# Tariffs, Investment, and the Missing Trade Collapse

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# Why Everyone Got Trump's Tariffs Wrong

Predictions of the duties' impact on the economy were buoyant or dire. Here's the reality.

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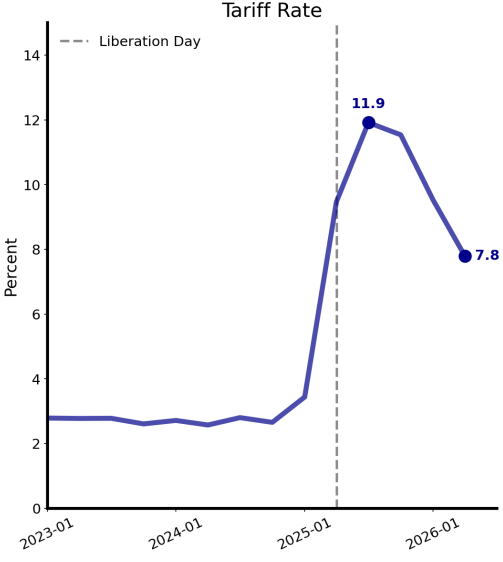
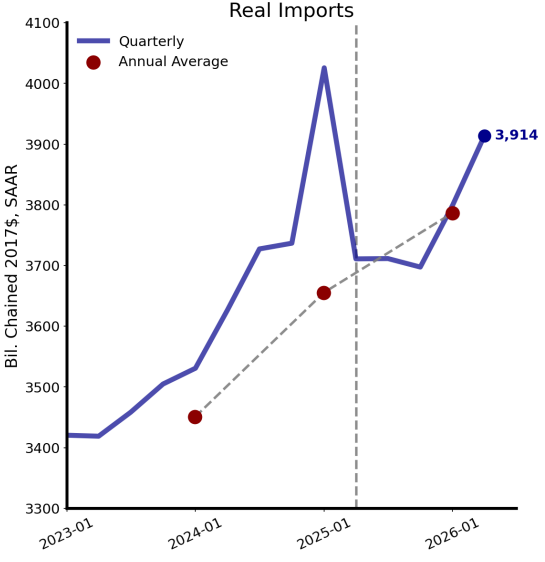
Dec. 14, 2025 9:00 pm ET

In the days following "Liberation Day," the contrast between Trump's optimism and more dire predictions from trade experts and economists was stark.

# Large tariffs, but no collapse in trade. . .



## Why were U.S. imports and the macroeconomy so resilient?

**Data:** Tariffs rose 10pp, but incidence *and* quantity responses differ sharply across consumption, intermediates, and capital.

**Model:** A New Keynesian open-economy model with:

- Heterogeneous tariff shocks across consumption, intermediates, and capital,
- MEI shocks — the AI-driven investment boom,
- UIP shocks — the dollar.

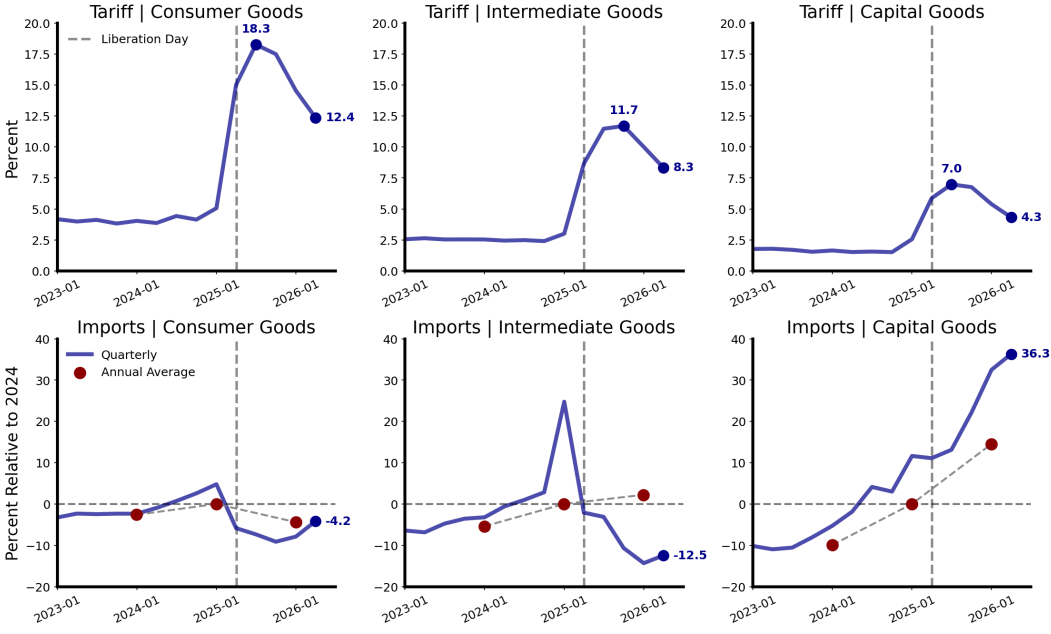
**Three results:**

**1.** The model matches the *untargeted* paths of imports, GDP, consumption, and inflation.

**2.** The AI-driven investment boom (the MEI shock) masks the costly effects of tariffs.

**3.** *Which* goods are tariffed matters for the output vs. inflation tradeoff: consumption and intermediate tariffs are supply shocks; tariffs on capital goods act like demand shocks.

# Tariffs landed unevenly — And so did the import response...



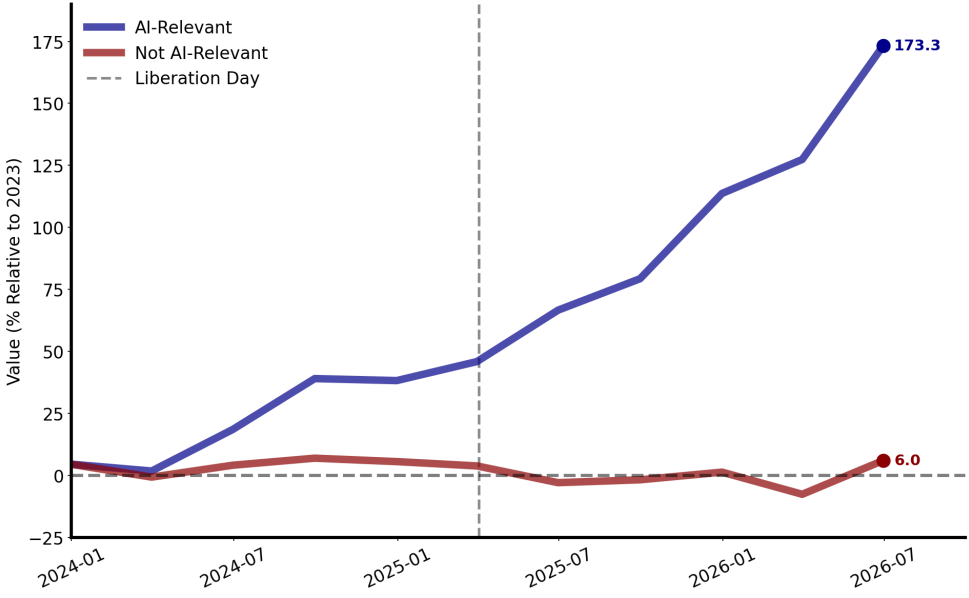
# The role of AI-related products in trade

Waugh (2026): LLM classifier of all HS10 codes by relevance to AI data-center infrastructure.

| | | Tariff rate (%) | | Imports ($B) | | |
|---|---|---|---|---|---|---|
| Category | Capital goods (% of imports) | Before | After | Before | After | Change (%) |
| **High AI relevance** | **93** | **1.9** | **4.7** | **506** | **727** | **+44** |
| Compute hardware | 99 | 0.6 | 0.9 | 238 | 417 | +75 |
| Electrical power | 89 | 3.8 | 12.5 | 133 | 143 | +8 |
| Networking / telecom | 100 | 1.8 | 3.7 | 74 | 111 | +49 |
| Cooling / HVAC | 91 | 3.4 | 13.3 | 47 | 46 | −2 |
| Low AI relevance | 22 | 2.9 | 11.5 | 2019 | 1752 | −13 |
| **Total** | **38** | **2.9** | **10.6** | **2908** | **2815** | **−3** |

Note: Before = Apr 2024–Mar 2025, After = Apr 2025–Mar 2026.

# What drives the capital-goods surge? AI...



## Model — Overview

A standard two-country New Keynesian open economy, U.S. and Rest of World.

- **Households:** habits; consume a bundle of domestic and imported goods; supply labor to unions; save in bonds and capital; the U.S. bond is the only internationally traded asset.
- **Firms:** produce with labor, capital, and materials. Materials and capital are bundles of domestic and imported goods.
- **Monetary Policy:** Inertial Taylor rule on four-quarter domestic inflation.

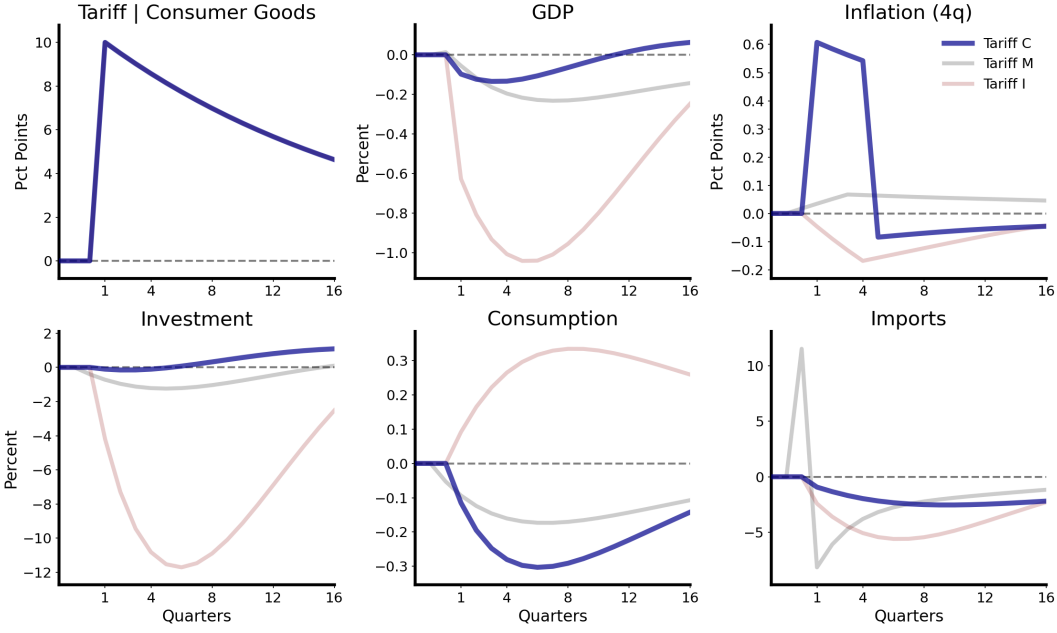
Important elements:

**1.** The tariff depends on what the good is used for: consumption, materials, and investment.

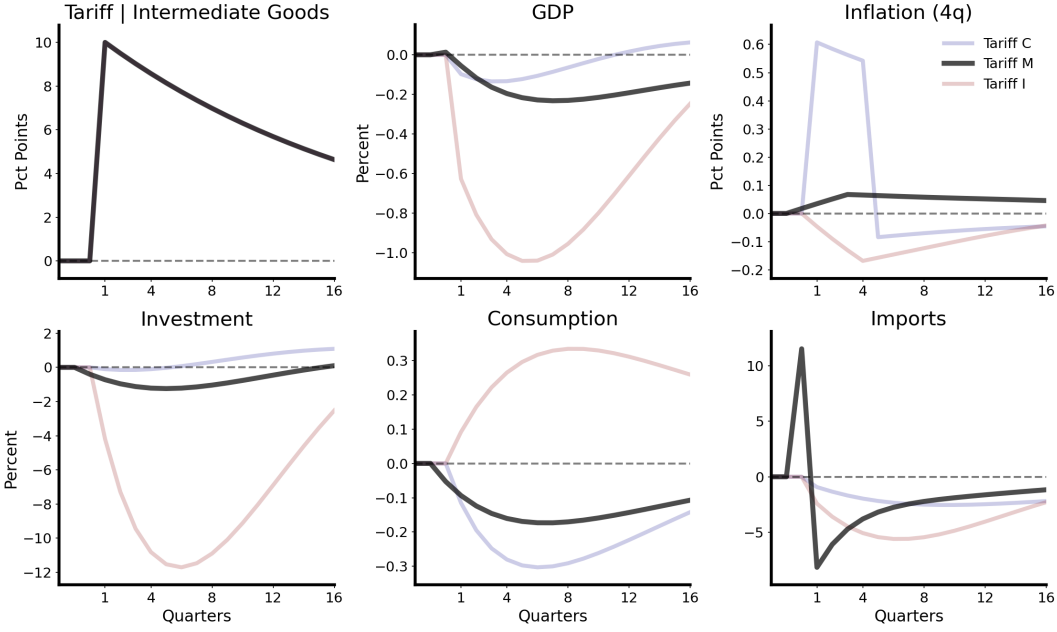
**2.** Dominant-currency pricing, so both sides of U.S. trade are sticky in dollars.

**3.** Inventories in materials, following the approach of Auclert et al. (2025), inspired by Alessandria et al. (2010).

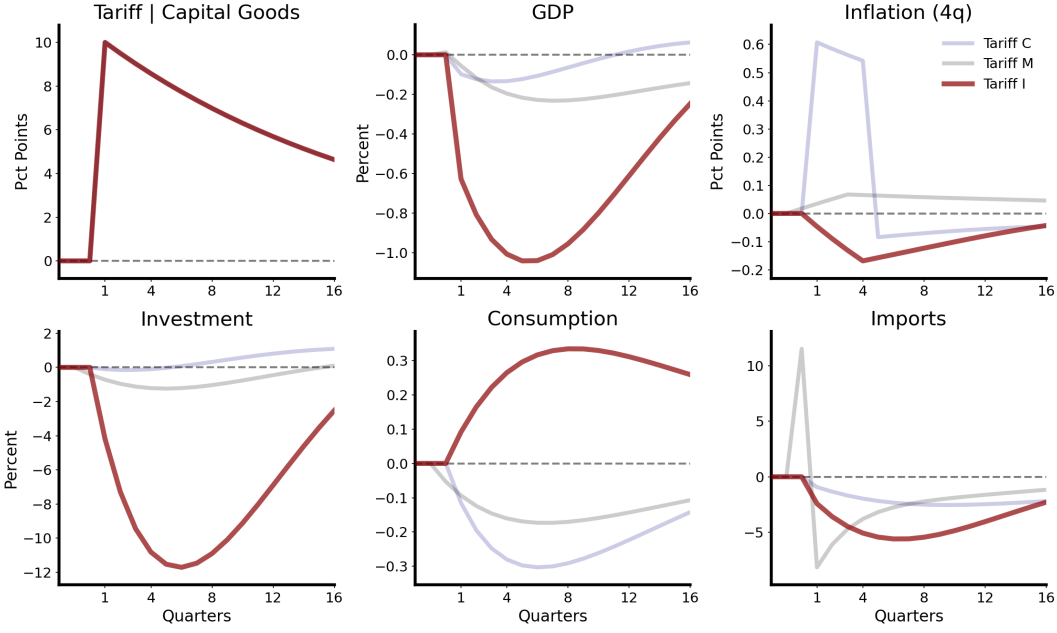
# Tariffs on consumption — High inflation



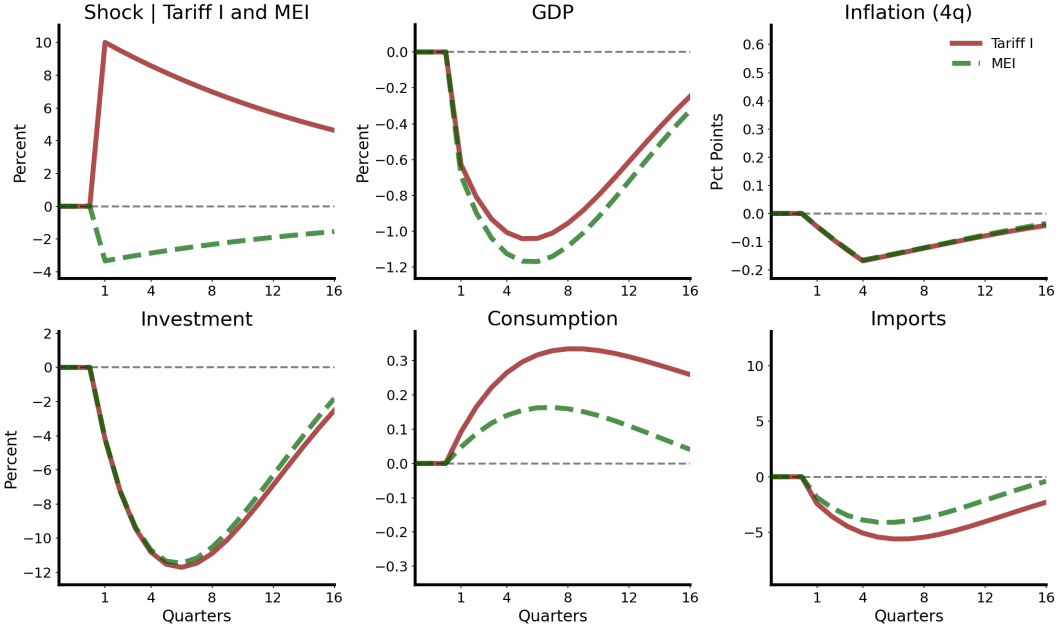
# Tariffs on materials + news — Front-running in trade



# Tariffs on investment — Large output cost *and* deflationary



# Tariffs on investment — Same transmission as an MEI shock



## Quantitative analysis

**1.** Tariff shocks to consumption, materials, investment — anticipated, the actual paths.

**2.** MEI shocks — unanticipated, chosen so the model matches realized aggregate investment.

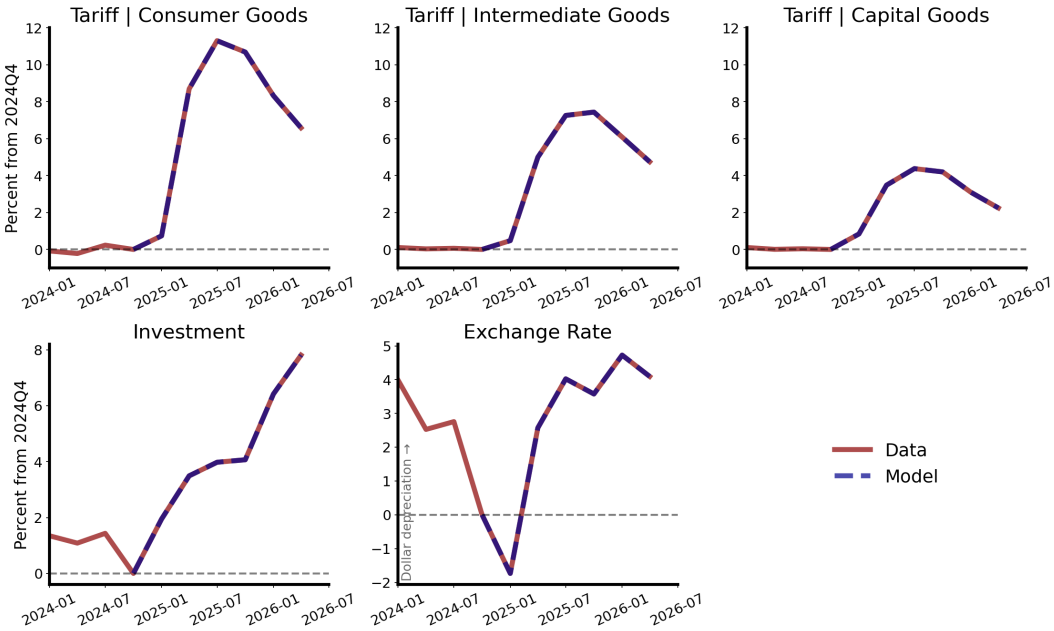
**3.** UIP shocks — unanticipated, chosen so the model matches the realized real exchange rate.

All shocks have persistence $\rho = 0.95$. **Nothing else is fitted.**

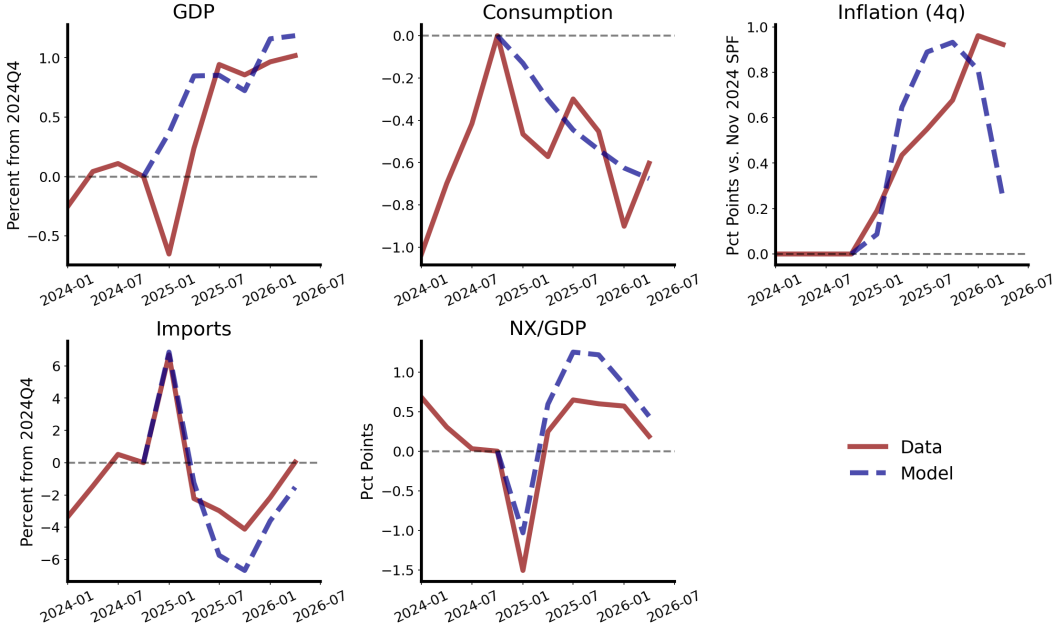
Then ask:

- How well does the model fit imports, GDP, consumption, and inflation?
- What accounts for the dynamics of trade?
- How do the shocks, and tariffs in particular, impact macro aggregates?

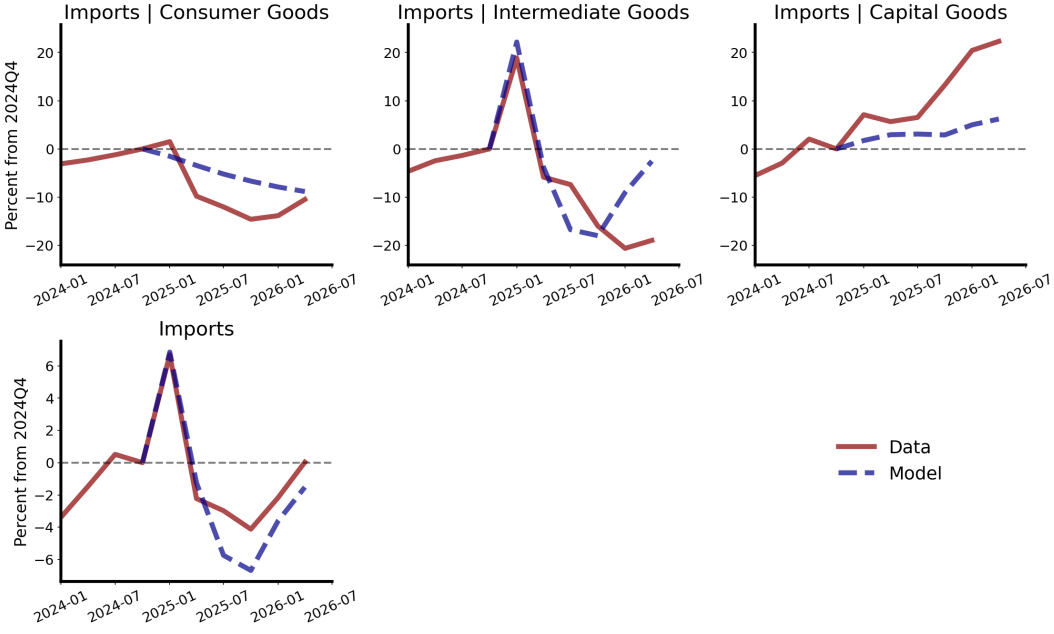
# Inputs — Tariffs, the investment boom, and the dollar



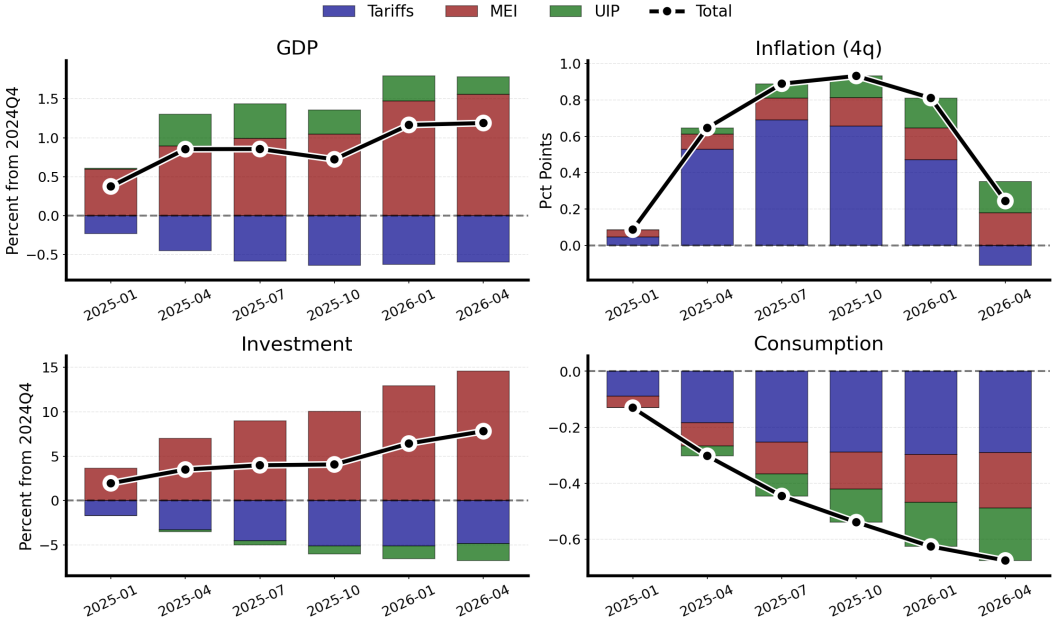
# Model fit — Macro aggregates



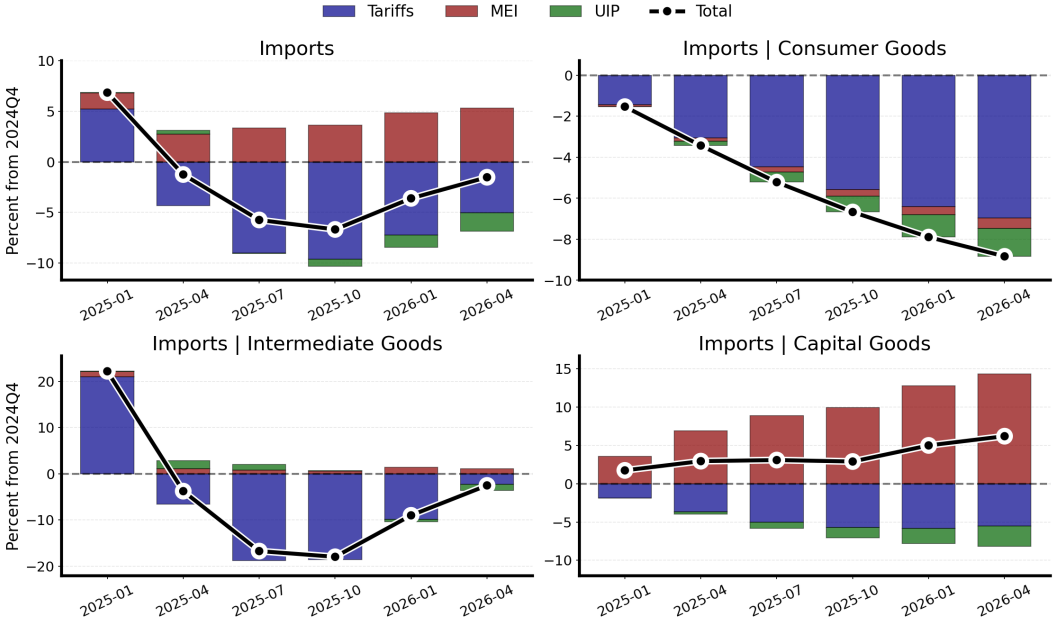
# Model fit — Imports by end use



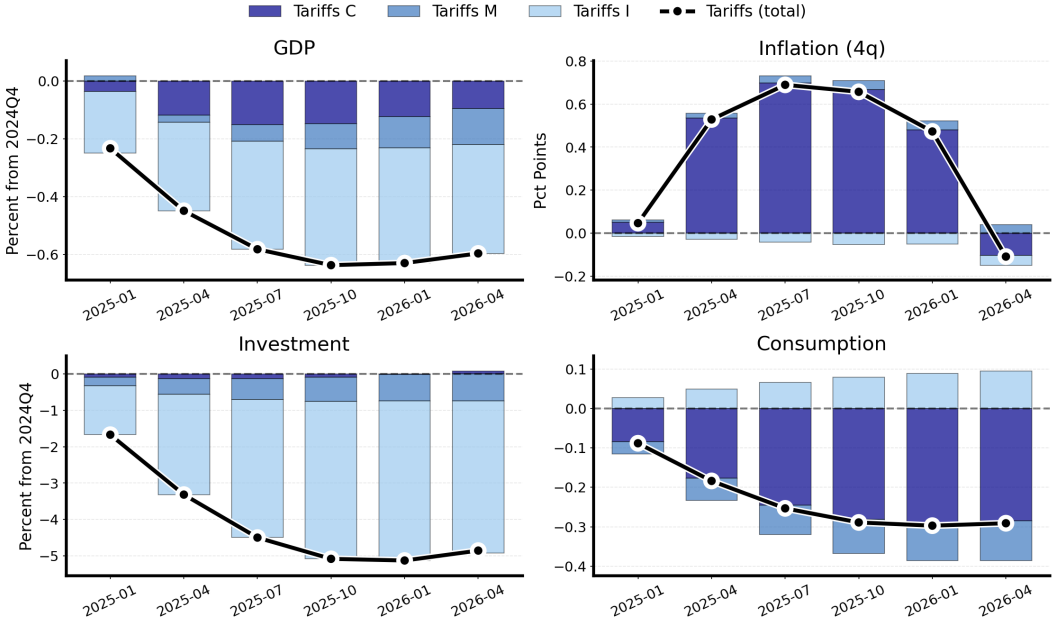
# How do the shocks impact macro aggregates?



# What accounts for the dynamics of trade?



# How do tariffs impact macro aggregates?



## Taking stock...

**1.** The model matches the *untargeted* paths of GDP, consumption, inflation, and imports.

**2.** How do the shocks impact macro aggregates?

- Tariffs alone are stagflationary: GDP $-0.6\%$, inflation $+0.7$pp.
- The investment boom more than offsets the tariff drag on output.

**3.** What accounts for the dynamics of trade?

- The investment boom pulls in capital goods despite tariffs. Absent it, imports fall 10%.

**4.** Which goods are tariffed matters...

- Consumption tariffs drive inflation; intermediate tariffs drive trade dynamics.
- Investment tariffs act like demand shocks — most of the output cost, and *deflationary*.

## Final Thoughts: Policy vs. Shocks

A popular view is the following: After Liberation Day, everything turned out A-OK.

But one should separate out two issues when thinking about 2025 and beyond:

1. **Policy:** Tariffs,
2. **Shocks:** AI investment boom.

One contribution of our paper is to show **shocks** masked the effects of **policy.**

- This is important because absent those **shocks**, i.e., the AI boom slows down or stops, we are left with the effects of the **policy.**

A second contribution is to show how trade **policy** influences the output vs. inflation tradeoff.

- Also important because the **shocks** may dissipate or trade **policy** changes.

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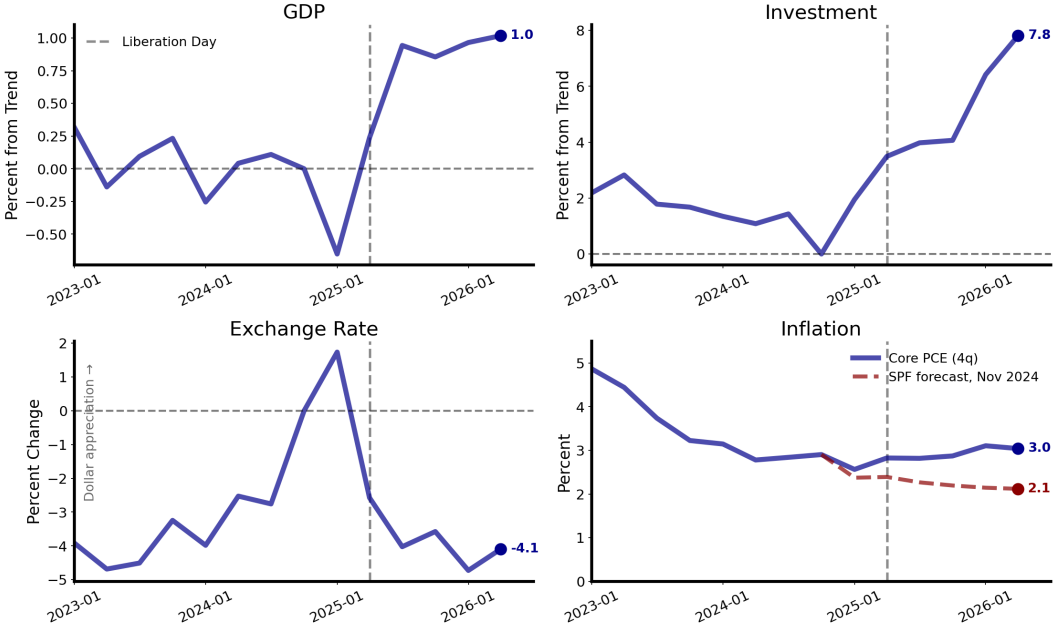
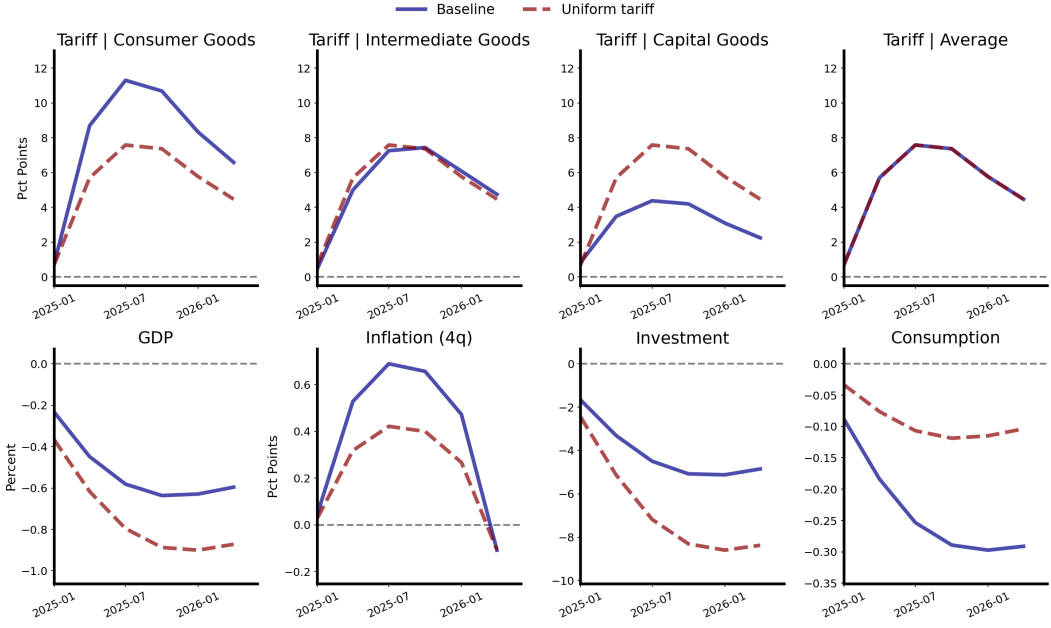
# Appendix

# Meanwhile, the macroeconomy was resilient...



# How much does tariff composition matter?



# Household problem

Households choose consumption $C_{i,t}$ and savings (bonds and capital):

$$\max \; E_t \sum_{s \geq t} \beta^s \left[ \frac{(C_{i,s} - hC_{i,s-1})^{1-\sigma}}{1-\sigma} - \bar{\varphi} \frac{L_{i,s}^{1+\varphi}}{1+\varphi} \right]$$

subject to the budget constraint

$$\begin{aligned} & C_{i,t} + B_{ii,t} + B_{i1,t} + \frac{\varphi_i \, \xi_{i,t}^{UIP}}{2} \left( B_{i1,t} - \bar{b}_i \right)^2 + Q_{i,t}^k K_{i,t} \\ & \leq w_{i,t} L_{i,t} + B_{ii,t-1} \frac{R_{i,t-1}^n}{\pi_{i,t}} + B_{i1,t-1} \frac{Q_{i1,t}}{Q_{i1,t-1}} \frac{R_{1,t-1}^n}{\pi_{1,t}} + \Pi_{i,t} + T_{i,t} + \left( r_{i,t}^k u_{i,t} + (1-\delta_k) Q_{i,t}^k \right) K_{i,t-1}. \end{aligned}$$

The consumption bundle is the Armington aggregate with $x = c$, so absent adjustment costs

$$C_{ij,t} = \omega_{ij}^c \left( \frac{p_{ij,t} \, \tau_{ij,t}^c}{p_{i,t}^c} \right)^{-\eta_c} C_{i,t}.$$

# Household problem (cont.) — First-order conditions

Bond and capital Euler equations:

$$1 = \beta\, E_t \frac{U^c_{i,t+1}}{U^c_{i,t}} \frac{R^n_{i,t}}{\pi_{i,t+1}},$$

$$1 + \varphi_i\, \xi^{UIP}_{i,t} (B_{i1,t} - \bar{b}_i) = \beta\, E_t \frac{U^c_{i,t+1}}{U^c_{i,t}} \frac{R^n_{1,t}}{\pi_{1,t+1}} \frac{Q_{i1,t+1}}{Q_{i1,t}} \quad \text{if } i \neq 1,$$

$$1 = \beta\, E_t \frac{U^c_{i,t+1}}{U^c_{i,t}} \frac{r^k_{i,t+1} u_{i,t+1} + (1-\delta_k) Q^k_{i,t+1}}{Q^k_{i,t}},$$

with marginal utility

$$U^c_{i,t} = (C_{i,t} - hC_{i,t-1})^{-\sigma} - \beta h\, E_t (C_{i,t+1} - hC_{i,t})^{-\sigma}.$$

The wedge $\varphi_i\, \xi^{UIP}_{i,t} (B_{i1,t} - \bar{b}_i)$ is the deviation from uncovered interest parity; the UIP shock scales it.

## Balance of payments

From the foreign household's budget constraint, the change in net foreign assets equals the trade balance:

$$B_{i1,t} + \frac{\varphi_{i,t}}{2}\left(B_{i1,t} - \bar{b}_i\right)^2 - B_{i1,t-1}\frac{Q_{i1,t}}{Q_{i1,t-1}}\frac{R^n_{1,t-1}}{\pi_{1,t}} = EX_{i,t} - IM_{i,t}, \qquad \varphi_{i,t} \equiv \varphi_i\, \xi^{UIP}_{i,t}.$$

Exports and imports aggregate across the three end uses:

$$EX_{i,t} = p_{ii,t}\left(Y_{i,t} - C_{ii,t} - I^s_{ii,t} - I_{ii,t}\right),$$
$$IM_{i,t} = \sum_{j \neq i} p_{ij,t}\left(C_{ij,t} + I^s_{ij,t} + I_{ij,t}\right).$$

Resource constraint: gross output is absorbed by consumption, materials purchases, fixed investment, and utilization costs, summed across destinations. Domestic bonds are in zero net supply outside the U.S.; U.S. bonds clear globally.

# Model — Price setting and dominant-currency pricing

**Production chain:** country good $Y_{i,t} \to$ wholesale retailers (differentiate by destination; *all* sticky prices live here) $\to$ final retailers (competitive) $\to$ end uses $C$, $M$, $I$ (tariffs enter here).

**Country good:** $Y_{i,t}$ is CES in value added (Cobb-Douglas in utilized capital and labor) and materials $M_{i,t}$; real marginal cost $mc_{i,t}$ is the matching CES aggregate of $p^v_{i,t}$ and $p^m_{i,t}$.

**Wholesale retailers** set prices subject to Rotemberg costs, $\kappa_i$ at home and $\kappa^*_i$ on exports. The domestic Phillips curve:

$$(\pi_{ii,t} - 1)\pi_{ii,t} = \frac{\varepsilon - 1}{\kappa_i}\left[mc_{i,t}\frac{\varepsilon}{\varepsilon - 1} - p_{ii,t}\right] + \beta E_t \Lambda_{i,t+1}(\pi_{ii,t+1} - 1)\pi_{ii,t+1}\frac{X_{ii,t+1}}{X_{ii,t}}.$$

**Dominant-currency pricing:** both sides of U.S. trade are priced in sticky dollars.

- U.S. exports, $\kappa^*_1 = 0$: law of one price, $Q_{ij,t}\, p_{ji,t} = p_{ii,t}$, so U.S. export prices inherit the domestic dollar stickiness.
- Foreign exports to the U.S., $\kappa^*_2$ large: sticky *dollar* prices,

$$(\pi_{ji,t} - 1)\pi_{ji,t} = \frac{\varepsilon - 1}{\kappa^*_i}\left[mc_{i,t}\frac{\varepsilon}{\varepsilon - 1} - Q_{ij,t}\, p_{ji,t}\right] + \beta E_t \Lambda_{i,t+1}(\pi_{ji,t+1} - 1)\pi_{ji,t+1}\frac{X_{ji,t+1}}{X_{ji,t}}.$$

When tariffs hit, foreign exporters cannot cut dollar prices to absorb them $\Rightarrow$ near-complete pass-through, as in 2018–19.

**Calibration:** $\varepsilon = 6$, $\kappa = \kappa^*_2 = \kappa_w = 500 \Rightarrow$ Phillips-curve slope $(\varepsilon - 1)/\kappa \approx 0.01$.

## Model — End-use bundles and the Armington structure

One Armington structure for all three uses, $x \in \{c, m, I\}$:

$$Z^x_{i,t} = \left( \sum_j (\omega^x_{ij})^{1/\eta_x} \left( (1 - \Psi^x_{ij,t}) Z^x_{ij,t} \right)^{\frac{\eta_x - 1}{\eta_x}} \right)^{\frac{\eta_x}{\eta_x - 1}},$$

with import adjustment costs $\Psi$:

$$\Psi^x_{ij,t} = \frac{\psi^x_{ij}}{2} \left( \frac{Z^x_{ij,t}}{Z^x_{ij,t-1}} \cdot \frac{Z^x_{ii,t-1}}{Z^x_{ii,t}} - 1 \right)^2.$$

**Where tariffs enter.** For consumption and capital, the source-$j$ price is the cum-tariff price:

$$p^c_{ij,t} = \tau^c_{ij,t}\, p_{ij,t}, \qquad p^I_{ij,t} = \tau^I_{ij,t}\, p_{ij,t}.$$

For materials, $p^m_{ij,t}$ is pinned down by the inventory block.

# Model — Inventories in imported materials

Following Auclert, Rognlie, and Straub (2025), imported materials come off a shelf. For each source $j$, a **materials firm** chooses the flow drawn off the shelf $\tilde{M}_{ij,t}$ and the stock $S_{ij,t}$:

$$\max \; E_t \sum_{s \geq t} \beta^{s-t} \Lambda_{i,t,s} \left[ p^m_{ij,s} M_{ij,s} - q^s_{ij,s} I^s_{ij,s} \right]$$

subject to

$$M_{ij,t} = \left[ (1-\chi_i)^{\frac{1}{\varepsilon_S}} \tilde{M}_{ij,t}^{\frac{\varepsilon_S - 1}{\varepsilon_S}} + \chi_i^{\frac{1}{\varepsilon_S}} S_{ij,t-1}^{\frac{\varepsilon_S - 1}{\varepsilon_S}} \right]^{\frac{\varepsilon_S}{\varepsilon_S - 1}}, \qquad I^s_{ij,t} = S_{ij,t} - (1-\delta_s) S_{ij,t-1} + \tilde{M}_{ij,t}.$$

The Euler equation for the stock:

$$q^s_{ij,t} = \beta E_t \Lambda_{i,t+1} \Big[ \underbrace{p^m_{ij,t+1} \, \chi_i^{1/\varepsilon_S} \left( \tfrac{M_{ij,t+1}}{S_{ij,t}} \right)^{1/\varepsilon_S}}_{\text{marginal product tomorrow}} + \underbrace{(1-\delta_s) \, q^s_{ij,t+1}}_{\text{resale value}} \Big].$$

An **inventory producer** buys goods at the tariff-inclusive price, with adjustment cost $\gamma_s$:

$$q^s_{ij,t} = \left( 1 + \gamma_s (I^s_{ij,t} - I^s_{SS}) \right) \tau^m_{ij,t} \, p_{ij,t}.$$

**Front-loading:** an announced rise in $\tau^m_{ij,t+1}$ raises $E_t \, q^s_{ij,t+1} \Rightarrow$ stock is worth more tomorrow $\Rightarrow$ build $S_{ij,t}$ today $\Rightarrow$ imported materials $I^s_{ij,t}$ jump *before* the tariff, then unwind.

# Model — Capital producers

Capital producers buy the investment bundle $I_{i,t}$ (the Armington aggregate with $x = I$, price $p^I_{i,t}$) and convert it into installed capital:

$$\max \; E_t \sum_{s \geq t} \beta^{s-t} \Lambda_{i,t,s} \left[ Q^k_{i,s} I_{i,s} \, \xi^{MEI}_{i,s} - \left( I_{i,s} + \frac{\gamma_I}{2} \left( \frac{I_{i,s}}{I_{i,s-1}} - 1 \right)^2 I_{i,s} \right) p^I_{i,s} \right]$$

subject to

$$K_{i,t} = I_{i,t} \, \xi^{MEI}_{i,t} + (1 - \delta_k) K_{i,t-1}.$$

The first-order condition delivers the real price of capital:

$$Q^k_{i,t} \, \xi^{MEI}_{i,t} = \left( 1 + \frac{\gamma_I}{2} \left( \frac{I_{i,t}}{I_{i,t-1}} - 1 \right)^2 + \gamma_I \frac{I_{i,t}}{I_{i,t-1}} \left( \frac{I_{i,t}}{I_{i,t-1}} - 1 \right) \right) p^I_{i,t}$$
$$- \beta E_t \Lambda_{i,t+1} \gamma_I \left( \frac{I_{i,t+1}}{I_{i,t}} \right)^2 \left( \frac{I_{i,t+1}}{I_{i,t}} - 1 \right) p^I_{i,t+1}.$$

**Investment tariffs $\approx$ negative MEI shocks:** a higher $\tau^I_{ij,t}$ raises the bundle price $p^I_{i,t}$, so each unit spent buys less capital — the same wedge a fall in $\xi^{MEI}_{i,t}$ creates. Negative MEI shocks cut labor demand and marginal cost, so they are contractionary *and* deflationary (Justiniano et al., 2010).

# Model — Labor market, monetary policy, and GDP

**Labor:** unions set nominal wages under Rotemberg costs ($\kappa_w$) $\Rightarrow$ a wage Phillips curve that mirrors the price one, with the marginal rate of substitution in place of marginal cost; real wages are sluggish.

**Monetary policy:** inertial Taylor rule on four-quarter *domestic* inflation, as in Galí and Monacelli (2005):

$$\log R^n_{i,t} = (1-\rho_r)\log R_{SS} + \rho_r \log R^n_{i,t-1} + (1-\rho_r)\,\kappa_\pi \log\left(\pi^{4q}_{ii,t}\right) + \xi^m_{i,t}.$$

The rule responds to inflation in domestic goods, $\pi_{ii,t}$, not CPI: the direct effect of tariffs on consumer prices does not enter it.

**GDP** includes inventory investment, which is where front-loading shows up in 2025Q1:

$$GDP_{i,t} = C_{i,t} + I_{i,t} + \sum_j \Delta S_{ij,t} + NX_{i,t} = Y_{i,t} - \sum_j \tilde{M}_{ij,t}, \qquad \Delta S_{ij,t} \equiv I^s_{ij,t} - \tilde{M}_{ij,t}.$$

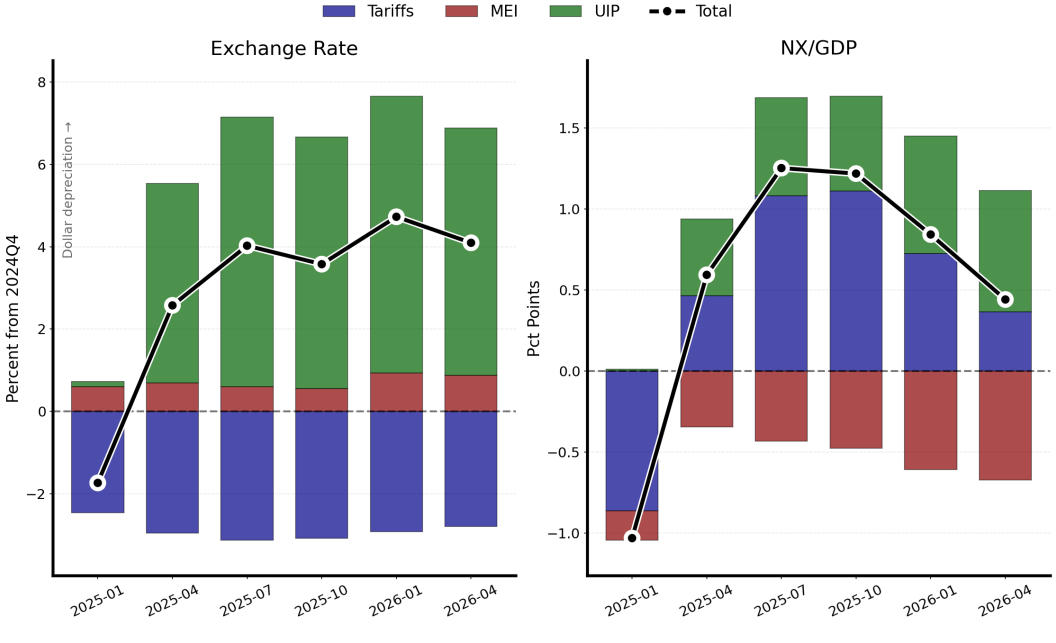
Data counterpart: $C + I^* + NX$, where $I^*$ is equipment, intellectual-property products, and the change in private inventories (structures and residential investment excluded).

# Full calibration

| Parameter | Value | Description / target |
|---|---|---|
| **Preferences** | | |
| $\beta$ | 0.99 | Discount factor |
| $\sigma$ | 1.00 | Inverse IES |
| $\varphi$ | 1.00 | Inverse Frisch |
| $h$ | 0.75 | Habit formation |
| **Technology** | | |
| $\nu$ | 0.40 | Materials share in production |
| $\alpha$ | 0.33 | Capital share in VA |
| $\varepsilon_Y$ | 1.00 | Elast. subst. VA / materials |
| $\varepsilon_k$ | 1.00 | Elast. subst. capital / labor |
| $\delta_k$ | 0.025 | Capital depreciation |
| $\gamma_I$ | 1.70 | Capital adj. cost, Gertler and Karadi (2011) |
| **Price setting** | | |
| $\varepsilon$ | 6.00 | Elasticity across varieties (20% markup) |
| $\kappa$ | 500 | Rotemberg, domestic (PC slope $\approx 0.01$) |
| $\kappa_2^*$ | 500 | Rotemberg, imports |
| $\kappa_1^*$ | 0 | Rotemberg, U.S. exports (DCP) |
| $\kappa_w$ | 500 | Rotemberg, wages |

| Parameter | Value | Description / target |
|---|---|---|
| **Trade** | | |
| $\eta_C = \eta_M = \eta_I$ | 5.00 | Trade elasticity |
| $\omega_{11}^C$ | 0.94 | Home bias, C (import share 6%) |
| $\omega_{11}^M$ | 0.91 | Home bias, M (import share 9%) |
| $\omega_{11}^I$ | 0.70 | Home bias, I (import share 30%) |
| $\psi^C = \psi^M = \psi^I$ | 2.00 | Import adj. cost (SR/LR elasticity $= 1/2$) |
| **Inventories** | | |
| $\chi$ | 0.0046 | Inventory share (inv./sales $= 1.5$ months) |
| $\varepsilon_S$ | 1.00 | Elasticity of substitution |
| $\gamma_s$ | 1.20 | Adjustment cost |
| $\delta_s$ | 0.00 | Inventory depreciation |
| **Monetary policy, shocks, country size** | | |
| $\rho_r$ | 0.75 | Smoothing |
| $\kappa_\pi$ | 1.50 | Taylor coefficient on $\pi^{4q}$ |
| $\rho$ | 0.95 | Persistence of tariff / MEI / UIP shocks |
| $n_1$, $n_2$ | 0.25, 0.75 | Population share, U.S. / RoW |

# Drivers of the exchange rate and net exports



## Two-sector extension

**Robustness:** the one-sector model underpredicts the pickup in capital-goods imports. Add an AI sector.

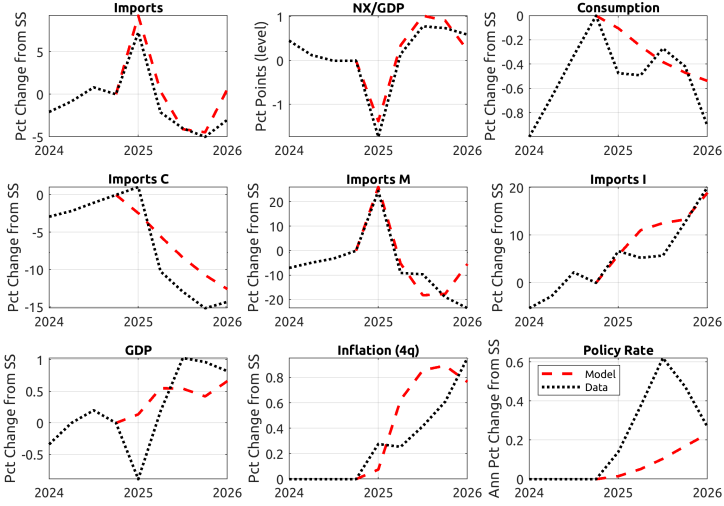
**Structure:**

- Traditional sector + AI sector (data-center / compute operators).
- AI capital is far more import-intensive: import share of investment about 70% vs. about 25%.
- MEI shocks concentrated in the AI sector.
- AI sector largely shielded from 2025 tariffs — the exemption pattern in Waugh (2026).

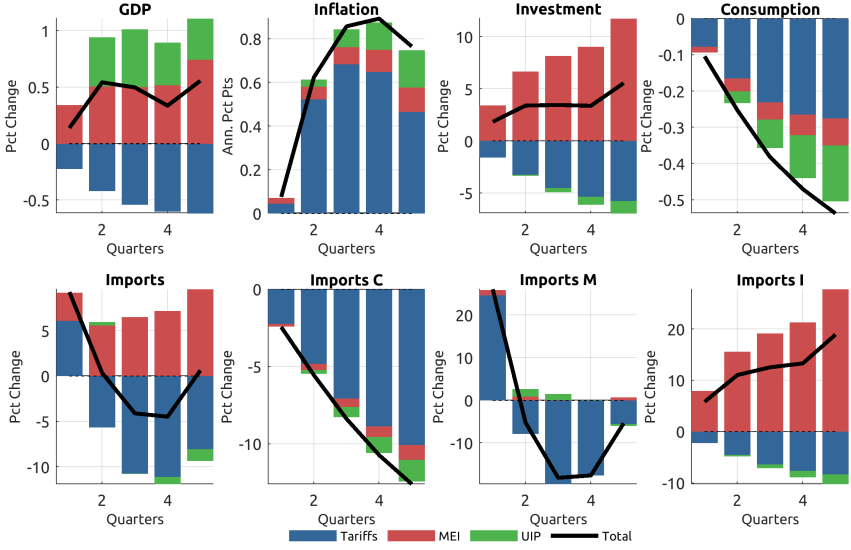
**Results:**

- Same calibration strategy delivers C, M, and I imports in line with the data.
- Fit of the other variables is unchanged; main insights unchanged.

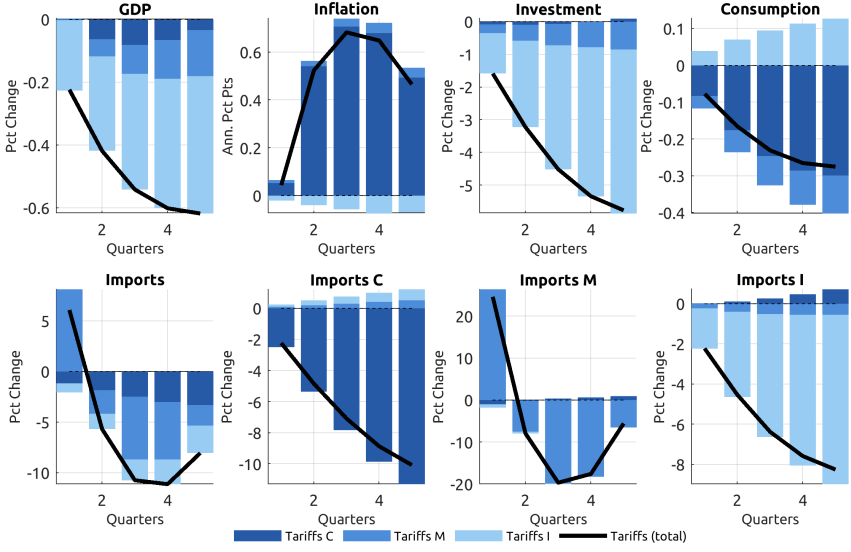
# Two-sector model — Fit



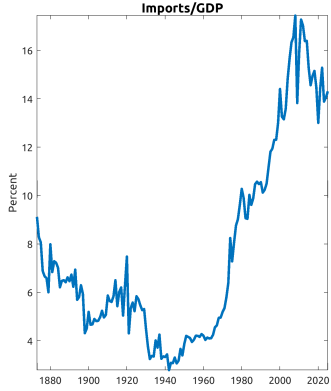
# Two-sector model — Shock decomposition

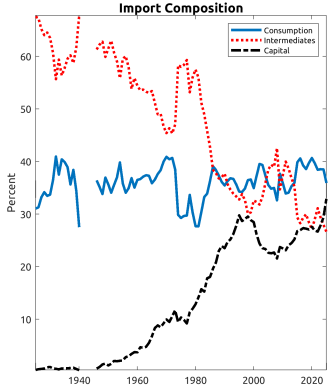


# Two-sector model — Inside the tariff shock



# 150 years of U.S. imports — More open, and more capital goods...

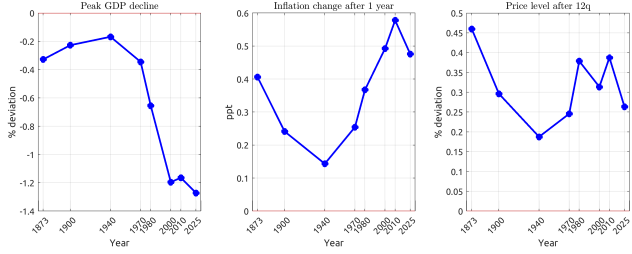



- Imports/GDP: from about 4% in the 1940s to about 15% today. Capital share of imports: from near zero to about 30%.

# Same 10% tariff, different economy — Output cost tripled, inflation stable...

Recalibrate the model to each year's import/GDP ratio and end-use composition; feed in a common 10% tariff.




- **Output:** openness and the tilt toward capital goods reinforce each other — the output cost of a broad tariff has more than tripled since WWII.
- **Inflation:** openness raises the impulse, the capital tilt dampens it — roughly a wash.
- Rationalizes time-series evidence that tariffs are contractionary and, postwar, often deflationary (Den Besten, Barnichon, Känzig, and Singh, 2026; Schmitt-Grohé and Uribe, 2025).