

## Calibrating Monetary Policy

Regis Barnichon and Aayush Singh

The new SF Fed Policy Calibration Tool is designed to help construct a monetary policy path that aligns with one's views of the economy and policy objectives. Applying the tool to recent tariff increases shows that preferred policy paths vary depending on one's assessment of the economic effects of tariffs. If tariffs predominantly affect demand, more policy accommodation may be warranted; if they predominantly affect supply, less accommodation may be appropriate. The high uncertainty surrounding these effects implies a wide range of possible scenarios for the best course of action.

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How do policymakers decide on a path for interest rates that best achieves the Federal Reserve's dual mandate of ensuring price stability and maximum employment? This question is at the heart of U.S. monetary policy, and it is extraordinarily difficult to answer.

To achieve the dual mandate, Fed policymakers adjust the current and anticipated future levels of the federal funds rate—the policy path (Choi et al. 2022). The Federal Open Market Committee (FOMC) considers myriad factors in its decisions: the state of the economy today, the effects of the policy path on employment and inflation, and the long and variable lags at which monetary policy operates. In particular, monetary policymakers sometimes need to balance a tradeoff between the two objectives, because monetary policy cannot generally counter the inflationary effects of an adverse supply shock without some cost to employment.

Recent research by Barnichon and Mesters (2023) introduced a new methodology to approach this challenge. In this *Economic Letter*, we describe the San Francisco Fed's [Policy Calibration Tool](#) (PCT), which we designed using the Barnichon and Mesters methodology. The PCT computes the federal funds rate path that will best achieve the dual mandate given two inputs. The first one's economic outlook under status quo policy, defined as the policy path currently expected by market participants. The second input is one's preferred weight between the two objectives, meaning how much weight to give to price stability relative to maximum employment in determining the path for the U.S. economy.

### Considering policy scenarios

The PCT is designed to answer questions about so-called *counterfactual* policy scenarios with minimal assumptions. In the context of economic policy, such a counterfactual question takes the following form: What would happen if policymakers did Y instead of X? By considering many such scenarios, a policymaker can search for the course of action that best aligns with their economic outlook and dual mandate preferences.

Barnichon and Mesters (2023) propose an approach that does not require a fully detailed economic model. Instead, two sets of data are sufficient to study policy scenarios: a baseline macroeconomic forecast, known informally as the economic outlook, and estimates for the policy *multipliers*, which capture the expected effects of the federal funds rate on the economy and its components.

The methodology starts with a baseline forecast to capture how the economy is expected to perform under status quo policy. This makes it possible to use the policy multipliers to calculate alternative forecasts to capture how the economy would be expected to perform under specific policy path scenarios. One can then search for the course that delivers the policymaker’s most preferred outcome for stabilizing inflation and reaching full employment.

Our tool applies this methodology, relying on three inputs: one’s interpretation of the dual mandate, that is, the weight on achieving the inflation goal relative to maximum sustainable employment; one’s status quo economic outlook; and the dynamic policy multipliers. These first two inputs are subjective choices of the policymaker. The third is an objective, empirical set of estimates of policy multipliers provided by the tool.

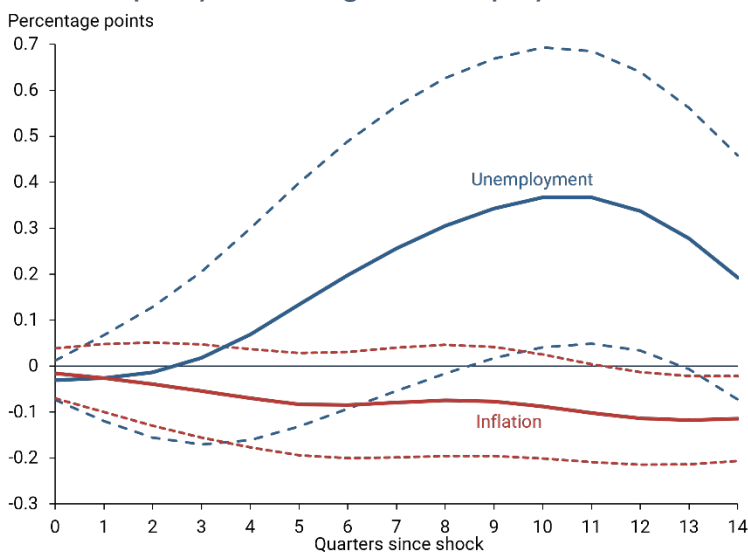
### Estimating policy multipliers

These policy multipliers are estimates of the effects of monetary policy on inflation and unemployment over time. Obtaining these estimates is not straightforward: While economists cannot conduct controlled experiments, nature or history can provide so-called natural experiments that allow them to estimate cause and effect in macroeconomics. For instance, a natural experiment to estimate the effect of a monetary policy change on inflation and unemployment would be a policy decision made for a reason unrelated to the short-run evolution of inflation and unemployment. This could happen if the Fed changed policy to deal with exceptional developments in financial markets or following a change in FOMC members (Nakamura and Steinsson 2018).

Numerous researchers have used such natural experiments—or monetary policy *shocks*—to calculate the effects of a policy change. Barnichon and Mesters (2023) estimate the effect of raising the federal funds rate one-quarter percentage point (25 basis points) over one year using historical data for 1990–2007. Although the sample period is relatively short, it has the benefit of being a fairly stable period for monetary policy that also avoids the zero lower bound constraint following the 2008–09 Great Recession, when there were no federal funds rate policy changes.

The estimated policy multipliers, shown by solid lines in Figure 1, have wide

**Figure 1**  
Effects of policy rate change on unemployment, inflation



Note: See Barnichon and Mesters (2023) for details. Dashed lines denote the upper and lower ranges of the 95% confidence bands for the line of the same color.

uncertainty bands (dashed lines) but point to two key patterns. First, monetary policy may take about a year to substantially affect inflation. Second, a federal funds rate shock large enough to bring inflation down about 0.1 percentage point after two years would be expected to increase unemployment about 0.3 percentage point over the same period. This second finding quantifies the unemployment-inflation tradeoff that monetary policymakers must grapple with.

### Illustrating a policy path scenario

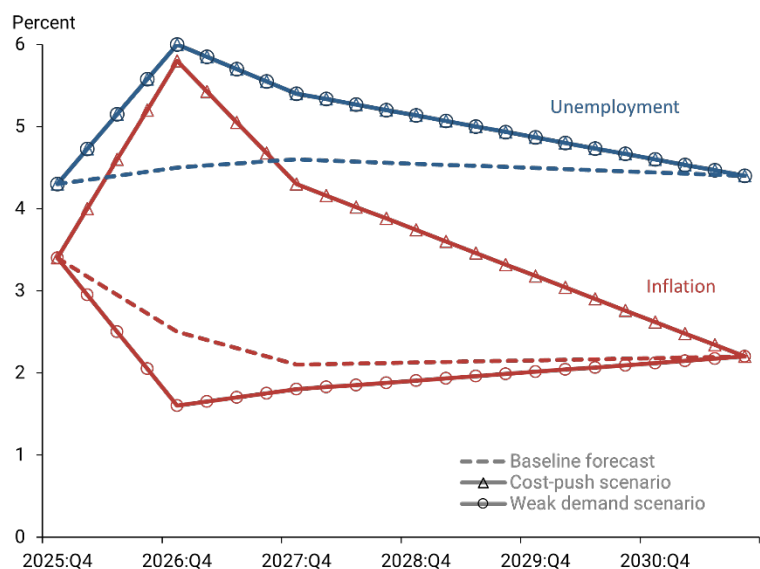
Our PCT combines these estimated policy multipliers with the other two inputs noted above to compute a preferred interest rate policy path. To illustrate how this method can be used, we apply it to a subject of current economic interest, the policy implications of a large change to tariff rates. In particular, we use it to analyze how a monetary policymaker may wish to respond to this change given possible multipliers, the person’s preferences on the unemployment–inflation tradeoff, and how tariff changes have altered their economic outlook.

To simplify the analysis, we consider two hypothetical scenarios in which tariff changes could alter a policymaker’s economic outlook. These scenarios illustrate how tariff announcements can lead to different policy paths depending on whether tariffs primarily affect demand or supply. Importantly, they are illustrative and do not reflect any specific quantitative assessment of the actual effects of the 2025 tariffs.

In the first scenario, the tariff increase has a *cost-push* effect that increases the cost of production inputs and thus is assumed to cause a marked rise in inflation. Such a scenario is depicted in Figure 2 with triangle markers. Compared with the median outlook of professional forecasters (dashed line), which we use as the policymaker’s pre-tariff economic outlook, the scenario assumes that inflation rises substantially, close to 6%, before slowly reverting to the Fed’s 2% goal over the long run. The scenario assumes unemployment also rises to 6% in tandem with inflation.

The second scenario is motivated by recent research that finds that tariff shocks may cause or coincide with increased economic uncertainty. In this *weak demand* scenario, uncertainty shocks can depress economic activity by lowering consumers’ and investors’ confidence and can also put downward pressures on inflation (Leduc and Liu 2016). This could lead to a rise in unemployment and a decline in inflation (Barnichon and Singh 2025). The scenario is depicted in Figure 2 with circle markers. The path of unemployment is assumed to be the same as in the first scenario, but inflation dips below the baseline forecast, falling below 1.5% by the end of 2026.

**Figure 2**  
Inflation and unemployment paths in different scenarios



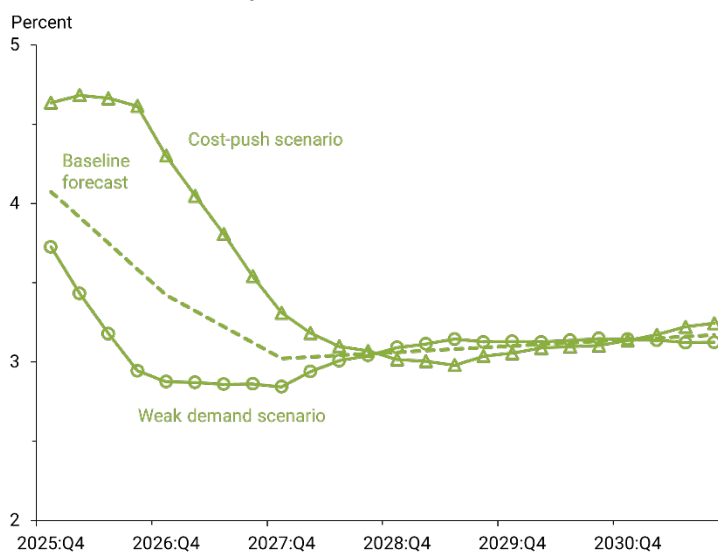
Note: Blue lines refer to unemployment forecasts and red lines refer to inflation forecasts. Baseline forecasts (dashed lines) show the latest forecast from the FRB Philadelphia’s Survey of Professional Forecasters.

We can use the PCT to compute a preferred federal funds rate path for a policymaker whose outlook changes from the dashed lines in Figure 2 (the median professional forecaster’s outlook) to either the cost-push or weak demand scenarios. We assume that the policymaker places equal weight on inflation and unemployment in achieving the dual mandate goals.

Figure 3 shows the PCT’s prescription for how this hypothetical policymaker’s preferred policy path should change under each scenario. Under the cost-push scenario (triangle line), the PCT would call for raising the interest rate to fight off inflation, even though this comes at the cost of higher unemployment. The prescribed federal funds rate path rises sharply in the first year before gradually returning to near the baseline path.

Under the weak demand scenario (circle line), the PCT would call for the policy path to go in the opposite direction: If uncertainty stemming from tariff or other policy changes were to lead to lower inflation, the PCT would call for cutting the interest rate. With this more expansionary stance, inflation reverts faster to the 2% goal and unemployment reverts faster to its natural rate.

**Figure 3**  
Federal funds rate paths calibrated for different scenarios



Note: Baseline forecast (dashed line) shows the federal funds rate path expected from the FRB Philadelphia’s Survey of Professional Forecasters. Lines with markers show policy calibration tool recommended paths for two scenarios.

We caution that the PCT should be seen only as an indicative tool with important limitations. Our multipliers are estimated with uncertainty, and the transmission of monetary policy may be affected by exceptional factors not captured by our estimates. The tool also uses an assumption that the economy behaves linearly; for instance, it reacts in a similar fashion for small recessions as for large recessions.

To summarize, there is no one-size-fits-all policy path for policymakers responding to economic development. For instance, our analysis shows that whether a policymaker wants to change their preferred interest rate path in response to an economic shock such as tariff changes will depend crucially on how they see these changes affecting their outlook for inflation and unemployment.

## Conclusion

This *Letter* describes recent research to help economists and policymakers compute a policy path that best aligns with their views of the economy and their policy objectives. We illustrate the usefulness of the SF Fed’s Policy Calibration Tool by applying it to the question of how a policymaker may wish to respond to tariff changes. We show that, depending on their views about the economic effects of tariffs, monetary policymakers may prefer different courses of action, lowering or raising the interest rate controlled by the central bank. The uncertainty surrounding the effects of large tariff changes implies that uncertainty about

the best course of action and thus disagreement among policymakers could also be substantial. While it's important to keep some limitations in mind, the ability to compare multiple policy path scenarios using the PCT can provide new insights for calibrating policy during times of economic uncertainty.

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## Data

[Download data for figures](#) (Excel, 175 kb)

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