Technical Appendix
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Maintaining the Anchor: An Evaluation of Inflation Targeting in the Face of Covid-19*

Brent Bundick† A. Lee Smith‡ Luca Van der Meer

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†Federal Reserve Bank of Kansas City. Email: brent.bundick@kc.frb.org

‡Federal Reserve Bank of Kansas City. Email: andrew.smith@kc.frb.org

A Derivation & Details of Theoretical Model

This section provides further details on the derivation and calibration of our theoretical model in Section 3 of the main text. The framework below draws heavily from prior work in Bundick and Petrosky-Nadeau (2026), Ireland (2007), and Bundick and Smith (2025), but also includes some additional shocks to help capture the inflation and unemployment dynamics during the COVID-induced inflation surge.

A.1 Longer-Term Inflation Expectations

In the model, longer-term inflation expectations can either be anchored at the central bank's target or they can be unanchored and drift with realized inflation outcomes. The following equation captures this idea:

$$\pi_t^{LT} = \rho^{\pi} \pi_{t-1}^{LT} + \Big(1 - \rho^{\pi}\Big)\pi^* + \delta^{\pi}\Big(\pi_t - \mathbb{E}_t \pi_{t-1}\Big), \tag{1}$$

where π_t^{LT} is the long-term inflation expectation in period t, π_t is the inflation rate, and π^* represents the central bank's inflation objective. The coefficient δ^{π} determines the degree to which long-term inflation expectations are anchored. If $\delta^{\pi} = 0$, then long-term inflation expectations are fully anchored meaning they are invariant to realized inflation and longer-term expectations coincide with the central bank's target. If instead $\delta^{\pi} > 0$, then inflation expectations are unanchored and drift with realized inflation. If $\delta^{\pi} > 0$, the parameter $0 \leq \rho^{\pi} \leq 1$ determines the persistence of the fluctuations in longer-term expectations in response to unexpected changes in current inflation.[1]

A.2 Households

Our model features a representative household in which a fraction N_t of its members work H_t hours on the job at an hourly wage W_t. A fraction U_t of the household are unemployed and search for work. The representative household chooses consumption C_t and holdings of the one-period nominal bond B_{t+1} to maximize its lifetime utility:

$$\max \mathbb{E}_t \sum_{i=0}^{\infty} a_{t+i}\, \beta^i \left\{ \frac{C_{t+i}^{1-\sigma}}{1-\sigma} + \nu_0 \frac{\left(1 - H_{t+i}\right)^{1-\nu_1}}{1-\nu_1} N_{t+i} + \nu_u\, U_{t+i} \right\}$$

[1] As discussed in the main text, we remain agnostic about the microfoundations of Equation (1) and instead focus on the testable implications if inflation expectations become unanchored. Previous work by Ireland (2007), Gürkaynak, Sack and Swanson (2005), Rudebusch and Wu (2008), and Rudebusch and Swanson (2012) also use similar specifications in modeling longer-term inflation expectations.

subject to its budget constraint each period:

$$C_t + T_t + \frac{B_t}{P_t R_t} = \frac{B_{t-1}}{P_t} + W_t\, H_t\, N_t + b\, U_t + D_t,$$

where β represents household discount factor over time. The parameters $\sigma > 0$, $\nu_0 > 0$ and $\nu_1 > 0$ affect the utility of consumption and the disutility of hours worked out relative to total amount of time available each period (which we normalize to 1). ν_u affects the utility of non-employment and b denotes unemployment benefits. a_t is an exogenous preference shock which causes unexpected fluctuations in household demand. Finally, R_t denotes the gross nominal interest rate, T_t denotes lump-sum taxes to fund unemployment benefits, and D_t denotes dividends from owning shares in the wholesale and retail firms.

We denote λ_t^C as the Lagrange multiplier on the household's budget constraint and $\Pi_t = P_t/P_{t-1}$ as the gross inflation rate. The household's first-order condition for bond holdings yields the Euler equation

$$1 = \mathbb{E}_t \left\{ M_{t+1} \frac{R_t}{\Pi_{t+1}} \right\}, \tag{2}$$

in which the stochastic discount factor, M_{t+1}, is given by:

$$M_{t+1} \triangleq \beta \left(\frac{\lambda_{t+1}^C}{\lambda_t^C} \right) \tag{3}$$

The law of motion for the exogenous demand shock is as follows:

$$a_t = \rho^a a_{t-1} + \left(1 - \rho^a\right) a + \sigma^a \varepsilon_t^a \tag{4}$$

where $\rho^a \in (0, 1)$ and $\sigma^a > 0$ control the persistence and volatility of the demand shocks, its steady-state value a equals 1, and ε_t^a is an independently and identically-distributed standard normal shock.

A.3 Aggregation Sector

The aggregating sector produces the aggregate final consumption good Y_t using a basket of differentiated retail goods as inputs. Denote by $Y_t(j)$ as a type-j retail good for $j \in [0, 1]$. We assume:

$$Y_t = \left(\int_0^1 Y_t(j)^{\frac{\omega_t - 1}{\omega_t}} \mathrm{d}j \right)^{\frac{\omega_t}{\omega_t - 1}}, \tag{5}$$

where $\omega_t > 1$ denotes the elasticity of substitution between differentiated products. Expenditure minimization implies a demand for type j retail good that is inversely related to the relative price, with the demand schedule given by

$$Y_t^D(j) = \left(\frac{Y_t(j)}{P_t}\right)^{-\omega_t} Y_t, \tag{6}$$

where $Y_t^D(j)$ and $P_t(j)$ denote the demand for and the price of retail good of type j, respectively. The price index P_t is related to individual prices $P_t(j)$ through

$$P_t = \left(\int_0^1 P_t(j)^{\frac{1}{1-\omega_t}} \mathrm{d}j\right)^{1-\omega_t}. \tag{7}$$

A.4 The Labor Market and Wholesale Sector

Firms in the wholesale sector hire workers in a labor market subject to search frictions. They post job vacancies V_t to attract jobs seekers. Employed workers experience exogenous separation shocks which occur at a time-varying rate s_t each period. These exogenous separation shocks help the model capture the sudden increase in unemployment during the COVID pandemic. Each vacant position costs $\kappa_t = \kappa_0 + \kappa_1 q_t > 0$ units of final output per unit of time. $\kappa_0 > 0$ is a variable cost and κ_1 a fixed cost paid by a representative firm after hiring.

Vacancies are filled via a constant returns to scale matching function, $G(U_t, V_t)$. We define labor market tightness as $\theta_t \equiv V_t/U_t$. The probability for a vacancy to be filled per unit of time (the vacancy filling rate) is:

$$\frac{G(U_t, V_t)}{V_t} = q(\theta_t) \text{ with } q'(\theta_t) < 0, \tag{8}$$

and such that $q(\theta_t)V_t$ is the number of new hires. Employment, N_t, evolves as

$$N_{t+1} = (1 - s_t)N_t + q(\theta_t)V_t. \tag{9}$$

The matching function is specified as $G(U_t, V_t) = \frac{U_t V_t}{(U_t^\iota + V_t^\iota)^{1/\iota}}$, in which $\iota > 0$ is a constant parameter. This matching function, specified as in Den Haan, Ramey and Watson (2000), has the desirable property that matching probabilities fall between zero and one. The job filling rate is given by $q(\theta_t) = (1 + \theta_t^\iota)^{-1/\iota}$. The exogenous separation rate follows a standard autoregressive process:

$$s_t = \rho^s s_{t-1} + \left(1 - \rho^s\right)s + \sigma^s \varepsilon_t^s, \tag{10}$$

in which $\rho^s \in (0, 1)$ is the persistence, $\sigma^s > 0$ is its volatility, s is its steady-state value, and ε_t^s is an independently and identically-distributed standard normal shock.

The wholesale goods-producing firms produce with a production technology $X_t N_t H_t^\alpha$ where H_t denotes hours worked per worker, $\alpha \in (0,1)$ is a parameter capturing diminishing returns to additional hours, and X_t is aggregate productivity subject to exogenous fluctuations. Firms sells their output at unit price ψ_t. Aggregate productivity follows a standard autoregressive process:

$$X_t = \rho^X X_{t-1} + \left(1 - \rho^X\right) X + \sigma^X \varepsilon_t^X, \tag{11}$$

in which $\rho_X \in (0,1)$ is the persistence, $\sigma^X > 0$ is its volatility, its steady-state value X equals 1, and ε_t^x is an independently and identically-distributed standard normal shock.

The firm posts an optimal number of job vacancies to maximize the cum-dividend market value of equity, denoted S_t^W, taking the vacancy filling rate, employment, wage and hours of work as given:

$$S_t^W \triangleq \max \ \mathbb{E}_t \left\{ \sum_{i=0}^{\infty} M_{t+i} \left(\psi_{t+i} X_{t+i} N_{t+1} H_{t+i}^\alpha - W_{t+i} H_{t+i} N_{t+i} - \kappa_{t+i} V_{t+i} \right) \right\}, \tag{12}$$

subject to the employment accumulation Equation (9) and a non-negativity constraint on vacancies as the only source of job destruction in the model is the exogenous separation of employed workers from the firm:

$$V_t \geq 0. \tag{13}$$

Let λ_t^V denote the multiplier on the non-negativity constraint rewritten as $q(\theta_t)V_t \geq 0$ and λ_t^N define the multiplier on the employment accumulation equation. Optimization with respect to V_t and N_{t+1} implies the following first-order conditions:

$$\lambda_t^N = \frac{\kappa_t}{q_t} - \lambda_t^V \tag{14}$$

$$\lambda_t^N = \mathbb{E}_t \left\{ M_{t+1} \left(\psi_{t+1} X_{t+1} H_{t+1}^\alpha - W_{t+1} H_{t+1} + \left(1 - s_{t+1}\right) \lambda_{t+1}^N \right) \right\} \tag{15}$$

Intuitively, the marginal cost of hiring at time t equals the marginal value of employment to the firm which equals the discounted marginal benefit of hiring at period $t+1$. The marginal benefit at $t+1$ includes the marginal revenue from an employed worker, $\psi_{t+1} X_{t+1} H_{t+1}^\alpha$, net of the wage bill, $W_{t+1} H_{t+1}$, plus the marginal value of a retained worker into the next period, which equals the marginal cost of hiring at $t+1$. Finally, the optimal vacancy policy also satisfies the Kuhn-Tucker conditions:

$$q_t V_t \geq 0, \quad \lambda_t^V \geq 0, \quad \text{and} \quad \lambda_t^V q_t V_t = 0. \tag{16}$$

Since we will ultimately linearize model arounds its deterministic steady state, the non-negativity constraint on vacancies will not bind in equilibrium:

$$\lambda_t^V = 0 \tag{17}$$

A.5 Wages

Keeping with much of the literature, we assume workers and firms engage in bilateral Nash bargaining over hours and wages. The Appendix of Bundick and Petrosky-Nadeau (2026) shows that the Nash bargained wage can be expressed as compensation per worker $W_t H_t$:

$$W_t H_t = \eta \left[\psi_t X_t H_t^{\alpha} + \kappa_t \theta_t\right] + (1-\eta) Z_t, \tag{18}$$

where $\eta \in (0,1)$ is the worker's relative bargaining weight. Z_t captures the worker's reservation wage as a function of unemployment compensation b and the change in flow utility from employment compared to remaining unemployed:

$$Z_t = b + \frac{1}{\lambda_t^C}\left(\nu_u - \nu_0 \frac{(1-H_t)^{1-\nu_1}}{1-\nu_1}\right), \tag{19}$$

where λ_t^C denotes the marginal utility of consumption. Bilateral Nash bargaining over hours results in the following equilibrium condition:

$$\frac{\nu_0}{\lambda_t^C}\left(1-H_t\right)^{-\nu_1} \; = \; \alpha \psi_t X_t H_t^{\alpha-1} \tag{20}$$

which equates the marginal utility of hours of leisure to the marginal revenue product of an additional hour of work.

A.6 Retail Goods Producers

A continuum of firms in the monopolistically-competitive retail goods sector each produce a differentiated product $Y_t(j)$ using the homogeneous wholesale good as input. ω_t denotes the elasticity of substitution among the differentiated retail goods, which is subject to exogenous fluctuations. Increases in ω_t act as inefficient markup shocks which help the model capture the increase in inflation caused by the pandemic-induced disruptions in supply chains. Firm j faces a quadratic cost to adjusting its nominal price $P_t(j)$:

$$\frac{\Omega}{2}\left[\frac{P_t(j)}{\Pi_t^{LT} P_{t-1}(j)} - 1\right]^2 Y_t,$$

where $\Pi_t = P_t/P_{t-1}$, $\Pi_t^{LT} = \exp(\pi_t^{LT})$ is the gross rate of long-term inflation expectations, Ω governs the magnitude of the adjustment costs, and Y_t is the final output good. ω_t follows a standard autoregressive process:

$$\omega_t = \rho^\omega \omega_{t-1} + \Big(1 - \rho^\omega\Big)\omega + \sigma^\omega \varepsilon_t^\omega \tag{21}$$

in which $\rho^\omega \in (0,1)$ is the persistence, $\sigma^\omega > 0$ is its volatility, ω is its steady-state value, and ε_t^ω is an independently and identically-distributed standard normal shock.

A retail firm that produces good j maximizes the value of its equity S_t^R by choosing the price $P_t(j)$ for its differentiated good solves the following problem:

$$S_t^R \triangleq \max \mathbb{E}_t \left\{ \sum_{i=0}^{\infty} M_{t+i} \left[\left(\frac{P_{t+i}(j)}{P_{t+i}} - \psi_{t+i} \right) Y_{t+i}^D(j) - \frac{\Omega}{2} \left(\frac{P_{t+i}(j)}{\Pi_t^{LT} P_{t+i-1}(j)} - 1 \right)^2 Y_{t+i} \right] \right\} \tag{22}$$

In a symmetric equilibrium with $P_t(j) = P_t$ for all j, the optimal price-setting decision relates marginal costs ψ_t and price inflation Π_t as follows:

$$\Omega \left(\frac{\Pi_t}{\Pi_t^{LT}} \right) \left(\frac{\Pi_t}{\Pi_t^{LT}} - 1 \right) = \Big(1 - \omega_t\Big) + \omega_t \, \psi_t + \Omega \, \mathbb{E}_t \left\{ M_{t+1} \left(\frac{\Pi_{t+1}}{\Pi_{t+1}^{LT}} \right) \left(\frac{\Pi_{t+1}}{\Pi_{t+1}^{LT}} - 1 \right) \left(\frac{Y_{t+1}}{Y_t} \right) \right\}$$

A.7 Monetary Policy

The central bank in the model sets its short-term nominal policy rate R_t to minimize deviations inflation from relative to long-term expectations and fluctuations in unemployment:

$$\log \Big(R_t\Big) = \phi_\pi \log \Big(\Pi_t/\Pi_t^{LT}\Big) + \phi_u \Big(U_t - U\Big) + \sigma^r \varepsilon_t^r, \tag{23}$$

where $\phi_\pi > 1$ and $\phi_u \leq 0$ capture the central bank's responses to inflation and unemployment deviations while U denotes the steady-state unemployment rate. Similar to Gürkaynak, Sack and Swanson (2005), we assume the central bank responds to deviations from long-term expectations rather than its target Π^*, even if a target has been announced.[2] While we remain agnostic as to why the central bank may behave this way, policymakers could perceive the costs of driving inflation back to target as larger than the benefits, allowing expectations to drift. The policy rule also includes an exogenous monetary policy shock ε_t^r with volatility σ^r.

[2] If instead the central bank responds to deviations from its target, Equation (1) plays no meaningful role in shaping inflation dynamics.

A.8 Equilibrium and Aggregation

In a symmetric equilibrium, all retail-goods producing firms make identical decisions ($Y_t(j) = Y_t$ and $P_t(j) = P_t$). Households hold all the shares in the retail and wholesale firms and the nominal bond is in zero net supply. After aggregation, we can write the aggregation production function and national income identify as follows:

$$Y_t = X_t N_t H_t^{\alpha}, \tag{24}$$

$$Y_t = C_t + \kappa_t V_t + \frac{\Omega}{2}\left(\frac{\Pi_t}{\Pi_t^{LT}} - 1\right)^2 Y_t. \tag{25}$$

Thus, search frictions in the labor market through vacancy postings and nominal rigidities cost real economic resources. Under the assumption of full participation in the labor market, we can write the unemployment rate as:

$$U_t = 1 - N_t \tag{26}$$

A.9 Empirical Proxies for Longer-Term Inflation Expectations

As we discuss in the main text, most countries in our empirical study do not have an active inflation-linked debt market, therefore, we often rely on far-forward nominal interest rates. To generate these concepts in the model, we compute the 10-year (120-month) forward inflation breakevens (π_t^{120}) and the 10-year nominal forward rates (r_t^{120}):

$$\pi_t^{120} \triangleq \log\left(\Pi_t^{120}\right) = \mathbb{E}_t\left\{\log\left(\Pi_{t+120}\right)\right\} \tag{27}$$

$$r_t^{120} \triangleq \log\left(R_t^{120}\right) = \mathbb{E}_t\left\{\log\left(R_{t+120}\right)\right\} \tag{28}$$

A.10 Complete Model

We can write down the complete model as follows:

$$
\begin{aligned}
Y_t &= X_t N_t H_t^{\alpha} \\
\kappa_t &= \kappa_0 + \kappa_1 q_t \\
Y_t &= C_t + \kappa_t V_t + \frac{\Omega}{2}\left(\frac{\Pi_t}{\Pi_t^{LT}} - 1\right)^2 Y_t \\
\theta_t &= \frac{V_t}{U_t} \\
q_t &= \frac{1}{(1+\theta_t^{\iota})^{1/\iota}} \\
N_{t+1} &= (1-s_t)N_t + q_t V_t \\
W_t H_t &= \eta\left[\psi_t X_t H_t^{\alpha} + \kappa_t \theta_t\right] + (1-\eta) Z_t \\
Z_t &= b + \frac{1}{\lambda_t^C}\left(\nu_u - \nu_0 \frac{(1-H_t)^{1-\nu_1}}{1-\nu_1}\right) \\
\lambda_t^N &= \frac{\kappa_t}{q_t} - \lambda_t^V \\
U_t &= 1 - N_t \\
\lambda_t^C &= a_t\, C_t^{-\sigma} \\
M_t &= \beta\left(\frac{\lambda_t^C}{\lambda_{t-1}^C}\right) \\
\lambda_t^N &= \mathbb{E}_t\left\{M_{t+1}\left(\psi_{t+1} X_{t+1} H_{t+1}^{\alpha} - W_{t+1}H_{t+1} + \left(1 - s_{t+1}\right)\lambda_{t+1}^N\right)\right\} \\
\lambda_t^V &= 0 \\
\alpha \psi_t X_t H_t^{\alpha-1} &= \frac{\nu_0}{\lambda_t^C}\left(1-H_t\right)^{-\nu_1} \\
\Omega\left(\frac{\Pi_t}{\Pi_t^{LT}}\right)\left(\frac{\Pi_t}{\Pi_t^{LT}} - 1\right) &= \left(1-\omega_t\right) + \omega_t\, \psi_t + \Omega\, \mathbb{E}_t\left\{M_{t+1}\left(\frac{\Pi_{t+1}}{\Pi_{t+1}^{LT}}\right)\left(\frac{\Pi_{t+1}}{\Pi_{t+1}^{LT}} - 1\right)\left(\frac{Y_{t+1}}{Y_t}\right)\right\} \\
1 &= \mathbb{E}_t\left\{M_{t+1}\frac{R_t}{\Pi_{t+1}}\right\} \\
r_t \triangleq \log\left(R_t\right) &= \phi_\pi \log\left(\Pi_t/\Pi_t^{LT}\right) + \phi_u\left(U_t - U\right) + \sigma^r \varepsilon_t^r \\
\pi_t^{LT} \triangleq \log\left(\Pi_t^{LT}\right) &= \rho^\pi \log\left(\pi_{t-1}^{LT}\right) + \left(1-\rho^\pi\right)\log\left(\Pi^*\right) + \delta^\pi\left(\log\left(\Pi_t\right) - \mathbb{E}_t \log\left(\Pi_{t-1}\right)\right)
\end{aligned}
$$

$$
\begin{aligned}
a_t &= \rho^a a_{t-1} + \Big(1-\rho^a\Big) a + \sigma^a \varepsilon_t^a \\
X_t &= \rho^X X_{t-1} + \Big(1-\rho^X\Big) X + \sigma^X \varepsilon_t^X \\
s_t &= \rho^s s_{t-1} + \Big(1-\rho^s\Big) s + \sigma^s \varepsilon_t^s \\
\omega_t &= \rho^\omega \omega_{t-1} + \Big(1-\rho^\omega\Big) \omega + \sigma^\omega \varepsilon_t^\omega \\
\pi_t^{120} \triangleq \log\Big(\Pi_t^{120}\Big) &= \mathbb{E}_t \Bigg\{ \log\Big(\Pi_{t+120}\Big) \Bigg\} \\
r_t^{120} \triangleq \log\Big(R_t^{120}\Big) &= \mathbb{E}_t \Bigg\{ \log\Big(R_{t+120}\Big) \Bigg\}
\end{aligned}
$$

All of the exogenous shocks $\left(\varepsilon_t^a\, \varepsilon_t^X, \varepsilon_t^s, \varepsilon_t^\omega, \varepsilon_t^r\right)$ are independent, normally-distributed random variables with a variance of 1. λ_t^C, λ_t^N, and λ_t^V denote the Lagrange multipliers on the household's budget constraint, the law of motion for employment, and the non-negativity constraint on vacancies. We enter the non-linear model into Dynare and generate the model responses based on a first-order perturbation approximated around the deterministic steady-state. Since the level of employment is predetermined in the model, we lag N_t in each of the previous equations in the Dynare model file. Also, since we linearize the economy around its deterministic steady state, we set the non-negativity constraint on vacancies λ_t^V equal to zero each period.

A.11 Calibration, Estimation, and Solution Method

We want to use our theoretical model to illustrate some testable implications that would occur *if* inflation expectations became unanchored following the COVID pandemic. To help ensure our model remains tractable but also captures the key dynamics of unemployment and inflation during that period, we follow a two-step calibration and estimation procedure for the model parameters. First, we calibrate many of the structural parameters of our model based on previous studies or steady-state relationships. Table A.1 contains a full summary of the calibrated parameters of our model which we calibrate to a monthly frequency. Since our model shares numerous features with the specification of Bundick and Petrosky-Nadeau (2026), we often use the parameters from that paper in calibrating the parameters in the model.

We calibrate the δ^π parameter governing the process for long-term inflation expectations based on our cross-country empirical evidence from the main text. Under the anchored inflation expectations specification, we set $\delta^{\pi} = 0$. For the unanchored specification in Section 3 of the main text, we set $\delta^{\pi} = 0.05$ which is between our Pre-COVID empirical estimates for Norway and the United Kingdom from Table 5 of the main text. We set $\rho^{\pi} = 0.995$ which generates persistent but ultimately temporary movements in longer-term inflation expectations following a shock. This calibration of ρ^{π} is very close to the drifting inflation target specifications of Rudebusch and Swanson (2012) or Gürkaynak, Sack and Swanson (2005).

Given these calibrated parameters, we then estimate the parameters governing the exogenous shock processes and the slope of the structural Phillips curve. These parameters crucially affect the model's implied sacrifice ratio (a key interest in our study), so we estimate them to ensure that our model provides a reasonable description of the economy during and after the pandemic. We use a Bayesian estimation procedure that combines priors on the estimated parameters with U.S. data. We assume fairly uninformative priors for the exogenous shock processes. The priors for the serial correlation coefficients in the AR(1) shock processes are assumed to follow a Beta distribution with mean of 0.5 and standard deviation of 0.2. The prior for the volatility of each shock process is assumed to follow an Inverse-Gamma distribution with mean 0.02 and standard deviation 0.5.

In contrast, we set a more informative prior for the cost of price adjustment, which determines the slope of the marginal cost Phillips curve. For this parameter, we rely on the mapping between the Rotemberg (1982) and Calvo (1983) specifications of nominal rigidities. In particular, under Calvo-style price rigidity, the slope of the marginal cost Phillips curve is given by:

$$k_{mc}^{Calvo} = \frac{(1-\zeta)(1-\beta\zeta)}{\zeta}, \tag{29}$$

where ζ is the Calvo parameter that determines the probability of not adjusting prices and $(1-\zeta)$ of firms adjust prices each period. Under this specification, the average duration of prices is given by $1/(1-\zeta)$. The micro evidence on the average duration of prices from Nakamura and Steinsson (2008) suggests that prices remain unchanged anywhere from 7-11 months. If prices remain unchanged for 11 months, that implies a value of $\zeta = 0.91$ and under our calibration of β, $k_{mc}^{Calvo} = 0.0091$.

In the Rotemberg (1982) specification,

$$k_{mc}^{Rotemberg} = \frac{(\omega-1)}{\Omega}, \tag{30}$$

where ω is the elasticity of substitution among differentiated retail goods and Ω is the Rotemberg cost of price adjustment. We calibrate the elasticity of substitution $\omega = 10$, which implies a value of Ω near 800 is needed to equate $k_{mc}^{Rotemberg} = k_{mc}^{Calvo} \approx 0.01$. To bring this prior information to bear on the estimation, we set an Inverse-Gamma prior on Ω with a mean of 800 and a standard deviation of 25.

We estimate the shock autocorrelations and volatilities, as well as the cost of price adjustment, using U.S. data on four macroeconomic observables: monthly real GDP growth, the unemployment rate, year-over-year PCE inflation, and the 2-yr Treasury yield. The monthly measure of GDP is produced by IHS Markit, formerly Macroeconomic Adivsers. All the data were accessed through Haver Analytics. The data were demeaned prior to estimation, so that the empirical series align with their model counterparts measured in deviations from the non-stochastic steady state. The estimation period is from October 2020 through December 2024. The start date is chosen to avoid issues with the closing and re-opening of the economy around the pandemic. Figure 1 plots the series that were used in the estimation as they enter the observation equations.

Table A.2 shows the posterior mode and standard deviation of the estimated parameters. The posterior mode of the Rotemberg cost of price adjustment is centered at the prior mean, suggesting the dynamics in the 2020-2024 data were broadly consistent with the marginal cost Phillips curve slope that prevailed before the pandemic. The persistence parameters suggest that technology shocks are highly persistent and that demand and separation shocks relatively less persistent, consistent with estimates in the prior literature. In terms of the estimated standard deviations of the shocks, markup shocks are an overwhelming driver of inflation in our estimation. These are likely standing in for the role played by supply chain disruptions, which are not explicitly present in our model. Figure 2 illustrates the model responses for each of the observables to either a demand, productivity, markup, or separations shock which increases output. While all four shocks increase output, they all have different implications for either inflation, unemployment, or the 2-year yield, which helps the estimation procedure separately identify the parameters governing the shock processes.

Figure 3 shows the historical decomposition of inflation according to the estimated model. Weak demand and rising separations roughly offset each other in 2020, keeping inflation fairly low. By 2021, the negative contribution of adverse demand shocks began to reverse, consistent with the economy reopening and additional stimulus from fiscal policy. As demand picked up, impaired supply chains struggled to accommodate the stronger demand, likely captured in the model by large contributions from markup shocks. Along these lines, the model's interpretation of the COVID-19 inflation surge is broadly consistent with other accounts which attribute the surge to a combination of growing demand and impaired supply.

A.12 Additional Model Simulation Results

Using the model parameters discussed in the previous section, we use our theoretical model to illustrate some robustness exercises for our testable predictions regarding the potential deanchoring of inflation expectations. Specifically, we redo our simulation exercises under both anchored and drifting inflation expectations from Section 3 of the main text but also allow for simultaneous changes in other model parameters. For these exercises, we continue to assume that inflation expectations become unanchored after 111 periods but we also simultaneously change the central bank's response to inflation in its policy rule. Table A.3 illustrates the results if the central bank's inflation response falls from ϕ_π our baseline calibration of 1.5 to 1.1 at the same time as δ^π becomes positive. In contrast, Table A.4 shows the results if ϕ_π increases from 1.5 to 3. Finally, Table A.5 shows the results if the composition and volatility of the underlying exogenous shocks changes at the same time as the deanchoring of expectations, which we model as a doubling of the volatility of the markup, separation, and productivity shocks.

For each of these alternative economies, the results in Tables A.3 , A.4, and A.5 show that an econometrician can always exactly identify changes in δ^π if we could perfectly observe longer-term inflation expectations in the model. However, we see that our statistical break tests still uncover changes in the relationships even if we can only observe far forward inflation breakevens or nominal forward rates. These findings are particularly noteworthy given the potential for structural change in the economy coming out of the pandemic. They suggest that the relationship between inflation surprises and far forward breakevens or nominal rates remains informative about the degree of anchoring even if other policy parameters change at the same time.

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Table A.1: Calibrated Model Parameters

Parameter	Description	Value	Source
β	Household Discount Factor	$e^{-0.5/1200}$	0.5% Annualized Real Rate
ι	Curvature of Matching Function	1.25	Den Haan, Ramey and Watson (2000)
ν_1	Controls Elasticity of Labor Supply	2	Bundick and Petrosky-Nadeau (2026)
α	Diminishing Returns to Hours	0.067	Bundick and Petrosky-Nadeau (2026)
σ	Risk Aversion	2	Standard
ω	Intermediate Elasticity of Substitution	10	Average Markup over Marginal Cost
s	Steady-State Separation Rate	0.03	Unemployment Flows
ϕ_π	Central Bank Response to Inflation	1.5	Standard
ϕ_u	Central Bank Response to Unemployment	-0.05	Bundick and Petrosky-Nadeau (2026)
Π^*	Central Bank Inflation Target	$1.02^{1/12}$	2% Annual Inflation Target
U^*	Longer-Run Unemployment Rate	0.05	Bundick and Petrosky-Nadeau (2026)
H	Steady-State Hours Worked	0.2	Standard
ν_0	Utility Shifter Over Leisure	6.4	Bundick and Petrosky-Nadeau (2026)
ν_u	Utility Over Non-Employment	-6.7	Bundick and Petrosky-Nadeau (2026)
η	Worker's Bargaining Weight	0.25	Bundick and Petrosky-Nadeau (2026)
κ_0	Vacancy Cost	0.04	Bundick and Petrosky-Nadeau (2026)
κ_1	Fixed Hiring Cost	0.06	Bundick and Petrosky-Nadeau (2026)
b	Unemployment Benefits	0.15	Bundick and Petrosky-Nadeau (2026)
ρ^π	Persistence of Inflation Expectations	0.995	Rudebusch and Swanson (2012)
δ^π	Drifting or Anchored Expectations	0 or 0.05	Empirical Estimates

Table A.2: Estimated Model Parameters

		Prior			Posterior	
Parameter	Description	Distribution	Mean	Std. Dev.	Mode	Std. Dev.
Ω	Rotemberg Nominal Rigidity	Inverse-Gamma	800	25	798.58	24.6896
ρ^a	Demand Shock Persistence	Beta	0.5	0.2	0.9665	0.0139
ρ^x	Technology Shock Persistence	Beta	0.5	0.2	0.9902	0.0028
ρ^s	Separation Shock Persistence	Beta	0.5	0.2	0.8412	0.0308
σ^a	Demand Shock Volatility	Inverse-Gamma	0.02	0.5	0.0117	0.0015
σ^x	Technology Shock Volatility	Inverse-Gamma	0.02	0.5	0.0054	0.0008
σ^s	Separation Shock Volatility	Inverse-Gamma	0.02	0.5	0.0033	0.0003
σ^ω	Markup Shock Volatility	Inverse-Gamma	0.02	0.5	27.1183	2.5801
σ^r	Monetary Policy Shocks Volatility	Inverse-Gamma	0.02	0.5	0.0045	0.0007

Notes: Estimation is performed using Dynare 4.5.7

Table A.3: Testable Predictions of Unanchoring Inflation Expectations with Simultaneous Decrease in Central Bank's Response to Inflation

Event-Study Regressions Using Simulated Data From Model

	Δ Long-Term Inflation Expectations		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.000	0.050***	0.000
	(0.000)	(0.000)	(0.000)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.050***
			(0.000)
	Δ 10-Year Inflation Forward		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.001	0.285***	0.001
	(0.002)	(0.009)	(0.002)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.284***
			(0.009)
	Δ 10-Year Nominal Forward		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.002	0.284***	0.002
	(0.002)	(0.009)	(0.002)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.282***
			(0.009)
Observations	111	45	156

We show bootstrapped standard errors using model-simulated data. Each regression includes a constant but is always estimated to be numerically close to zero. See Section A.12 for more details. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table A.4: Testable Predictions of Unanchoring Inflation Expectations With Simultaneous Increase in Central Bank's Response to Inflation

Event-Study Regressions Using Simulated Data From Model

	Δ Long-Term Inflation Expectations		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.000	0.050***	0.000
	(0.000)	(0.000)	(0.000)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.050***
			(0.000)
	Δ 10-Year Inflation Forward		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.001	0.042***	0.001
	(0.002)	(0.002)	(0.002)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.041***
			(0.003)
	Δ 10-Year Nominal Forward		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.002	0.042***	0.002
	(0.002)	(0.003)	(0.002)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.040***
			(0.004)
Observations	111	45	156

We show bootstrapped standard errors using model-simulated data. Each regression includes a constant but is always estimated to be numerically close to zero. See Section A.12 for more details. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

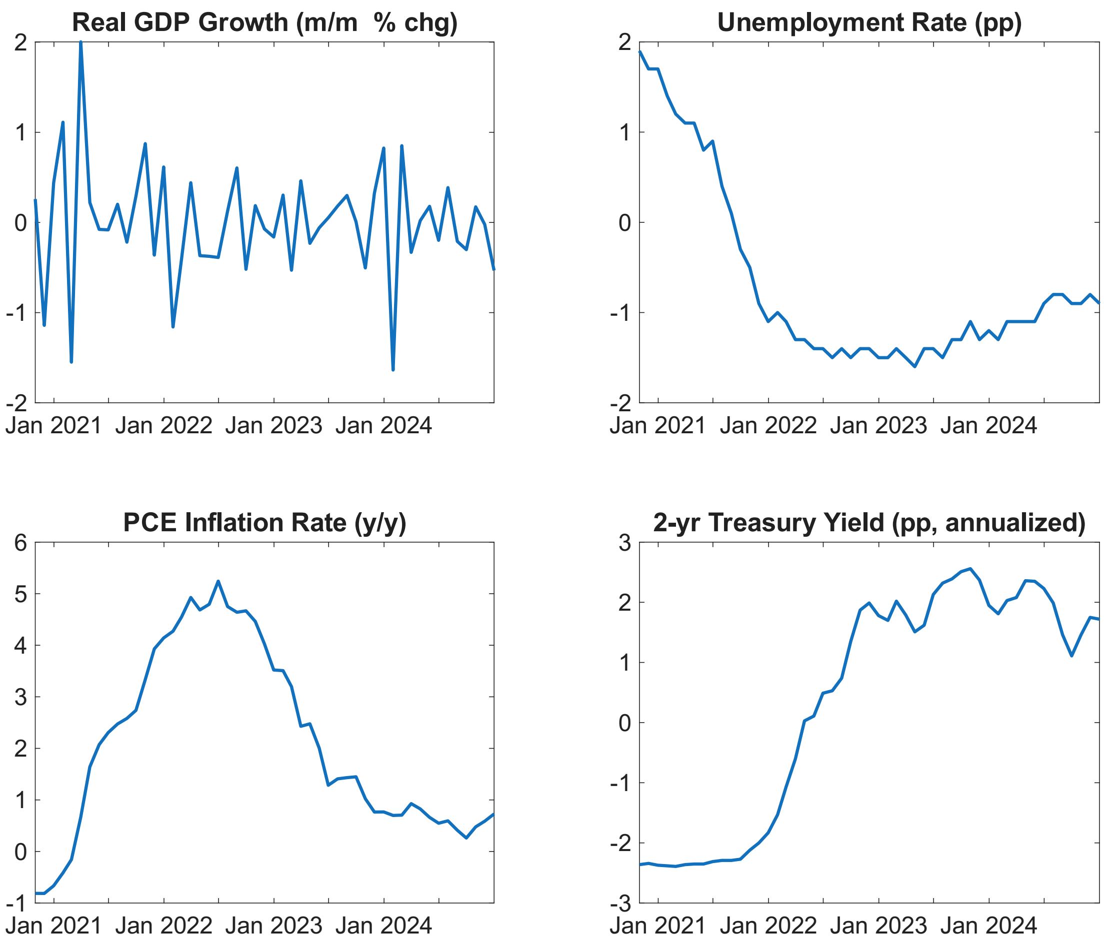
Table A.5: Testable Predictions of Unanchoring Inflation Expectations With More Volatile Supply Shocks

Event-Study Regressions Using Simulated Data From Model

	Δ Long-Term Inflation Expectations		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.000	0.050***	0.000
	(0.000)	(0.000)	(0.000)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.050***
			(0.000)
	Δ 10-Year Inflation Forward		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.001	0.082***	0.001
	(0.002)	(0.002)	(0.002)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.081***
			(0.003)
	Δ 10-Year Nominal Forward		
	Pre-Pandemic	COVID	Full Sample
$\pi_t - \mathbb{E}_{t-1}\pi_t$	0.002	0.081***	0.002
	(0.002)	(0.003)	(0.002)
$\pi_t - \mathbb{E}_{t-1}\pi_t \times \mathcal{I}_{COVID}$			0.080***
			(0.004)
Observations	111	45	156

We show bootstrapped standard errors using model-simulated data. Each regression includes a constant but is always estimated to be numerically close to zero. See Section A.12 for more details. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Figure 1: Data Used for Model Estimation



Note: Real GDP growth is demeaned using the sample average. The other series are demeaned using the non-stochastic steady state of the model.

Figure 2: Responses of Model Observables to Exogenous Shocks

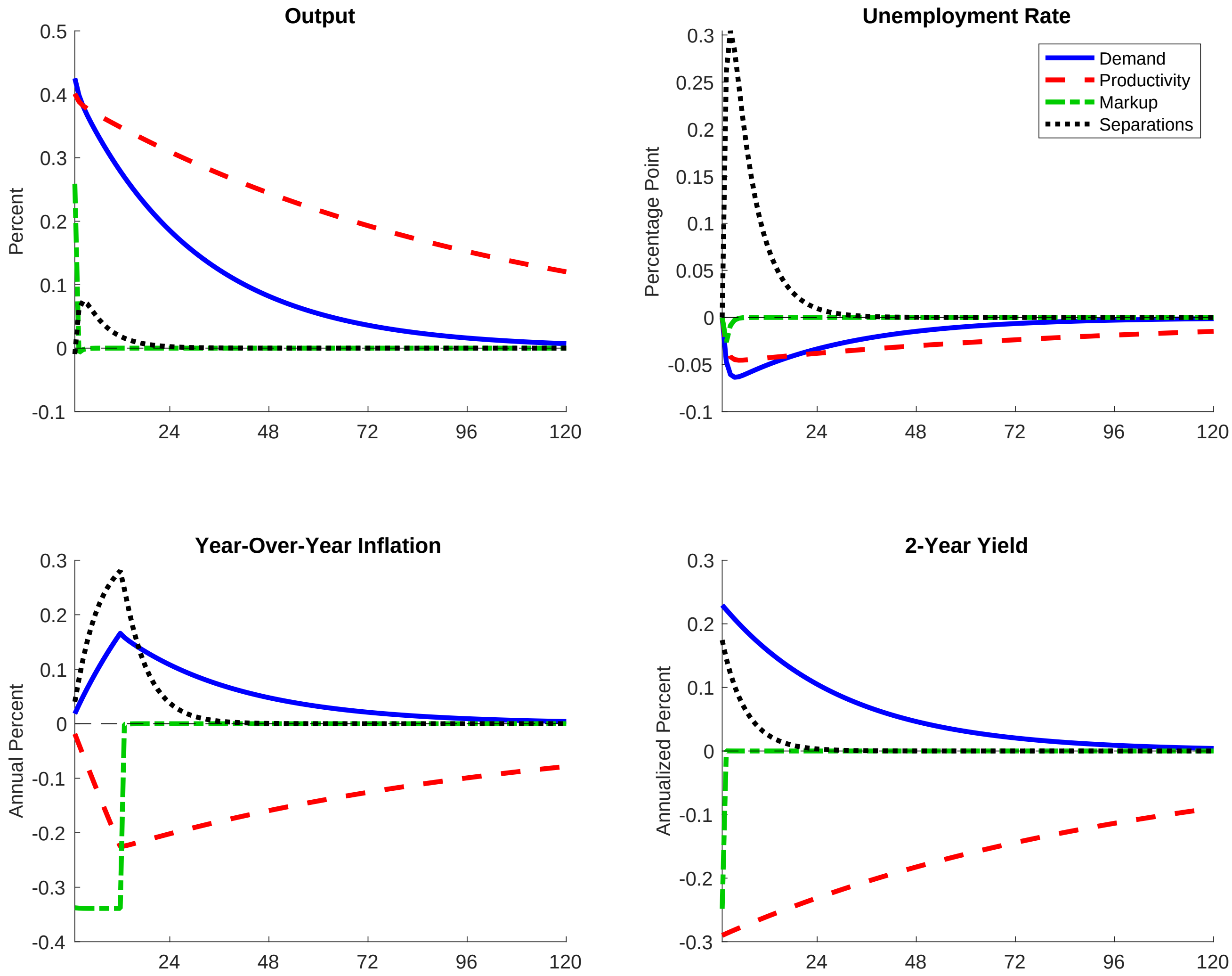
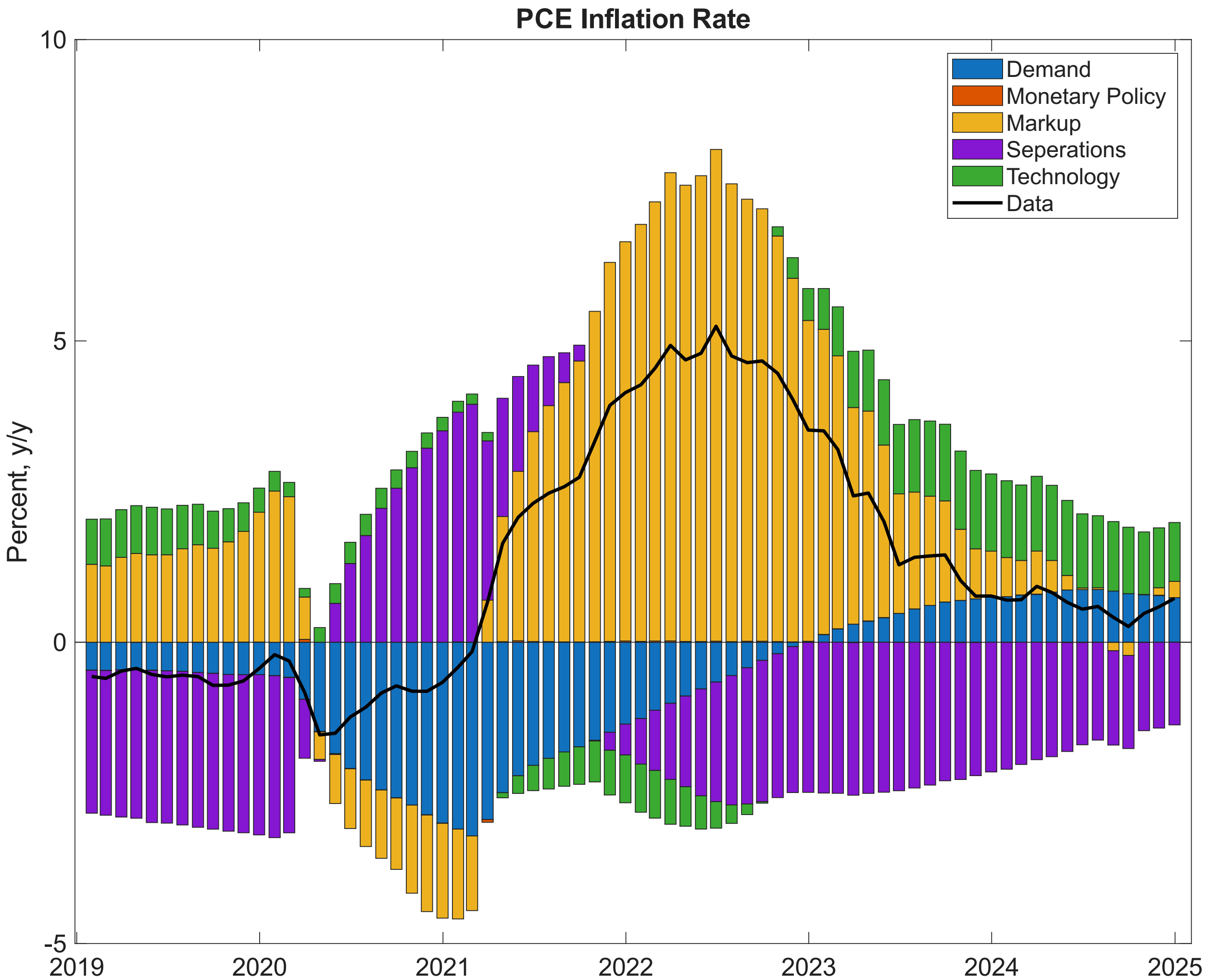


Figure 3: Historical Decomposition of Inflation Before & After the Pandemic



Note: For the purpose of this chart, we begin filtering the model in January 2000 to eliminate the effects of initial conditions on the hisotrical decomposition.