# The Pass-Through of Fuel Costs and Other Reasons the Outlook for Core PCE Inflation is Bleak (or is 3% Inflation the New 2?)

©Joel Prakken[1]

## Overview

Iran's closure of the Straits of Hormuz on March 2 has sent fuel costs spiraling upwards. The Fed's preferred measure of inflation is of the price index for core personal consumption expenditures (PCE). These exclude consumers' direct (or "final") purchases of gasoline & other motor fuel. However, increases in the cost of fuel used to produce and transport core consumer goods & services may pass through to core prices. Here I present strong evidence that the pass-through of intermediate fuel costs to final core consumer prices is highly significant and could contribute as much as 0.7 extra percentage points to Q2 annualized core inflation, re-enforcing several other inflationary forces.

## Price index of fuels in intermediate use

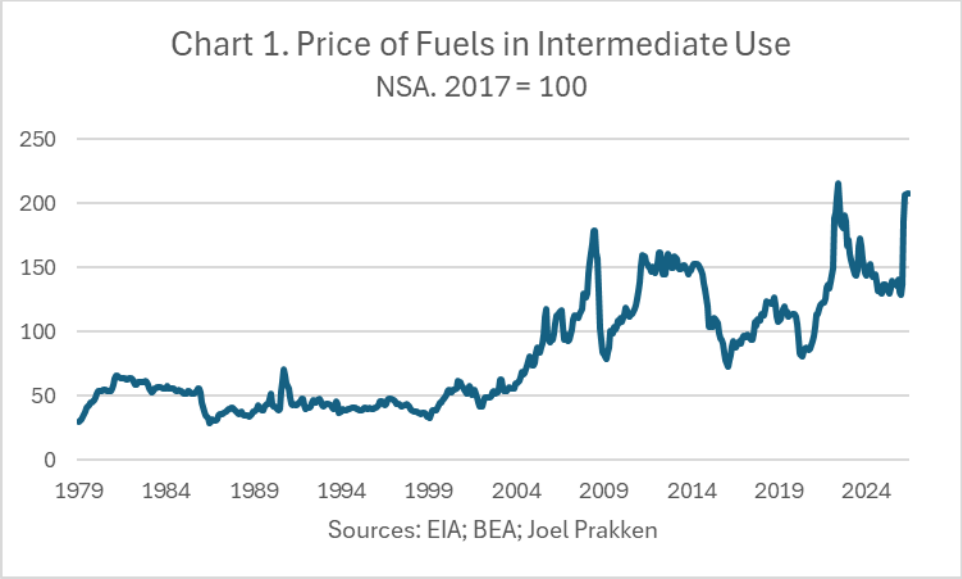
I constructed a chain-type price index for the intermediate consumption of three major fuels: diesel fuel, gasoline, and jet fuel.[2] I assume the domestic consumption of diesel fuel and jet fuel is all intermediate while treating as intermediate the domestic consumption of gasoline not included in PCE.[3] Since 1979 this averaged 19% of total gasoline consumption, but recently it's hovered near 14%. The average (again since 1979) shares of the three fuels in intermediate use are: diesel fuel (62%), gasoline (25%), and jet fuel (14%), but recently those shares are 70%, 14% and 16%, respectively. The monthly price index (2017=100, not seasonally adjusted) is shown through April in Chart 1. I seasonally adjusted the monthly index using X-13, then quarterly averaged the seasonally adjusted index for inclusion in my longstanding Phillips Curve model for core PCE inflation.

---

[1] Joel Prakken is former Chief US Economist of S&P Global and IHS Markit, co-founder of Macroeconomic Advisers, and past president and director of the National Association for Business Economics. He has served as an outside advisor to the Congressional Budget Office, on the Advisory Panel of the Bureau of Economic Analysis, and as a consultant to the Joint Committee on Taxation. He holds a BA in economics from Princeton University and a PhD in economics from Washington University in Saint Louis.

[2] This is a divisia index. Monthly changes in each price are weighted by the geometric mean of the current and lagged monthly shares of expenditures on each fuel in total expenditures. The weighted changes are then summed to total changes, and the total changes cumulated into an index scaled to 100 in 2017.

[3] A tiny portion of diesel fuel, and even smaller portion of jet fuel, are included in PCE for gasoline & other motor fuel and so are excluded from core prices. The price of gasoline is the retail price for all grades, all blends. The price of diesel is the retail price for on-highway diesel (including taxes); the price of jet fuel is the spot price at the Gulf Coast. Prices (cents per gallon) and volumes (thousands of barrels per day, 42 gallons per barrel) are from the Energy Information Agency. Contact author for additional details.




**Extended Phillips Curve model**

The basic specification, similar to that described by Yellen,[4] is:

$$\pi_t = -\beta(u_t - \tilde{u}_t) + a\pi^e_{t-1} + \sum_{j>0} b_j \pi_{t-j}$$

where: $\pi$ is the annualized, not compounded percent change in the price index for core PCE; $u$ is the civilian (U3) unemployment rate (%); $\tilde{u}$ is CBO's non-cyclical unemployment rate (%); $\pi^e$ is the median expectation for average annual 10-year PCE inflation from the Philadelphia Fed's Survey of Professional Forecasters (%); $-\beta$ is the short-run trade-off between inflation and unemployment; $a$ reflects the strength of the expectations anchor; and $b_j$ captures lagged effects arising from sticky price setting. Theory suggests, and empirical evidence supports, that:

$$a + \sum_{j>0} b_j = 1$$

so that, in the long run with $\pi^e = \pi$, there is no trade-off between unemployment and inflation. Under that restriction the specification becomes:

$$\Delta\pi_t = -\beta(u_t - \tilde{u}_t) - a(\pi_{t-1} - \pi^e_{t-1}) - \sum_{j>0} \gamma_j \Delta\pi_{t-j}$$

[4] https://www.federalreserve.gov/newsevents/speech/files/yellen20170926a.pdf

where and $\gamma_j$ are linear combinations of $b_j$. Finally, I included in the specification: the annualized not compounded percent change in the Federal Reserve's broad, real, trade-weighted exchange rate, $\dot{\$}$; the New York Fed's Global Supply Chain Pressure Index, $cscpi$; and the annualized, not compounded percent change in the *real* price index for intermediate fuels, $\dot{p}_f$. Hence, the final specification is:

$$\Delta\pi_t = -\beta(u_t - \tilde{u}_t) - a(\pi_{t-1} - \pi^e_{t-1}) - \sum_{j>0} \gamma_j \Delta\pi_{t-j} - \delta_1 \dot{\$}_t + \delta_2 gscpi_t + \delta_3 \dot{p}_{f,t}$$

I estimated this specification on quarterly data by OLS over the sample 1980:Q1 – 2026:Q1. Results are presented in the table below. All coefficients have the expected sign and are highly significant. The estimates of $\beta$, $a$, and $\gamma_j$ and $\delta_1$ are typical of this genre of model.

Dep Vaiable: $\Delta\pi_t$
Method: Least Squares
Sample: 1980Q1 - 2026Q1

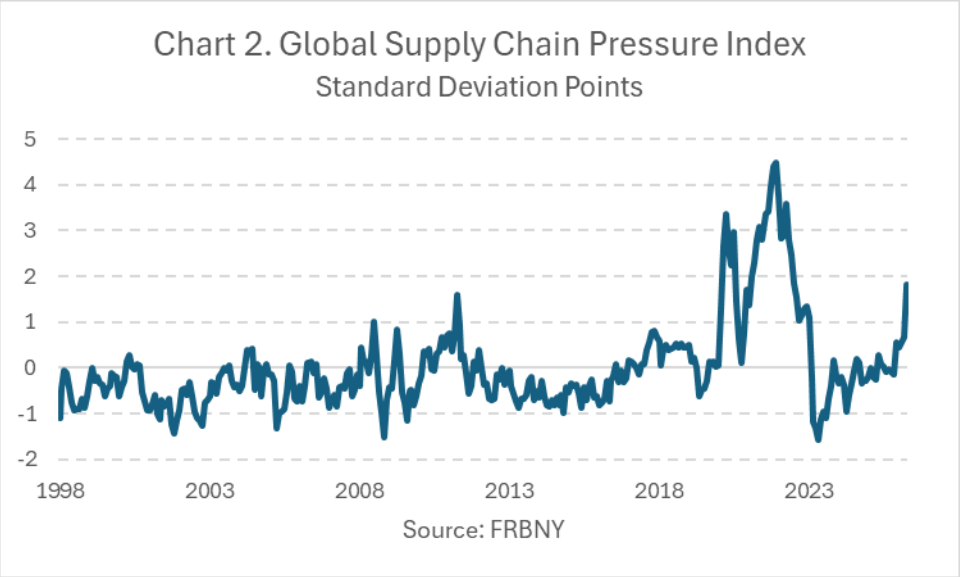
| Variable | Coef | Std. Error | t-Stat |
|---|---|---|---|
| $u_t - \tilde{u}_t$ | -0.08798 | 0.03135 | -2.80659 |
| $\pi_{t-1} - \pi^e_{t-1}$ | -0.32471 | 0.06741 | -4.81707 |
| $\Delta\pi_{t-1}$ | -0.39819 | 0.08159 | -4.88033 |
| $\Delta\pi_{t-2}$ | -0.25337 | 0.07194 | -3.52218 |
| $\dot{\$}_t$ | -0.01871 | 0.00584 | -3.20424 |
| $gscpi_t$ | 0.33847 | 0.07555 | 4.48024 |
| $\dot{p}_{f,t}$ | 0.00525 | 0.00152 | 3.46065 |
| R-squared | 0.44619 | | |
| Std. Error | 0.65595 | | |
| Durbin-Watson | 1.70954 | | |

**Fuel costs pass through**

In 2026:Q1 the real real price of intermediate fuels grew at a 48.1% annual rate, contributing 0.00525*48.1 = 0.25 percentage point to core PCE inflation. However, almost all the Q1 increase in the prices of fuels occurred in March, creating the possibility of much larger increase in Q2. Assume, as seems reasonable today, that recent daily fuel prices persist through June. Then, the Q2 rate of increase in the real price index of intermediate fuels would be around 137%, contributing 0.00525*140 = 0.72 percentage point to core PCE inflation! Lags in the model temporarily would propagate these shocks.

**It gets worse: supply chain disruptions**

The Supply Chain Pressure Index (Chart 2) drifted up in March, then jumped sharply in April and, given circumstances in the Straits of Hormuz, who doesn't expect it to rise further? But even if it remains at April's level through June, the resulting quarterly increase of 1.26 points would contribute 0.338468*1.26 = 0.42 percentage point to Q2 core PCE inflation.




And finally, as I wrote in a previous post, since last October, when a government shutdown prevented the BLS from conducting its monthly survey of consumer prices, the CPI for shelter costs has been understated by one month's increase equaling approximately 0.3%.[5] This understatement will be corrected in April. Given the weight of housing rents in core PCE, the effect will be to boost Q2 core PCE inflation by about 0.2 percentage point.

That's 0.7 + 0.4 + 0.2 = 1.3 extra percentage points of core PCE inflation Q2.

**Is 3% the new 2%?**

Viewed from the perspective of my regression, the near-term outlook for core inflation is worrisome, if not just bleak.

The unemployment rate, at 4.3% in May, remains *below* the non-cyclical unemployment rate of 4.4%. So, no cyclical disinflation in the offing. Lagged core inflation is running close

[5] See *Next week, on "CPI day," Don't Forget the Corrected for Understated Shelter Costs*, LinkedIn post, May 7, 2026.

to 3%. So, inertia, too, is working against disinflation. Inflation expectations in Q1 were 2.2%, above the Fed's 2% long-run objective, and I won't be surprised if, when reported early next month for Q2, they move higher. So, there's no guarantee that expectations are, or will remain, anchored at 2%, especially as they tend to adapt gradually towards recent (now elevated!) rates of inflation. The real exchange rate has fallen 7.2% since the Trump Administration imposed a new round of tariffs in early 2025. Steep increases in Intermediate fuel costs are passing through to core consumer prices. So are other cost pressures from supply chain disruptions. A one-time correction to housing rents will boost Q2 core inflation.

Perhaps on the positive side of the ledger, the inflationary impact of the recent increase in tariff rates may be waning or even reversing following recent court rulings judging the tariffs to be illegal. Note, however, that the tariff rate does not appear in my equation *because it proved completely insignificant in the regression*. This suggests that most of the tariffs have been either absorbed in domestic margins or, as I suggested in a previous post, passed backwards onto foreign suppliers.[6]

What would reduce core inflation towards 2%? Again, from the perspective of this equation: a significant and persistent rise in the unemployment rate that this Fed (but not the Volker Fed!) seems unwilling to engineer. If the economy does enter a recession - and borrowing a term from the Greenspan era - the Fed might bank any "opportunistic disinflation." Until then, I worry that 3% inflation is the new 2%.

`

[6] See *The Backwards Pass of Tariffs?*, LinkedIn post, April 5, 2026.