E German original text of translated statements

In this appendix, we provide the German original texts of the translated quotes.

- "(...) from the disease we could create our weapon."
  - Own translation. German original text: "Aus der Krankheit konnten wir unsere Waffe machen."
- "(...) the catastrophic world economic crisis has also positive effects for us in terms of reparations."
  - Own translation. German original text: "(...) die katastrophale Weltwirtschaftskrise reparationspolitisch für uns auch ihr Gutes habe."
- (...) "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."
  - 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."

# 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 Bayesian estimation

We employ a natural conjugate Normal inverse Wishart prior as outlined, for example, in Kadiyala and Karlsson (1997). The VAR model with n endogenous variables and p lags is given as:

$$Y = XB + U$$
 or  $y = (I_n \otimes X)b + u$ 

with y = vec(Y),  $X = I_n \otimes X$ , b = vec(B), and u = vec(U).

The prior for the VAR coefficients *b* is given by

$$b \sim \mathcal{N}(b_0, \Sigma \otimes \Phi_0).$$

 $b_0$  is an  $n(np+1) \times 1$  vector,  $\Phi_0$  is a  $np+1 \times np+1$  diagonal matrix, and  $\Sigma$  is the VAR residual variance-covariance matrix. For  $b_0$ , we use values of o for cross variable coefficients and own first lag coefficients of all continuous variables, the austerity variable, the constant, and the crisis dummy. For  $\Phi_0$ , we set for own and cross lag terms the variance as  $\sigma_{nij}^2 = \left(\frac{1}{\sigma_j^2}\right) \left(\frac{\lambda_1}{p^{\lambda_3}}\right)^2$  and the variance for the constant as  $\sigma_c^2 = (\lambda_1 \lambda_4)^2$ , where  $\sigma_j^2$  is the residual variance for variable j in the VAR model, approximated by univariate autoregressive regressions.  $\lambda_1$  controls the overall tightness of the prior,  $\lambda_3$  controls the lag decay, and  $\lambda_4$  controls the tightness of the constant. We set  $\lambda_3 = 1$  and  $\lambda_4 = 10000$ , and determine  $\lambda_1$  with a marginal data density. The corresponding value for the baseline specification including GDP is  $\hat{\lambda}_1 = 0.166$ , and for the baseline specification including the unemployment rate, it is  $\hat{\lambda}_1 = 0.245$ .

The prior for the VAR covariance matrix  $\Sigma$  is given by

$$\Sigma \sim \mathcal{IW}(S_0, \alpha_0)$$

where  $S_0$  is the  $n \times n$  scale matrix for the prior, and  $\alpha_0$  stands for the prior degrees of freedom. We set  $\alpha_0 = n + 2$  and  $S_0$  as

$$S_{0} = (\alpha_{0} - n - 1) \begin{bmatrix} \sigma_{1}^{2} & 0 & 0 & 0 \\ 0 & \sigma_{2}^{2} & 0 & 0 \\ 0 & 0 & \ddots & 0 \\ 0 & 0 & 0 & \sigma_{n}^{2} \end{bmatrix}.$$

The posterior is obtained as

$$\bar{B} = \bar{\Phi}[\Phi_{\scriptscriptstyle O}^{-1}B_{\scriptscriptstyle O} + X'Y]$$

with

$$\bar{\Phi} = [\Phi_0^{-1} + X'X]^{-1}$$

and

$$\begin{split} \bar{\alpha} &= T + \alpha_{\mathrm{O}} \\ \bar{S} &= Y'Y + S_{\mathrm{O}} + B_{\mathrm{O}}\Phi_{\mathrm{O}}^{-1}B_{\mathrm{O}} - \bar{B}\bar{\Phi}^{-1}\bar{B}. \end{split}$$

Draws from the posterior can be obtained by direct Monte Carlo sampling.

# Appendix H Additional results

In this appendix, we show that our main results are robust to various alternatively plausible specifications, like variations of the austerity and crisis dummy, as well as alternative variables for economic activity and the price level.

#### Appendix H.1 Baseline specificatio: Impulse responses for VAR model with GDP

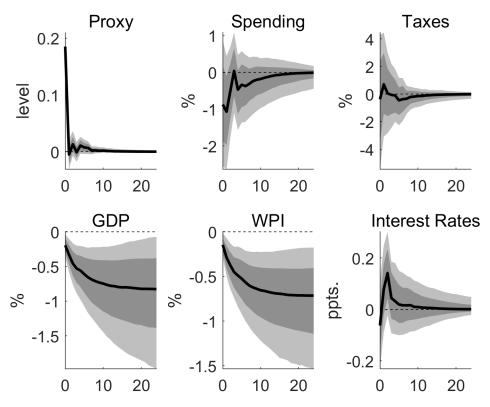


Figure 9: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

### Appendix H.2 Robustness results: VAR model with GDP

Appendix H.2.1 Excluding emergency decree of June 1931 in austerity instrument

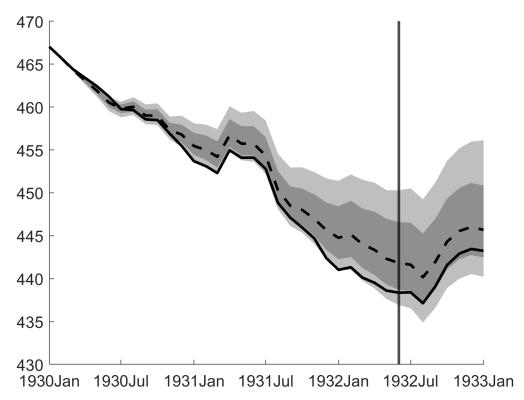


Figure 10: Counterfactual for GDP per capita (log x 100) computed between March 1930 and January 1933. The dashed line depicts median counterfactual GDP in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates observed GDP. The vertical lines indicates the end of Brüning's tenure in office.

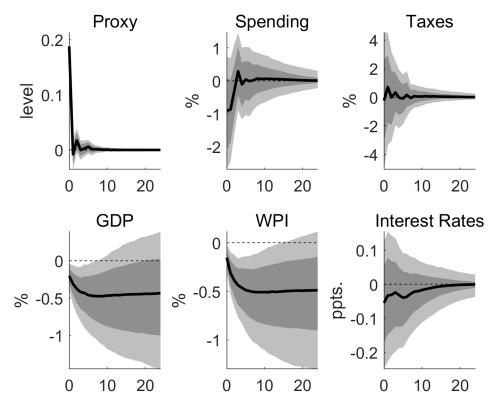


Figure 11: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

Appendix H.2.2 Excluding emergency decree of June 1931 in austerity instrument, five lags of crisis dummy (June 1931)

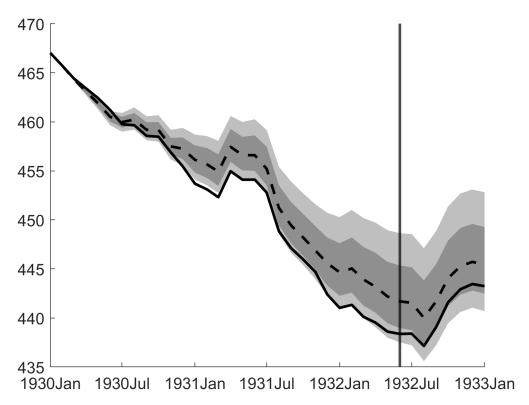


Figure 12: Counterfactual for GDP per capita (log x 100) computed between March 1930 and January 1933. The dashed line depicts median counterfactual GDP in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates observed GDP. The vertical lines indicates the end of Brüning's tenure in office.

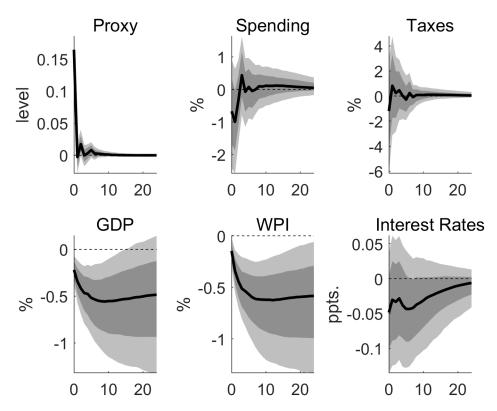


Figure 13: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

Appendix H.2.3 CPI, instead of WPI, as price indicator, and industrial production, instead of GDP

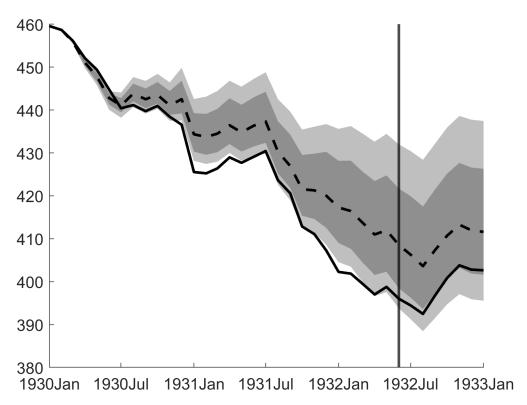


Figure 14: Counterfactual for industrial production (log x 100) computed between March 1930 and January 1933. The dashed line depicts median counterfactual industrial production in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates observed industrial production. The vertical lines indicates the end of Brüning's tenure in office.

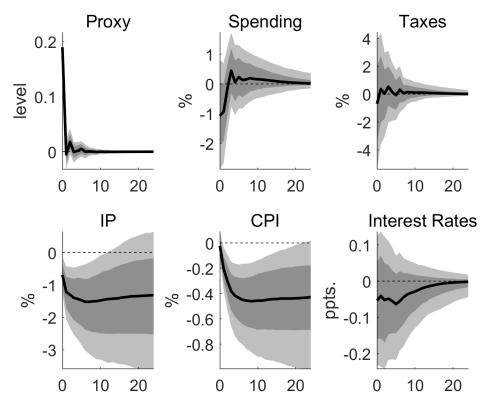


Figure 15: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

### Appendix H.3 Robustness results: VAR model with unemployment

#### Appendix H.3.1 Excluding emergency decree of June 1931 in austerity instrument

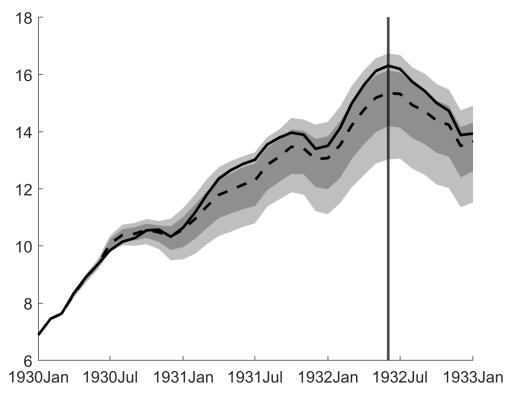


Figure 16: Counterfactual for the unemployment rate (%) computed between March 1930 and January 1933. The dashed line depicts median counterfactual unemployment in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates the observed unemployment rate. The vertical lines indicates the end of Brüning's tenure in office.

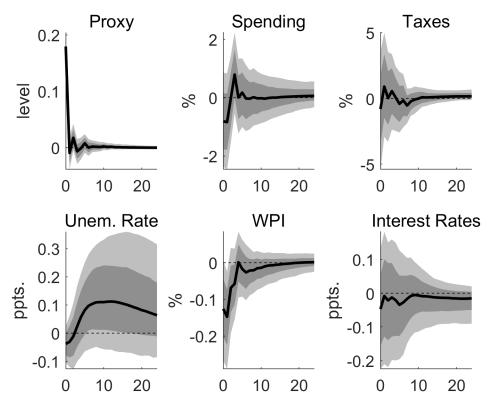


Figure 17: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

Appendix H.3.2 Excluding emergency decree of June 1931 in austerity instrument, five lags of crisis dummy (June 1931)

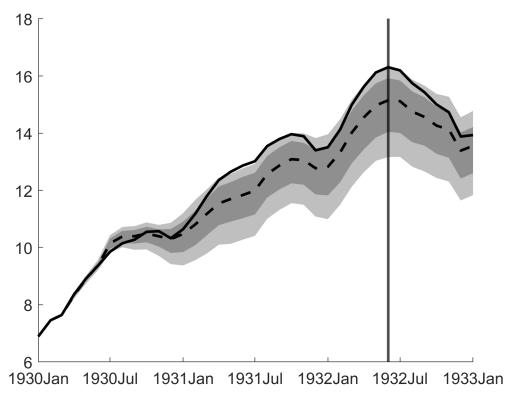


Figure 18: Counterfactual for the unemployment rate (%) computed between March 1930 and January 1933. The dashed line depicts median counterfactual unemployment in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates the observed unemployment rate. The vertical lines indicates the end of Brüning's tenure in office.

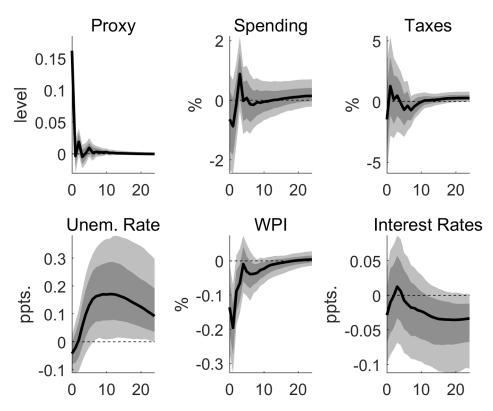


Figure 19: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.

#### Appendix H.3.3 CPI, instead of WPI, as price indicator

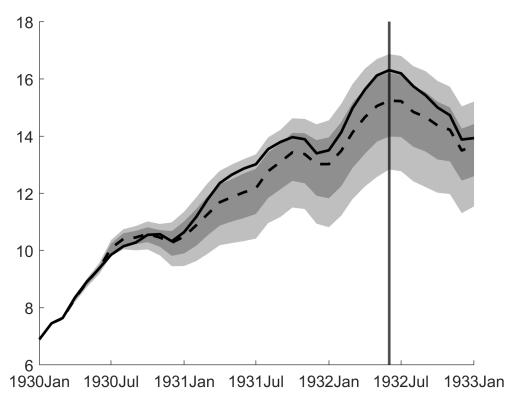


Figure 20: Counterfactual for the unemployment rate (%) computed between March 1930 and January 1933. The dashed line depicts median counterfactual unemployment in the absence of austerity shocks, the dark-grey shaded area shows 68 percent credible bands, and the light-grey shaded area shows 90 percent credible bands. The bold line illustrates the observed unemployment rate. The vertical lines indicates the end of Brüning's tenure in office.

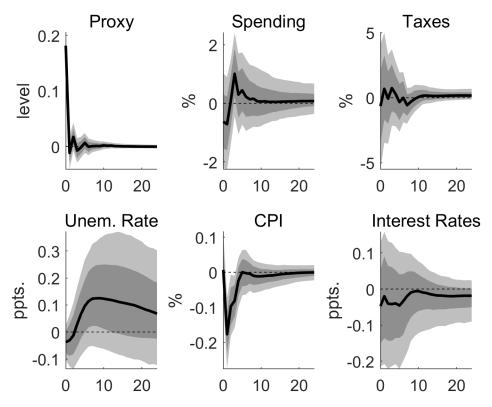


Figure 21: Impulse responses to an austerity shock. The solid line depicts the median impulse response of the specified variable to a one standard deviation austerity shock. Shaded bands denote 68 percent and 90 percent credible sets.