Import Tariffs and the Systematic Response of Monetary Policy*

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Abstract

We estimate the macroeconomic effects of U.S. import tariff shocks using several tariff measurement and identification approaches. Tariff shocks reduce output but increase consumer prices. Monetary policy partially accommodates these shocks with a policy easing. To quantify the dependence on systematic monetary policy, we use empirically identified monetary policy shocks to construct counterfactuals that are robust against model misspecification and the Lucas critique. When monetary policy strictly stabilizes inflation, the output contraction at the trough is 36% larger than in the baseline. In contrast, strict output stabilization implies a peak inflation effect that almost doubles, compared to the baseline.

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1 Introduction

What are the macroeconomic effects of tariff shocks? How are these effects shaped by the systematic response of central banks? Partly motivated by the 2025 rise in tariffs by the Trump Administration, a myriad of papers has emerged to answer these questions, primarily using microfounded structural models. These papers study the business cycle effects of tariffs (e.g., Antonova, Huxel, Matvieiev, and Müller, 2025; Auclert, Rognlie, and Straub, 2025; Kalemi-Özcan, Soylu, and Yildirim, 2025; Costinot and Werning, 2025), the design of tariff policies (Becko, Grossman, and Helpman, 2025; Dávila, Rodríguez-Clare, Schaab, and Tan, 2025; Itskhoki and Mukhin, 2025; Kocherlakota, 2025), and the optimal monetary policy response to tariffs (e.g., Bergin and Corsetti, 2023, 2025; Bianchi and Coulibaly, 2025; Monacelli, 2025; Werning, Lorenzoni, and Guerrieri, 2025).[1]

While the above papers focus on theoretical analyses, there is little empirical evidence on the business cycle effects of tariffs, and no evidence on how the effects of tariffs are shaped by systematic monetary policy. We fill this gap with two main contributions.

First, we estimate the macroeconomic effects of U.S. import tariff shocks, using several tariff measurement and identification approaches. We find robust evidence that tariff shocks are contractionary, inflationary, and partially accommodated by monetary policy. This contribution is valuable because there are only few empirical studies. These studies offer a wide set of results, ranging from tariffs being possibly expansionary and deflationary (Schmitt-Grohé and Uribe, 2025), contractionary but still deflationary (Barnichon and Singh, 2025), and contractionary and inflationary (e.g., Boer and Rieth, 2024). While our results are consistent with the latter, we also discuss potential reasons for the conflicting empirical results.

Second, we estimate how the macroeconomic effects of tariff shocks depend on the systematic monetary policy response, without relying on a fully specified structural model. This approach follows McKay and Wolf (2023) and is appealing because it is robust to the Lucas critique and to model misspecification. We consider counterfactuals featuring a central bank

[1] Alessandria, Ding, Khan, and Mix (2025) focus on tariff revenues that enable tax cuts.

that aims to (i) not respond to the tariff shock, (ii) strictly stabilize prices, or (iii) strictly stabilize real activity. Relating to optimal policy, our counterfactuals map into a loss function that puts a zero weight (iii) on price stabilization, or (ii) on output stabilization, and (i) represents an intermediate case, where monetary policy "looks through" the shock, as sometimes advocated for supply shocks. As such, our results quantify the policy tradeoff and provide new moments to discipline structural models.

We estimate the effects of import tariff shocks using a vector autoregression (VAR) and quarterly U.S. data from 1990 to 2024. Import tariffs are measured using three approaches: a trade-weighted and an unweighted average tariff rate, and the trade restrictiveness index from Schmitt-Grohé and Uribe (2025), which also captures cross-sectional tariff variation. The responses are identified via the timing restriction that import tariff shocks affect macroeconomic outcomes with a one-period lag, except for the federal funds rate. We impose this assumption to allow other macroeconomic shocks to affect our import tariff measures through compositional changes, e.g., in import prices, imported products, and trading partners.[2] Furthermore, we show that our identifying restrictions are not overly restrictive by considering alternative identification approaches that relax those assumptions. The first adopts the penalty function approach of Uhlig (2005), the second imposes a block-recursiveness assumption similar to Christiano, Eichenbaum, and Evans (2005), and the third relaxes each zero restriction individually. In all three approaches, the unrestricted contemporaneous effects are close to zero, in line with our baseline approach. Lastly, we construct a time series of narratively identified tariff policy events and use only tariff changes due to those events as a source of plausibly exogenous variation. Across all four approaches, we obtain very similar dynamic effects.

We find that a shock that increases the trade-weighted U.S. import tariff rate by 1 percentage point induces considerable pressure on consumer prices. The CPI inflation rate responds with a delay of 4 quarters and, subsequently, increases continuously to its peak effect of 0.78

[2] For example, since the U.S. tariff code is regressive (Acosta and Cox, 2019), changes in income inequality and associated changes in import composition may affect trade-weighted tariff rates.

percentage points after 11 quarters. The trough in real GDP is -1.23% and is reached after 6 quarters. This confirms the theoretical predictions that U.S. import tariffs are contractionary (Auclert et al., 2025) and act as supply shocks (Werning et al., 2025). Furthermore, we estimate an increase in macroeconomic uncertainty and a decrease in real investment, imports, and exports. The terms of trade improve, albeit with a delay. We obtain similar results when considering the alternative import tariff measures discussed above.

Monetary policy partially accommodates the tariff shock with a temporary easing, potentially contributing to inflationary pressure while cushioning the decline in output. Interestingly, such partial accommodation can be the optimal response to import tariff shocks (e.g., Bergin and Corsetti, 2025; Bianchi and Coulibaly, 2025; Monacelli, 2025; Werning et al., 2025). The finding of partial accommodation raises several questions. How much of the inflation is genuinely caused by the tariff hike, and how much is due to the monetary easing? Similarly, how much output must be sacrificed to fully stabilize prices? And, conversely, how much inflation must be tolerated if the central bank fully stabilizes real activity?

To study these questions, we follow McKay and Wolf (2023) and use identified monetary policy shocks to construct policy counterfactuals. These counterfactuals are valid in a broad class of macroeconomic models, including conventional New Keynesian frameworks. As in McKay and Wolf (2023), we estimate a monetary VAR using the high-frequency identified monetary policy shock from Miranda-Agrippino and Ricco (2021) and the Taylor rule residual from Romer and Romer (2004), and use the resulting responses to construct three counterfactuals.[3]

First, we consider a counterfactual in which the federal funds rate is unresponsive to the tariff shock. This scenario is useful for comparison with the findings from Auclert et al. (2025), who also consider such a case in a New Keynesian model. It also resembles the commonly expressed idea of “looking through” supply shocks.[4] Interest rates are higher than in the

[3]We provide a sensitivity analysis using alternative monetary policy shocks.

[4]For example, U.S. Fed Chair Jerome Powell discussed this idea on November 9, 2023 (https://www.federalreserve.gov/newsevents/speech/powell20231109a.htm?).

baseline, leading to moderately lower real GDP and CPI inflation. Hence, we confirm that the inflationary impact of tariffs is partly driven by the monetary easing.

The above counterfactual keeps monetary policy neutral in terms of the nominal policy rate. But how potent is monetary policy in fighting the inflationary pressure from the tariff shock? To answer this question, we consider a second counterfactual in which monetary policy aims to perfectly stabilize prices. Instead of an initial easing, monetary policy sharply raises interest rates by 0.82 percentage points in the short run. As a result, the tariff shock does not lead to meaningful inflation, with a peak impact of only 0.21 percentage points.[5] The baseline inflation response in the same quarter is almost four times larger. However, this sacrifices a considerable amount of real GDP, which is 36% (0.44 percentage points) lower at the trough.

Finally, we consider the opposite counterfactual, in which monetary policy aims to strictly stabilize output. In this scenario, monetary policy cuts the federal funds rate more aggressively and more swiftly than in the baseline. The trough interest rate response is -2.0 percentage points. This policy reduces the adverse output effects but does not achieve full output stabilization. Yet, the easing generates a pronounced amplification of inflation, with the peak effect being almost twice as large than in the baseline.

Related literature. Beyond the theoretical papers mentioned above, our work is connected to three strands of literature. First, we relate to the surprisingly scant literature that identifies the macroeconomic effects of tariff shocks from aggregate time series data. Two close papers are Schmitt-Grohé and Uribe (2025), who identify permanent and transitory tariff shocks, and Barnichon and Singh (2025), who adopt a long-run perspective. Both argue that observed fluctuations in (trade-weighted) average tariffs may be treated as exogenous, whereas we are concerned about potential endogeneity due to tariff measurement. Their results agree that non-permanent tariff increases are deflationary, but only Barnichon and

[5]The counterfactual achieves full inflation stabilization only approximately since an exact counterfactual would require infinitely many distinct monetary policy (news) shocks.

Singh (2025) find tariffs to be contractionary. In the Online Appendix, we show that differences in results are likely driven by the sample. If we expand the sample to start in 1980, we still obtain that tariffs act as supply shocks. When extending the start date further back to 1967 – the earliest year permitted by data availability – tariffs instead appear deflationary and not contractionary. These deflationary effects seem relatively robust in historical samples, consistent with the evidence documented in the two papers discussed above.[6] However, the absence of an output contraction in the extended sample is exclusively driven by two exceptional episodes, the so-called Nixon and Ford tariff shocks. As also documented in the narrative account by Barnichon and Singh (2025), these episodes largely reflect endogenous responses to contemporaneous macroeconomic conditions. If we exclude these events from the tariff rate time series, we recover a significant real GDP contraction. Different from the two papers discussed above, several earlier contributions find effects consistent with tariffs being supply shocks using sign restrictions with quarterly U.S. data (Boer and Rieth, 2024), and zero restrictions with annual cross-country data (Furceri, Hannan, Ostry, and Rose, 2018; Barattieri, Cacciatore, and Ghironi, 2021).[7] Relative to these papers, we contribute with robust evidence that tariffs act as supply shocks using several tariff measurement and identification approaches, while also delivering novel monetary policy counterfactuals.

Another recent strand of literature studies the tariff announcements by the Trump Administration on so-called "Liberation Day" using structural models (e.g., Ignatenko, Lashkaripour, Macedoni, and Simonovska, 2025; Rodríguez-Clare, Ulate, and Vasquez, 2025) or high-frequency data (e.g., Acharya and Laarits, 2025; Jiang, Krishnamurthy, Lustig, Richmond, and Xu, 2025; Pinter, Uslu, and Smets, 2025; Yan and Morck, 2025). Such event studies

[6] A theoretical explanation may be that supply chain complexity and reliance on imported goods have increased. For instance, Bergin and Corsetti (2023) show that a sufficiently low share of material inputs in marginal cost induces producer-price deflation in response to a tariff shock.

[7] Further related empirical work studies the financial market response to tariff changes (Ostry, Lloyd, and Corsetti, 2025), as well as the effects of trade policy uncertainty (e.g., Caldara, Iacoviello, Molligo, Prestipino, and Raffo, 2020; Poilly and Tripier, 2025), policy uncertainty (e.g., Baker, Bloom, and Davis, 2016), and geopolitical risk (e.g., Caldara and Iacoviello, 2022; Franconi, 2024). We instead focus on the first-order effects of import tariff shocks, but our results are robust to including these measures in the VAR, as shown in the Online Appendix.

provide complementary insights into the economic consequences of the tariff trade war launched by the Trump Administration in 2025, although Liberation Day likely conflates uncertainty and tariff news shocks. Further related are the complementary works by Coibion, Gorodnichenko, and Weber (2025), who surveyed U.S. households about the potential Trump tariffs before the 2025 inauguration, and Cavallo, Llamas, and Vazquez (2025), who track the price impact of tariffs in real time.

Finally, we relate to the literature concerned with systematic policy changes. Using monetary policy shocks, Barnichon and Mesters (2023) focus on the optimality of policy, whereas McKay and Wolf (2023) and Caravello, McKay, and Wolf (2024) focus on the construction of policy counterfactuals. Such methods are used to construct counterfactual monetary responses to government spending shocks (Wolf, 2023) and counterfactual fiscal responses to monetary policy shocks (Bouscasse and Hong, 2023; Breitenlechner, Geiger, and Klein, 2024). Different from these approaches, Hack, Istrefi, and Meier (2023) leverage the exogenous rotation of voting rights in the Fed's Federal Open Market Committee.

2 Data and econometric methodology

2.1 Tariff shocks

Tariff VAR model. We estimate a quarterly vector autoregression model (VAR) with a deterministic intercept and a linear time trend. The VAR includes four lags of the nine endogenous variables. Specifically, we use real GDP, CPI inflation, and the federal funds rate as measures of real activity, prices, and monetary policy, respectively. Beyond these core variables, we include real imports and real exports as well as a terms-of-trade index to capture international trade dynamics. Lastly, we include real investment, macroeconomic uncertainty from Jurado, Ludvigson, and Ng (2015), and an import tariff measure.[8] All

[8]Except for the last two series, we take all data from FRED with identifiers *GDPC1, CPIAUCSL, DFF, IMPGSC1, EXPGSC1, W371RG3Q020SBEA, GPDIC1.*

variables are in logs except for the federal funds rate, the CPI inflation rate, and the tariff rate measure. The sample period spans 1990Q1-2024Q4 and is determined by the availability of disaggregated tariff data. We also view it as favorable to use a comparatively recent sample to capture the typical propagation of tariffs in today's economy. Finally, we estimate the VAR using conventional Bayesian techniques by imposing inverse-Wishart priors on the reduced-form VAR parameters.[9]

Tariff measurement. We consider three distinct import tariff measures. First, we use the trade-weighted average import tariff rate, given by customs duties divided by dutiable imports. The advantage is that it captures not only statutory tariff rates but also weighs them by their aggregate importance. However, it has the disadvantage that its variation can be partly driven by changes in import composition and import prices, both across origin countries and product categories. Thus, as an alternative, we consider an unweighted average import tariff rate as a second measure. Both of these tariff rates focus on the aggregate. Yet, tariffs can induce distortions and misallocation even if the (weighted or unweighted) average tariff rate remains unchanged. To address this, we use the tariff restrictiveness index originally proposed by Feenstra (1995) and expanded by Schmitt-Grohé and Uribe (2025) as a third tariff measure. This index has the advantage of capturing distortions due to cross-sectional variation in import tariff rates, but has the drawback of being a trade-weighted import tariff measure. Overall, every tariff measure has distinct advantages and disadvantages. This motivates the use of all three approaches to investigate whether we obtain consistent results across measures.[10]

[9]All reported results are based on 20,000 draws from the posterior distribution.

[10]The trade-weighted tariff rate is computed as customs duties (FRED *B235RC1Q027SBEA*) divided by dutiable imports. Dutiable imports are given by all goods imports (FRED *A255RC1Q027SBEA*) multiplied by the average share of dutiable goods over all imported goods taken from the DataWeb of the United States International Trade Commission. Using data from the latter source, the unweighted tariff rate is computed via the following approximation. First, we compute all disaggregated trade-weighted tariff rates at the four-digit HTS times origin country level. Then, we compute the (unweighted) arithmetic average across these disaggregated tariff rates. To limit the influence of small trading partners, we drop all countries with average import values below the median.

Tariff shock identification. The tariff shock is identified based on two assumptions. First, we assume partial invertibility of the VAR so that we can recover the tariff shock (Forni, Gambetti, and Sala, 2019).[11] A potential reason for invertibility failure may be the presence of tariff news shocks, i.e., tariff changes being announced several quarters in advance. We address this potential concern in two ways. We first employ the statistical testing procedure from Forni and Gambetti (2014). They show that invertibility can be evaluated by testing whether lagged principal components estimated from a large macroeconomic and financial dataset predict tariff shocks. Following their procedure, we find strong evidence that partial invertibility holds. As an additional exercise, we directly include the principal components in the VAR and find that this does not change impulse responses, reconfirming that invertibility likely holds. We provide both complementary results in the Online Appendix.

Second, we impose the timing restriction that a tariff shock affects all macroeconomic variables only with a one-period lag, except for the federal funds rate and the tariff measure. In turn, we allow other macroeconomic shocks to affect the tariff measure contemporaneously. This is important because variation in (trade-weighted) tariff measures can result from tariff shocks, but may also arise from changes in import composition or differential changes in import prices. By allowing other macroeconomic shocks to impact the tariff rate contemporaneously, we may control for these channels. Importantly, we allow the federal funds rate to respond to tariff shocks contemporaneously, remaining agnostic about the monetary response to tariffs, which we eventually perturb in the counterfactual exercises.

The second identifying assumption could be restrictive. Thus, we evaluate the imposed restrictions with four alternative identification approaches. First, we relax each zero restriction individually by allowing the tariff rate to affect the corresponding variable contemporaneously. Second, we employ a block-recursive identification similar to Christiano et al. (2005). That is, we relax the zero restrictions jointly on all "fast-moving" variables, which are the terms of trade, macroeconomic uncertainty, and the inflation rate. Third, we relax

[11] We emphasize that our VAR is partially identified and we only impose restrictions on the tariff shock but not on other macroeconomic shocks that affect, e.g., supply and demand.

all zero restrictions jointly by identifying the tariff shock via the penalty function approach of Uhlig (2005). Specifically, we identify the tariff shock as the one that increases the tariff rate the most over the first four quarters after a shock. This is sufficient to achieve point identification, and no other restrictions are required. Fourth, we adopt a narrative identification strategy and identify quarters in which changes in tariffs are primarily due to policy changes.[12] Based on this, we compute a time series of quarter-on-quarter changes in the trade-weighted average tariff rate, which takes zero values in all quarters without narratively identified policy changes. We include this as an exogenous series in the VAR and trace out the associated responses.

2.2 Monetary policy counterfactuals

Counterfactual method. We construct monetary policy counterfactuals following McKay and Wolf (2023) (MW, henceforth). Their method relies on the core assumption of *instrument sufficiency*, i.e., private agents do not care about the monetary rule per se, but only about the movements in the policy instrument, which is the federal funds rate in our application. This assumption holds in a broad class of macroeconomic models, including conventional New Keynesian theory. With this assumption, MW prove that many monetary policy (news) shocks can be used to correctly identify impulse responses to a macroeconomic shock that would prevail under a counterfactual monetary policy rule. To conserve space, we omit a formal description of the method and refer interested readers to the original paper for details. Instead, we focus on the empirical implementation of the counterfactual method.

Counterfactual implementation. The aim is to compute counterfactual responses when the central bank tries to stabilize a given variable of interest i, e.g., inflation. To expound the computation of counterfactuals, we denote the impulse response of variable i to shock j by vector IRF_i^j. In anticipation of our empirical implementation, we assume that we have two

[12] These events cover, e.g., the 2018 Trump trade war and the establishment of the WTO. The full list of events is provided in the Online Appendix.

distinct monetary shocks, s^1 and s^2, and the associated impulse responses at our disposal. Similarly, we assume to possess a baseline response to a tariff shock, IRF_i^{τ}. Given these inputs, the counterfactual is constructed by choosing the sizes of both monetary shocks that materialize simultaneously with the tariff shock. Formally, we solve

$$(\hat{s}^1, \hat{s}^2) = \underset{s^1, s^2}{\arg\min} \parallel IRF_i^{\tau} + s^1 IRF_i^{s^1} + s^2 IRF_i^{s^2} \parallel_{\omega}, \tag{1}$$

where $\| \cdot \|_{\omega}$ denotes a weighted Euclidean norm. Our baseline weights decay at a quadratic rate, placing more weight on the short-run responses in the above minimization.[13] Intuitively, we pick both monetary shocks, $\hat{s}^1$ and $\hat{s}^2$, so that variable i is as unresponsive as possible. Given these shocks, we can compute the implied counterfactual responses for any variable k as $IRF_k^{\tau} + \hat{s}^1 IRF_k^1 + \hat{s}^2 IRF_k^2$, provided that all three impulse responses are available. Our counterfactuals consider a monetary authority that aims to (i) not respond to the tariff shock with its policy rate, (ii) strictly stabilize inflation, or (iii) strictly stabilize output. These counterfactuals are implemented by solving (1), with variable i being (i) the federal funds rate, (ii) CPI inflation, and (iii) real GDP, respectively.

Monetary VAR model. We follow MW and estimate a separate monetary VAR model that uses the high-frequency identified monetary policy shock from Miranda-Agrippino and Ricco (2021) (MAR) and the Taylor rule residuals from Romer and Romer (2004) (RR) as two distinct shocks. For consistency with the baseline tariff VAR, we use the same VAR variables, lag specification, and estimation method. Following the internal instruments approach from MW, we further include both monetary shocks in the VAR vector. The MAR shock is ordered first, and the RR shock is ordered before the federal funds rate, but after all other

[13] This assumption is not restrictive. It only reflects our preference for the counterfactual being more accurate at shorter horizons. Effectively, one can solve the minimization problem by weighted least squares in impulse response space. The baseline sequence of weights is proportional to $(H+1)^2, (H)^2, (H-1)^2, .., (1)^2$, where H is the maximum response horizon that we report.

variables, and identification is achieved via a lower-triangular Cholesky decomposition.[14] The estimation sample is 1969Q1-2014Q4 and is determined by the availability of the monetary policy shocks, which we take directly from MW.[15] Finally, to obtain valid inference for the counterfactual, we take the baseline response to the tariff shock as given and account for joint estimation uncertainty of both monetary shocks by solving the minimization in (1) for each posterior draw of the monetary VAR.

3 The macroeconomic effects of tariff shocks

3.1 Baseline estimates

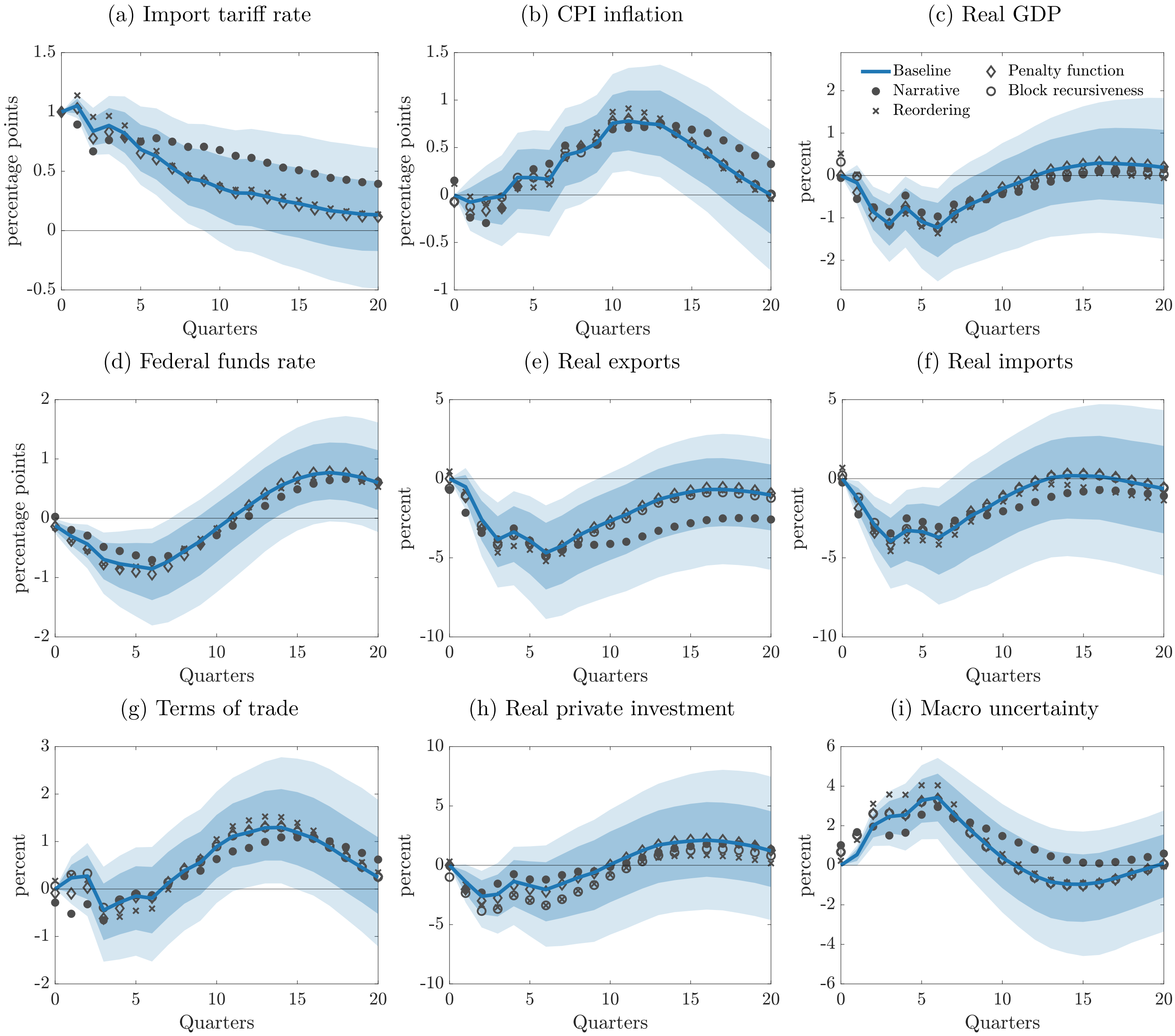
In Figure 1, we present impulse responses to a shock that raises the import tariff rate by 1 percentage point on impact. The baseline estimates use the trade-weighted average import tariff rate, and the medians of the posterior distribution are reported as blue solid lines. The shaded areas indicate 68% and 90% credible sets. As shown in Panel (a), the effects on the tariff rate are persistent and slowly revert over the five-year response horizon.

Core outcomes. Panels (b)-(d) show the responses of CPI inflation, real GDP, and the federal funds rate. Inflation starts increasing with a delay and peaks at 0.78 percentage points after 11 quarters. This inflation effect is somewhat persistent, and the 68% credible set includes zero only after 17 quarters. In contrast, real GDP declines more quickly. The trough is reached 6 quarters after the shock, with output being 1.23% lower. This decline is more transitory and vanishes after the second year, when even the 68% credible set overlaps the zero line. Lastly, we find partial monetary accommodation of the tariff shock. The federal funds rate responds negatively for two years. Quantitatively, at the trough, the federal funds

[14] Ordering the RR shock second-to-last is also done in MW and is often used as "exogeneity insurance" to address residual identification concerns (see, e.g., Ramey, 2016).

[15] The MAR shock is available from 1980Q1-2014Q4, and the RR shock from 1969Q1-2007Q4. We set missing values within the estimation sample to zero. In the Online Appendix, we provide additional results by changing the sample period and using alternative monetary policy shock measures.

Figure 1: Responses to the import tariff rate shock



Notes: This figure shows impulse responses estimated based on a Bayesian VAR, as specified in Section 2. The solid blue line represents the posterior median, and the shaded areas are 68% and 90% credible sets. The baseline estimates impose the identifying restriction that the shock affects only the import tariff rate and the federal funds rate contemporaneously. The gray markers show the posterior medians using alternative identification approaches that relax the baseline assumptions. Reordering: We relax each zero restriction individually by reordering the VAR vector. Block recursiveness: Along the lines of Christiano et al. (2005), we jointly relax the zero restrictions for all "fast moving" variables, which are macro uncertainty, terms of trade, and CPI inflation. Penalty function: Following Uhlig (2005), we identify the tariff shock by maximizing the impact on the tariff rate for the first four quarters after the shock and imposing no zero restrictions at all. Narrative: We compile a time series that captures changes in tariffs due to narratively identified tariff policy changes, include this series as additional exogenous variable to the VAR, and present responses to a shock to this series.

rate is 0.85 percentage points lower after 6 quarters and starts to revert thereafter.

Additional outcomes. The responses of the remaining VAR variables are displayed in Panels (e)-(i) of Figure 1. These variables enable us to further understand the mechanism by which tariff shocks are transmitted. Focusing on trade, we find declining real exports and imports, and a more delayed increase in the terms of trade. Macroeconomic uncertainty increases and real investment declines transitorily, consistent with real-option theory.

Discussion. The responses align well with the theoretical literature. First, we confirm that tariff shocks are contractionary, in line with, e.g., Auclert et al. (2025).[16] Second, tariffs are inflationary and, as a result, act as supply shocks, consistent with Werning et al. (2025). Third, we find that monetary policy partially accommodates the contractionary tariff shock to cushion its effect on real activity, albeit at the expense of higher prices. Interestingly, such partial accommodation can be the optimal response to a tariff shock (e.g., Bergin and Corsetti, 2025; Bianchi and Coulibaly, 2025; Monacelli, 2025; Werning et al., 2025).

Relaxing identifying assumptions. Next, we carefully evaluate our identifying assumptions by considering four alternative identification approaches, as explained in Section 2.1. We show the corresponding median posteriors as gray markers in Figure 1. We suppress the posterior credible sets because they are very similar to the baseline, but provide them in the Online Appendix. Across all alternative approaches, we find results close to our baseline, with the impact effects being remarkably close to zero even without imposing short-run zero restrictions. Additionally, even the narrative approach delivers similar effects, suggesting that our estimates are unlikely to be confounded by changes in import prices or composition due to other macroeconomic shocks. In summary, this confirms that our baseline identification approach is not unduly restrictive.

Alternative tariff measures. In Figure 2, we provide the responses when using two alternative tariff measures, as introduced in Section 2.1. We normalize both tariff series to

[16] The theory in Antonova et al. (2025) suggests that our tariff shocks mostly capture tariffs imposed on upstream sectors, since they find only upstream-sector tariffs to be clearly recessionary.

have the same variance as the trade-weighted average tariff rate to make them as comparable as possible. The estimates are broadly similar to the baseline. The trade restrictiveness index delivers slightly larger magnitudes, plausibly because it also captures distortions due to cross-sectional tariff variation. In contrast, the unweighted tariff rate yields smaller effects, suggesting that weighting tariffs by aggregate importance is important. Nevertheless, we view it as reassuring that these results confirm that tariff shocks are inflationary, recessionary, and, if anything, partly accommodated by monetary policy.

Further sensitivity analysis. We further investigate the sensitivity of our results to various modeling choices and present this complementary analysis in the Online Appendix. We relax VAR assumptions by adjusting the lag order or by estimating local projections, as recommended by Montiel Olea, Plagborg-Møller, Qian, and Wolf (2025). We account for the Covid-19 pandemic in our sample by dummying out the pandemic period, as recommended by Lenza and Primiceri (2022). Lastly, we include higher-order deterministic time trends to account for slow-moving trends in international trade. None of these extensions changes our conclusions. Moreover, in the next subsection, we augment the VAR with various additional variables to further study the propagation of tariff shocks. When doing so, we find that the responses of the baseline variables remain similar, suggesting that our results are not driven by the omission of important variables from the VAR.

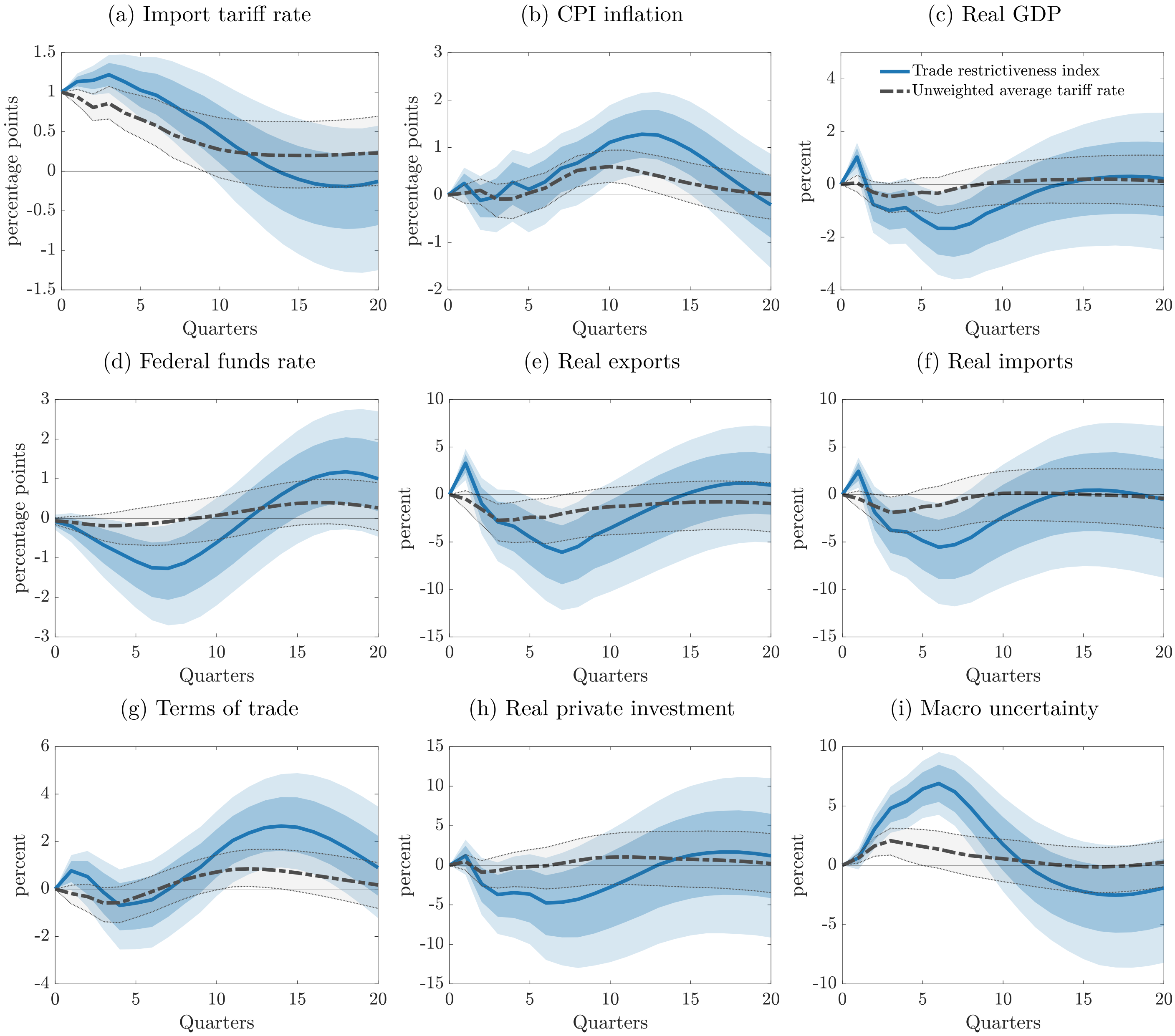
3.2 A further look at the propagation of tariff shocks

In Figure 3, we present the responses of various additional variables to the baseline tariff shock to further understand the propagation mechanisms.[17]

Fiscal implications. Motivated by Alessandria et al. (2025), we focus on the implications for the government budget constraint. In the first row of Panel A, we show that tariff shocks generate revenues via customs duties and induce a corresponding transitory increase

[17] We impose a zero impact effect on all additional variables in Panel A, except for customs duties.

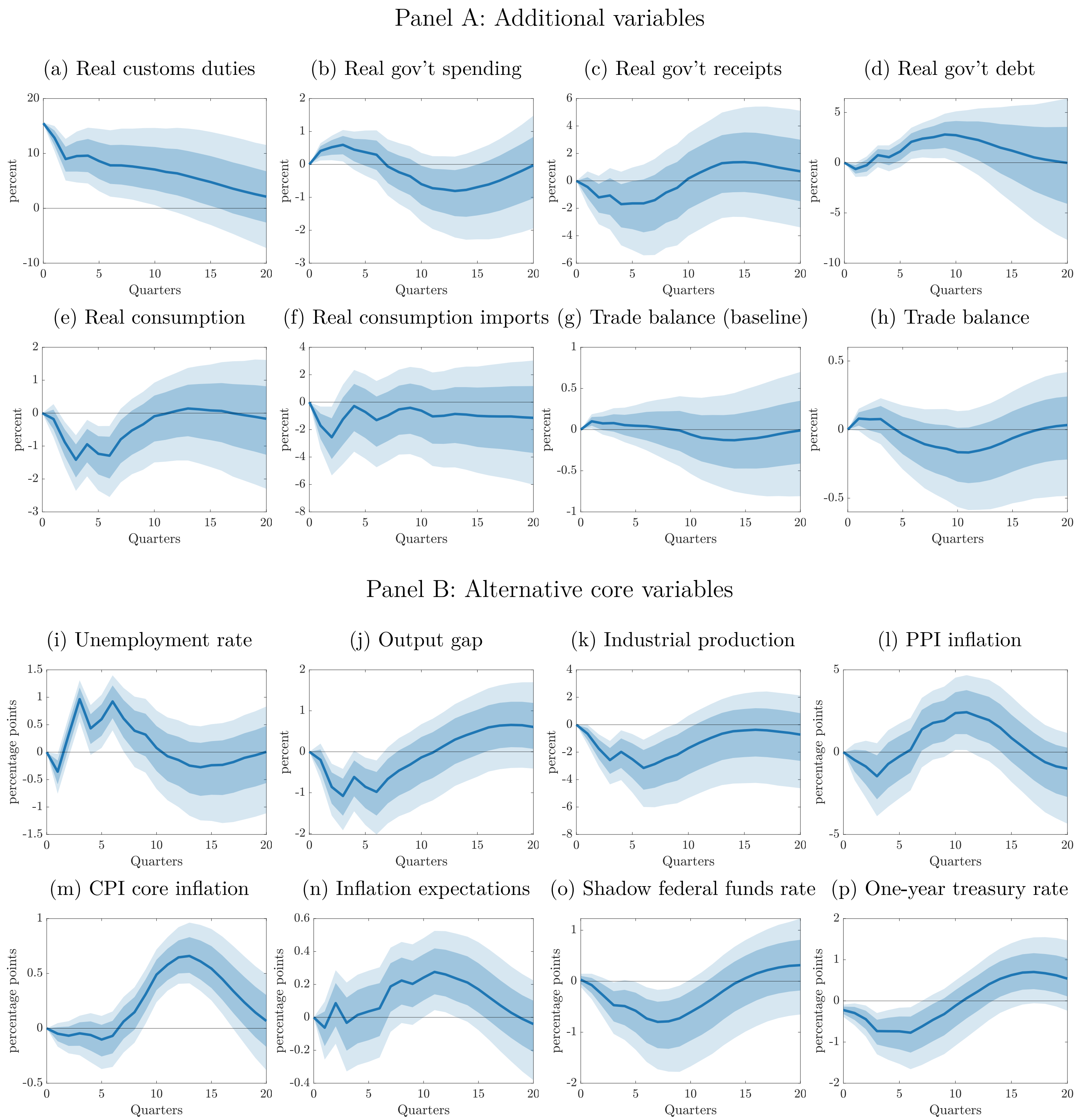
Figure 2: Responses to the import tariff shock using alternative tariff measures



Notes: This figure shows impulse responses estimated based on a Bayesian VAR, as specified in Section 2. The solid blue line represents the posterior median using the trade restrictiveness index from Schmitt-Grohé and Uribe (2025), and the shaded areas are 68% and 90% credible sets. The dashed-dotted gray line represents the posterior median using an unweighted average import tariff rate, and the thin dotted lines indicate the 90% credible sets. Identification is achieved via our baseline approach.

in government spending, consistent with the narratives of some tariff proponents. However, government receipts tend to decline due to the contractionary impact. Overall, we find that tariffs have a negative effect on the government budget, and real federal debt increases.

Figure 3: Responses of further macroeconomic variables to the import tariff shock



Notes: This figure shows impulse responses estimated based on a Bayesian VAR, as specified in Section 2. The solid blue line represents the posterior median, and the shaded areas are 68% and 90% credible sets. Identification is achieved via our baseline approach. In Panel A, (a)-(f), we augment the baseline VAR by each variable individually and re-estimate the model. In Panel (g), we use our baseline VAR and compute the implied trade balance response, as described in the text. In Panel (h), we include the trade balance relative to GDP instead of real imports and exports in the VAR. In Panel B, we replace individual variables from the baseline VAR by alternative measures. We replace real GDP by alternative measures of real activity in Panels (i) to (k). We replace CPI inflation by other price measures in Panels (l) to (n). We replace the federal funds rate by alternative interest rates in Panels (o) to (p).

Consumption. Since the main mechanism in Auclert et al. (2025) operates via consumption, we study the effects on private consumption and on imports of consumption goods and report the responses in Panel A. The former confirms that the contractionary effects are partly driven by consumption, while the latter shows that imports of consumption goods decline only very transitorily.

Trade balance. Tariffs are often justified with protectionist arguments claiming they shield domestic producers from foreign competition, which would suggest an improvement in the trade balance. To investigate this, we use our baseline estimates and compute the implied trade balance effects, presented in Panel (g).[18] Alternatively, we include the trade balance (exports minus imports over GDP) directly in the VAR instead of real imports and exports and plot its response in Panel (h). If anything, we find that the trade balance improves only transitorily, indicating little evidence for the above protectionist argument.

Alternative core variables. In Panel B of Figure 3, we consider alternative measures of real activity, prices, and interest rates. Throughout, we replace each baseline variable in the VAR with the corresponding alternative measure. All measures of real activity – unemployment rate, output gap, and industrial production – indicate that a tariff hike is recessionary. Similarly, all price measures – PPI inflation, CPI core inflation, and one-year inflation expectations from the Michigan survey – indicate that tariffs are inflationary. Finally, we consider alternative interest rates that account for the zero lower bound in our sample. Both the one-year Treasury yield and the shadow federal funds rate from Wu and Xia (2016) confirm partial monetary accommodation of tariff shocks.

[18]We compute the trade balance response based on our estimated semi-elasticities of real exports and real imports, which we convert into level effects by multiplying by average real exports and average real imports, respectively. We then use the implied level effects to compute real exports minus real imports and divide by average real GDP to obtain the trade balance.

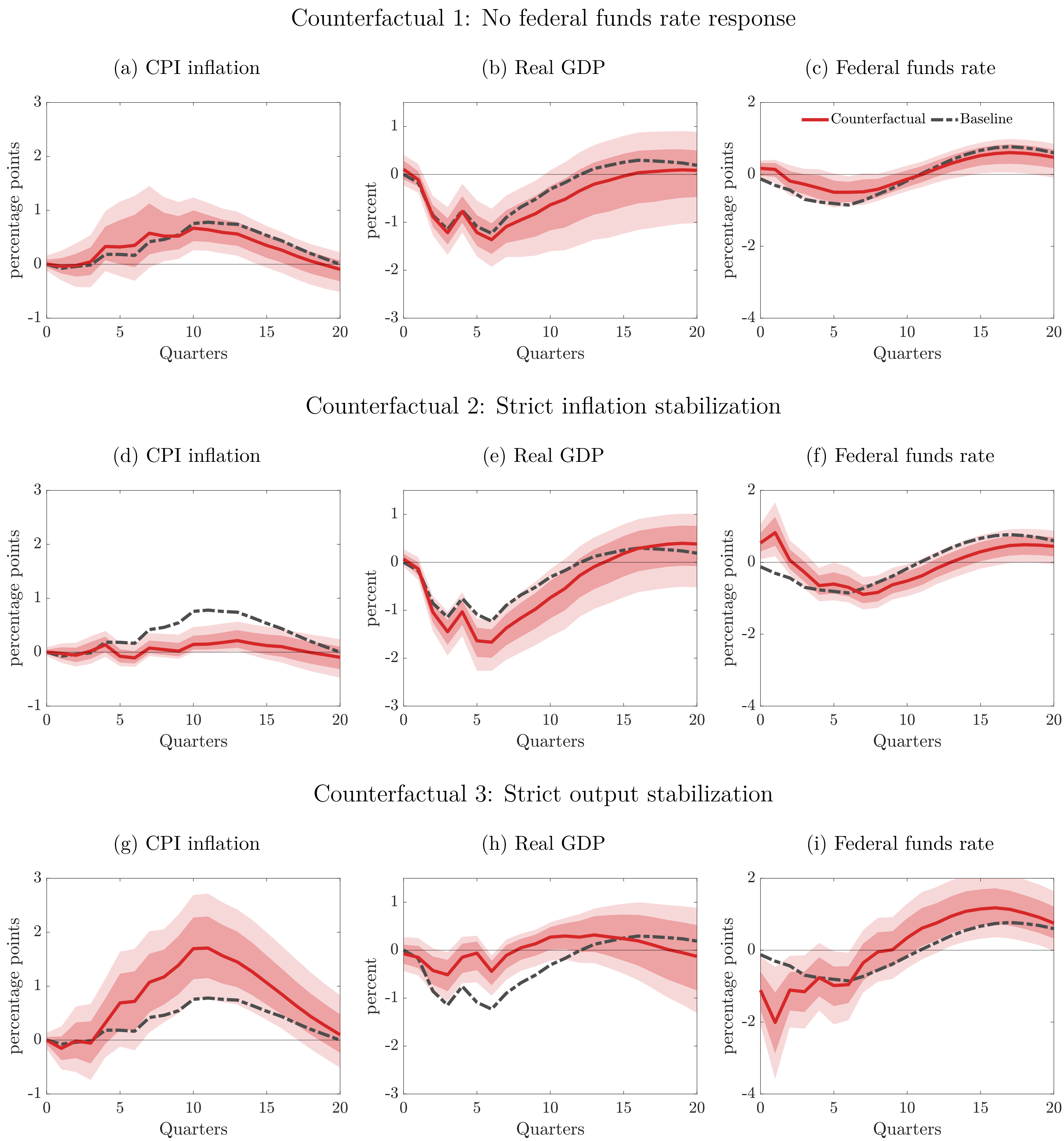
4 The monetary policy response to tariff shocks

We construct three distinct monetary policy counterfactuals using the methodology from McKay and Wolf (2023), as outlined in Section 2.2. The counterfactuals use the baseline responses to the tariff shock shown in Figure 1. We focus our discussion on the counterfactual responses of the core variables, which we present in Figure 4. The displayed 68% and 90% credibility sets account for the joint estimation uncertainty of both monetary shocks. For comparison, we also show the baseline responses to the tariff shock as a gray dashed line. Finally, we also discuss the remaining variables and the sensitivity of the results.

No interest rate response. The baseline responses from Section 3 suggest that U.S. monetary policy partly accommodates tariff shocks. Such an easing is consistent with a Taylor rule that puts relatively more weight on stabilizing real activity. However, a natural benchmark is a scenario in which nominal interest rates do not respond to a temporary tariff shock, as considered by Auclert et al. (2025). Therefore, we construct a corresponding counterfactual in which the federal funds rate responds as little as possible to the tariff shock. The counterfactual is in the first row of Figure 4. Panel (c) shows that the federal funds rate is less responsive than in the baseline.[19] Real GDP is broadly unaffected by this alternative monetary response for around 4 quarters. However, the adverse GDP effects are stronger at the trough and more persistent, absent the monetary easing from the baseline. In turn, this pays off via a 14% lower peak inflation effect (0.11 percentage points lower) and a less persistent inflation response. Thus, we confirm that the inflationary impact of tariffs is partly driven by the monetary easing.

[19] A perfectly unresponsive federal funds rate would require not only two but infinitely many distinct monetary shocks. Alternatively, one would require more structural assumptions to extrapolate from the existing empirical evidence (Caravello et al., 2024). We refrain from doing so to keep the structural assumptions to a minimum.

Figure 4: Responses of core variables to tariffs under counterfactual monetary policy



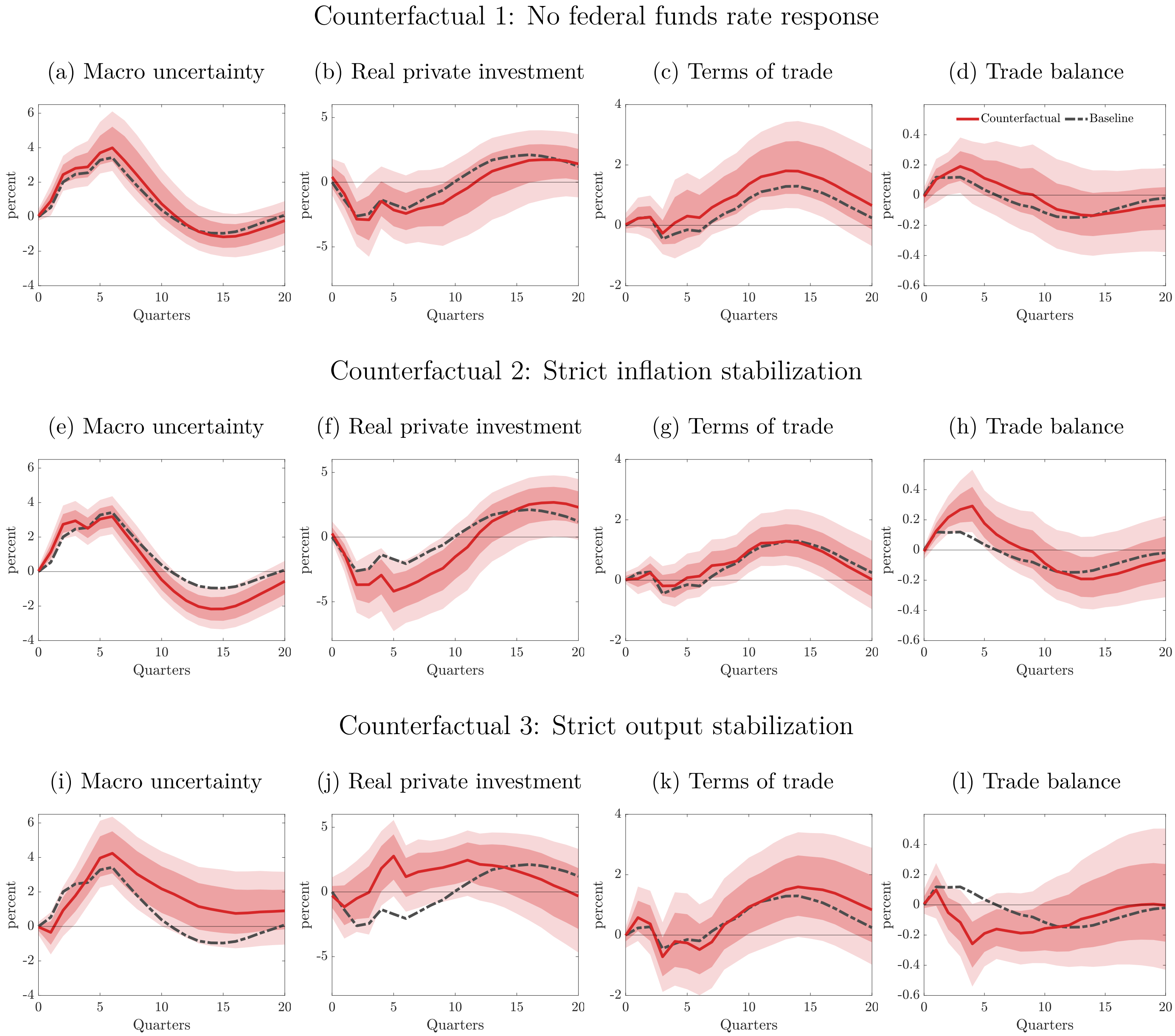
Notes: This figure shows counterfactual impulse responses estimated based on a Bayesian VAR, as specified in Section 2. The counterfactuals are computed using monetary policy shocks following McKay and Wolf (2023). The solid red line represents the posterior median of the counterfactual, and the shaded areas are 68% and 90% credible sets. The dashed gray line corresponds to the baseline median response to a tariff shock, as displayed in Figure 1. For comparison, we keep the vertical axis for each variable across counterfactuals fixed.

Strict inflation stabilization. Since inflation is less persistent absent partial monetary accommodation, we explore how potent monetary policy is in stabilizing prices and what output costs it implies. To this end, we consider a counterfactual in which CPI inflation responds as little as possible and show the results in the second row of Figure 4. This policy requires a short-lived interest rate hike that peaks at 0.82 percentage points only 1 quarter after the shock. Then, the policy rate falls quickly, reaching the baseline response after 7 quarters and undershooting thereafter. Such a sharp and short-lived rate hike is sufficient to tame inflation, with peak inflation being reduced from 0.78 to only 0.21 percentage points. However, this policy amplifies the recessionary impact of the shock considerably. The counterfactual real GDP trough is 0.44 percentage points lower than the baseline. In comparison, this represents a 36% increase in the adverse output effects between the baseline and counterfactual troughs. Moreover, it takes 16 quarters for the counterfactual response to catch up with the baseline, suggesting persistent adverse output effects.

Strict output stabilization. As the last counterfactual, we estimate the alternative policy scenario in which monetary policy aims to fully stabilize real activity while ignoring inflation. This counterfactual is given in the third row of Figure 4 and is implemented with a peak interest rate cut of about 2 percentage points reached only 1 quarter after the tariff shock. As expected, inflation increases considerably in this counterfactual scenario. Specifically, the peak inflation effect almost doubles compared with the baseline (an increase of 0.93 percentage points). This suggests a sizable sacrifice of price stability to minimize the adverse GDP impact, which is strongly dampened. However, the interest rate cut is not large enough to fully offset the adverse GDP effects. Thus, even stronger monetary easing may be necessary to achieve full output stabilization. This suggests that the increase in inflation is likely a lower bound for the strict output stabilization counterfactual.

Additional counterfactual outcomes. We present counterfactual responses of the additional outcome variables in Figure 5. The results suggest that real investment is an impor-

Figure 5: Responses of additional variables to tariffs under counterfactual monetary policy



Notes: This figure shows counterfactual impulse responses estimated based on a Bayesian VAR, as specified in Section 2. The counterfactuals are computed using monetary policy shocks following McKay and Wolf (2023). The solid red line represents the posterior median of the counterfactual, and the shaded areas are 68% and 90% credible sets. The dashed gray line corresponds to the baseline median response to a tariff shock, as displayed in Figure 1. For comparison, we keep the vertical axis for each variable across counterfactuals fixed.

tant channel through which interest rates are transmitted. Instead, macro uncertainty is less affected by the different monetary responses over the first part of the response horizon. Further, output stabilization reverses the effects on the trade balance, whereas inflation stabilization amplifies the trade balance improvement.

This pattern is consistent with the dominant currency paradigm (Gopinath, Boz, Casas, Díez, Gourinchas, and Plagborg-Møller, 2020), in which muted expenditure-switching effects imply that monetary policy primarily influences the trade balance through its impact on domestic demand. This illustrates a trade-off between avoiding the recessionary impact of tariffs and improving the trade balance. Finally, we detect no meaningful differences for the terms of trade.

The role of monetary policy shocks. Following McKay and Wolf (2023), there are two limitations. The first limitation is that the class of models for which their counterfactual method is valid may be too small. While this is a legitimate concern, we view the class of models as sufficiently broad, as it includes conventional New Keynesian theory. The second limitation concerns the responses to monetary policy shocks used to construct the counterfactuals. We provide a complementary analysis of these responses in the Online Appendix. We show that responses to both monetary shocks conform well with theory. We also construct counterfactuals using only one of the two monetary policy shocks. Regardless of which shock we pick, we can only partially achieve our baseline counterfactuals, suggesting that both shocks contribute to the counterfactuals. Beyond this, we also vary the sample period and use a shock identified via a heteroskedasticity-based approach (Jarociński, 2024) and an augmented Romer and Romer (2004) regression that accounts for time variation in systematic monetary policy (Hack, Istrefi, and Meier, 2024).

5 Conclusion

Tariff increases act as adverse supply shocks, which monetary policy partially accommodates by lowering interest rates. This insight aligns well with economic theory and is robust to several tariff measurement and identification approaches. Our monetary policy counterfactuals further demonstrate that the systematic response of monetary policy crucially shapes the macroeconomic effects of tariff shocks.

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Online Appendix

Import Tariffs and the Systematic Response of Monetary Policy

December 8, 2025

Alessandro Franconi and Lukas Hack

Contents

A Data sources

All data sources are described below. We use the arithmetic average across observations to aggregate to a quarterly frequency for all monthly data except the monetary shocks.

Table A.1: Import tariff measures

Variable	Data identifier and details
Trade-weighted average tariff rate	Computed as customs duties (*B235RC1Q027SBEA*) divided by dutiable imports. Dutiable imports are given by all goods imports (*A255RC1Q027SBEA*) multiplied by the average share of dutiable goods over all imported goods taken from the DataWeb of the United States International Trade Commission.
Not trade-weighted average tariff rate	We use an approximate unweighted average tariff rate computed as follows. First, we compute all disaggregated trade-weighted tariff rates at the four-digit HTS times origin country level. Then, we compute the (unweighted) arithmetic average across these disaggregated tariff rates. To limit the influence of small trading partners, we drop all countries with average import values below the median, where average import values are computed over the full sample. The data is retrieved from the DataWeb of the United States International Trade Commission.
Trade restrictiveness index	The index is provided by Schmitt-Grohé and Uribe (2025) and can be downloaded here.

Notes: Data identifiers are in italic letters if taken from FRED, provided by the FRB of St. Louis.

Table A.2: Macroeconomic data

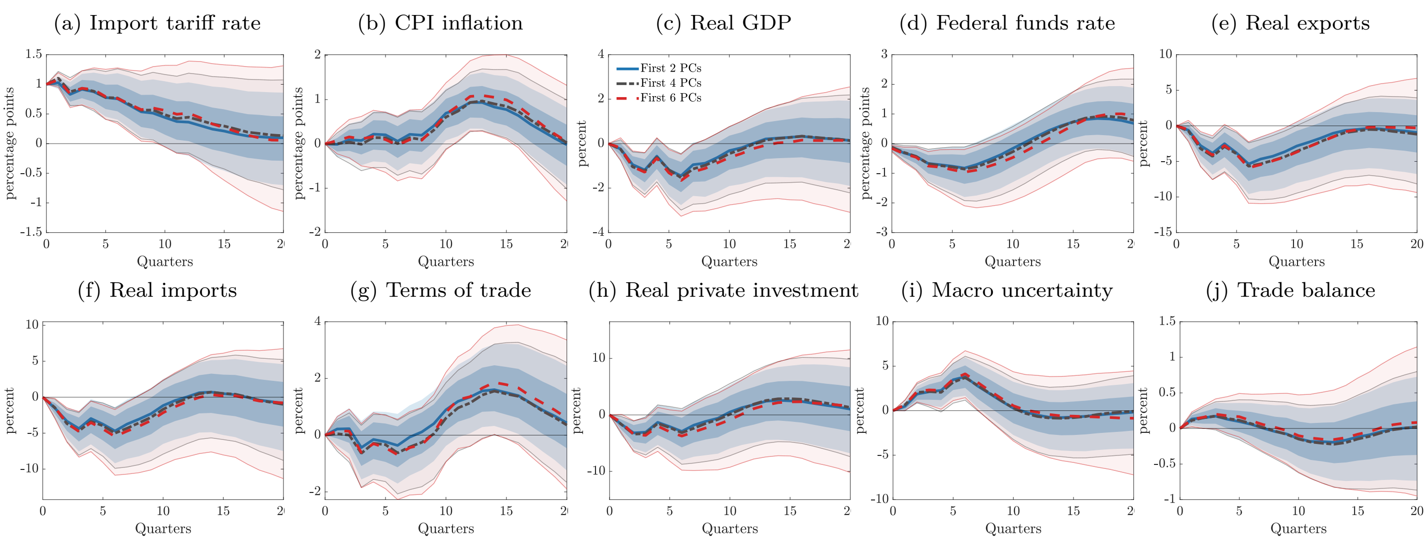
Variable	Data identifier and details
CPI inflation	*CPIAUCSL* and implied year-over-year inflation.
CPI core inflation	*CPILFESL* and implied year-over-year inflation
Inflation expectations.	*MICH* (One-year horizon).
PPI inflation	*PPIACO* and implied year-over-year inflation.
Real GDP	*GDPC1*
Real investment	*GPDIC1*
Real consumption	*PCECC96*
Imported consumption goods	Computed as nominal imported consumption goods (excluding automotive and food) (*A652RC1Q027SBEA*) divided by the GDP deflator (*GDPDEF*).
Real government spending	*GCEC1*
Real exports	*EXPGSC1*
Real imports	*IMPGSC1*
Unemployment rate	*UNRATE*
Industrial production	*INDPRO*
Output gap	Computed as real GDP (*GDPC1*) divided by potential output (*GDPPOT*).
Terms of trade (non-petrolium goods)	*W371RG3Q020SBEA*
Federal funds rate	*DFF*
One-year treasury yield	*GS1*
Real federal debt	Computed as nominal federal debt (*FGSDODNS*) divided by the GDP deflator (*GDPDEF*).
Real government receipts	Computed as nominal federal debt (*FGRECPT*) divided by the GDP deflator (*GDPDEF*) minus real customs duties (*B235RC1Q027SBEA*).
Macroeconomic uncertainty	We use the 12-month index, which can be downloaded here.
Shadow federal funds rate	We use the shadow federal funds rate from Wu and Xia (2016), which can be downloaded here.
Romer and Romer (2004) shock	We use the extended shock that ends in 2007Q4, taken from McKay and Wolf (2023).
Miranda-Agrippino and Ricco (2021) shock	We use the shock that ends in 2014Q4, taken from McKay and Wolf (2023). They take the shock corresponding to the posterior mode of the reduced-form parameters of the original paper.
Jarociński (2024) shock	We use the conventional monetary shock (*u1*), which can be downloaded here.
Hack et al. (2024)	We take the refined Romer and Romer (2004) shock kindly provided by the authors.

Notes: The displayed variables are from FRED, provided by the FRB of St. Louis. Data identifiers are in italic letters. All remaining variables are provided by the mentioned scholars as indicated in the second column.

B Testing partial invertibility

To ensure that our baseline VAR contains sufficient information to identify the tariff shock, we perform the orthogonality test proposed by Forni and Gambetti (2014). First, we estimate the principal components using a large quarterly dataset of macroeconomic and financial variables for the U.S. economy, taken from McCracken and Ng (2021). Then, we test for orthogonality with respect to the lags of these principal components. To select the optimal number of principal components to be included in the test, we rely on the criteria proposed by Alessi, Barigozzi, and Capasso (2010), which suggests the first four or first six principal components. The results of the orthogonality test are reported in Table B.1. In all cases, we cannot reject the null hypothesis of orthogonality, indicating a lack of shock predictability by the information set spanned by the principal components. As an additional test, we include the first two, four, and six principal components in the VAR and order them after the federal funds rate. The results in Figure B.1 are similar to the baseline. This indicates that our results are not driven by the omission of important macroeconomic and financial variables from our VAR.[1] Overall, both exercises indicate that our baseline VAR is informationally sufficient to identify the tariff shock.

Figure B.1: Include principal components in VAR vector



Notes: The solid blue, dashed-dotted gray, and dashed red lines represent posterior medians. The blue shaded areas are 68% and 90% credible sets, and the thin-dotted lines indicate 90% credible sets. We include principal components in the VAR and allow the tariff shock to impact these principal components in the quarter of the shock; see text for details.

[1] Including more principal components does not meaningfully change the results.

Table B.1: Testing partial invertibility based on Forni and Gambetti (2014)

	First 4 PCs, k lags				First 6 PCs, k lags			
	$k=1$	$k=2$	$k=3$	$k=4$	$k=1$	$k=2$	$k=3$	$k=4$
F-stat	0.161	0.429	0.425	0.472	0.249	0.497	0.569	0.527
p-value	0.958	0.902	0.951	0.956	0.959	0.913	0.915	0.964

Notes: The table shows the results of the "Structuralness" test proposed in Forni and Gambetti (2014). Specifically, we report the F-statistics and the p-values for regressions of the tariff shock on up to k lags of the first four and six principal components. The shock is based on the posterior median of the Tariff VAR, taken over the reduced-form parameters.

C Narrative identification

Our baseline tariff rate measure is trade-weighted and, thus, may also be affected by compositional changes in imports and import prices. To address the concern that our estimates pick up these alternative sources of variation, we compile a series of narratively identified tariff policy changes, which are unlikely to be confounded by the above-described issues. To this end, we define an indicator, $\mathbb{I}_t\{\text{tariff policy event}\} \in \{0,1\}$, which is only activated when we identify a tariff policy change in quarter t. Table C.1 lists all of these events. Finally, we compute our narrative tariff change time series as $\Delta\tau_t^{narr} = \mathbb{I}_t\{\text{tariff policy event}\}\Delta\tau_t$, where $\Delta\tau_t$ denotes the quarter-on-quarter change in the trade-weighted average tariff rate. We include this series as an exogenous variable in the VAR.

Table C.1: Narratively identified tariff policy changes

#	Event description	Quarterly date
(1)	NAFTA Agreement	1994Q1
(2)	WTO Establishment	1995Q1
(3)	US–Canada SLA Agreement I	1996Q2
(4)	WTO ITA I	1997Q3
(5)	Trade & Development Act (Sub-Saharan Africa)	2000Q2
(6)	Bush Steel Safeguard	2002Q1
(7)	Early Removal of Bush Steel Safeguard	2003Q4
(8)	US–Canada SLA Agreement II	2006Q4
(9)	WTO ITA II	2016Q3
(10)	US Tariffs (Solar, Washing Machines, Steel, Aluminum)	2018Q1
(11)	Section 232 Expansion (EU, Canada, Mexico)	2018Q2
(12)	Section 301 China Tariffs – List 1 & 2	2018Q3
(13)	Section 301 China Tariffs – List 3	2018Q4
(14)	Section 301 China Tariffs – List 3 Increase	2019Q1

D Comparison with Schmitt-Grohé and Uribe (2025) and Barnichon and Singh (2025)

Schmitt-Grohé and Uribe (2025) estimate transitory and permanent U.S. import tariff shocks. Different from our results, they find that transitory import tariff shocks are deflationary and expansionary. Their permanent shocks deliver a very transitory inflation response and a mostly insignificant expansion of output. Barnichon and Singh (2025) estimate an annual VAR model over 150 years and also find that tariffs are deflationary. However, different from Schmitt-Grohé and Uribe (2025), they document contractionary effects of tariffs. Below, we investigate why their results differ from our findings.

The core methodological differences of Schmitt-Grohé and Uribe (2025) relative to our approach are that they (i) use a state-space model following Uribe (2022), (ii) impose that the trade-weighted average tariff rate is exogenous to the economy (in their baseline), (iii) consider a different set of macroeconomic variables, and (iv) use a sample that starts already in 1959Q2.

To compare with their results, we use our baseline identification approach and focus on (iv), the sample period. First, we re-estimate our VAR but let our sample start in 1980Q1 to ensure that our results are not unduly sensitive to starting the sample in 1990Q1.[2] The results are shown as solid blue lines in Figure D.1. In this sample, our main results remain unchanged. In particular, we still find that tariff shocks are inflationary and contractionary. Next, we go further and start the sample in 1967Q1, which is the earliest feasible sample start due to data availability.[3] The results are shown as gray dashed-dotted lines. Indeed, in this long sample, we find that the shock is deflationary and not contractionary anymore, broadly consistent with Schmitt-Grohé and Uribe (2025).

However, the extended sample includes two large tariff spikes, the so-called Nixon and Ford shocks, which are also discussed in Schmitt-Grohé and Uribe (2025); see their Figure 4. However, the Nixon shock partly captures the endogenous response of the US government to

[2]Recall that this sample start is chosen because all three tariff measures are available from 1990 onward.
[3]An earlier sample start is infeasible since the terms of trade index is only available starting in 1967.

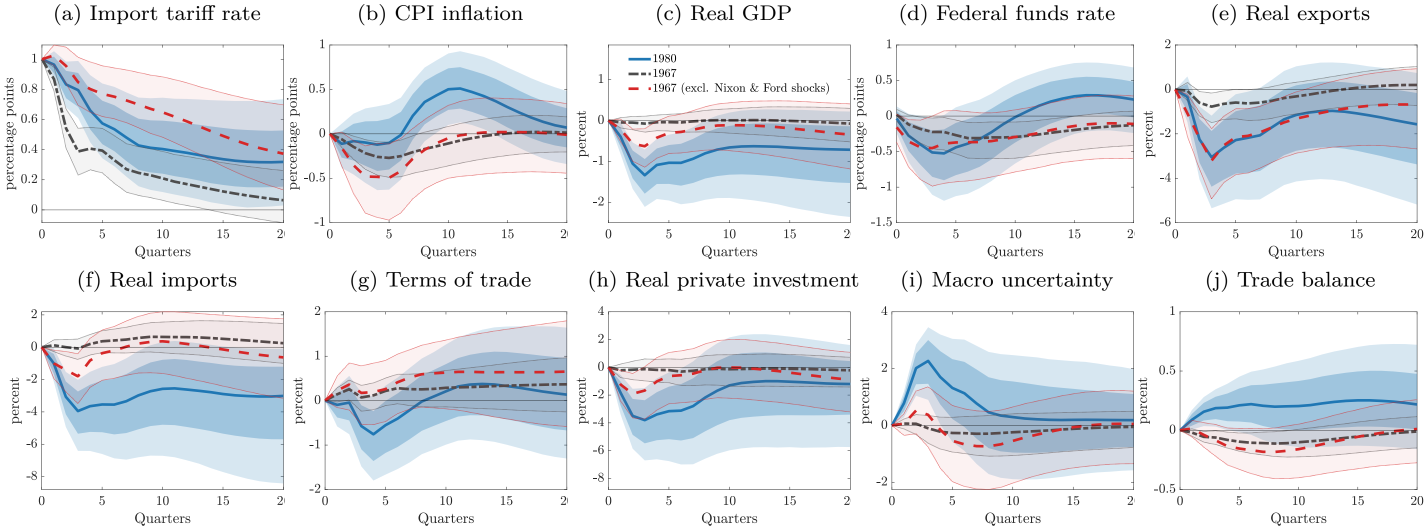
the turmoil associated with the end of the Bretton Woods system. The Ford shock was a tariff on oil imports, partly in response to high oil prices (Dainauskas and Lastauskas, 2024). Note that Barnichon and Singh (2025) raise similar concerns in their narrative account. Because of these potential endogeneity concerns, we would like the estimates not to be unduly affected by these events.

Thus, we investigate how the results change if one takes out these shocks. Specifically, we smooth out these events from the average tariff rate time series in the following way: We replace the values during these shock episodes with the average import tariff across the pre- and post-event tariff rate.[4] The responses using the smoothed import tariff series are shown as dashed red lines in Figure D.1. It turns out that we recover a significant output contraction, which is also visible in other components of aggregate demand, e.g., in real private investment. Thus, we conclude that there is robust evidence for tariffs being contractionary, consistent with Barnichon and Singh (2025), while the effects on inflation are more sample dependent.

A potential reason for this sample dependence is that supply chain length and supply chain complexity have increased substantially, so that more products are affected by tariff changes in today's economy. In a similar vein, Bergin and Corsetti (2023) show that a sufficiently low share of material inputs in marginal cost may predict tariff hikes to be deflationary. Investigating such dependencies in greater detail is left for future research, however.

[4]The Nixon shock took place in the third and fourth quarters of 1971. The Ford shock took place during all quarters of 1975.

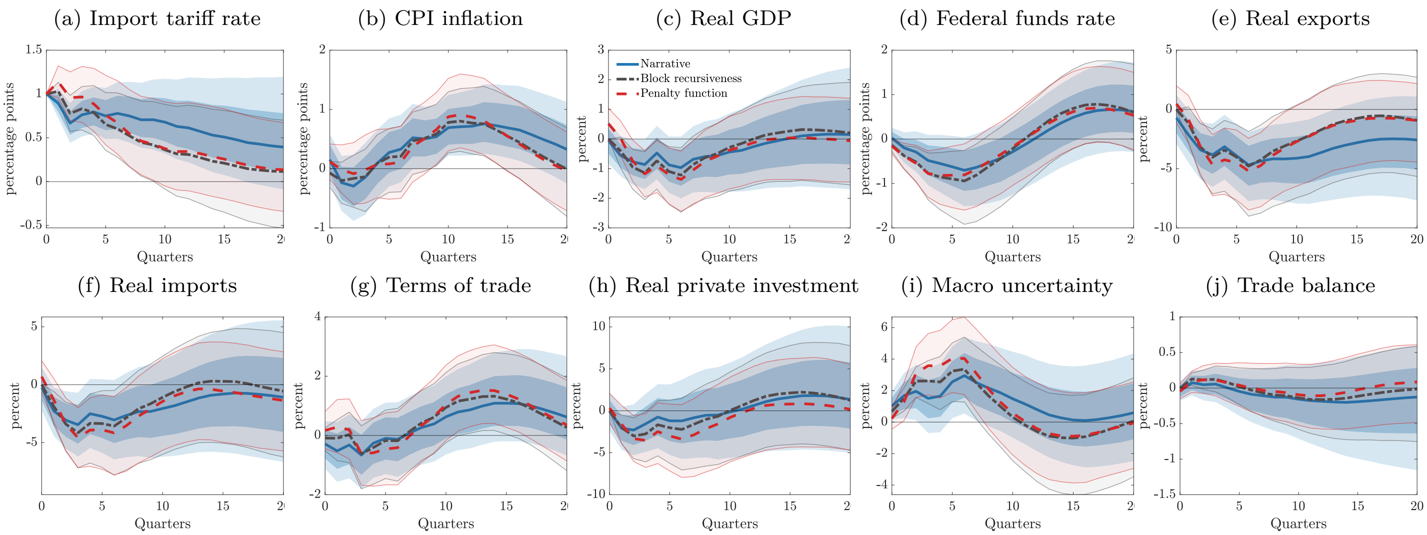
Figure D.1: Varying sample starts to compare with Schmitt-Grohé and Uribe (2025)



Notes: The solid blue, dashed-dotted gray, and dashed red lines represent posterior medians. The blue shaded areas are 68% and 90% credible sets, and the thin-dotted lines indicate 90% credible sets. The legend indicates the sample start of the respective specification; see text for details.

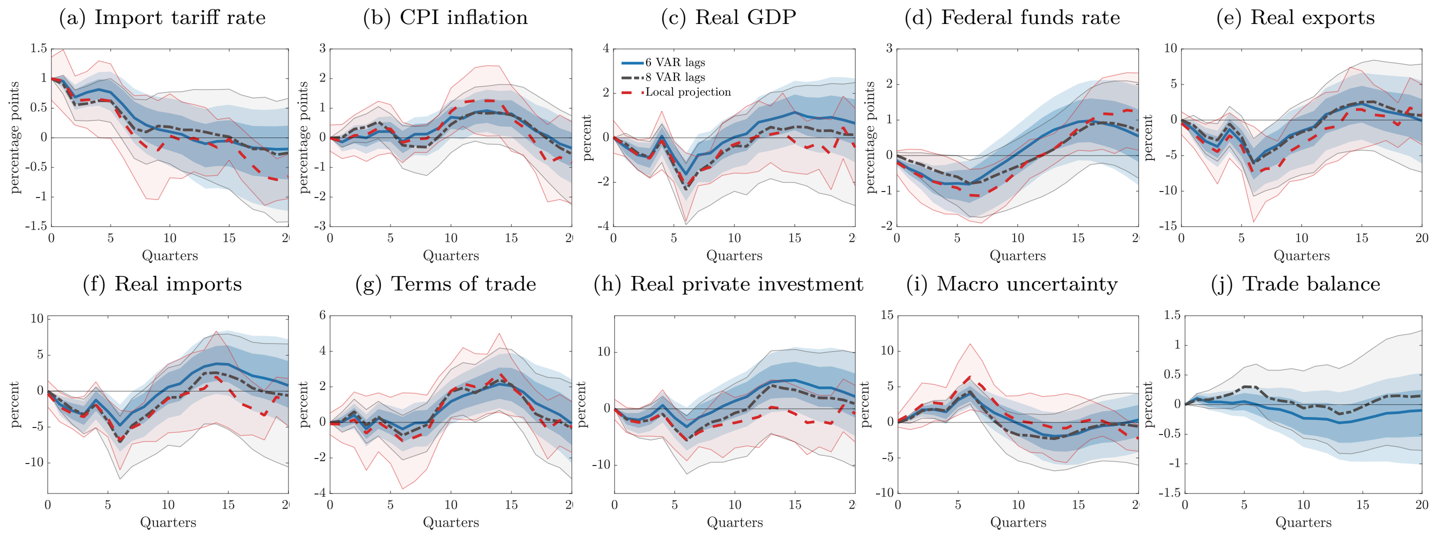
E Additional results and robustness for tariff shocks

Figure E.1: Alternative identification approaches



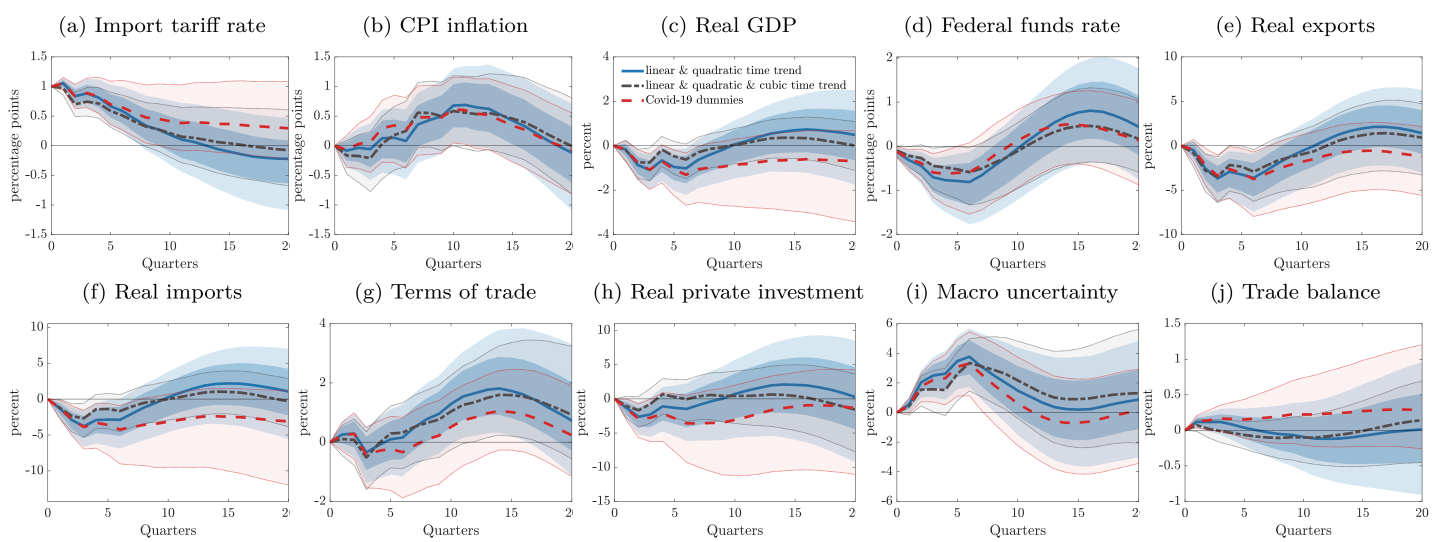
Notes: The solid blue, dashed-dotted gray, and dashed red lines represent posterior medians. The blue shaded areas are 68% and 90% credible sets, and the thin-dotted lines indicate 90% credible sets. The legend indicates the identification approach of the respective specification; see main text for details.

Figure E.2: Relaxing VAR assumptions



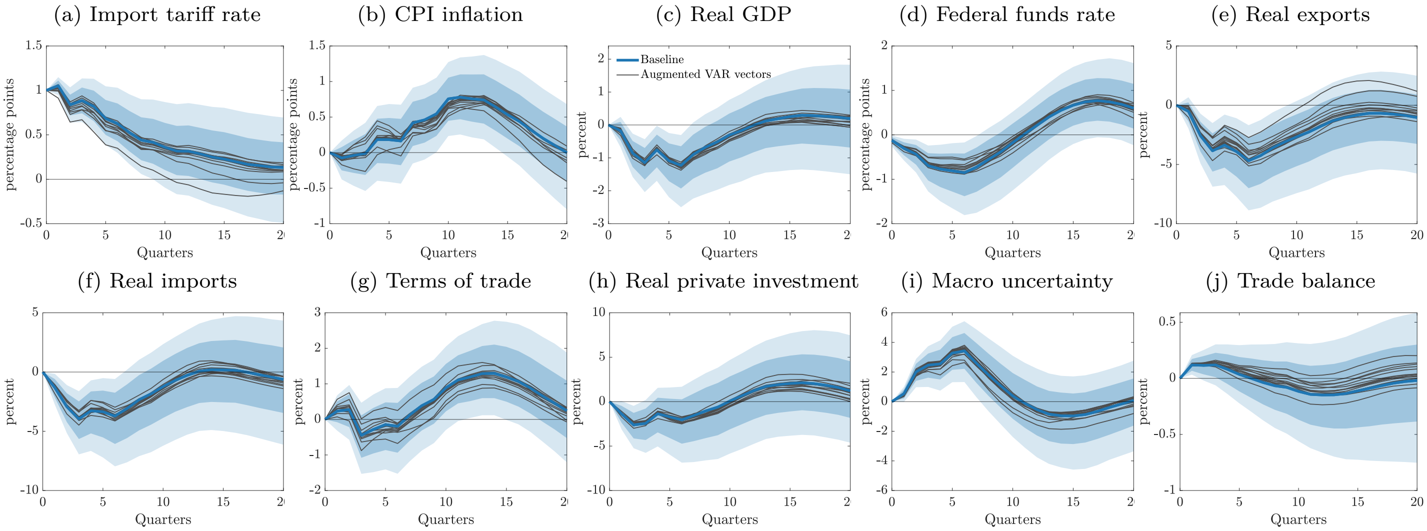
Notes: The solid blue and dashed-dotted gray lines represent posterior medians. The blue shaded areas are 68% and 90% credible sets, and the thin-dotted gray lines indicate 90% credible sets. The dashed red line corresponds to a local projection point estimate, and the thin-dotted red lines indicate 90% confidence bands based on standard errors robust to heteroskedasticity and serial correlation. The local projection includes four lags of the shock and the outcome variable as controls. The shock is based on the posterior median of the baseline tariff VAR, taken over the reduced-form parameters.

Figure E.3: Additional deterministic variables



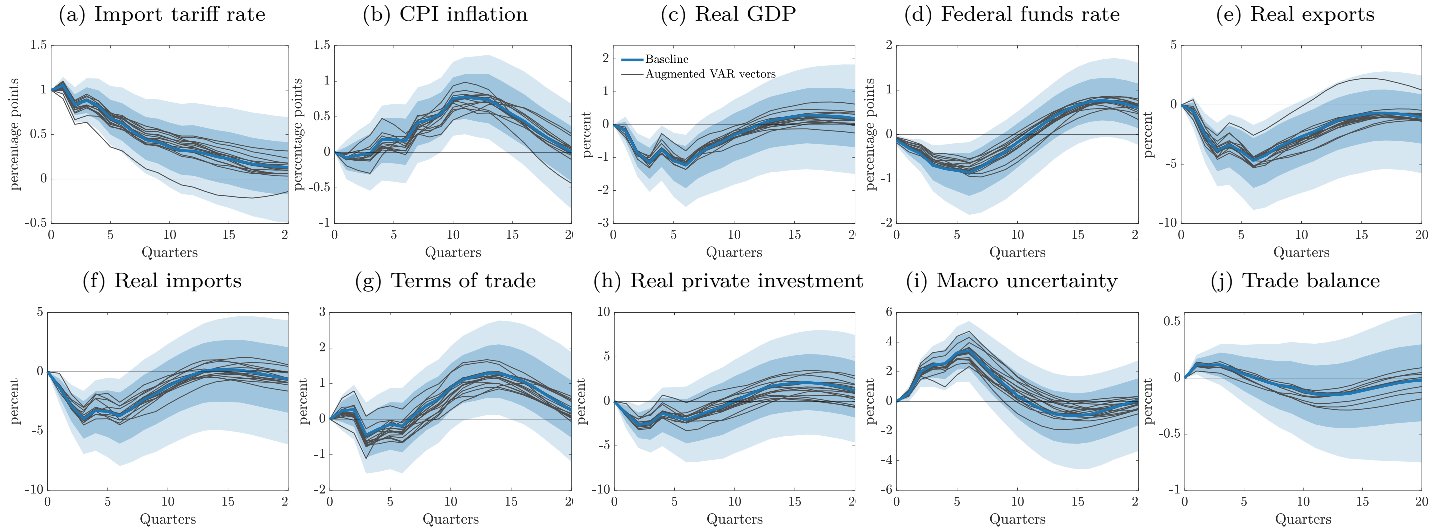
Notes: The solid blue, dashed-dotted gray, and dashed red lines represent posterior medians. The blue shaded areas are 68% and 90% credible sets, and the thin-dotted lines indicate 90% credible sets. The legend indicates the included deterministic variables of the respective specification.

Figure E.4: Controlling for additional measures of uncertainty



Notes: The solid blue lines represent the posterior median of the baseline tariff VAR, and the blue shaded areas are 68% and 90% credible sets. Each thin gray line corresponds to the posterior median of an augmented VAR, where we include an additional measure of uncertainty and allow the tariff shock to impact this variable in the quarter of the shock. We consider the 12 categorical economic policy uncertainty indices from Baker et al. (2016), the geopolitical risk measure from Caldara and Iacoviello (2022), and the trade policy uncertainty index from Caldara et al. (2020). All indices are available via the website https://www.policyuncertainty.com.

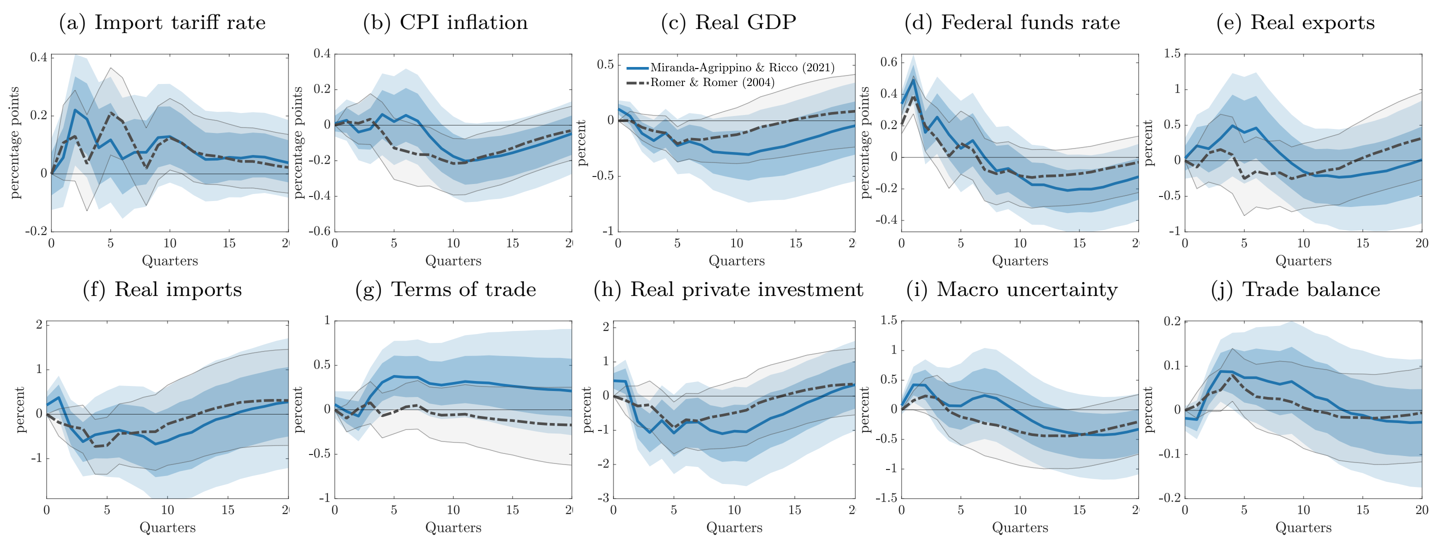
Figure E.5: Controlling for additional variables from Figure 3 in the main text



Notes: The solid blue lines represent the posterior median of the baseline tariff VAR, and the blue shaded areas are 68% and 90% credible sets. Each thin gray line corresponds to the posterior median of an augmented VAR, where we include an additional variable to the VAR or replace a baseline measure by a different variable. The displayed specifications correspond to all VAR results shown in Figure 3 of the main text.

F Additional results and robustness for counterfactuals

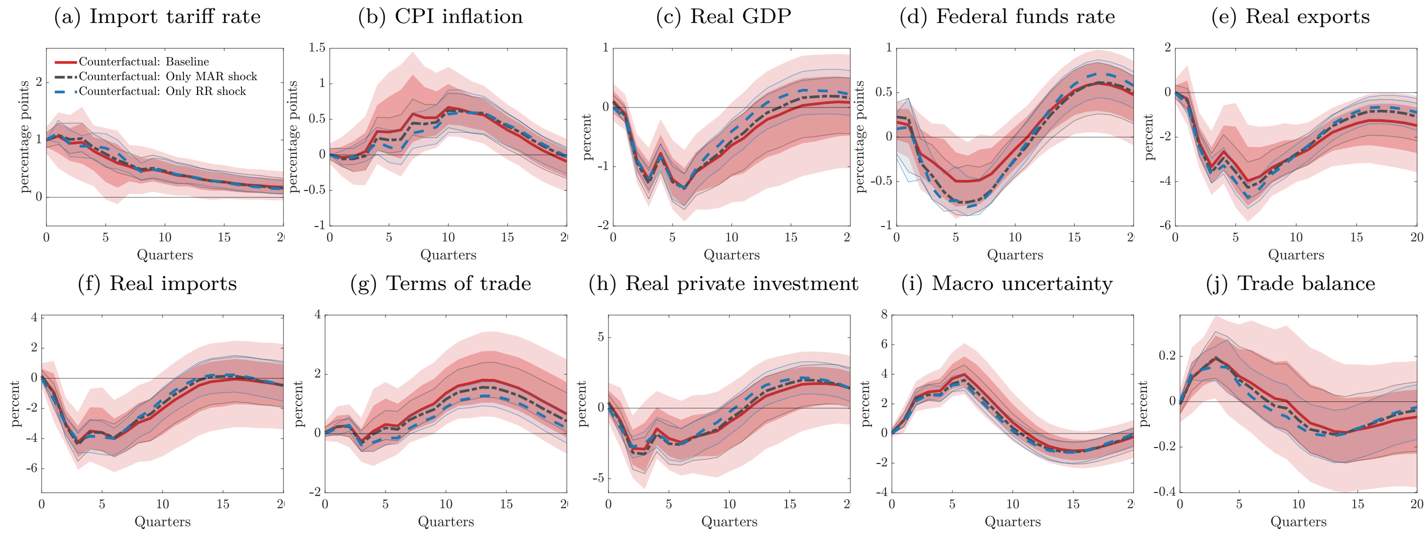
Figure F.1: Baseline responses to monetary policy shocks



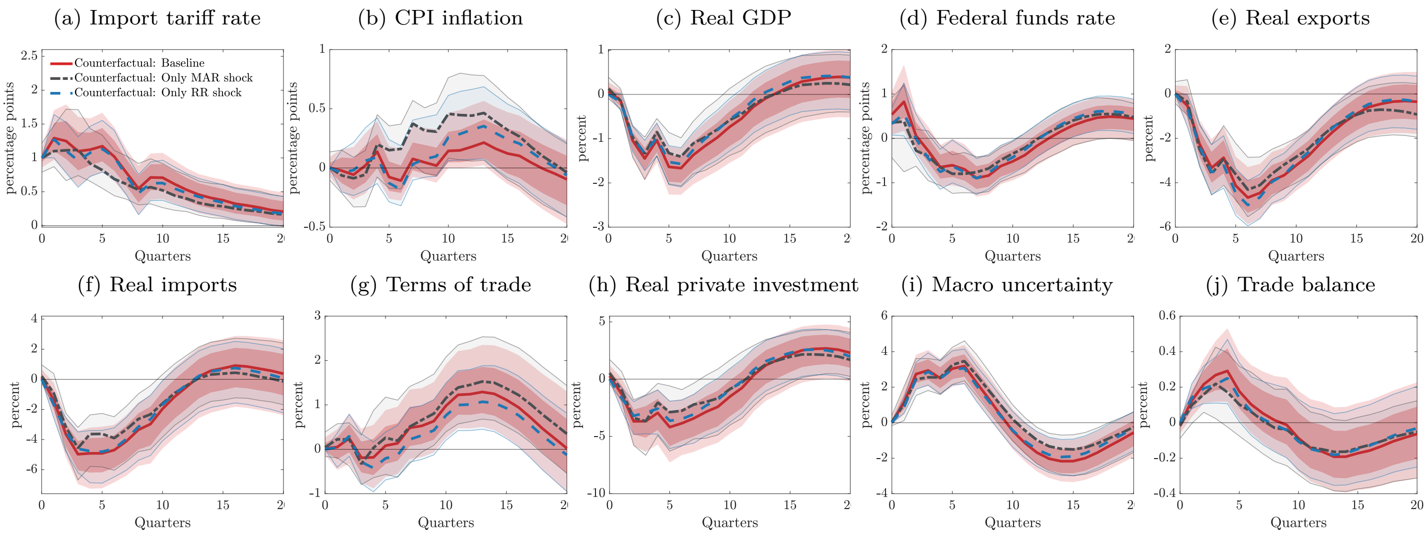
Notes: The solid blue and dashed-dotted gray lines represent posterior medians. The blue shaded areas are 68% and 90% credible sets, and the thin-dotted gray lines indicate 90% credible sets. The results are from the baseline VAR.

Figure F.2: Counterfactuals using only a single monetary policy shock

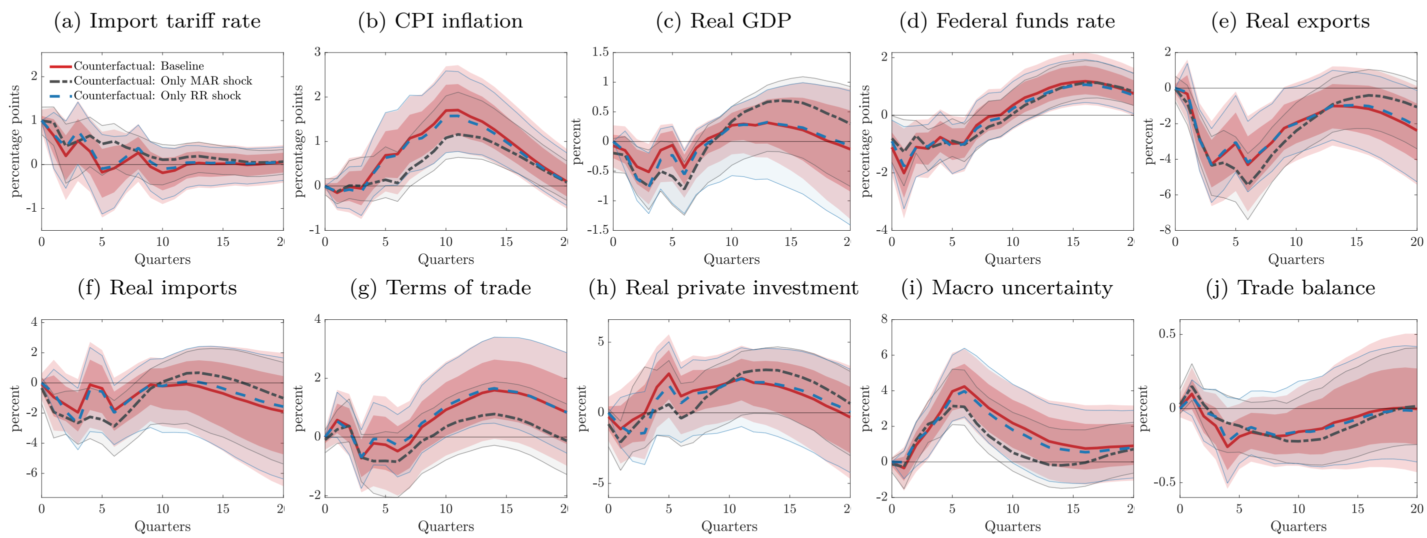
Counterfactual 1: No federal funds rate response



Counterfactual 2: Strict inflation stabilization



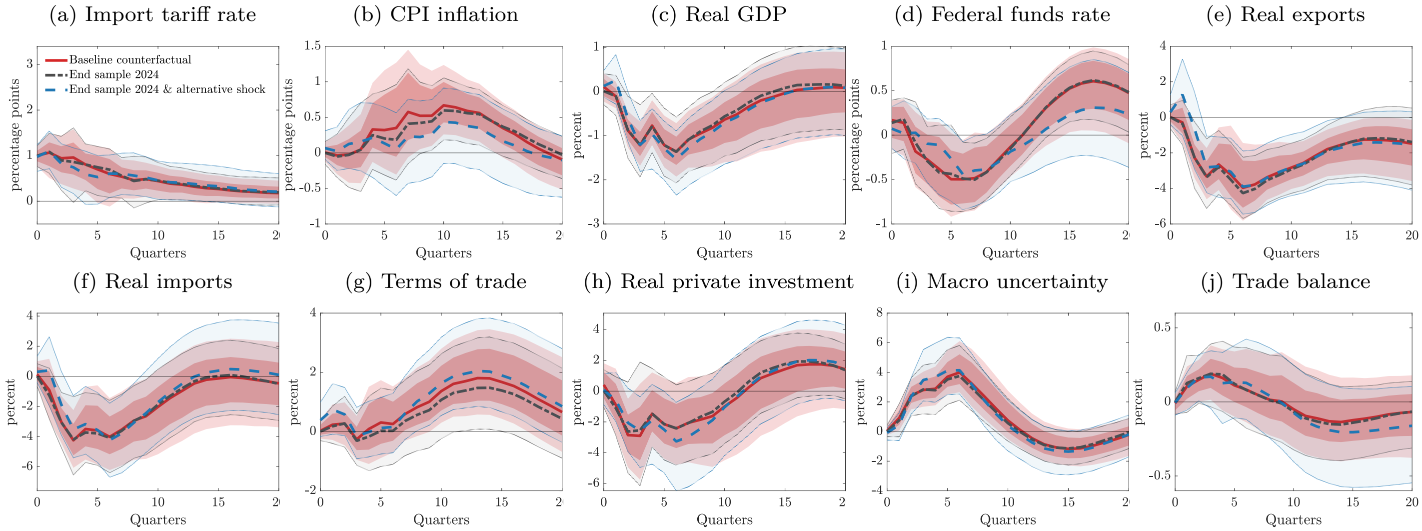
Counterfactual 3: Strict output stabilization



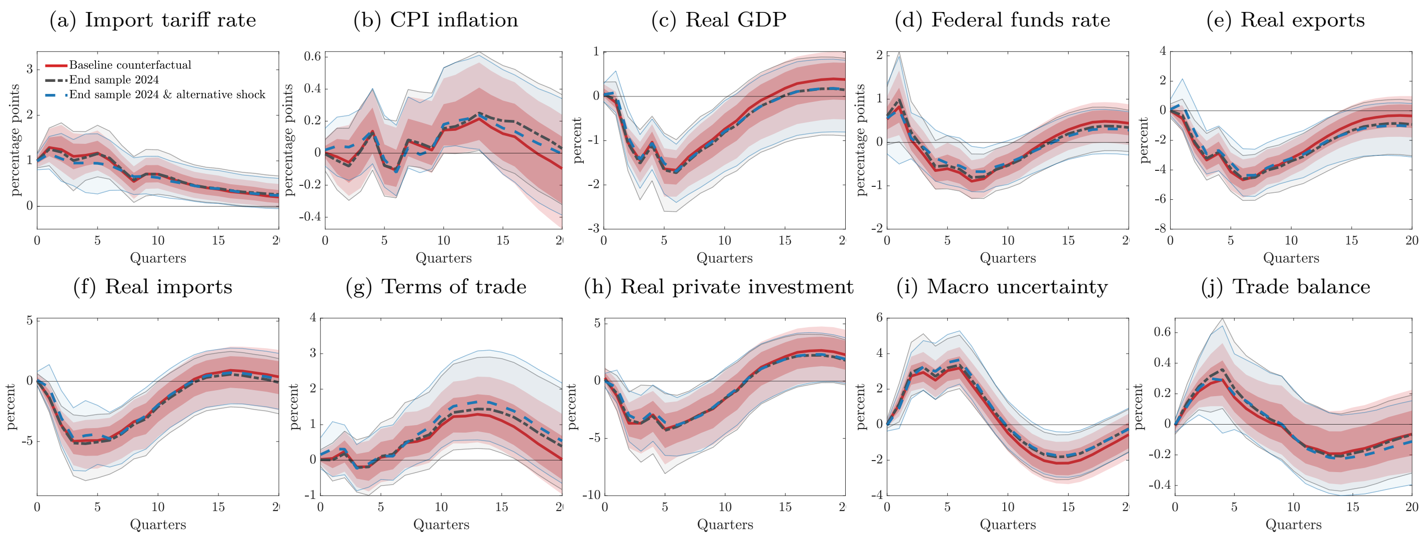
Notes: Alternative monetary policy counterfactuals in comparison to the baseline counterfactual.

Figure F.3: Counterfactuals using an extended sample and the Jarociński (2024) shock

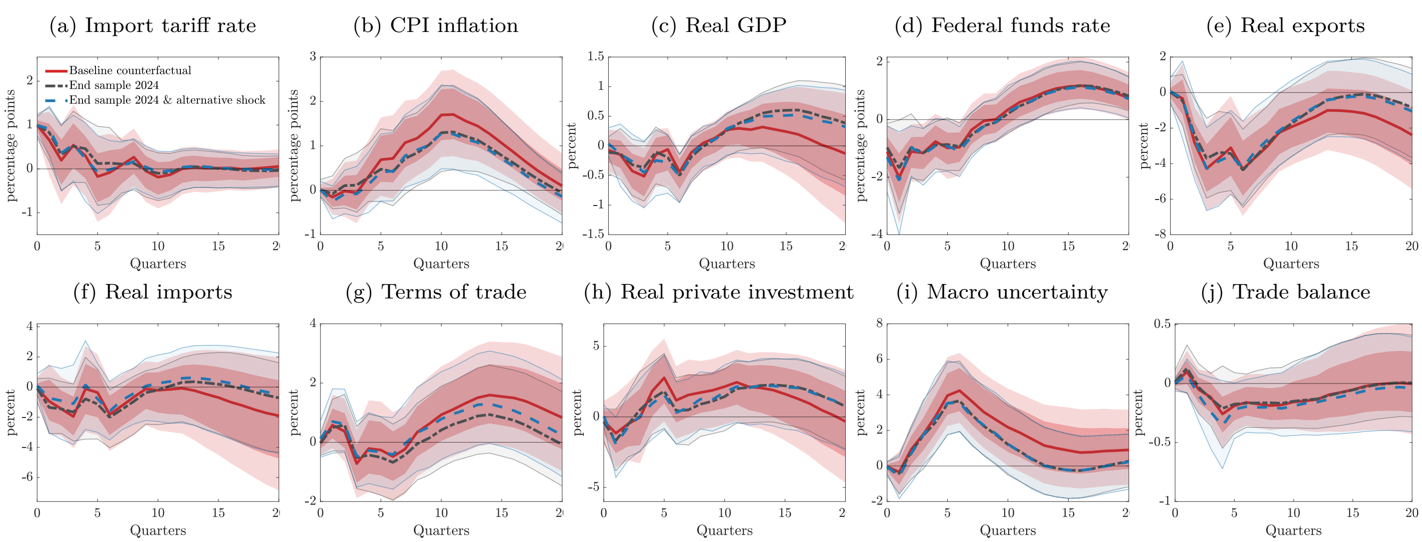
Counterfactual 1: No federal funds rate response



Counterfactual 2: Strict inflation stabilization



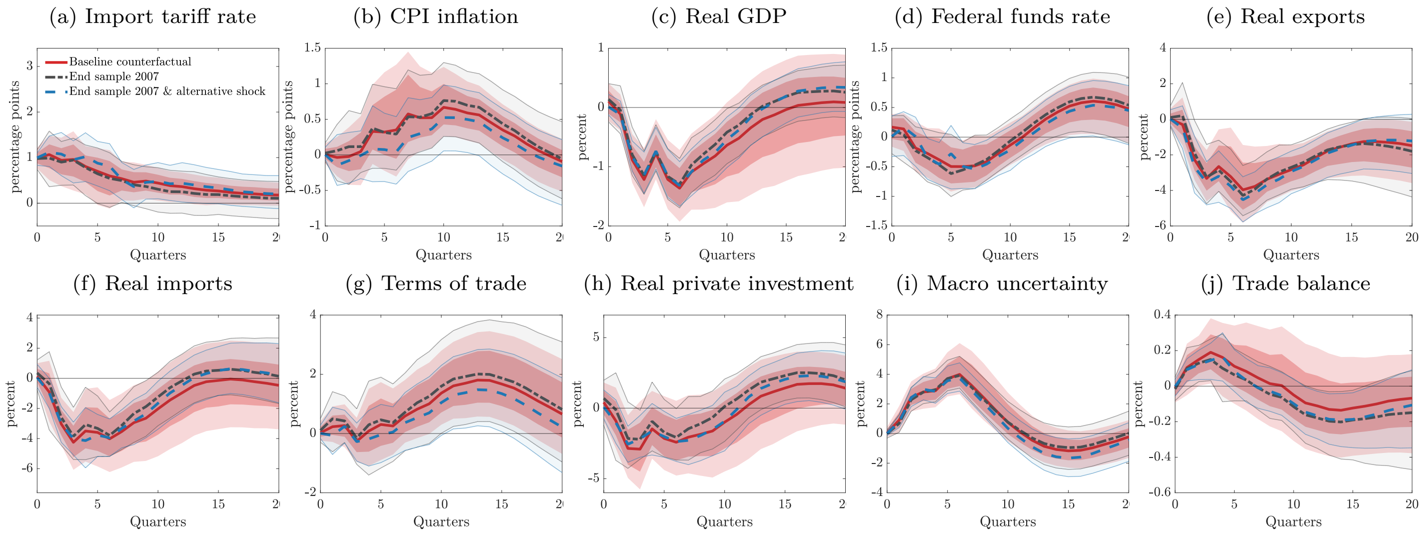
Counterfactual 3: Strict output stabilization



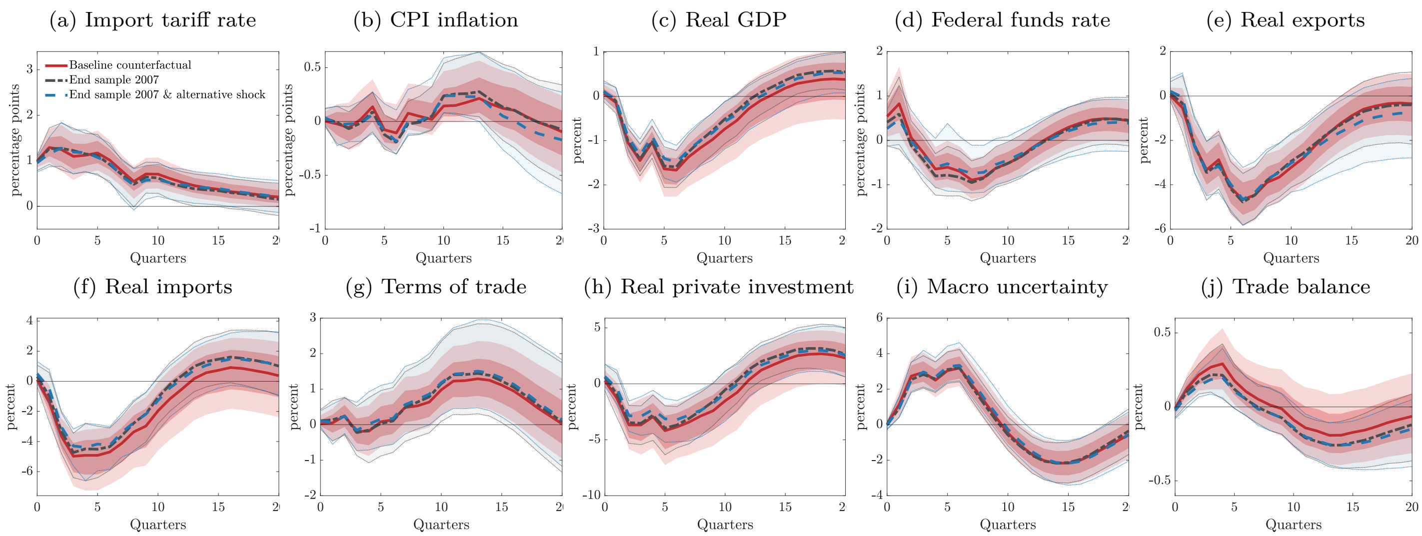
Notes: Alternative monetary policy counterfactuals in comparison to the baseline counterfactual. Extended sample end to 2024 and Jarociński (2024) *u1* shock instead of MAR.

Figure F.4: Counterfactuals using an shorter sample and the Hack et al. (2024) shock

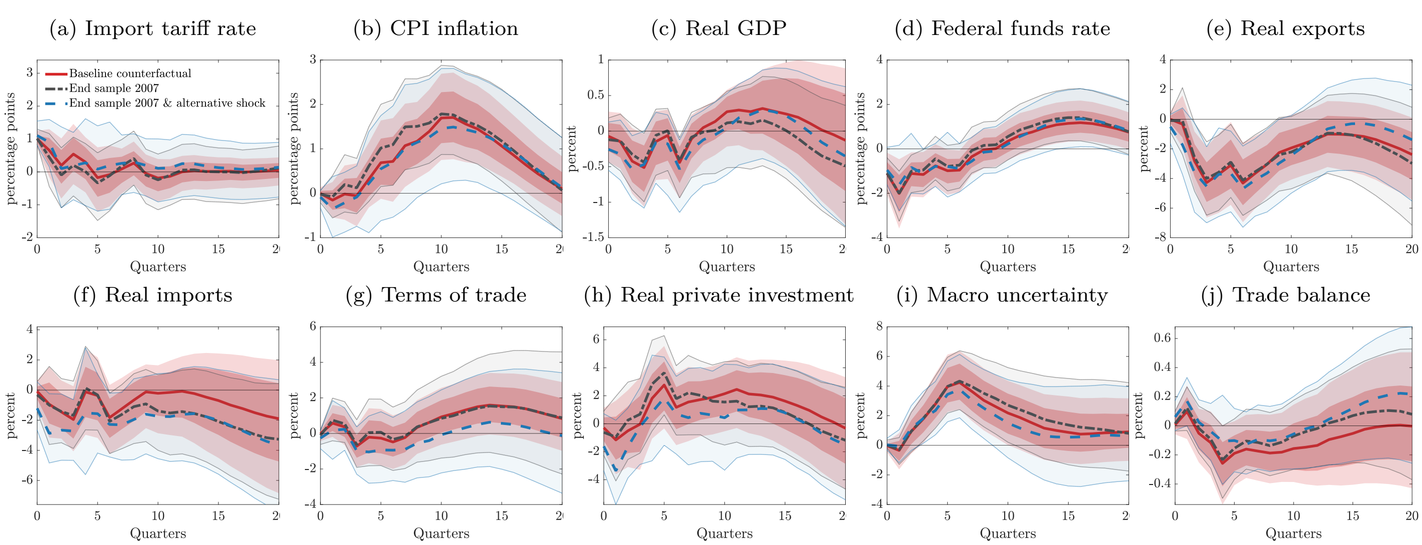
Counterfactual 1: No federal funds rate response



Counterfactual 2: Strict inflation stabilization



Counterfactual 3: Strict output stabilization



Notes: Alternative monetary policy counterfactuals in comparison to the baseline counterfactual. Reduced sample end to 2007 and Hack et al. (2024) shock instead of RR.