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The Impact of the 2026 Iran War on U.S. Inflation: A Scenario Analysis[*]

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Abstract

This paper shows how to assess the inflationary impact of the rise in the price of oil caused by the 2026 Iran War. We first generate projections of the quarterly price of oil from a calibrated DSGE model of the global economy under a range of scenarios and then incorporate these projections into a monthly VAR model of the impact of U.S. gasoline price shocks on inflation and inflation expectations. Our analysis speaks to the magnitude and persistence of the impact of higher oil prices on headline and core PCE inflation and on household inflation expectations.

Keywords: Geopolitical risk, rare disasters, oil prices, gas prices, inflation, structural VAR

JEL Classification: C54, E31, E37, Q43

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1 INTRODUCTION

The outbreak of the Iran War in February 2026 caused a major disruption to oil trade and resulted in a surge in oil prices, which was quickly reflected in higher retail gasoline prices. A question of great interest to policymakers and market participants is to what extent recent and future retail gasoline price increases driven by this geopolitical event will raise headline and possibly core inflation. There is also concern that these gasoline price increases may raise household inflation expectations, amplifying the direct impact of higher gasoline prices.[1]

Interest in this question surged in late March 2026. For example, political observers highlighted how EU central bankers are agonizing over how to respond to the inflationary pressures caused by the Iran War. Similarly, Federal Reserve officials expressed concern about a short-term increase in inflation stemming from rising energy prices, and the International Monetary Fund warned that "if prolonged, higher energy prices will lead to higher headline inflation."[2] We study this inflationary impact based on U.S. data available at the end of March 2026, reflecting the real-time data constraints faced by policymakers. Our analysis helps assess the impact on U.S. inflation under a range of alternative scenarios that could play out in the future. While our paper focuses on the current geopolitical oil supply disruption, it also provides a blueprint for analyzing similar crises in the future, which is particularly important given that such disruptions have been a recurrent phenomenon since the 1970s.

A key challenge in quantifying the inflationary impact of higher oil prices in real time is that the evolution of the price of oil (and hence the price of gasoline) remains highly uncertain. It is not clear how long the closure of the Strait of Hormuz will last or how much oil will be exported from the Persian Gulf if the war continues. To date, studies attempting to answer this question

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[1] For a review of why economists tend to associate rising oil prices with higher inflation see Kilian and Zhou (2025).

[2] See "Europe faces its next big problem: The Iran war is driving up inflation" by G. Smith, March 31, 2026, https://www.politico.eu/article/iran-war-drives-eurozone-inflation-up-to-2-x-percent-in-march; "Economic Outlook and Energy Effects," Speech by Vice Chair P.N. Jefferson at the Global Perspectives Speaker Series, Federal Reserve Bank of Dallas, March 26, 2026, https://www.federalreserve.gov/newsevents/speech/jefferson20260326a.htm; Press Briefing Transcript: Julie Kozack, Director, Communications Department, IMF, March 19, 2026, https://www.imf.org/en/news/articles/2026/03/20/tr-03192026-imf-regular-press-briefing-march-19-2026.

have mainly relied on back-of-the-envelope calculations or simple rules of thumb. In this paper, we address this question by drawing on recent advances in modeling geopolitical oil supply disruptions using a calibrated nonlinear dynamic stochastic general equilibrium (DSGE) model of the global economy (see Kilian et al., 2026).

We do not forecast the evolution of the price of oil. Instead, we use the DSGE model to illustrate the potential impact of this oil supply disruption on the West Texas Intermediate (WTI) price under a range of scenarios about how long the shortfall will persist. We simulate the path of the quarterly WTI price of oil under each scenario and derive the implied path of the U.S. retail price of gasoline given the cost share of crude oil in the retail price, as discussed in Kilian and Zhou (2022b, 2024). We then rely on a structural VAR model developed in Kilian and Zhou (2022a,b) to derive the implied path of U.S. headline and core PCE inflation and of short-run and long-run household inflation expectations under each scenario.[3]

Feeding global oil price projections from the nonlinear DSGE model into a structural VAR model of the effects of gasoline price shocks on U.S. inflation is appealing because it combines the strength of both frameworks. In the DSGE model, the oil price is determined endogenously based on supply and demand in the oil market and expectations about the size and duration of the geopolitical oil supply disruption. The model accounts for downside risk to oil production and oil storage. Extending the DSGE model of the global economy to a multi-country setting that includes domestic inflation not only would be challenging, but would require taking a stand on nominal frictions, monetary policy, and feedback from the rest of the world. To the extent those assumptions are incomplete or incorrect, the model would provide misleading answers as to how U.S. inflation evolves over time. However, given an oil price path, there is a well established methodology for cleanly identifying the effects of changes in oil prices on inflation and inflation expectations that involves structural VAR models. Quantifying the inflationary impact of various

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[3] Our analysis focuses on rising oil and gasoline prices as the most immediate effect of the war. It does not incorporate the impact of rising prices for fertilizer, aluminum, and natural gas or the supply chain disruptions in global shipping. The direct effect of rising natural gas prices is not likely to be quantitatively important, given that capacity constraints on U.S. liquified natural gas exports largely insulate the U.S. natural gas price from price increases in the rest of the world. The other cost shocks, in contrast, add to the overall inflationary impact of the war.

oil price scenarios through their effect on retail gasoline prices in a structural VAR model allows us to bypass these complications.

It also solves the problem of mapping simulated data from the quarterly DSGE model into real-world data when geopolitical events do not line up with calendar quarters. The use of a monthly structural VAR model allows us to map the price effects of a geopolitical oil supply disruption in the impact quarter into the months of March, April and June, enabling more accurate projections of the inflationary effect by calendar quarter than would be possible using a quarterly VAR model. The use of monthly data also raises our confidence in the adequacy of the identification. The key identifying assumption of this model is that gasoline prices are predetermined with respect to the economy, consistent with evidence in Kilian and Vega (2011).

In the baseline model, we consider a complete closure of the Strait of Hormuz, not allowing for any diversion of oil exports by pipeline to the Red Sea, which removes close to 20% of global oil supplies from the market. There are a number of ways in which these export restrictions may be weakened over time, but this scenario serves as a useful benchmark. Much depends on the duration of this event. We find that a cessation of oil exports from the Persian Gulf that only lasts one quarter would raise the average WTI price to $110 per barrel in April 2026. An outage lasting two quarters would cause the WTI price to peak at $132 per barrel in July 2026 and an outage lasting three quarters would cause the WTI price to peak at $167 in October of 2026.

Taking into consideration the path of oil and gasoline prices in each case, the model predicts that closing the Strait of Hormuz for 1, 2, or 3 quarters would increase Q4/Q4 headline PCE inflation in 2026 by 0.35, 0.79 and 1.47 percentage points, respectively. The corresponding effect on core PCE inflation would only be 0.18 percentage points if the closure ends after one quarter, but would rise to 0.31 and 0.49 percentage points if the closure persists for two or three quarters, suggesting potentially sizable effects on core inflation. These effects are not associated with a shift in household inflation expectations. The effect on 1-year inflation expectations by 2026Q4 is quite modest, ranging from near 0 when the closure lasts 1 or 2 quarters to 0.61 when it lasts 3 quarters. The effects on 5-10 year inflation expectations are even smaller, ranging from 0 to 0.07 percentage points. The overall effects on Q4/Q4 inflation mask considerable heterogeneity in how gasoline price shocks affect PCE inflation in 2026, depending on how long the Strait remains closed.

In addition to the baseline scenario, we present results that allow for uncertainty about when the Strait of Hormuz will reopen after a 1, 2 or 3 quarter closure has occurred. We also show how the inflationary effect is affected by the expected duration of the disruption and the magnitude of the shortfall in global oil supplies. These changes may substantially amplify the effect on the price of oil and on inflation.

Related Literature We are not the first to investigate the inflationary impact of oil and fuel price shocks. Our analysis is related to a large literature examining the impact of oil price shocks on inflation and inflation expectations based on monthly or quarterly VAR models. Examples include Bernanke et al. (1997), Hooker (2002), Leduc et al. (2007), Clark and Terry (2010), Bachmeier and Cha (2011), Kilian and Lewis (2011), Wong (2015), Conflitti and Luciani (2019), Känzig (2021), and Bernanke and Blanchard (2025). There is also a growing literature on the inflationary impact of fuel price shocks based on monthly or quarterly VAR models, given recent evidence that the link between oil and gasoline prices is not stable over time. Examples include Kilian and Zhou (2022b, 2023, 2025), Vatsa and Pino (2024), Karaki and El Chaar (2026), and Kilian and Chudik (2026). A key difference from these studies is that we use scenario analysis to quantify the effects of oil supply disruptions that have yet to occur. Scenarios are represented as sequences of price shocks, building on the methodology in Kilian and Zhou (2022a). Further discussion of this type of scenario analysis can be found in Kilian and Lütkepohl (2017).

Finally, our paper relates to a literature employing linearized DSGE models to examine the inflationary impact of oil price shocks on inflation. Examples include Leduc and Sill (2004), Bodenstein et al. (2008) and Gagliardone and Gertler (2024). The key difference is that our paper explicitly models major geopolitical oil supply disruptions in a nonlinear setting, taking into account agents' expectations surrounding these events. Allowing for nonlinearities is particularly important when dealing with very large oil supply disruptions. The nonlinear DSGE model also allows us to investigate how factors such as the magnitude and expected duration of the disruption affect the price of oil.

Outline The remainder of the paper is organized as follows. Section 2 reviews the 2026 Iran War and its effect on oil trade and production. Section 3 summarizes the key features of the DSGE model used to simulate the path of the quarterly price of oil in response to the outbreak of the Iran War. Section 4 describes our econometric methodology. The baseline results are presented in Section 5. Section 6 examines alternative scenarios and illustrates what is driving the inflationary impact. The concluding remarks are in Section 7. Further details for the DSGE model and data sources are provided in the online appendix, along with additional empirical results.

2 THE 2026 IRAN WAR AND ITS IMPACT ON OIL TRADE

The 2026 Iran War started on February 28, 2026, on a weekend while oil futures markets were closed. When markets reopened on March 1, the response of the daily WTI price initially was modest until it became clear that the Strait of Hormuz, through which most crude oil and refined products produced in the Persian Gulf are exported, had effectively become closed.

Initially, this closure was mainly driven by the need to adjust insurance contracts for oil tankers to compensate for the heightened risk, but the ultimate concern was attacks on oil shipping in the Strait causing unacceptable and unsustainable losses and shipwrecks closing the shipping lanes. Hundreds of oil and product tankers ended up stranded in the Persian Gulf. As the military action escalated into a sustained regional conflict involving direct strikes on energy infrastructure and disruptions to maritime trade routes, oil importers unable to access oil from the Persian Gulf had to turn to other oil suppliers, putting upward pressure on oil prices worldwide.

From the point of view of the rest of the world, a disruption of oil exports from the Persian Gulf is equivalent to a disruption of oil production in the Gulf. Oil producers in the Gulf in turn had no choice but to shut in many of their oil wells as the oil could not be stored or exported. Lack of storage capacity is why many oil producers in the region, starting with Iraq and Kuwait, started curtailing their production in early March 2026, while other producers experienced attacks on oil facilities that forced reductions in oil output.

While about 4 million barrels per day of Saudi crude oil production are being diverted to the Yanbu port on the Red Sea, these remaining exports are exposed to attacks by the Houthis in Yemen—one of the regional allies of Iran—and may cease at any time. Likewise, the remaining trickle of oil exports through the Strait of Hormuz allowed by Iran and the oil diverted by pipeline to the UAE port of Fujairah in the Gulf of Oman may be disrupted at any time. A complete cessation of oil exports from the Persian Gulf region would amount to removing close to 20% of global oil supplies from the market, about 80% of which is shipped to Asia. This makes the outbreak of the 2026 Iran War the largest geopolitical oil supply disruption in history. It is between two and three times as large as the largest previous geopolitical oil supply disruptions in 1973 and 1990, depending on whether one includes diverted oil or not.

In March 2026, the WTI price of oil increased from about $60 per barrel in late January, before military action was anticipated, to $91 per barrel on average, alongside broad-based increases in refined product prices (e.g., gasoline, diesel, and jet fuel). These price dynamics reflected a combination of reduced oil and oil product exports and higher transportation costs. This makes this episode a classical example for an exogenous geopolitical oil supply shock, as discussed in Kilian (2008) and Kilian et al. (2026). In this paper, we examine the impact of the variation in global oil prices caused by the Iran War on U.S. inflation and inflation expectations, exploiting the fact that these fluctuations are driven by a plausibly exogenous shock to the U.S. economy.

3 MODELING THE IMPACT OF GEOPOLITICAL OIL SUPPLY DISRUPTIONS

Rather than forecasting the evolution of the price of oil, we rely on the DSGE model of the global economy developed in Kilian et al. (2026), which examines the effects of geopolitical oil supply disruptions on the path of the oil price. The model is a nonlinear stochastic growth model that includes risk averse agents with Epstein-Zin preferences, an oil production sector with limited substitutability between oil and capital, and an oil storage firm to account for expectations-driven inventory demand. The price of oil is determined endogenously. Geopolitical risk in the oil market arises from the possibility of major oil production disruptions driven by geopolitical events. Geopolitical oil production disruptions are of stochastic length and occur with a time-varying probability. What distinguishes this model from earlier work is its focus on modeling downside risk to oil production. A full description of the model and its calibration is provided in the appendix. Further details about the model fit and its robustness to alternative modeling choices can be found in Kilian et al. (2026).

3.1 MODELING GEOPOLITICAL OIL SUPPLY DISRUPTIONS

The part of the model that is most central to our analysis is the determination of global oil production. The production of oil is given by $o_t^s = a_t^o e_t$, where a_t^o is the permanent component and e_t is the transitory component. The permanent component reflects factors that influence the productive potential of the oil sector and is given by

$$a_t^o = \kappa_0 g_t^{\kappa_1} \epsilon_{t-1}^{\kappa_2} a_{t-1}^o \exp(\sigma_{go}\varepsilon_{go,t}),$$

where a_t is the level of productivity in the broader economy and g_t is its growth rate. $\epsilon_t = a_t/a_t^o$, κ_1 determines the impact response of a shock to g_t on a_t^o, and κ_2 governs the speed at which a_t^o converges to a_t. This setup allows for a slow response of oil production to productivity growth shocks in the rest of the economy, which is a key feature of the data.

The transitory component of global oil production is given by

$$\ln e_t = \ln \bar{e} - \zeta_e(v_t^e - \bar{\pi}_1^e).$$

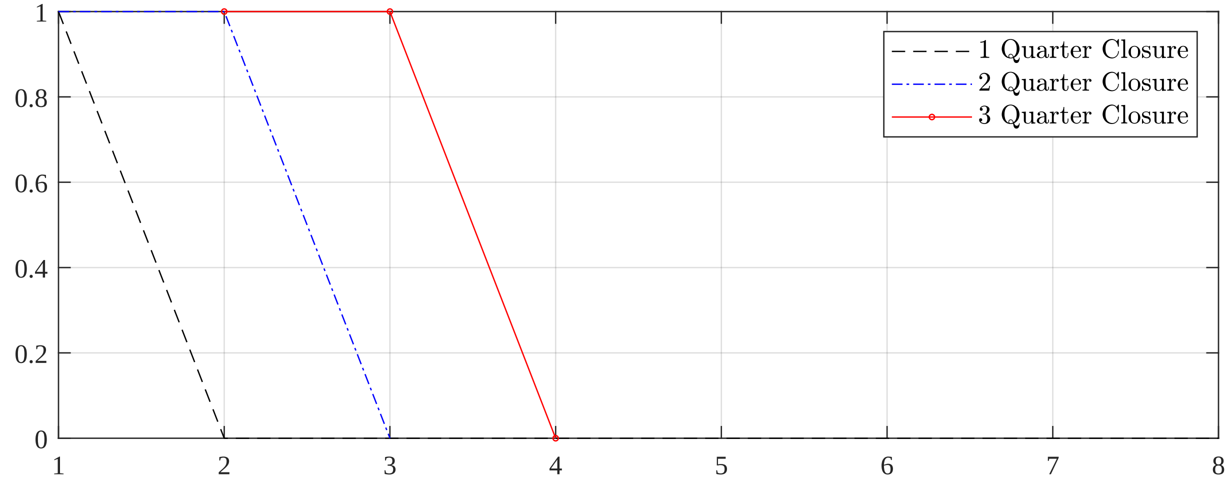
The indicator variable v_t^e equals 1 if a major geopolitical oil supply disruption occurs and 0 otherwise. The transition matrix for v_t^e is summarized by

$$\Pr(v_{t+1}^e = 1 | v_t^e = 1) = \bar{q}^e, \quad \Pr(v_{t+1}^e = 1 | v_t^e = 0) = p_t^e,$$

where the probability of a geopolitical oil supply disruption (p_t^e) follows

$$\ln p_t^e = (1-\rho_p^e)\ln \bar{p}^e + \rho_p^e \ln p_{t-1}^e + \sigma_p^e \varepsilon_{p,t}^e, \quad \varepsilon_{p,t}^e \sim \mathbb{N}(0,1).$$

Figure 1: Conditional quarterly probability of Strait of Hormuz being closed



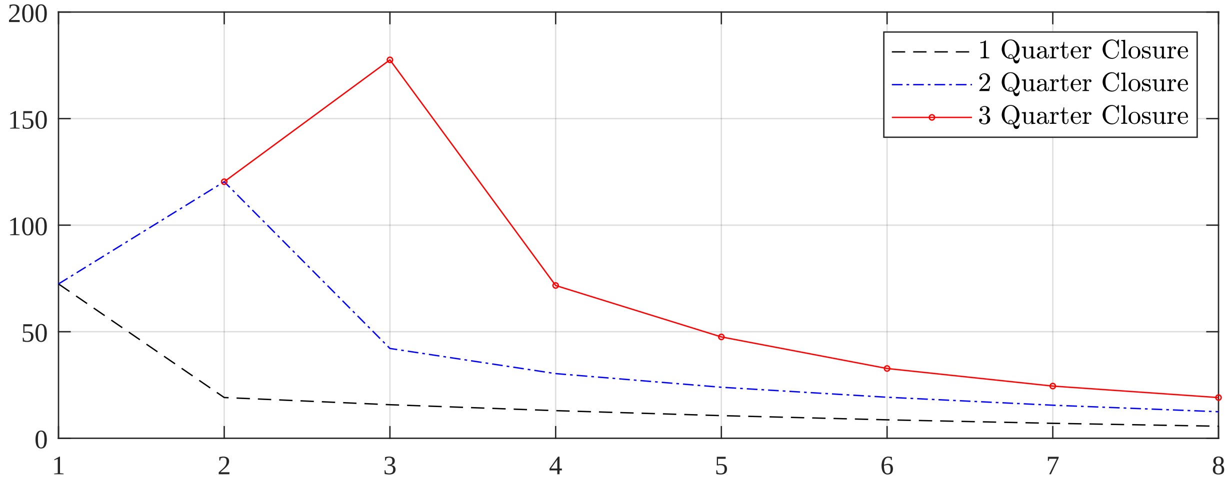
The size of the disruption is ζ_e, and $\bar{\pi}_1^e$ is the unconditional probability of the disruption, which is evaluated by simulation.

In our baseline specification, the magnitude of the geopolitical oil production disruption is set to 20% of global oil production ($\zeta_e = 0.2$), corresponding to a cessation of all oil exports from the Persian Gulf. The expected duration of this disruption is set to 3 quarters ($\bar{q}^e = 0.67$), matching the length of the disruption that followed the Arab-Israeli War in 1973. The persistence (ρ_{pe}) of the probability shock is set to 0.5 to match the increase in the oil price that occurred during the Twelve Day War in June 2025. The standard deviation (σ_{pe}) of the probability shock is set to 1.4 to help match the volatility of oil price uncertainty, which is equal to the conditional variance of log oil price growth. The model allows us to assess the effects of an increase in the probability of a major geopolitical oil supply disruption as well as the realization of such a disruption.

3.2 BASELINE SCENARIO

Suppose the Strait of Hormuz shuts down in quarter 1 for the duration of the quarter. Agents in the model understand that the probability of a closure in this quarter is 100%. We do not make any projections about how long this closure will actually last, but for the purposes of discussion, we make assumptions to illustrate the potential impact. For example, suppose the Strait reopens in quarter 2, after only one quarter (see Figure 1). In that case, the probability of a closure is 100% on impact, before dropping to 0% in quarter 2 and beyond. Alternatively,

Figure 2: Quarterly oil price in percent deviations from the baseline



the Strait may remain closed with 100% probability for two or three quarters before reopening.

Figure 2 illustrates the percent increase in the quarterly average global oil price, relative to the baseline of no geopolitical oil supply disruption, for each of these scenarios. Table 1 maps these model predictions into the quarterly WTI price. Regardless of the likelihood of the Strait reopening in the future, the baseline specification of the DSGE model implies that a closure of the Strait of Hormuz that removes close to 20% of global oil supplies from the market during quarter 1 is expected to raise the quarterly WTI price from \$60 on average in the three months from mid-November to mid-February, before the war was anticipated, to \$103 per barrel (see Table 1).[4]

The subsequent effects depend on when oil shipments resume. For example, if the Strait reopens after one quarter, the oil price drops to \$71 per barrel in quarter 2. When the oil supply shortfall lasts longer than one quarter, richer dynamics arise. Extending the closure to two quarters causes the oil price to rise further to \$132 per barrel in quarter 2 before falling to \$85 per barrel in quarter 3. If shipping resumes after three quarters, the oil price will rise even further before declining, reaching \$167 per barrel in quarter 3 (see Table 1).

3.3 INTEGRATING DSGE AND STRUCTURAL VAR ANALYSIS

The main methodological contribution of this paper is to integrate these quarterly oil price projections into a monthly structural

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[4] When modeling the Brent price, the same percent deviation from the baseline would imply a higher Brent price per barrel, given that the Brent price exceeded the WTI price prior to the war.

Table 1: Effect on quarterly WTI price by duration of closure ($/barrel)

	1-Quarter Closure	2-Quarter Closure	3-Quarter Closure
0	60	60	60
1	103	103	103
2	71	132	132
3	69	85	167
4	68	78	103
5	66	74	89
6	65	72	80
7	64	69	75
8	63	67	71

Notes: The baseline oil price is the average WTI price from mid-November to mid-February. Closure starts in quarter 1.

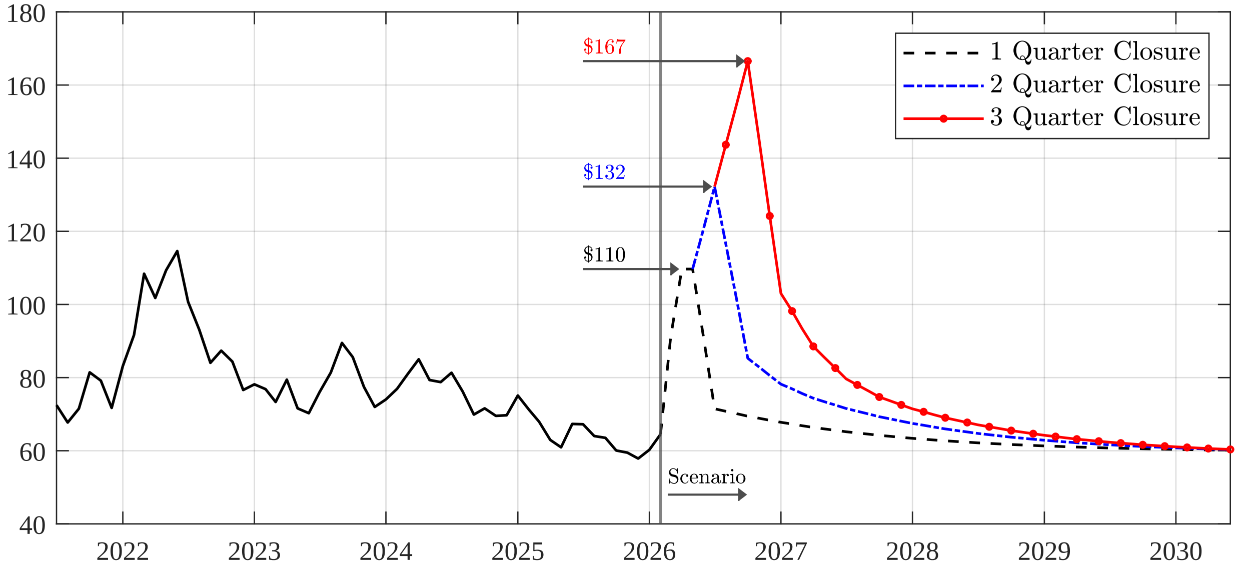
VAR of the effect of gasoline price shocks on U.S. inflation and inflation expectations, taking careful account of the timing of the outbreak of the Iran War. An obvious question is why we use a structural VAR model to evaluate the simulated path of oil prices from the DSGE model rather than simulating the inflationary effects directly using the DSGE model.

One reason is that our DSGE model represents the real economy. It makes no predictions about inflation. It does not distinguish between oil and gasoline or between core and headline inflation. Nor does the DSGE model speak to household inflation expectations. Another reason is that the DSGE model underlying our analysis is a model of the global economy rather than the U.S. economy, which is the appropriate setting to study the implications of geopolitical oil supply disruptions for the price of oil. Generalizing this model to a multi-country setting is challenging, both computationally and conceptually. Existing DSGE models of the transmission of oil price shocks to U.S. inflation are not suitable for answering this question because they are linear and cannot accurately capture the effects of rare major geopolitical oil supply disruptions.

4 ECONOMETRIC METHODOLOGY

Given the projected percent increases in the quarterly global price of oil from the DSGE model, it is straightforward to recover the implied quarterly WTI price of oil, depending on the duration of

Figure 3: Monthly WTI oil price ($/barrel)



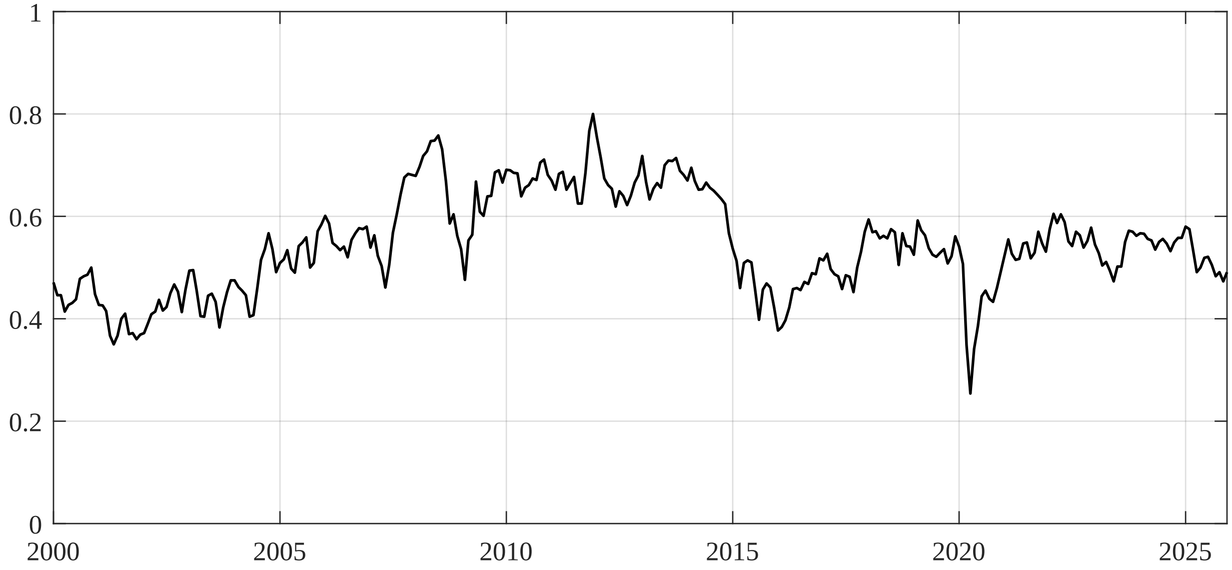
Notes: The vertical line marks February 2026.

the closure. Our ultimate interest is to quantify the quarterly inflation impact measured in calendar time. For a better alignment with the timing of the geopolitical event, we associate the first quarter in the DSGE model with the months of March-May in the data. For March 2026, we set the WTI price to $91 per barrel based on the average daily WTI front-month futures price. The April and May observations are both set to $110 per barrel to replicate the quarterly average price from the DSGE model. Next, we use linear interpolation to map the path of the quarterly price of oil into monthly oil price data with the second monthly observation in each of the following quarters set to the average quarterly price. This procedure implies quarterly prices very close to those in Table 1. Figure 3 illustrates the evolution of the monthly WTI price starting in March 2026 depending on the duration of the closure of the Strait of Hormuz.

4.1 MAPPING THE PATH OF THE WTI PRICE INTO A PATH FOR U.S. RETAIL GASOLINE PRICES

Under the maintained assumption that among all cost components of the retail price of gasoline only the cost of crude oil is changing, the percent change in the price of gasoline is the percent change in the price of crude oil weighted by the cost share of crude oil in the retail price of

Figure 4: Cost share of crude oil in retail price of gasoline, January 2000-December 2025



gasoline. As Figure 4 shows, this cost share has evolved over time, ranging from 0.25 to 0.8. For our projections we work with a cost share of 0.5 in line with the most recent EIA data. The level of the retail gasoline price may be recovered by cumulating the growth rates, starting with the February 2026 gasoline price. This allows us to infer the log difference in the retail price of gasoline, as used in the VAR model, consistent with the targeted path of the WTI price.[5]

4.2 RECOVERING THE IMPLIED PATH OF INFLATION AND INFLATION EXPECTATIONS

To recover the implied responses of inflation and inflation expectations, given the prespecified path of the monthly retail price of gasoline, we rely on a widely used structural VAR model developed in Kilian and Zhou (2022a,b). Let $y_t = [\Delta p_t^{\text{gas}}, \pi_t, \pi_t^{\text{core}}, E\pi_t^{1y}, E\pi_t^{5y}]$, where Δp_t^{gas} denotes the growth rate of the price of unleaded regular gasoline, as reported in the EIA's *Monthly Energy Review*.[6] π_t denotes the headline PCE inflation rate and π_t^{core} the PCE inflation rate excluding food and energy, which is a common measure of the core inflation rate. Both series are seasonally adjusted. Including both headline and core inflation measures helps separate the broader inflationary impact

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[5] When modeling other economies, this approach must be adapted by first expressing the price of oil in domestic currency to control for exchange rate fluctuations.

[6] Unlike in Europe, few consumers in the U.S. buy diesel fuel, so the price of gasoline largely captures the price of motor fuel.

of gasoline price shocks from their impact on headline inflation. The model also includes both short-run and long-run household inflation expectations data given the importance of these expectations for the debate about the possible emergence of a wage-price spiral (see Kilian and Zhou, 2025).[7] $E\pi_t^{1y}$ and $E\pi_t^{5y}$ denote the median 1-year and 5-10 year household inflation expectations in the University of Michigan Survey of Consumers.

As in Kilian and Zhou (2022a), we postulate that these data are jointly explained by a block recursive VAR model with an intercept. The model is partially identified in that only the gasoline price shock is identified based on the assumption that the nominal price of gasoline is predetermined with respect to the other model variables.[8] The vector of structural shocks, w_t, is linked to the vector of reduced-form VAR errors, u_t, by the structural impact multiplier matrix B_0^{-1}. Under these identifying assumptions,

$$\begin{pmatrix} u_t^{p^{\text{gas}}} \\ u_t^{\pi} \\ u_t^{\pi^{\text{core}}} \\ u_t^{E\pi^{1y}} \\ u_t^{E\pi^{5y}} \end{pmatrix} = \begin{bmatrix} * & 0 & 0 & 0 & 0 \\ * & * & * & * & * \\ * & * & * & * & * \\ * & * & * & * & * \\ * & * & * & * & * \end{bmatrix} \begin{pmatrix} w_t^{p^{\text{gas}}} \\ w_t^2 \\ w_t^3 \\ w_t^4 \\ w_t^5 \end{pmatrix} \tag{1}$$

where asterisks denote elements of B_0^{-1} that remain unrestricted. Since the 5-10 year inflation expectations data are only available starting in April 1990, the model is estimated on monthly data from April 1990 to February 2026.[9] The model is estimated by Bayesian methods (see, e.g., Rubio-Ramírez et al., 2010). We work with a diffuse Gaussian-inverse Wishart prior for the

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[7] The use of household survey data makes sense in this context because household expectations are widely viewed as a more appropriate indicator of the inflation expectations of businesses than alternative measures of inflation expectations such as professional inflation forecasts, making them the best overall measure of inflation expectations in the economy (e.g., Coibion and Gorodnichenko, 2015). In addition, the Michigan survey data provide a consistent measure of expectations for the short and the long run, with the 5-10 year expectation measuring inflation expectations at a longer horizon than alternative household data sources. Finally, they are available at monthly rather than just quarterly frequency and for a sufficiently long period.

[8] This assumption is supported by empirical evidence in Kilian and Vega (2011) who show that surprise changes in inflation and in inflation expectations, measured at daily frequency, do not affect the price of gasoline for the next 20 business days. The responses to the nominal gasoline price shock are invariant to the identification of the remaining structural shocks.

[9] For the February 2026 PCE inflation rates, the Federal Reserve Bank of Cleveland nowcast was used.

reduced-form parameters. The prior of the VAR slope parameter vector is $\beta \sim \mathbb{N}(0, \Sigma \otimes \Omega_0)$, where Ω_0 is a diagonal matrix with j^{th} diagonal element $(1/\sigma_j^2)(0.2/l)^2$, σ_j^2 is approximated as the residual variance of an AR(1) regression for variable j, l indicates the lag, and $\Sigma \sim \mathbb{IW}(S_0, \alpha_0)$ with $\alpha_0 = 7$ and $S_0 = (\alpha_0 - 5 - 1)\text{diag}(\sigma_1^2, \sigma_2^2, \sigma_3^2, \sigma_4^2, \sigma_5^2)$. All results are based on $5{,}000$ posterior draws. The Bayes estimate of the vector of impulse responses underlying the scenario analysis is constructed under additively separable absolute loss, as discussed in Inoue and Kilian (2022).

Our scenario analysis involves simulating future values of the model variables from the fitted VAR model, subject to a gasoline price shock sequence for March 2026 through December 2027 recovered from the percentage changes in the gasoline price derived earlier. The remaining structural shocks are set to zero beyond February 2026. The gasoline price shock sequence for each scenario is constructed as follows.

The structural moving average decomposition implies

$$y_t \approx \sum_{i=0}^{t-1} \Theta_i w_{t-i}, \tag{2}$$

where y_t denotes the vector of the data at date $t = 1, \ldots, T$, T denotes February 2026 in our application, Θ_i is the 5×5 matrix of impulse response coefficients at horizon i whose (k, l) elements are denoted by $\theta_{kl,i}$, and w_t denotes the vector of structural shocks. We start by computing the expected path of the variables of interest in the absence of future shocks based on the structural moving average decomposition in the estimated model, which can be recovered from the estimates of B_0^{-1} and the reduced-form coefficients, as discussed in Kilian and Lütkepohl (2017).

For a given scenario, we refer to the path of the growth rate of the price of gasoline beyond February 2026 as the target growth rates. We estimate the expected path of each model variable in the absence of future shocks by iterating (2) forward for 22 months beyond the end of the sample, given $w_{T+1} = \ldots = w_{T+22} = 0$. We then compare the expected path for the growth rate of the price of gasoline with the targeted growth rates of the gasoline price (adjusted for the mean change in this growth rate) under each scenario, denoted by $x_{T+1}, \ldots, x_{T+22}$. This allows us to recursively infer, for each posterior draw, the magnitude of the gasoline price shock required for the predicted growth rate, $\hat{x}_{T+1}, \ldots, \hat{x}_{T+22}$, to match its targeted value. Let $w^c_{1,j}$ denote the counterfactual exogenous gasoline price shock at date j, where $w^c_{1,j} = w_{1,j}$ for $j \leq T$. Then

$$w^c_{1,j} = \frac{x_j - \hat{x}_{1,j}}{\theta_{11,j}}, \quad j = T+1, \ldots, T+22$$

where $\hat{x}_{1,t} = \sum_{q=1}^{5} \hat{x}^{(q)}_{1,t}$ and $\hat{x}^{(q)}_{1,t} = \sum_{i=0}^{t-1} \hat{\theta}_{1q,i} w^c_{q,t-i}$ are updated recursively, while $\hat{x}^{(q)}_{1,t} = \hat{y}^{(q)}_{1,t}$ for $q \neq 1$, and $\hat{\theta}_{kl,i}$ is the (k,l)-element of $\hat{\Theta}_i$. The resulting counterfactual shock sequence is then imposed in generating future realizations of all variables of interest by iterating forward the estimated structural VAR model for $T+1, \ldots, T+22$. The inflationary impact of the geopolitical oil supply disruption is defined as the difference in the predicted path of the model variables, given the path of gasoline prices under the baseline of $w_{T+1} = \ldots = w_{T+22} = 0$ and the counterfactual shock sequence under the targeted path for the gasoline price. Analogous procedures have been used in a variety of contexts in the literature (see, e.g., Baumeister and Kilian, 2014; Kilian and Lütkepohl, 2017; Kilian and Zhou, 2020, 2022a).

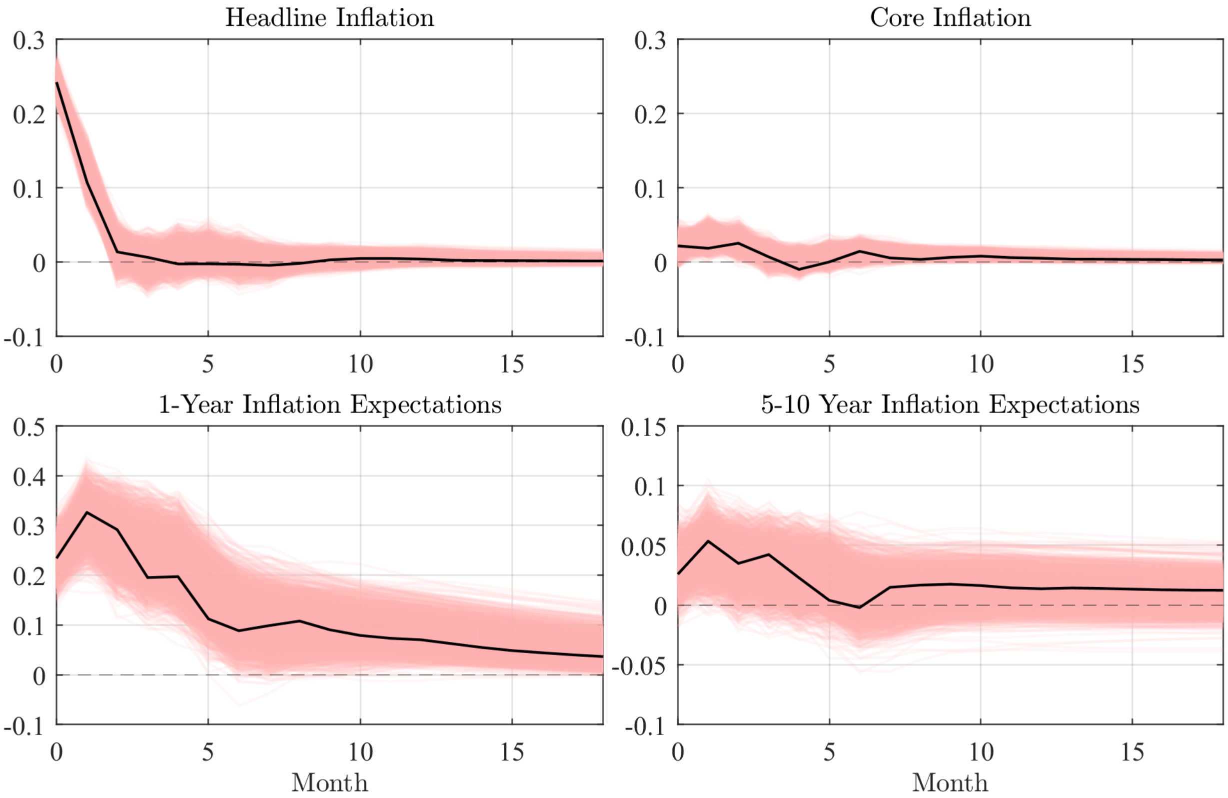
5 U.S. EVIDENCE

We estimate model (1) with 6 lags using data from April 1990 to February 2026.

5.1 THE INFLATIONARY EFFECTS OF A ONE-TIME GASOLINE PRICE SHOCK

Figure 5 shows the Bayes estimate of the responses of inflation and inflation expectations to a 10% shock to the retail price of gasoline, along with visual approximations to the 68% joint credible set (Inoue and Kilian, 2022). The shock raises headline PCE inflation by 0.24 percentage points on impact (not annualized). The response quickly returns to zero after two months. The effect on core PCE inflation is only modestly positive with an impact response of 0.02 percentage points. 1-year household inflation expectations rise modestly compared to their mean of 3.1%, with a peak response of 0.33 percentage points in the second month, while 5-10 year inflation expectations remain largely unresponsive with an impact response of 0.03 percentage points. These results mirror similar results in the literature for other estimation periods. There is little evidence of higher

Figure 5: Responses to a 10% gasoline price shock (percentage points)

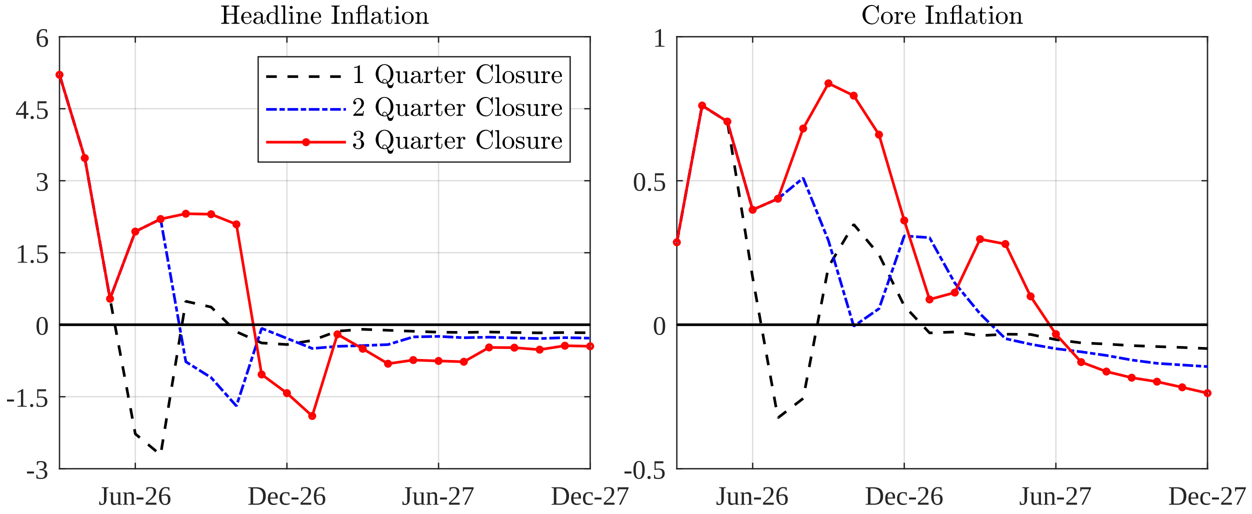


gasoline prices being passed through to core inflation or long-run inflation expectations becoming unanchored. Similar results are obtained when using 12 lags.

5.2 SCENARIOS FOR PCE INFLATION

Figure 6 quantifies the inflationary effect caused by the sequence of gasoline price shocks implied by each of the three oil price paths we derived. For example, when the closure of the Strait of Hormuz is limited to one quarter, headline PCE inflation increases by an annualized 5.2 percentage points in March 2026 and by 3.5 percentage points in April. That increase is partially reversed in June and July 2026 when headline inflation drops by more than 2 percentage points each month, after which the effect is close to zero. In contrast, when the Strait remains closed for two quarters, headline PCE inflation continues to increase by between 1.9 and 2.2 percentage points in June and July, before turning negative in August, September and October 2026. Finally, when the closure of the Strait persists for three quarters, the positive effect on headline PCE inflation persists until October 2026, before turning negative in November and

Figure 6: Projections of PCE inflation under baseline scenario (percentage points)



Notes: All inflation rates are annualized.

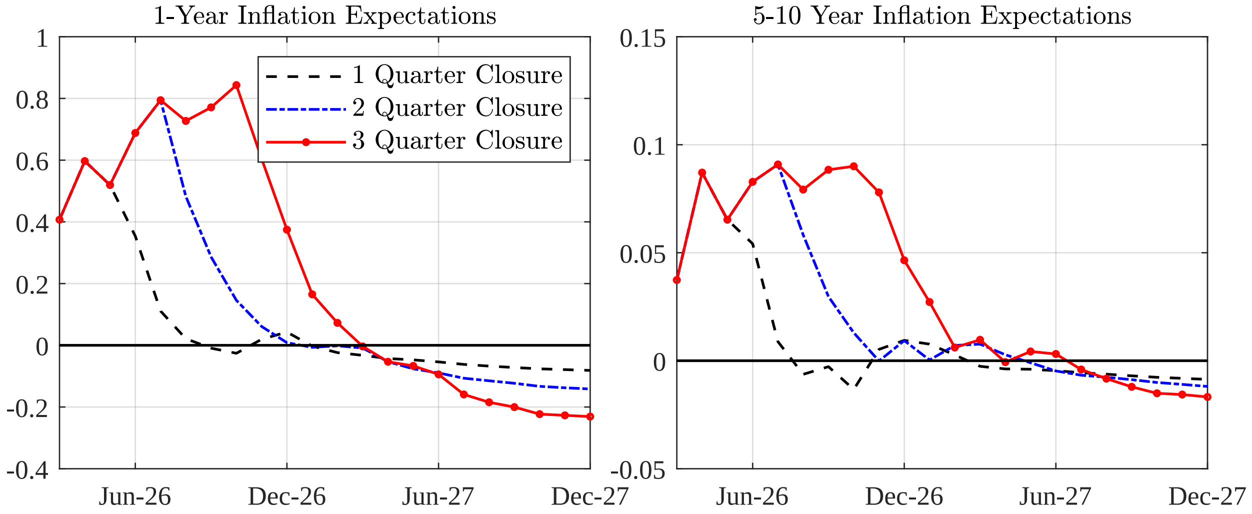
December 2026 and January 2027. In short, the duration of the oil supply disruption affects not only the overall magnitude, but the pattern of the effects on headline inflation over time.

This conclusion also applies to core PCE inflation. At one extreme, if the closure is over after one quarter, the effect on core inflation reaches 0.8 percentage points at an annualized rate in April 2026, followed by oscillating responses of diminishing amplitude. At the other extreme, if the closure persists for three quarters, the effect on core PCE inflation remains positive for the remainder of 2026, reaching as high as 0.8 percentage points as late as September 2026. Of course, the effects on core PCE inflation are an order of magnitude smaller than the effects on headline inflation.

5.3 SCENARIOS FOR HOUSEHOLD INFLATION EXPECTATIONS

Figure 7 shows the corresponding effects on 1-year and 5-10 year household inflation expectations. Both expectations measures show a positive effect that is gradually building, as the duration of the closure is extended, before declining toward zero. The key difference is in the magnitude. While 1-year expectations rise by between 0.4 and 0.8 percentage points at their respective peaks, 5-10 year expectations increase by at most 0.09 percentage points, making them an order of magnitude smaller. In both

Figure 7: Projections for inflation expectations under baseline scenario (percentage points)



Notes: All inflation rates are annualized.

cases, these effects are largely gone by the first months of 2027.[10]

5.4 SUMMARY OF EFFECTS IN 2026 Table 2 expresses these effects on a quarterly basis. The model predicts that under the three oil price paths, Q4/Q4 headline PCE inflation would increase in 2026 by 0.35, 0.79 and 1.46 percentage points, respectively. The corresponding effects on core PCE inflation would only be 0.18 if the closure ends after one quarter, but would rise to 0.31 and 0.49 percentage points if the closure persists for two or three quarters, respectively. The latter estimates suggest potentially sizable positive effects on core inflation. They do not appear to be driven by a shift in household inflation expectations. The effect on 1-year inflation expectations is approximately 0 percentage points by 2026Q4 under the first two oil price paths, but 0.6 percentage points under the third path. The responses are quite modest considering that on average 1-year inflation expectations are 3.1%. The effects of 0, 0 and 0.07 percentage points on 5-10 year inflation expectations, which are not shown to conserve space, are even smaller.

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[10] An alternative widely used measure of household inflation expectations is provided by the Federal Reserve Bank of New York. Since these data start only in June 2013, they cannot be used in our model.

Table 2: Inflationary impact under the baseline scenario (percentage points)

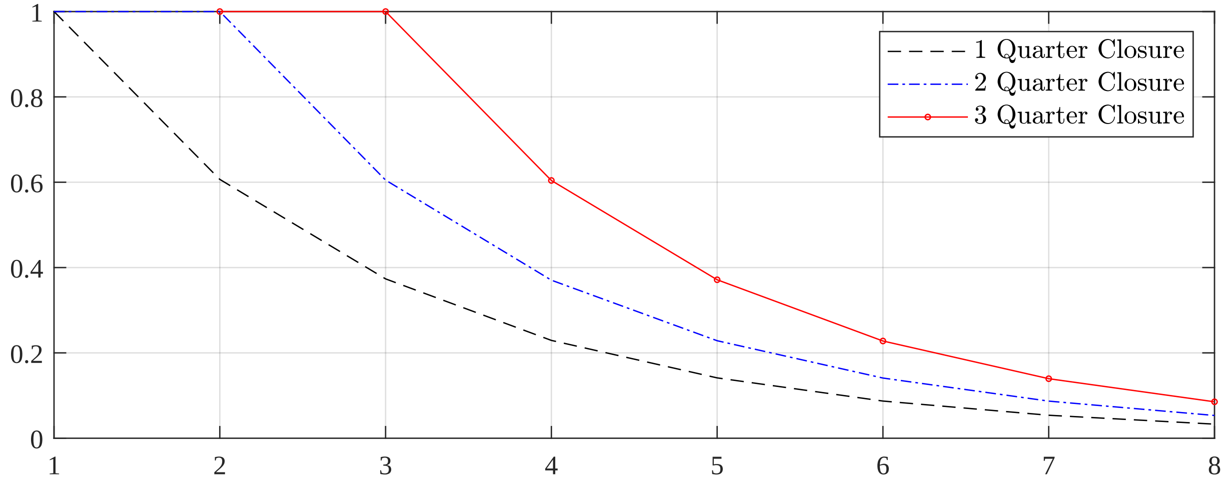
	1-Quarter Closure			2-Quarter Closure			3-Quarter Closure		
	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$
2026Q1	1.74	0.10	0.14	1.74	0.10	0.14	1.74	0.10	0.14
Q2	0.58	0.54	0.49	1.98	0.62	0.60	1.98	0.62	0.60
Q3	−0.62	−0.13	0.04	0.11	0.41	0.52	2.27	0.65	0.76
Q4	−0.31	0.22	0.01	−0.68	0.12	0.07	−0.12	0.61	0.61
Q4/Q4	0.35	0.18	–	0.79	0.31	–	1.47	0.49	–
2027Q1	−0.19	−0.03	−0.02	−0.46	0.16	−0.01	−0.87	0.17	0.08
Q2	−0.14	−0.04	−0.05	−0.30	−0.07	−0.07	−0.77	0.12	−0.07
Q3	−0.16	−0.07	−0.07	−0.27	−0.11	−0.11	−0.57	−0.16	−0.18
Q4	−0.17	−0.08	−0.08	−0.28	−0.14	−0.14	−0.47	−0.22	−0.23
Q4/Q4	−0.16	−0.05	–	−0.33	−0.04	–	−0.67	−0.02	–

Notes: All inflation rates are annualized.

5.5 COMPARISON WITH QUARTERLY STRUCTURAL VAR MODEL

It is also possible to estimate model (1) at quarterly frequency, although the validity of the exclusion restrictions for quarterly data is not supported by direct evidence. There are two more serious concerns. One challenge in using this approach to evaluate oil price scenarios is how to date the geopolitical oil supply shortfall. Assigning the oil supply disruption to 2026Q2 confuses the timing of the inflationary impact because the Iran War broke out in March 2026 and inflation began responding well before the start of the second quarter. Thus, the quarterly model systematically mismeasures the timing and magnitude of the quarterly effect on inflation. The other challenge is that the inflation and inflation expectations data for 2026Q1, on which the inflation scenario depends, are not available in real time, whereas those for February 2026 in the monthly VAR model are available as of the end of March 2026. This matters because the gasoline price shocks under the scenario and hence the inflationary effect depend on the history of the data. The latter problem may be addressed by fitting the quarterly model on pseudo-quarterly data, where 2026Q1 is defined as December 2025-February 2026, Q2 is defined as March 2026-May 2026, and so on. However, it is not possible to map the implied quarterly inflation outcomes of the scenario into calendar quarters. The advantage of our monthly model is that it is not subject to any of these problems.

Figure 8: Unconditional quarterly probability of Strait of Hormuz being closed



6 ALTERNATIVE SCENARIOS

The methodology employed in this paper may be adapted to fit the characteristics of a given geopolitical oil supply disruption, which makes this methodology of interest beyond the specific application in this paper. In this section, we explore how alternative assumptions alter the inflationary impact of a temporary closure of the Strait of Hormuz. Additional figures summarizing the empirical results are available in the online appendix.

6.1 SCENARIO 1: ALLOWING FOR UNCERTAINTY ABOUT THE REOPENING OF THE STRAIT

Our baseline scenario conditions on the assumption that the Strait of Hormuz is initially closed with 100% probability and subsequently is open with 100% probability. An alternative scenario accounts for the fact that market participants are likely uncertain about whether the Strait will reopen after having been closed for a certain number of quarters. Given an ongoing closure of the Strait of Hormuz for one quarter, how likely this closure is to continue depends on the expected duration of the closure. For example, if this expected duration is three quarters, corresponding to the length of the 1973 oil supply disruption, given a closure in the first quarter there is only a 61% probability of the Strait remaining closed in the next quarter. In the following quarter, this probability further declines to 37%, and so forth (see Figure 8). Longer or shorter expected durations would push these

Table 3: Effect on WTI price by duration of closure ($/barrel)

	1-Quarter Closure			2-Quarter Closure			3-Quarter Closure		
	S1	S2	S3	S1	S2	S3	S1	S2	S3
0	60	60	60	60	60	60	60	60	60
1	103	93	122	103	93	122	103	93	122
2	108	65	64	132	104	132	132	104	132
3	108	65	63	135	71	69	167	115	147
4	106	64	63	132	69	67	167	79	73
5	98	64	63	120	68	66	151	74	71
6	90	63	62	107	67	65	131	71	69
7	83	63	62	96	66	65	114	70	68
8	78	62	62	87	65	64	100	68	66

Notes: The baseline oil price is the average WTI price from mid-November to mid-February. S1 allows for uncertainty about the reopening of the Strait. S2 reduces the magnitude of the shortfall in oil supply from 20% to 15%. S3 increases the expected duration of the closure of the Strait from 3 quarters to 10 quarters.

probabilities up or down. A similar pattern emerges after closures lasting two or three quarters.

This scenario may also be interpreted as the expected shortfall gradually declining after a withdrawal of U.S. forces, as Arab countries make arrangements with Iran to resume exports through the Strait of Hormuz and slowly bring their oil production back online. Scenario 1 in Table 3 shows the implied path for the quarterly WTI price. While this change in assumptions does not affect the oil price during the closure, it substantially raises the oil price in the quarters that follow the reopening. This scenario captures the view that even after the Strait of Hormuz reopens, the price of oil will not return to its pre-war level.

These changes in the oil price path are reflected in a substantially larger impact on both inflation and inflation expectations (see Table 4a). For example, Q4/Q4 headline PCE inflation in 2026 rises by 1.09, 1.49, and 1.83 percentage points for 1, 2, and 3 quarter closures, respectively. The corresponding effects on core PCE inflation are 0.36, 0.46, and 0.53 percentage points. 1-year inflation expectations in 2026Q4 increase by 0.36, 0.54, 0.77 percentage points, while 5-10 year inflation expectations increase by 0.04, 0.06 and 0.09 percentage points, indicating that long-run inflation expectations remain largely unaffected.

Table 4: Inflationary impact under alternative scenarios (percentage points)

(a) Scenario 1: Uncertainty about the reopening of the Strait

	1-Quarter Closure			2-Quarter Closure			3-Quarter Closure		
	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$
2026Q1	1.74	0.10	0.14	1.74	0.10	0.14	1.74	0.10	0.14
Q2	1.46	0.59	0.56	1.99	0.62	0.60	1.99	0.62	0.60
Q3	0.82	0.33	0.46	1.51	0.57	0.68	2.27	0.65	0.76
Q4	0.36	0.44	0.36	0.72	0.56	0.54	1.33	0.76	0.77
2027Q1	0.06	0.30	0.24	0.21	0.47	0.38	0.55	0.62	0.57
Q2	−0.20	0.15	0.10	−0.18	0.26	0.18	−0.07	0.42	0.32
Q3	−0.36	0.02	−0.03	−0.43	0.08	0.01	−0.44	0.18	0.09
Q4	−0.44	−0.09	−0.12	−0.55	−0.08	−0.13	−0.64	−0.03	−0.10

(b) Scenario 2: Smaller oil supply shortfall

	1-Quarter Closure			2-Quarter Closure			3-Quarter Closure		
	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$
2026Q1	1.74	0.10	0.14	1.74	0.10	0.14	1.74	0.10	0.14
Q2	−0.20	0.35	0.32	0.85	0.40	0.41	0.85	0.40	0.41
Q3	−0.58	−0.11	−0.03	−0.25	0.27	0.30	1.29	0.44	0.48
Q4	−0.30	0.13	−0.02	−0.64	0.00	−0.03	−0.48	0.33	0.32
2027Q1	−0.13	−0.05	−0.04	−0.31	0.09	−0.04	−0.68	0.03	−0.04
Q2	−0.09	−0.05	−0.05	−0.17	−0.08	−0.06	−0.44	0.04	−0.08
Q3	−0.11	−0.06	−0.05	−0.16	−0.08	−0.08	−0.29	−0.13	−0.12
Q4	−0.12	−0.06	−0.06	−0.17	−0.10	−0.09	−0.26	−0.14	−0.14

(c) Scenario 3: Longer expected duration

	1-Quarter Closure			2-Quarter Closure			3-Quarter Closure		
	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$	π	π^{core}	$E\pi^{1y}$
2026Q1	1.74	0.10	0.14	1.74	0.10	0.14	1.74	0.10	0.14
Q2	1.45	0.83	0.72	2.79	0.90	0.82	2.79	0.90	0.82
Q3	−1.24	−0.35	−0.02	−0.76	0.20	0.45	1.48	0.44	0.70
Q4	−0.35	0.34	−0.02	−1.13	0.06	−0.12	−1.02	0.54	0.41
2027Q1	−0.16	−0.07	−0.03	−0.50	0.10	−0.09	−1.29	−0.09	−0.18
Q2	−0.04	−0.04	−0.04	−0.21	−0.15	−0.12	−0.59	0.04	−0.17
Q3	−0.07	−0.06	−0.05	−0.16	−0.13	−0.12	−0.32	−0.24	−0.19
Q4	−0.08	−0.06	−0.05	−0.18	−0.13	−0.12	−0.27	−0.21	−0.19

Notes: All inflation rates are annualized.

6.2 SCENARIO 2: SMALLER OIL SUPPLY SHORTFALL

In the baseline scenario, we postulated a shortfall of 20% of global oil supplies, corresponding to a cessation of all oil exports from the Persian Gulf. This is a reasonable benchmark given that whatever exports remain are subject to substantial risk of being disrupted. For example, the oil that Saudi Arabia has been diverting to its oil port on the Red Sea is likely to be disrupted by the Houthi rebels in Yemen. Likewise, the trickle of oil tankers that has been permitted by Iran to pass the Strait of Hormuz may be disrupted anytime by military action in the Strait.

An alternative, more optimistic scenario postulates that only 15% ($\zeta_e = 0.15$) of global oil supplies are disrupted. As shown in Scenario 2 in Table 3, this substantially reduces the impact on the quarterly WTI price. Likewise, the impact on inflation and inflation expectations declines (see Table 4b). For example, Q4/Q4 headline PCE inflation in 2026 rises by 0.16, 0.42, and 0.85 percentage points for 1, 2, and 3 quarter closures, respectively. The corresponding effect on core PCE inflation is 0.11, 0.19, and 0.32 percentage points. Inflation expectations in 2026Q4 increase only when the closure lasts 3 quarters. The effect on 1-year expectations is 0.32 percentage points and that on 5-10 year expectations is 0.04 percentage points.

6.3 SCENARIO 3: LONGER EXPECTED DURATION

Finally, we examine the effect of raising the expected duration of the oil supply shortfall from 3 quarters in the baseline scenario to 10 quarters ($\bar{q}^e = 0.9$). An increase in the expected duration could result from the U.S. terminating its military action with a large-scale attack on Iranian infrastructure, followed by Iranian retaliation against oil infrastructure in Arab countries. Rebuilding refinery, port, pipeline, oil production, and oil processing infrastructure and resuming production from wells that have been shut in would take considerable time, reflected in a higher expected duration of the shortfall.

Scenario 3 in Table 3 shows that this raises the initial impact of the WTI price regardless of the length of the closure. As shown in Table 4c, the impact on inflation increases, but not the impact on inflation expectations. For example, Q4/Q4 headline PCE inflation in 2026 rises by 0.40, 0.66, and 1.25 percentage points under the three scenarios, respectively. The corresponding effect on core

PCE inflation is 0.23, 0.31, and 0.50 percentage points. Inflation expectations in 2026Q4 increase only given a 3 quarter closure. The effect on 1-year expectations is 0.41 percentage points and that on 5-10 year expectations is 0.05 percentage points.

6.4 OTHER SCENARIOS Our scenarios are intended to illustrate plausible outcomes and to highlight the determinants of the inflationary impact. We do not aim to bound the worst possible impact. By changing the model parameters the overall effect on the WTI price and on inflation may be further increased. It should be noted, however, that in the DSGE model higher oil prices are associated with economic contractions. The destruction of oil demand associated with these contractions makes it difficult for the quarterly average price of oil to rise to levels of $200 per barrel or more, causing doubt on results based on back-of-the-envelope calculations.

7 CONCLUSION

One of the most pressing issues faced by monetary policymakers following of the outbreak of the 2026 Iran War is how to assess the inflationary effects of the rise in the price of oil. The challenge is that neither the path of the price of oil nor the implied adjustments to the path of inflation can be reliably predicted. We addressed this challenge by drawing on recent advances in formally modeling geopolitical oil price risk using a calibrated nonlinear DSGE model of the global economy. We first generated projections of the quarterly global price of oil under a range of scenarios. We then showed how these oil price scenarios can be incorporated into recently developed structural VAR models of the impact of U.S. gasoline price shocks on U.S. inflation and household inflation expectations, taking careful account of the timing of the outbreak of the war. Our analysis not only highlighted the main determinants of the inflationary impact, but it also allowed us to assess a range of plausible outcomes.

Our analysis speaks to the magnitude and persistence of the impact of higher oil prices on headline and core PCE inflation. We documented that, depending on the scenario, Q4/Q4 headline inflation in 2026 may increase by between 0.2 and 1.8 percentage points. The corresponding estimates for core PCE inflation are between 0.1 and 0.5 percentage points. This is consistent with the effects on 1-year household inflation expectations being modest and the effects on 5-10 year household inflation expectations being negligible. These ranges narrow substantially if the Strait of Hormuz reopens after 1, 2, or 3 quarters and remains open. For example, the range for headline inflation reduces to 0.16-0.40, 0.42-0.79, and 0.85-1.47 percentage points. Our analysis suggests that differences in views about the magnitude of the oil supply shortfall, its expected duration, and the uncertainty about a continuation of the shortfall help account for differences in opinions about the likely evolution of the global price of oil and hence of U.S. inflation.

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Online Appendix to
The Impact of the 2026 Iran War on U.S. Inflation: A Scenario Analysis

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A DSGE MODEL

This appendix provides an overview of the DSGE model used to generate oil price projections. Further details about the model fit and its robustness to alternative modeling choices can be found in Kilian et al. (2026)

A.1 MODEL EQUATIONS

The model is a nonlinear stochastic growth model augmented to include oil production. Oil is used as an intermediate input by a representative firm that produces a final good. The distinguishing feature of the model is that it includes downside risk to both oil production and the macroeconomy.

Productivity and Macroeconomic Disasters Productivity growth $g_t = a_t/a_{t-1}$ follows

$$\ln g_t = \ln \bar{g} + \sigma_g \varepsilon_{g,t} - \zeta_g (v_t^g - \bar{\pi}_1^g), \quad \varepsilon_{g,t} \sim \mathbb{N}(0,1),$$

where $\bar{g}$ is the steady-state growth rate. The indicator variable v_t^g equals 1 if a macroeconomic disaster occurs and 0 otherwise. The transition matrix for v_t^g is summarized by

$$\Pr(v_{t+1}^g = 1 | v_t^g = 1) = \bar{q}^g, \quad \Pr(v_{t+1}^g = 1 | v_t^g = 0) = p_t^g,$$

where the probability of a macroeconomic disaster follows

$$\ln p_t^g = \min\{0, (1-\rho_p^g)\ln \bar{p}^g + \rho_p^g \ln p_{t-1}^g + \sigma_p^g \varepsilon_{p,t}^g\}, \quad \varepsilon_{p,t}^g \sim \mathbb{N}(0,1),$$

which ensures that p_t^g is bounded between 0 and 1. The size of the disaster is ζ_g, and $\bar{\pi}_1^g$ is the unconditional probability of the disaster, which is evaluated by simulation.

Capital is destroyed when the disaster occurs. Let k_t denote the inherited stock of capital and i_t denote investment. The capital stock evolves according to

$$k_{t+1} = e^{-\zeta_g v_{g,t+1}}((1-\delta)k_t + i_t - \phi(i_t/k_t)k_t).$$

The functional form of the adjustment cost is given by

$$\phi(i_t/k_t) = i_t/k_t - (\mu_1 + \tfrac{\mu_2}{1-1/\nu}(i_t/k_t)^{1-1/\nu}),$$

where $\mu_1 = (\bar{g} - 1 + \delta)/(1-\nu)$ and $\mu_2 = (\bar{g} - 1 + \delta)^{1/\nu}$.

Final Goods Firm A representative firm maximizes profits by choosing its investment (i_t), capital (k_{t+1}), labor (n_t), and oil (o_t) inputs. The firm produces a final good y_t using a Cobb-Douglas technology that aggregates labor and capital services, which are produced using a normalized CES production function that aggregates capital and oil.

The firm's profit maximization problem is given by

$$V_t = \max_{i_t, k_{t+1}, n_t, o_t} \; y_t - i_t - p^o_t o_t - w_t n_t + E_t[x_{t+1} V_{t+1}]$$

subject to

$$\begin{gathered} k_{t+1} = e^{-\zeta_g v_{g,t+1}}((1-\delta)k_t + i_t - \phi(i_t/k_t)k_t), \\ y_t = y_0 (a_t n_t)^{1-\xi} \left((1-\alpha)(k_t/k_0)^{1-1/\sigma} + \alpha(o_t/o_0)^{1-1/\sigma}\right)^{\xi/(1-1/\sigma)}, \end{gathered}$$

where σ is the elasticity of substitution between capital and oil, δ is the depreciation rate of capital, $1-\xi$ is the share of labor in gross output, and α controls the share of oil in the capital services aggregate. The scalars y_0, k_0, and o_0 are set so that α is equal to the cost share of oil in the capital services aggregate.

The first-order conditions for the firm's problem are given by

$$\begin{gathered} w_t = (1-\xi) y_t / n_t, \\ p^o_t = \xi\alpha \tfrac{(o_t/o_0)^{1-1/\sigma}}{(1-\alpha)(k_t/k_0)^{1-1/\sigma} + \alpha(o_t/o_0)^{1-1/\sigma}} \tfrac{y_t}{o_t}, \\ E_t[x_{t+1} r^i_{t+1}] = 1, \end{gathered}$$

where

$$\begin{gathered} r^i_{t+1} \equiv e^{-\zeta_g v_{g,t+1}}(r^k_{t+1} + (1-\delta+\mu_1+\tfrac{\mu_2}{\nu-1}(i_{t+1}/k_{t+1})^{1-1/\nu})p^k_{t+1})/p^k_t, \\ r^k_t \equiv \xi(1-\alpha)\tfrac{(k_t/k_0)^{1-1/\sigma}}{(1-\alpha)(k_t/k_0)^{1-1/\sigma} + \alpha(o_t/o_0)^{1-1/\sigma}} \tfrac{y_t}{k_t}, \\ p^k_t \equiv \tfrac{1}{1-\phi'(i_t/k_t)} = \tfrac{1}{\mu_2}(\tfrac{i_t}{k_t})^{1/\nu}. \end{gathered}$$

Oil Production and Oil Production Disasters The production of oil is given by $o^s_t = a^o_t e_t$. The permanent component, a^o_t, reflects factors that influence the productive potential of the oil sector, including the evolution of oil reserves and technological progress that increases the ability of the sector to extract oil from current reserves. We include a shock to this permanent component to allow for productivity shocks in the oil sector not related to geopolitical oil supply disruptions. We also allow a^o_t to depend on the state of the economy since productivity in oil production is assumed to be cointegrated with productivity in the rest of the economy. This allows oil production to respond to changes in oil demand. The transitory component reflects temporary changes in the production of oil driven by exogenous geopolitical events. Oil production disasters are modeled as transitory, given evidence that geopolitical supply disruptions historically have not had long-lasting effects on global oil production, as discussed in the calibration section.

The permanent component of oil production is given by

$$a^o_t = \kappa_0 g_t^{\kappa_1} \epsilon_{t-1}^{\kappa_2} a^o_{t-1} \exp(\sigma_{go} \varepsilon_{go,t}),$$

where $\epsilon_t = a_t/a_t^o$, κ_1 determines the impact response of a growth shock on a_t^o, and κ_2 affects the speed at which a_t^o converges to a_t. This setup allows for a slow response of oil production to productivity growth shocks in the rest of the economy, which is a key feature of the data.

The transitory component of global oil production is given by

$$\ln e_t = \ln \bar{e} - \zeta_e(v_t^e - \bar{\pi}_1^e).$$

The indicator variable v_t^e equals 1 if an oil production disaster occurs and 0 otherwise. The transition matrix for v_t^e is summarized by

$$\Pr(v_{t+1}^e = 1 | v_t^e = 1) = \bar{q}^e, \quad \Pr(v_{t+1}^e = 1 | v_t^e = 0) = p_t^e,$$

where the probability of an oil disaster follows

$$\ln p_t^e = (1 - \rho_p^e) \ln \bar{p}^e + \rho_p^e \ln p_{t-1}^e + \sigma_p^e \varepsilon_{p,t}^e, \quad \varepsilon_{p,t}^e \sim \mathbb{N}(0, 1).$$

The size of the disaster is ζ_e, and $\bar{\pi}_1^e$ is the unconditional probability of the disaster, which is evaluated by simulation in the same way as the ergodic probability for the macroeconomic disaster.

Oil Storage A representative oil storage firm maximizes profits by choosing inventories, s_{t+1}, and how much oil to supply to the final goods firm, o_t. The firm's maximization problem is given by

$$V_t^o = \max_{o_t, s_{t+1}} \; p_t^o o_t + E_t[x_{t+1} V_{t+1}^o]$$

subject to

$$s_{t+1} = (1 - \omega) s_t + o_t^s - o_t - \tfrac{\tau}{2}\left(\tfrac{a_t}{s_t}\right)^2 a_t,$$

where ω is the cost of storage. The law of motion for s_t includes a penalty function that prevents stockouts, as they are not observed in the global oil market. The penalty function ensures $s_t > 0$.

The first-order condition for the storage firm is given by

$$1 = E_t[x_{t+1} r_{t+1}^s],$$

where

$$r_{t+1}^s \equiv ((1 - \omega + \tau(a_{t+1}/s_{t+1})^3) p_{t+1}^o)/p_t^o.$$

Household A representative household maximizes the present discounted value of utility by choosing consumption, c_t, hours worked, n_t, bond holdings, b_{t+1}, and equity shares, s_{t+1}^e, which have unit net supply. The household has Epstein-Zin recursive preferences to distinguish between risk aversion, γ, and the intertemporal elasticity of substitution, ψ.

The household's maximization problem is given by

$$J_t = \max_{c_t, n_t, s^e_{t+1}, b_{t+1}} \left((1-\beta) u_t^{1-1/\psi} + \beta (E_t[J_{t+1}^{1-\gamma}])^{\frac{1-1/\psi}{1-\gamma}} \right)^{\frac{1}{1-1/\psi}}$$

subject to

$$u_t = c_t^{\chi} (a_t(1-n_t))^{1-\chi},$$
$$c_t + p^e_t s^e_{t+1} + b_{t+1}/r_t = w_t n_t + (p^e_t + d^e_t) s^e_t + b_t,$$

where β is the discount factor, p^e_t is the equity price, r_t is the risk-free rate, w_t is the wage rate, d^e_t are dividends from firm ownership, and the Frisch elasticity of labor supply $\eta^{\lambda} = \frac{1-n_t}{n_t} \frac{1-(1-1/\psi)\chi}{1/\psi}$.

The first-order conditions for the household are given by

$$\chi w_t (1-n_t) = (1-\chi) c_t,$$
$$1 = E_t[x_{t+1} r_t],$$
$$1 = E_t[x_{t+1} r^e_{t+1}],$$

where

$$r^e_{t+1} \equiv (p^e_{t+1} + d^e_{t+1})/p^e_t,$$
$$x_{t+1} \equiv \beta (u_{t+1}/u_t)^{1-1/\psi} (c_t/c_{t+1}) (J_{t+1}/z_t)^{1/\psi-\gamma},$$
$$z_t \equiv (E_t[J_{t+1}^{1-\gamma}])^{1/(1-\gamma)}.$$

The equity risk premium is defined as $r^{ex}_t \equiv r^e_t - r_{t-1}$.

Market Clearing The final goods firm issues debt to finance its expected asset holdings, where ϑ determines leverage. Since the Modigliani-Miller theorem holds in our model, the introduction of firm leverage only affects equity returns. There is no effect on household or firm decisions. Aggregate firm dividends are given by

$$d^e_t = d^f_t + d^s_t - \vartheta (E_{t-1} k_t - \tfrac{1}{r_t} E_t k_{t+1}),$$

where $d^f_t = y_t - i_t - p^o_t o_t - w_t n_t$ and $d^s_t = p^o_t o_t$. Asset market clearing implies that $s^e_t = 1$ and total bond issuance is given by $b_t = \vartheta E_{t-1} k_t$. Market clearing in the goods market implies $c_t + i_t = y_t$.

Due to the stochastic trend in productivity, we detrend the model by defining $\tilde{x}_t \equiv x_t/a_t$. The detrending process introduces the growth terms $g_t = a_t/a_{t-1}$ and $g_{o,t} = a^o_t/a^o_{t-1}$.

A.2 CALIBRATION Each period in the model is one quarter. The parameters shown in Table 1 are informed by moments in the data and the related literature. See Kilian et al. (2026) for additional details.

Table 1: Baseline model calibration at a quarterly frequency

Parameter	Value	Target
Discount Factor (β)	0.997	$E(r)$
Risk Aversion (γ)	10	Gao et al. (2022), Croce (2014)
Intertemporal Substitution Elasticity (ψ)	2	Gao et al. (2022), Croce (2014)
Frisch Labor Supply Elasticity (η^{λ})	2	Peterman (2016), Basu-Bundick (2017)
Capital-Oil Elasticity of Substitution (σ)	0.105	$SD(\Delta p^o)$
Capital Depreciation Rate (δ)	0.025	Depreciation on fixed assets, durables
Capital-Oil Share of Production (ξ)	0.4043	Avg. labor share of income
Investment Adjustment Cost (ν)	3.3	$SD(\Delta i)$
Oil Storage Cost (ω)	0.025	Casassus et al. (2018), Gao et al. (2022)
Oil Production Weight (α)	0.134	$E[o/y]$
Oil Inventory Stockout Cost (τ)	0.00001	$E[s/o]$
Average Growth Rate ($\bar{g}$)	1.0039	$E(\Delta y)$
Firm Leverage (ϑ)	0.9	$SD(r^{ex})$
Elasticity of Oil Supply to TFP (κ_1)	0	Newell and Prest (2019)
Oil Supply Adjustment Speed to TFP (κ_2)	0.05	Half life of 3.5 years
Growth Shock SD (σ_g)	0.0095	$SD(\Delta y)$
Oil Production Growth Shock SD (σ_{go})	0.011	$SD(\Delta o^s)$
Growth Disaster Size (ζ_g)	0.018	$E(r^{ex})$
Prob. of Entering Growth Disaster ($\bar{p}_g$)	0.005	Occurs in expectation every 50 years
Prob. of Remaining in Growth Disaster ($\bar{q}_g$)	0.9	Gourio (2012)
Growth Disaster Prob. Persistence (ρ_{pg})	0.8	$AC(\mathcal{U}_y)$
Growth Disaster Prob. Shock SD (σ_{pg})	0.9	$SD(\mathcal{U}_y)$
Oil Production Disaster Size (ζ_e)	0.20	Avg. peak decline in oil prod. disasters
Prob. of Entering Oil Disaster ($\bar{p}_e$)	0.02	Avg. frequency of oil prod. disasters
Prob. of Remaining in Oil Disaster ($\bar{q}_e$)	0.67	Avg. duration of oil prod. disasters
Oil Disaster Prob. Persistence (ρ_{pe})	0.5	$AC(\mathcal{U}_{p^o})$
Oil Disaster Prob. Shock SD (σ_{pe})	1.4	$SD(\mathcal{U}_{p^o})$

B DATA SOURCES

We use the following time-series provided by Haver Analytics:

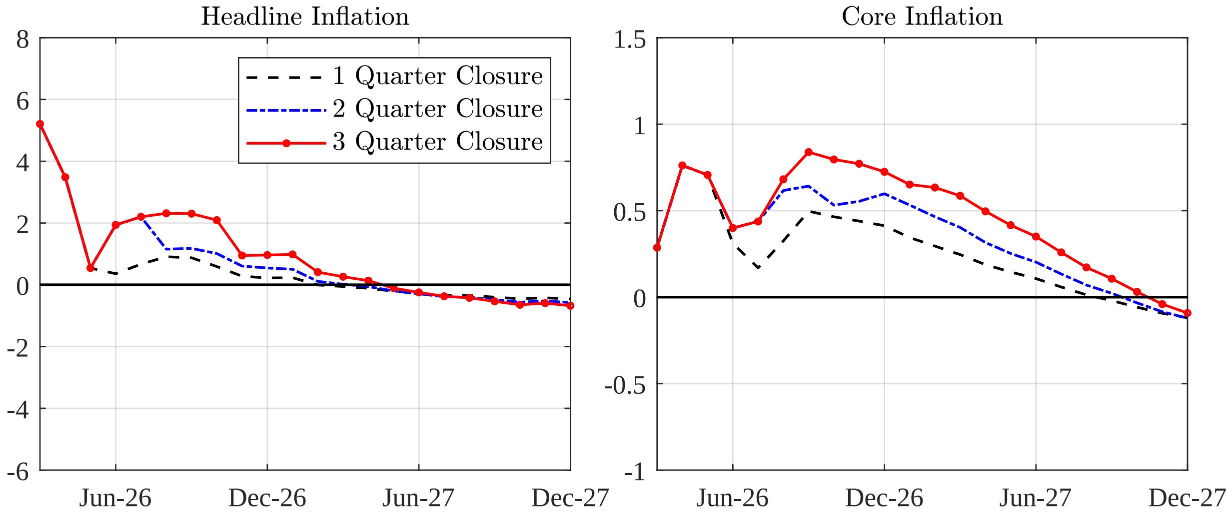
1. **Personal Consumption Expenditures: Chain Price Index**, Monthly, Seasonally Adjusted, Index (JCM@USNA)
2. **Personal Consumption Expenditures excluding Food and Energy: Chain Price Index**, Monthly, Seasonally Adjusted, Index (JCXFEM@USNA)
3. **Retail Motor Gasoline Price, Unleaded Regular Gasoline**, Monthly, Dollars per Gallon, published in the EIA's *Monthly Energy Review*, Table 9.4 (PUSSGMWG@USENERGY)
4. **Survey Research Center at the University of Michigan: Expected Inflation Rate, Next Year**, Monthly, Percent (CINF1@USECON)
5. **Survey Research Center at the University of Michigan: Expected Inflation Rate, Next 5 Years**, Monthly, Percent (CINF5@USECON)
6. **WTI Front-Month Futures Price**, Daily, Dollars per Barrel, published by CME (PZTEXF1@DAILY)

We also use the following data series:

1. **Cost share of crude oil in the retail price of gasoline**, Monthly, percent, from the U.S. EIA's Gasoline Pump Components History: Crude oil (percentage), `https://www.eia.gov/petroleum/gasdiesel/gaspump_hist.php`

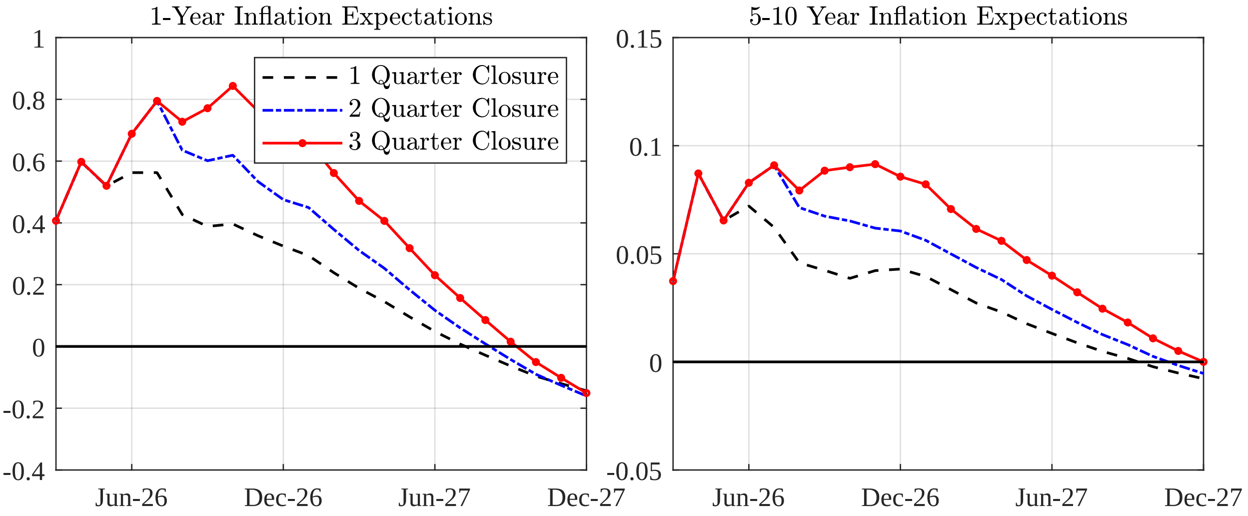
C FIGURES FOR ALTERNATIVE SCENARIOS

Figure 1: Projections of PCE inflation under scenario 1 (percentage points)



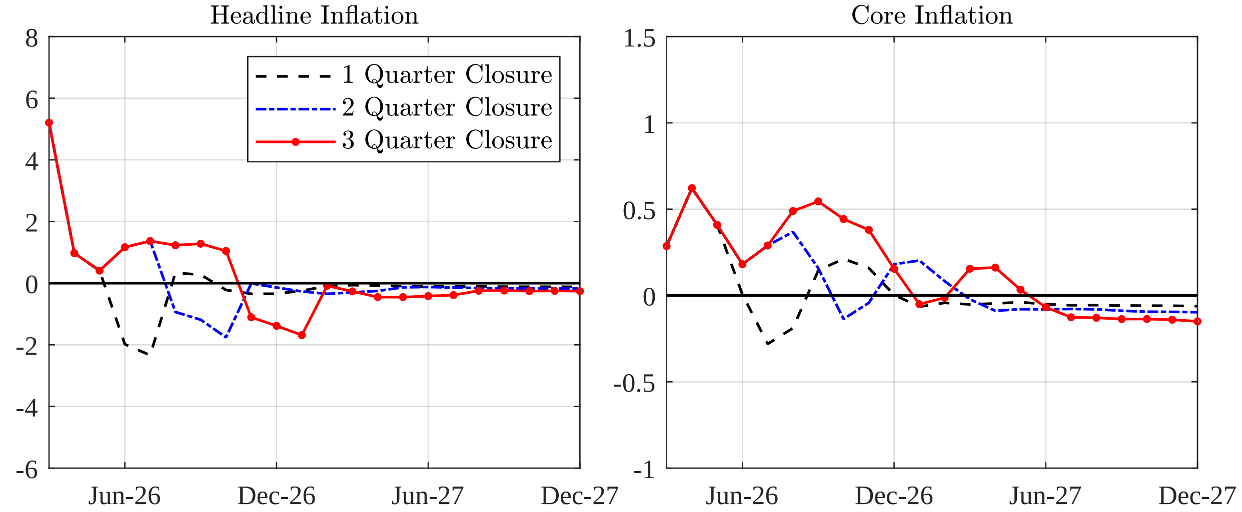
Notes: All inflation rates are annualized.

Figure 2: Projections for inflation expectations under scenario 1 (percentage points)



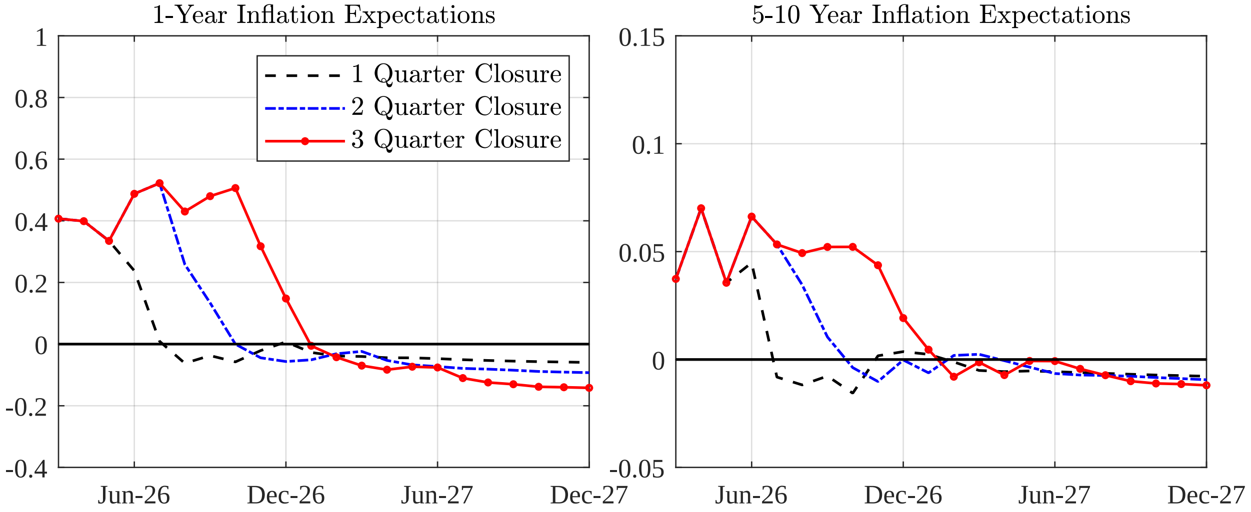
Notes: All inflation rates are annualized.

Figure 3: Projections of PCE inflation under scenario 2 (percentage points)



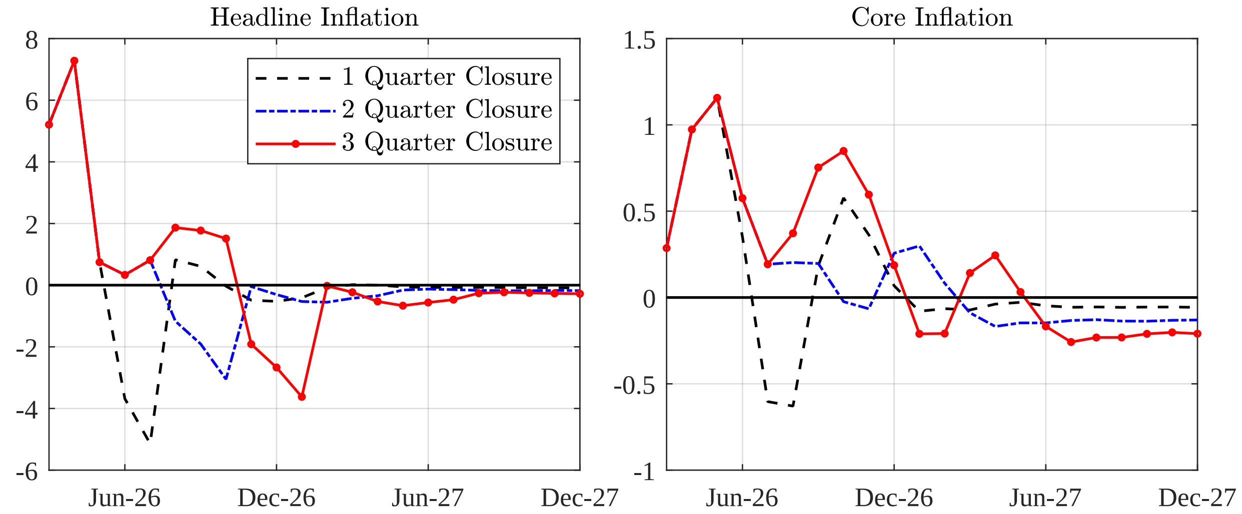
Notes: All inflation rates are annualized.

Figure 4: Projections for inflation expectations under scenario 2 (percentage points)



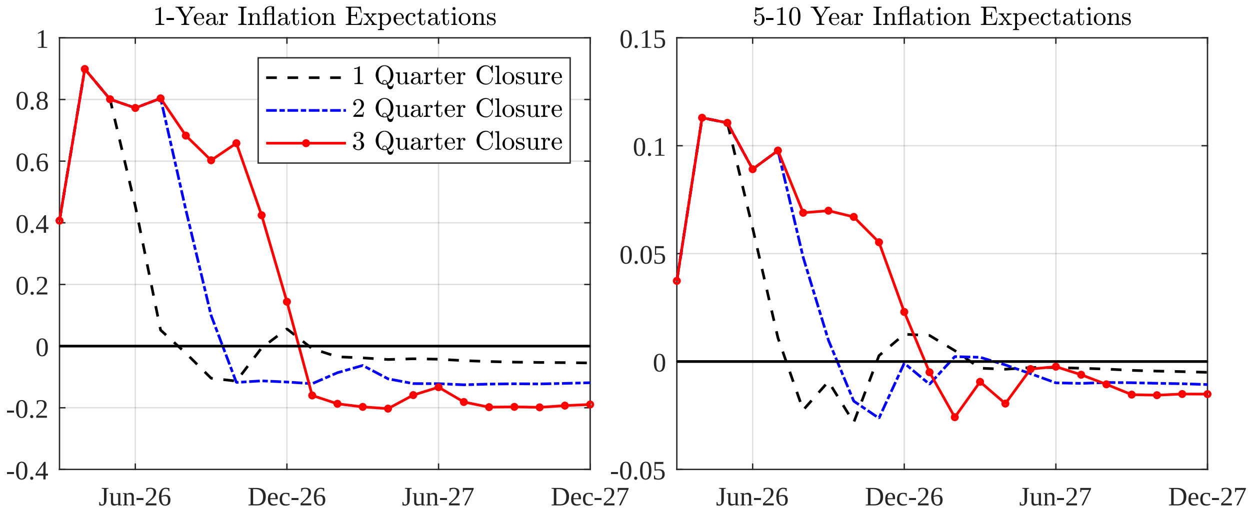
Notes: All inflation rates are annualized.

Figure 5: Projections of PCE inflation under scenario 3 (percentage points)



Notes: All inflation rates are annualized.

Figure 6: Projections for inflation expectations under scenario 3 (percentage points)



Notes: All inflation rates are annualized.

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