OPTIMAL MONETARY POLICY UNDER HIGHER TARIFFS

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The unprecedented changes to U.S. trade policy that started in 2025, along with their potential impact on U.S. inflation and economic activity, have sparked intense debate on the appropriate monetary policy response to rising tariffs. A small but fast-growing literature addresses aspects of this question from the perspective of open-economy New Keynesian models. To date, much of this work focuses on analytical results in relatively stylized models (Bianchi and Coulibaly, 2025; Werning et al., 2025; Auclert et al., 2025; Monacelli, 2025). Earlier work by Bergin and Corsetti (2023) computes the globally optimal monetary policy response to tariffs in a quantitative DSGE model, but does not place strong emphasis on the role of imported intermediate inputs and downplays the role of other factors such as wage rigidities and endogenous inflation inertia that may have important bearing on the question.

One theme that emerges from the existing literature, put forward forcefully in Bianchi and Coulibaly (2025; BC henceforth), is that the imposition of a tariff calls for an expansionary monetary policy response. But the framework studied in BC abstracts from elements that could potentially lead to the opposite policy prescription. First, their framework de-emphasizes the role of imported intermediates, network effects, and supply chain disruptions. As evidenced by the post-pandemic inflation surge, these factors can be associated with persistent inflation dynamics. In addition, as discussed by Christiano (2016), network effects—understood as input-output linkages in an economy with a roundabout production structure—can greatly increase the welfare costs of inflation, introducing a motive for central banks to fight the inflationary effect of a tariff-induced inflation surge. The importance of intermediates trade is evidenced in Figure 1, showing that there is greater trade openness in intermediates than in final goods. Second, BC do not consider the role of endogenous inflation inertia—driven, for example, by imperfectly-anchored inflation expectations, and capturing another prominent reason why central banks may want to lean against higher inflation. Third, their framework also abstracts from nominal wage rigidities.

In the proposed research paper outlined here, we study the optimal monetary policy response to an increase in tariffs, in a two-country model that includes trade in both final consumption goods and in intermediate inputs, nominal price and wage rigidities, and inertia terms in wage and price Phillips curves. The presence of intermediate inputs serves to capture supply chain linkages and "network" effects, both within and across countries. Rather than focusing on a stylized economic environment and on providing one single policy prescription—as in much related literature—our perspective is to identify features of the economic environment under which either a monetary policy easing or a tightening is desirable in response

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to rising tariffs. In doing so, we aim to provide insights that can inform both the academic debate and actual policymaking, by offering a framework to determine conditions under which each policy stance may be most appropriate.

Our preliminary results suggest that in environments in which tariffs apply mostly to finished consumption goods and in which wages are flexible, an easing stance is optimal, as in BC. But instead, when wages are rigid, or when tariffs are particularly concentrated on intermediate inputs, then optimal monetary policy dictates a tightening. This appears especially true in the presence of endogenous inertia in Phillips curves—a reduced-form way of capturing imperfectly anchored inflation expectations.

Model

Our model is based on the framework developed in Cuba-Borda, Queralto, Reyes-Heroles, and Scaramucci (2025; CQRS) and consists of an open-economy general equilibrium model of trade and inflation that features international trade in both final and intermediate goods and staggered price and wage adjustments. The model embeds the static Armington model of trade into a dynamic framework. It includes two regions: the U.S. and the rest of the world (ROW). Each region produces goods that can be traded across borders, subject to *ad valorem* tariffs. Goods can be used as final goods or intermediate inputs in producing differentiated goods in each country. The model features "network" effects between firms through trade in intermediate inputs, in that a firm in any country uses both domestically-produced and imported inputs in production (the two being imperfect substitutes with one another) and, in turn, part of the firm's output is used as an input by other firms—both domestic and foreign ones. Firms producing differentiated goods adjust prices infrequently, and households face nominal wage rigidities in labor markets. Non-optimizing wage- and price-setters partially index to past inflation, introducing a source of endogenous inertia in Phillips curves. Trade prices are set in the producer's currency. International trade in financial assets is restricted to non-state-contingent bonds denominated in U.S. dollars.

As described in CQRS, the model is consistent with empirically identified effects of trade cost shocks. As shown in Figure 2, taken from CQRS, these shocks are transmitted as supply shocks, in that they trigger an increase in inflation and a GDP decline. Further, the inflation effects are more persistent when trade costs affect intermediate inputs. As explained in CQRS, the model described previously is fully consistent with these facts.

Different from CQRS, who undertake the analysis assuming a Taylor rule for monetary policy, we consider here the Ramsey optimal monetary policy—in which the central bank aims to maximize the utility of the domestic representative household (taking foreign monetary policy as given, which is assumed to follow a Taylor rule) and is able fully commit to future policy actions. We assume constant subsidies such that the steady state is efficient and consider the optimal monetary policy in response to a tariff shock, as described next.

Baseline Results

Our baseline experiment considers an increase in U.S. tariffs calibrated to observed U.S. trade policy actions to date. We assume an increase in the U.S.'s effective tariff rate of 16 percentage points, in line with estimates from the Yale Budget Lab. We assume that the ROW region retaliates by imposing tariffs on U.S. products half as large as those imposed by the U.S. The presence of partial retaliation is consistent with recent developments, as well as with the 2018-19 episode of trade tensions between the U.S. and China. We assume that these tariffs increases are highly persistent (with an auto-regressive coefficient of 0.95) but not fully permanent, allowing for the realistic possibility that some trade deals are reached over time, reducing the effective tariff rate from its currently elevated level.

Figure 3 contrasts outcomes in this experiment under a standard inertial Taylor rule (blue solid line) to those under the optimal Ramsey monetary policy (red dashed line), in a model in which nominal wages are assumed to be fully flexible, as in BC. Under a Taylor rule, monetary policy tightens significantly—with both nominal and real rates rising around 75 basis points—in response to the surge in CPI inflation. In stark contrast, optimal monetary policy prescribes a policy *easing* of around 50 basis points. Easier policy mitigates the declines in consumption and output, at the cost of higher near-term inflation. This finding echoes the one emphasized by BC, who find an expansionary monetary policy response to higher tariffs is optimal.

Next, in Figure 4 we repeat the same experiment under the Ramsey optimal monetary policy, but this time contrasting our previous case (blue solid) with one with staggered nominal wage setting (red dashed). With nominal wage rigidities present, optimal monetary policy prescribes a policy tightening: Both the nominal and the real rate rise over 100 basis points. Wage-setting frictions imply that an important margin of adjustment to lower tariffs on intermediate inputs—namely, a reduction in the real wage—is costlier, making contractionary monetary policy more desirable. Optimal monetary policy thus resolves an unpleasant tradeoff, with persistently higher Producer Price Index (PPI) inflation (which entails considerable efficiency losses due to higher price dispersion among domestic producers) and persistently depressed activity. We highlight that higher tariffs in this case do *not* manifest as a one-time jump in the price level: As seen in the top right panel, the CPI price level rises gradually and peaks after about 8 quarters, despite a slow undoing of the higher tariffs. An important reason for this result is the presence of tariffs on intermediate inputs. As described in CQRS, the imposition of such tariffs forces firms into a suboptimal input mix, ultimately reducing their efficiency and raising their marginal cost persistently. As domestic firms adjust prices, persistently higher marginal costs are passed through as persistently elevated PPI inflation.

We next explore the role of intermediate input tariffs further in Figure 5, by contrasting a case in which higher tariffs apply only to final consumption goods (blue dashed line) with another in which they apply only to intermediate inputs (red dashed line). We set the size of the tariff hike imposed on each subset of imports such that the average effective tariff rate continues to increase 16 percentage points in each case. As shown in the figure, when tariffs are concentrated on intermediates, the rise in the nominal policy rate is considerably more persistent. This occurs despite a very negative hit to real GDP. PPI inflation rises much

more sharply, reflecting the impact of higher imported input prices on domestic marginal costs.

Taking stock, these tentative results point to two important reasons that may flip the optimal monetary policy response to higher tariffs relative to what has been emphasized in recent literature: The presence of nominal wage rigidities and the presence of tariffs highly concentrated on intermediate inputs. These two features both go in the direction of making the optimal monetary policy response to higher tariffs more contractionary.

Results from a Larger-Scale Model with an Ad-Hoc Loss Function

We have also performed a similar experiment but assuming that monetary policy minimizes an ad-hoc loss function that penalizes deviations of inflation and output gap from target as well as changes in the policy rate.[2] This approach provides a complementary perspective by studying an objective that is closer to the one guiding many central banks in practice (including the Federal Reserve). We perform this exercise in a larger-scale version of the model, augmented to include capital and trade in investment goods, variable capital utilization, and financial frictions. We continue to assume full commitment by the central bank.

In Figure 6 we consider a higher overall tariffs scenario (in red), as well as a case in which tariffs are concentrated on final (blue) and intermediate (green) goods, and a case in which the backward-looking terms in Phillips curves have a larger weight, as a reduced-form way of capturing imperfectly-anchored inflation expectations (in orange). A similar theme as described previously emerges: When tariffs are more concentrated on intermediate inputs, optimal monetary policy is much more likely to call for tightening. This result is magnified in the presence of imperfectly anchored inflation expectations, calling for a particularly large and persistent rise in the monetary policy rate. This latter case—in which tariffs focused on intermediates occur alongside imperfect expectations anchoring—delivers the worst macroeconomic outcomes of all, with persistently elevated inflation alongside a large and persistent hit to activity.

Related Issues

Our ongoing research will address the issues outlined above and shed light on the key mechanisms at work. An issue we plan to devote particular attention to, which the literature thus far has not emphasized, is the role of network effects in magnifying the costs of inflation-induced inefficiencies. As shown in Christiano (2016), the presence of a network structure with input-output linkages combined with price-setting frictions leads to particularly large costs of inflation. We also plan to devote attention to the role of uncertainty about future tariffs, which has clearly been a relevant factor in recent events.

[2] This type of loss function is commonly assumed in optimal control simulations at central banks, such as those described in the Federal Reserve's Tealbook.

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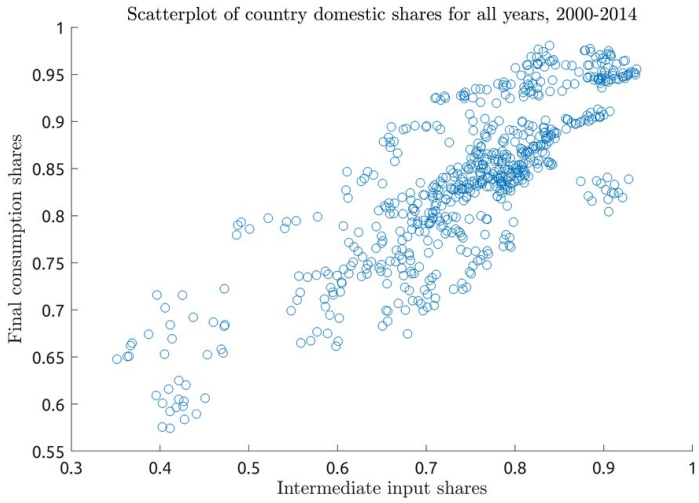
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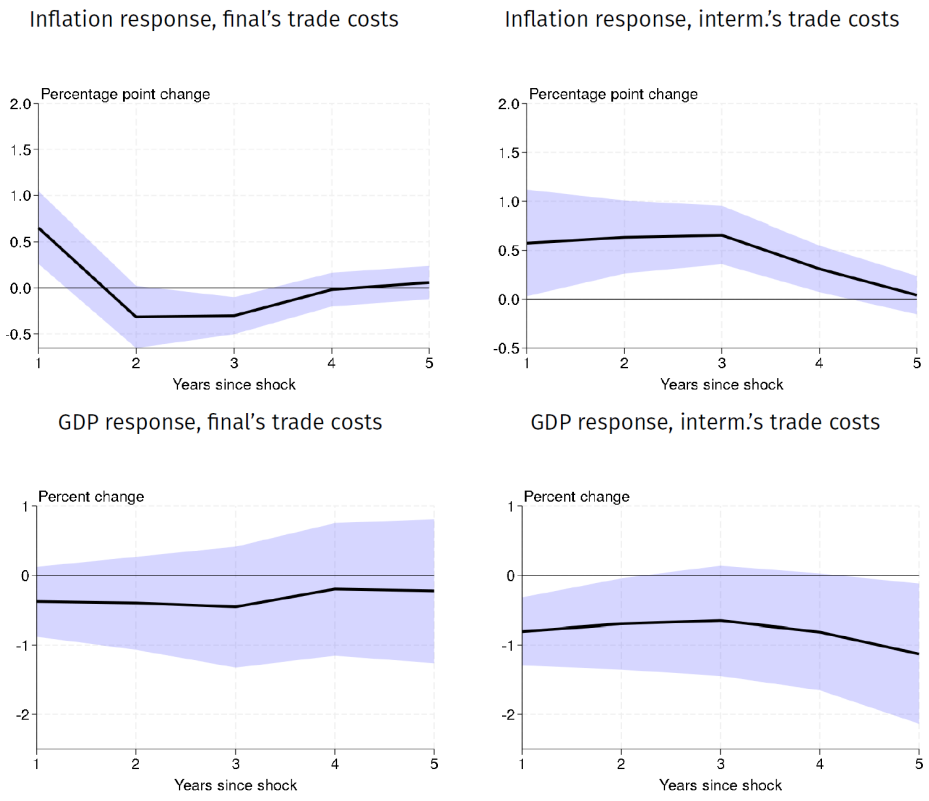
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Figure 1: Domestic sourcing shares around the world



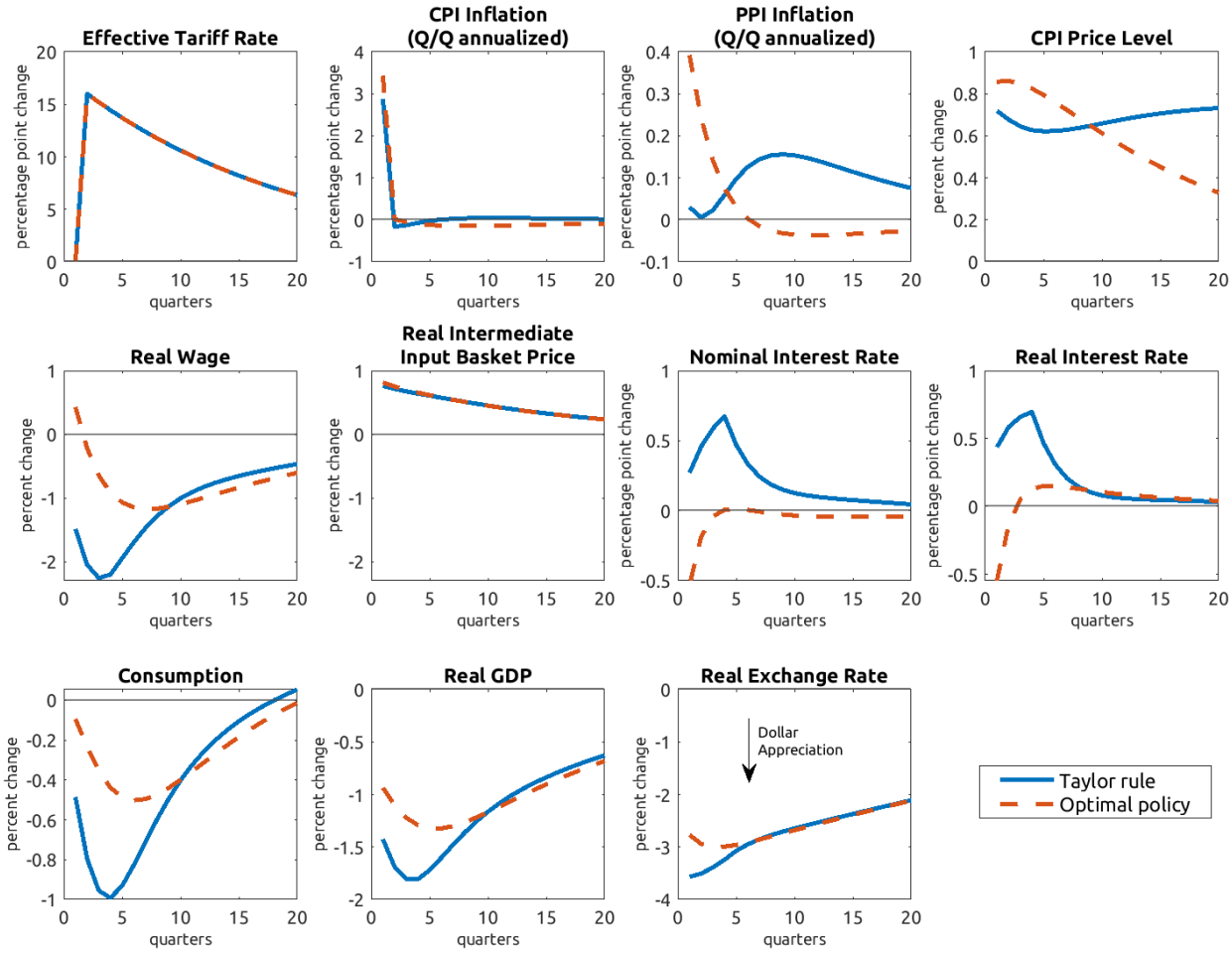
Note: Each dot represents the share of final consumption and of intermediate inputs sourced domestically, from a sample of 41 advanced and emerging countries over the period 2000-2014.

Figure 2: Estimated effects of trade costs shocks



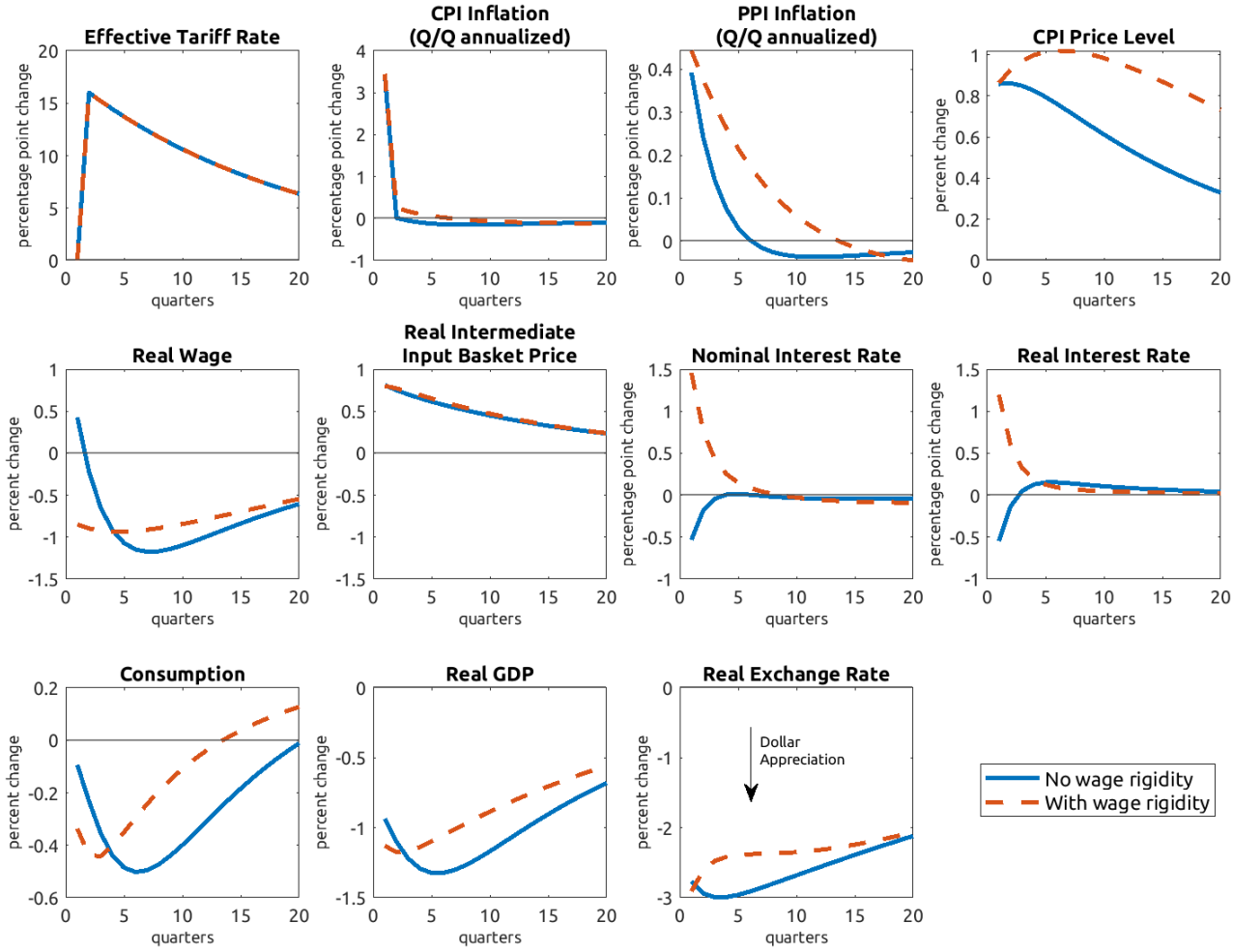
Note: Effects of positive shocks to trade costs on inflation and GDP obtained from local projections. See Cuba-Borda et al. (2025) for details.

Figure 3: Increase in tariffs, Taylor rule v. optimal monetary policy



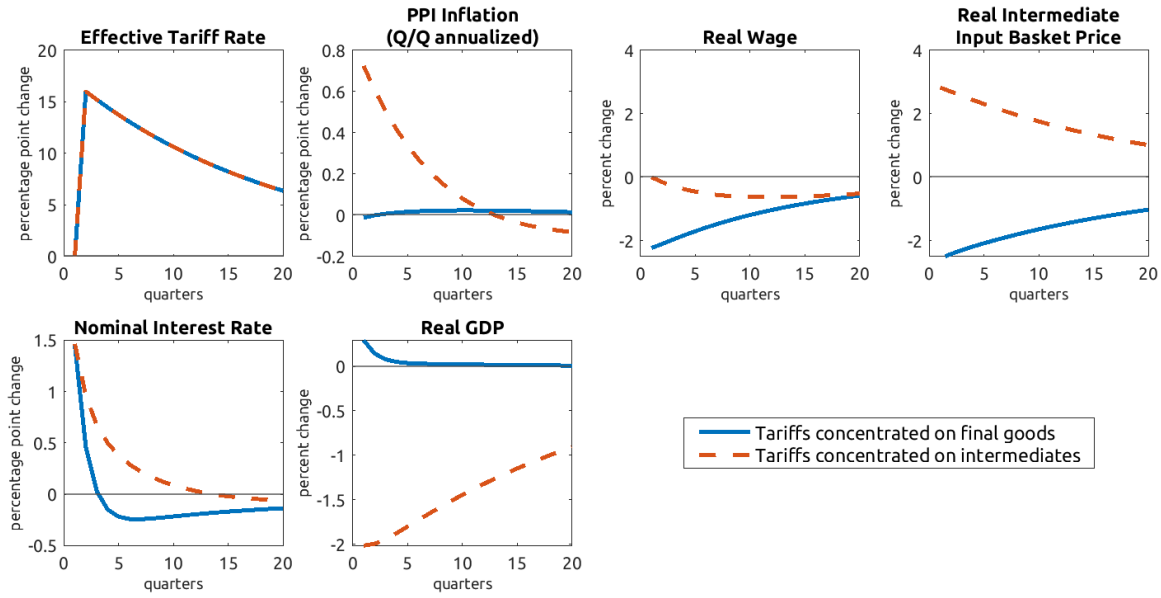
Note: Model-implied response to an increase in tariffs under an inertial Taylor rule (blue solid line) and under the Ramsy optimal monetary policy (red dashed line), in an economy with fully flexible nominal wages.

Figure 4: Increase in tariffs with Ramsey optimal monetary policy, role of wage rigidity



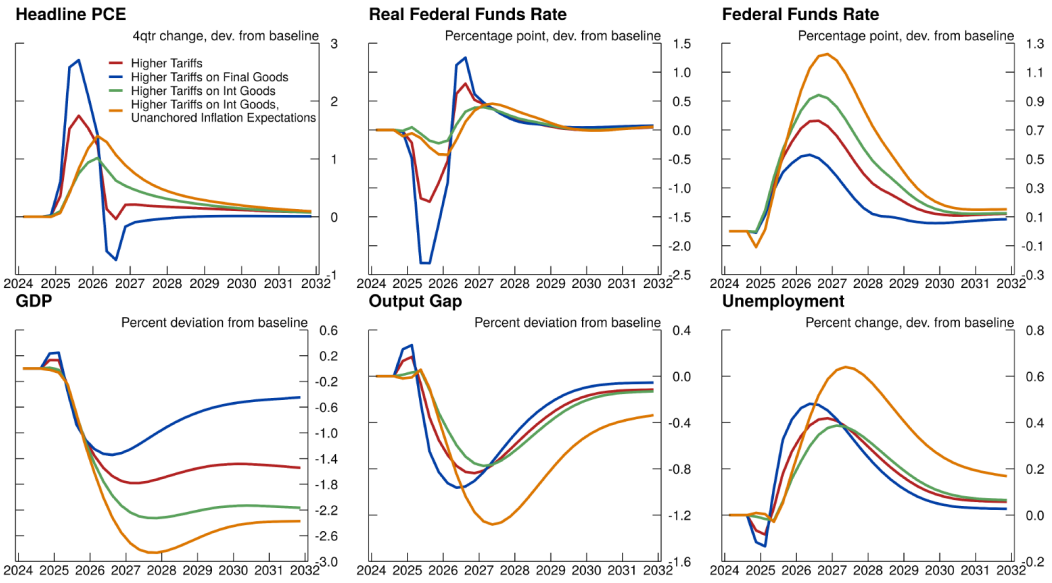
Note: Effects of higher tariffs under optimal monetary policy, with fully flexible wages (blue solid) and with nominal wage rigidities (red dashed).

Figure 5: Optimal Ramsey monetary policy, tariffs on final consumption v. intermediate inputs



Note: Effects of higher tariffs under optimal monetary policy, with tariffs applied only on final consumption goods (blue solid) and only on intermediate inputs (red dashed).

Figure 6: Optimal control simulations in larger-scale model



Note: Optimal monetary policy simulations under an ad-hoc loss function in a larger scale model, with tariffs applied on all goods (red), only on final goods (blue), only on intermediates (green) and only on intermediates with imperfectly-anchored inflation expectations (yellow).