The Missing Trade Collapse: Tariffs, AI-Driven Investment, and the Resilience of U.S. Imports*

Francesco Ferrante, Andrea Prestipino, Andrea Raffo, Michael Waugh

March 2026
PRELIMINARY DRAFT

Abstract

U.S. import tariffs in 2025 rose to levels not seen since the Great Depression. Yet, U.S. imports also *increased*. We develop a 2-country New-Keynesian model with tariffs, AI-shocks to investment, and inventories of imported inputs. The model accounts for the missing trade collapse as well as for the resilience of the U.S. macroeconomic performance. Absent the AI-driven investment boom, imports would have declined nearly 15 percent and overall economic activity would have weakened substantially. Tariffs on imported consumer goods and intermediates are stagflationary, whereas tariffs on investment goods are contractionary and *deflationary*. We characterize the transmission mechanisms underlying these contrasting effects.

JEL classification: E12, E52, F13, F41

Keywords: International Trade, Tariffs, Open Economy Macroeconomics, AI Boom

*Ferrante: Federal Reserve Board (francesco.ferrante@frb.gov); Prestipino: Federal Reserve Board (andrea.prestipino@frb.gov); Raffo: Federal Reserve Bank of Minneapolis (andrea.raffo@mpls.frb.org); Waugh: Federal Reserve Bank of Minneapolis (michael.waugh@mpls.frb.org). The views in this paper are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System, or of any other person associated with the Federal Reserve System.

1 Introduction

U.S. tariffs on imports jumped about 10 percentage points in 2025, returning to levels not seen since the Great Depression. Yet, as shown in figure (1), U.S. imports *increased*. These developments are difficult to explain from the perspective of economic theory and the historical evidence. Standard trade theory implies that large increases in trade frictions should be associated with large declines in trade volumes.[1] Empirically, a large literature has studied, for example, the large effects of the Smoot-Hawley tariffs on imports during the Great Depression, and, more recently, the decline in imports from China in response to the tariff policies enacted in 2018-2019.[2]

In this paper, we investigate the puzzle of the missing trade collapse in a New Keynesian open-economy framework that builds on the contributions of Galí and Monacelli (2005) and Corsetti, Dedola and Leduc (2010). Relative to these authors, we assume a richer trade structure that allows for trade in consumption goods, investment goods, and intermediates and we introduce inventory accumulation following Auclert, Rognlie and Straub (2025). We consider two main shocks, namely (anticipated) tariff changes and shocks to the marginal efficiency of investment (MEI) to capture an AI-driven investment boom. This parsimonious framework can account for the dynamics of trade and the other U.S. macroeconomic variables–including output, inflation, and interest rates–remarkably well. Once a disturbance to the uncovered interest parity is added, the behavior of the dollar is also reproduced, without greatly affecting the fit of the model.

The richer trade structure is motivated by the observation that the 10 percentage points increase in U.S. aggregate import tariffs masks a great deal of variation in tariff rates and import dynamics across goods categories. As shown in Figure (2), tariffs on imported consumer goods increased more than 15 percentage points, tariffs on intermediate goods increased about 10 percent, whereas tariffs on imported capital

[1] Benchmark models a la Backus, Kehoe and Kydland (1992), Eaton and Kortum (2002), and Melitz (2003) would deliver such outcomes.

[2] See, for instance, Crucini and Kahn (1996) for an analysis of the macroeconomic effects of the trade war that erupted during the Great Depression.

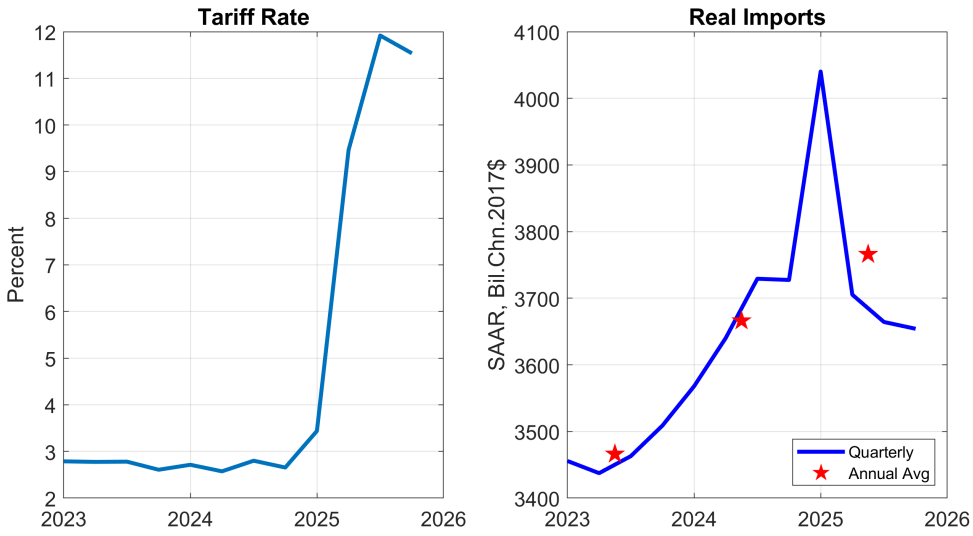


Figure 1: Average U.S. Tariff Rate and Real Imports

Notes: The left panel shows the average effective tariff rate on U.S. goods imports (percent). The right panel shows total real goods imports (seasonally adjusted at annual rates, billions of chained 2017 dollars); red markers denote annual averages. Tariff rates are from authors' calculations using USITC data. Import data are from the U.S. Census Bureau via Haver Analytics. Sample: 2023:Q1–2025:Q4.

goods increased about 5 percentage points, with many categories associated with AI investment experiencing very small tariff increases.[3] The response of imports was also heterogenous across these categories, with consumer goods imports declining, intermediate goods imports roughly flat, and imports of capital goods increasing over the course of 2025.

In our model, inventory accumulation in imported intermediates accounts for the observed behavior of imported intermediate inputs, with the large front-loading in anticipation of tariff increases, and the AI-driven boom in investment accounts for the increase in imported investment goods. The importance of inventory management in

[3]In 2025, semiconductors and key electronics (smartphones, computers, flat-panel displays, and related AI hardware) were explicitly carved out from the IEEPA reciprocal tariff regime introduced in April via Executive Order 14257, exempting them from both the country-specific elevated rates and the baseline 10 percent universal tariff.

international trade is well documented (see, for instance, Alessandria, Kaboski and Midrigan (2010)). Because of the more severe frictions of international transactions, firms involved in international trade tend to hold a larger stock of inventories. Adjustment in the stock of inventories in anticipation of adverse shocks causes large front-loading effects.

Turning to the broader macroeconomic effects of trade policies, a key insight from our analysis is that they critically depend on the type of imported good taxed. Tariffs on consumption goods cause a small contraction in GDP and a relatively large increase in inflation, as tariffs are quickly passed through to import prices and agents substitute from imported to domestically produced goods. Tariffs on intermediates have modest effects on both GPD and inflation. Tariffs on investment goods cause large declines in output and are *deflationary* because of their severe dampening of investment and labor demand.[4] To further illustrate this point, we conduct a counterfactual experiment in which the increase in tariffs is uniform across consumption, investment, and intermediate goods. In such scenario, investment would have declined nearly twice as much as in the baseline tariff, leading to substantially weaker GDP and markedly lower inflation.

We leverage the quantitative success of the model to decompose the effects of tariff changes and other shocks on macroeconomic dynamics. Tariff increases alone would have generated stagflationary effects, reducing GDP by about 1 percent while raising inflation by approximately 0.7 percentage points. As in Justiniano, Primiceri and Tambalotti (2010) and Raffo (2010), the MEI shocks cause offsetting expansionary effects, increasing absorption, production, and inflation. Shocks to the exchange rate, i.e. UIP shocks, modestly boost GDP and inflation by causing net exports and imported goods prices to rise.

We show that our results are robust to including in the model a multi-sector structure with an AI sector heavily dependent on imported inputs. This extended framework improves the model's ability to match the boom in AI investment and capital imports over 2025.

All told, our results underscore that the resilience of the U.S. economy in 2025

[4]Intuitively, tariffs on investment goods are similar to an adverse MEI shock.

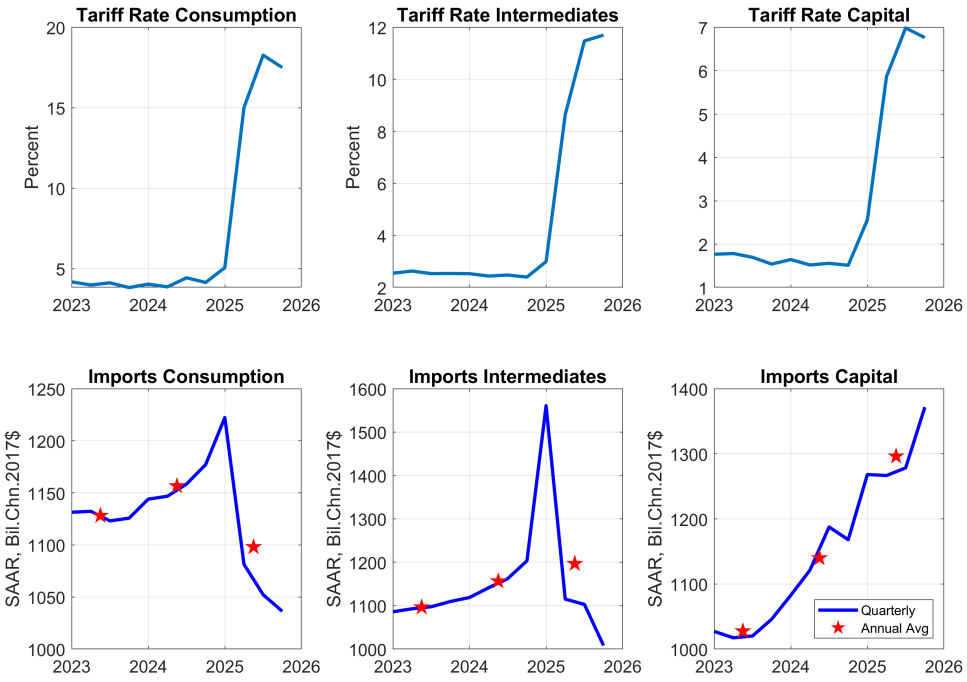


Figure 2: U.S. Tariff Rates and Real Imports by End-Use Category

Notes: The top row plots the average ad valorem tariff rate (percent) on U.S. imports of consumption goods (left), intermediate goods (center), and capital goods (right). Tariff rates are computed from USITC DataWeb HTS-6 level data mapped to end-use categories via the UN BEC Rev. 5 correspondence. The bottom row plots the corresponding real imports at a seasonally adjusted annual rate in billions of chained 2017 dollars. Annual averages are shown as red markers. See the Data Appendix for details on the construction of these series.

owed much to the confluence of the AI investment boom and the particular structure of tariff increases. Absent the AI-driven surge in investment demand for import-intensive capital goods, our model implies that imports would have declined nearly 15 percent and overall economic activity would have weakened substantially. The experience of 2025 thus illustrates both the power of anticipation effects in shaping trade dynamics and the critical role that sectoral heterogeneity plays in determining the macroeconomic consequences of large trade policy shocks.

2 Model

We develop a two-country New Keynesian open economy (NKOE) model to analyze the international transmission of tariff shocks and their effects on trade flows and macroeconomic outcomes.

There are 2 countries, indexed by i, j, each specialized in the production of one good with a technology that uses labor, capital, and materials. Country 1 represents the US whereas country 2 is the Rest of the World. Households consume a bundle of domestic and foreign final goods, supply labor to labor unions that set wages subject to nominal rigidities, and accumulate wealth through holdings of domestic bonds, US bonds, and domestic capital. The materials used in production are a bundle of domestic and imported materials, and we allow inventory accumulation in materials, which enables firms to smooth production in response to anticipated tariff-induced price changes and generates realistic dynamics in import flows. Investment in the capital stock also uses a bundle of domestic and imported goods. All imports can be subject to tariffs. We now describe the problem of each agent in the economy.

2.1 Household Problem

Households in country i choose consumption $C_{i,t}$ and savings. They can save in government bonds in each country, $\{\tilde{B}_{i,j}\}_{j=1,2}$, and in domestic capital, $K_{i,t}$. Households in country i solve:

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

$$s.t.$$

$$\begin{aligned} & P_{i,t}^c C_{i,t} + e_{ii,t}\tilde{B}_{ii,t} + e_{i1,t}\tilde{B}_{i1,t} + P_{i,t}^c \frac{\varphi_i \xi_{it}^{UIP}}{2} \left(\frac{e_{i1,t}\tilde{B}_{i1,t}}{P_{1,t}^c} - \bar{b}_i \right)^2 + \tilde{Q}_{i,t}^k K_{i,t} \\ \leq \; & \tilde{W}_{i,t} L_{i,t} + \tilde{B}_{ii,t-1} R_{i,t}^n + B_{i1,t-1} e_{i1,t} R_{1,t}^n + \tilde{\Pi}_{i,t} + \tilde{T}_{it} + \left[\tilde{r}_{i,t}^k + (1-\delta)\, \tilde{Q}_{i,t}^k \right] K_{i,t-1} \end{aligned}$$

where $P^c_{i,t}$ is the price of the consumption bundle $e_{ij,t}$ is the nominal exchange rate (price of good from country j in country i, so that $\varepsilon_{ii,t} = 1$), $\tilde{W}_{i,t}$ are nominal wages, $\tilde{r}^k_{i,t}$ is the nominal rental rate of capital, $\tilde{Q}^k_{,t}$ is the nominal price of capital , and $\tilde{\Pi}_{i,t}$ are nominal profits. We assume that US (country 1) bonds are the only asset traded internationally subject to quadratic bond adjustment costs. The term ξ^{UIP}_{it} for $i \neq 1$, is a UIP shock which affects the foreing demand for US assets.

We can rewrite the budget constraint in real terms as

$$\begin{aligned} & C_{i,t} + B_{ii,t} + B_{i1,t} + \frac{\varphi_{i,t}}{2}\left(B_{i1,t} - \bar{b}_i\right)^2 + Q^k_{i,t}K_{i,t} \\ \leq \;& w_{i,t}L_{i,t} + B_{ii,t-1}\frac{R^n_{i,t}}{\pi_{i,t}} + B_{i1,t-1}\frac{Q_{i1,t}}{Q_{i1,t-1}}\frac{R^n_{1,t}}{\pi_{1,t}} + \Pi_{i,t} + T_{i,t} + r^k_{i,t} + (1-\delta)\,Q^k_{i,t}K_{i,t-1} \end{aligned}$$

where $B_{ij,t} = \frac{\tilde{B}_{ij,t}e_{ij,t}}{P^c_{i,t}}$ are real bonds, $Q_{i1,t} = \frac{e_{i1,t}P^c_{1,t}}{P^c_{i,t}}$ is the real exchange rate of country i, $w_{i,t}$ is the real wage, $r^k_{i,t}$ is the real rental rate of capital, $Q^k_{i,t}$ is the real price of capital, $T_{i,t}$ are real taxes, and $\pi_{i,t} = \frac{P^c_{i,t}}{P^c_{i,t-1}}$ is CPI inflation.

The first order conditions for bond holdings and capital are

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

$$1 + \varphi_i \xi^{UIP}_{it}\left(B_{i1,t} - \bar{b}_i\right) = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}}\frac{R^n_{1,t}}{\pi_{1,t+1}}\frac{Q_{i1,t+1}}{Q_{i1,t}} \quad \text{if } i \neq 1 \tag{2}$$

$$1 = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}}R^k_{i,t+1} = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}}\frac{\left(r^k_{i,t+1} + (1-\delta)\,Q^k_{i,t+1}\right)}{Q^k_{i,t}} \tag{3}$$

where

$$U^c_{i,t} = \left(C_{i,t} - hC_{i,t-1}\right)^{-\sigma} - \beta h\left(C_{i,t+1} - hC_{i,t}\right)^{-\sigma} \tag{4}$$

2.2 Labor Unions

Labor unions set wages subject to Rotemberg adjustment costs $\frac{\kappa^w}{2}\left(\frac{W_{i,t}}{W_{i,t-1}}-1\right)^2$. Their optimization problem implies a standard wage Phillips curve

$$\pi^w_{i,t}(\pi^w_{i,t}-1)=\frac{(\varepsilon^w-1)}{\kappa^w}\left[\frac{\varepsilon^w}{(\varepsilon^w-1)}\frac{\bar{\varphi}L^{\varphi}_{i,t}}{U^c_{i,t}}-w_{i,t}\right]+\beta E_t\Lambda_{i,t,t+1}\pi^w_{i,t+1}(\pi^w_{i,t+1}-1)\frac{L_{i,t+1}}{L_{i,t}} \quad (5)$$

where $\pi^w_{i,t}=\frac{w_{i,t}}{w_{i,t-1}}\pi_{i,t}$.

2.3 Bundles of Consumption, Investment and Materials

The consumption, investment and materials bundles are CES functions of domestic and imported goods

$$C_{i,t}=\left(\sum_{j=1}^{N}\left(\omega^c_{ij}\right)^{\frac{1}{\eta_c}}\left(C_{ij,t}\right)^{\frac{\eta_c-1}{\eta_c}}\right)^{\frac{\eta_c}{\eta_c-1}} \quad \text{where } \sum_{j=1}^{N}\omega^c_{ij}=1 \quad (6)$$

$$I_{i,t}=\left(\sum_{j=1}^{N}\left(\omega^I_{ij}\right)^{\frac{1}{\eta_I}}\left(I_{ij,t}\right)^{\frac{\eta_I-1}{\eta_I}}\right)^{\frac{\eta_I}{\eta_I-1}} \quad \text{where } \sum_{j=1}^{N}\omega^I_{ij}=1 \quad (7)$$

$$M_{i,t}=\left(\sum_{j=1}^{N}\left(\omega^m_{ij}\right)^{\frac{1}{\eta_m}}\left(M_{ij,t}\right)^{\frac{\eta_m-1}{\eta_m}}\right)^{\frac{\eta_m}{\eta_m-1}} \quad \text{where} \quad \sum_{j=1}^{N}\omega^m_{ij}=1 \quad (8)$$

The consumption goods producers choose $C_{i,t}$ and $\{C_{ij,t}\}_{j=1,2}$ to maximize

$$\max P^c_{i,t}C_{i,t}-\sum_{j=1}^{N}P_{ij,t}\tau^c_{ij}C_{ij,t}$$

where $C_{ij,t}$ is the final consumption of goods in country i imported from country j, $P_{ij,t}$ is the (ex-tariff) price of exports from country j to country i, and τ^c_{ij} represents the tariff on these goods when used for final consumption.

The first order conditions imply the relative demand function

$$C_{ij,t} = \omega_{ij}^{c} \left(p_{ij,t}^{c}\right)^{-\eta_c} C_{i,t} \tag{9}$$

$$C_{i,t} = \left(\sum_{j=1}^{N} \left(\omega_{ij}^{c}\right)^{\frac{1}{\eta_c}} \left(C_{ij,t}\right)^{\frac{\eta_c - 1}{\eta_c}}\right)^{\frac{\eta_c}{\eta_c - 1}} \tag{10}$$

where $p_{ij,t} = \frac{P_{ij,t}}{P_{it}^{c}}$ is the (ex-tariff) real price of exports from country j to country i, and $p_{ij,t}^{c} = p_{ij,t}\tau_{ij}^{c}$ is the cum-tariff price.

A similar problem for investment goods and materials yields

$$I_{ij,t} = \omega_{ij}^{I} \left(\frac{p_{ij,t}^{I}}{p_{it}^{I}}\right)^{-\eta_I} I_{i,t} \tag{11}$$

$$I_{i,t} = \left(\sum_{j=1}^{N} \left(\omega_{ij}^{I}\right)^{\frac{1}{\eta_I}} \left(I_{ij,t}\right)^{\frac{\eta_I - 1}{\eta_I}}\right)^{\frac{\eta_I}{\eta_I - 1}} \tag{12}$$

$$M_{ij,t} = \omega_{ij}^{m} \left(\frac{p_{ij,t}^{m}}{p_{i,t}^{m}}\right)^{-\eta_m} M_{i,t} \tag{13}$$

$$M_{i,t} = \left(\sum_{j=1}^{N} \left(\omega_{ij}^{m}\right)^{\frac{1}{\eta_m}} \left(M_{ij,t}\right)^{\frac{\eta_m - 1}{\eta_m}}\right)^{\frac{\eta_m}{\eta_m - 1}} \tag{14}$$

where $p_{i,t}^{I} = \frac{P_{i,t}^{I}}{P_{i,t}^{c}}$, $p_{ij,t}^{I} = p_{ij,t}\tau_{ij}^{I}$ and $p_{i,t}^{m} = \frac{P_{i,t}^{m}}{P_{i,t}^{c}}$. Absent inventories, the price of imported materials is given by $p_{ij,t}^{m} = p_{ij,t}\tau_{ij}^{m}$. With inventories, this price has a forward looking formulation, as we discuss below.

2.3.1 Inventories of Materials

We introduce inventories in a tractable way following the approach of Auclert, Rognlie and Straub (2025). Materials used in production for a specific country pair are

produced by a materials producing firm with the following CES technology

$$M_{ij,t} = \left[(1-\chi_i)^{1/\varepsilon_S} \left(\tilde{M}_{ij,t} \right)^{\frac{\varepsilon_S - 1}{\varepsilon_S}} + \chi_i^{1/\varepsilon_S} \left(S_{ij,t-1} \right)^{\frac{\varepsilon_S - 1}{\varepsilon_S}} \right]^{\frac{\varepsilon_S}{\varepsilon_S - 1}} \tag{15}$$

where $\tilde{M}_{ij,t}$ is the use of inventories (flow), whereas $S_{ij,t-1}$ is the stock of inventories.

Inventories evolve according to

$$S_{ij,t} = S_{ij,t-1} + I^s_{ij,t} - \tilde{M}_{ij,t} \tag{16}$$

where $I^s_{ij,t}$ is inventories accumulation of domestic and foreign inputs whereas $\tilde{M}_{ij,t}$ captures the depletion of inventories.

Inventories of each intermediate input can be purchased from input retailers at a price $q^s_{ij,t}$. Hence, the per period profits of the materials producing firm are

$$\Pi^S_t = p^m_{ij,t} M_{ij,t} - q^s_{ij,t} I^s_{ij,t} \tag{17}$$

The materials producing firm problem then becomes:

$$\max_{\tilde{M}_{ij,t}, S_{ij,t}} E_t \sum_{s \geq t} \Lambda_{t,s} \Pi^S_s$$

subject to

$$\Pi^S_t = p^m_{ij,t} M_{ij,t} - q^s_{ij,t} \left[S_{ij,t} - (1-\delta_s) S_{ij,t-1} + \tilde{M}_{ij,t} \right]$$

$$M_{ij,t} = \left[(1-\chi_i)^{1/\varepsilon_S} \left(\tilde{M}_{ij,t} \right)^{\frac{\varepsilon_S - 1}{\varepsilon_S}} + \chi_i^{1/\varepsilon_S} \left(S_{ij,t-1} \right)^{\frac{\varepsilon_S - 1}{\varepsilon_S}} \right]^{\frac{\varepsilon_S}{\varepsilon_S - 1}} \tag{18}$$

Hence, the FOCs for $\tilde{M}_{ij,t}$ imply

$$\tilde{M}_{ij,t} = (1-\chi_i) \left(\frac{q^s_{ij,t}}{p^m_{ij,t}} \right)^{-\varepsilon_s} M_{ij,t} \tag{19}$$

and the FOC for $S_{ij,t}$ implies:

$$q_{ij,t}^{s} = E_t \Lambda_{t,t+1} \left[p_{ij,t+1}^{m} \left((\chi_i)^{1/\varepsilon_S} \left(\frac{M_{ij,t+1}}{S_{ij,t}} \right)^{\frac{1}{\varepsilon_S}} \right) + (1-\delta_s)\, q_{ij,t+1}^{s} \right] \tag{20}$$

Finally, for every country pair, inventory producers purchase inputs at price $\left(\tau_{ij,t}^{m} p_{ij,t}\right)$ and face convex adjustment costs $\Psi(I_t^s)\left(\tau_{ij,t}^{m} p_{ij,t}\right) = \frac{\gamma_s}{2}\left(I_t^s - I_{SS}^s\right)^2 \left(\tau_{ij,t}^{m} p_{ij,t}\right)$, and create inventories which are sold at price $q_{ij,t}^{s}$. The optimization problem is

$$\max E_t \sum_{t=0}^{\infty} \beta^t \Lambda_t \left[q_{ij,t}^{s} I_{ij,t}^{s} - \left(I_{ij,t}^{s} + \frac{\gamma_s}{2}\left(I_{ij,t}^{s} - I_{SS}^{s}\right)^2 \right) \left(\tau_{ij,t}^{m} p_{ij,t}\right) \right]$$

which implies

$$q_{ij,t}^{s} = \left(1 + \gamma_s \left(I_{ij,t}^{s} - I_{SS}^{s}\right)\right) \left(\tau_{ij,t}^{m} p_{ij,t}\right) \tag{21}$$

Absent inventories, that is with $\chi_i = 0$, we obtain $I_{ij,t}^{s} = \tilde{M}_{ij,t} = M_{ij,t}$ and $p_{ij,t}^{m} = q_{ij,t}^{s} = \tau_{ij,t}^{m} p_{ij,t}$.

2.4 Retailers

Final retailers

Final retailers buy differentiated goods $X_{ijt}(s)$ from wholesale retailers, aggregate them into a country specific final good X_{ijt} with a CES production function

$$X_{ij,t} = \left[\int \left(X_{ij,t}(s) \right)^{\frac{\varepsilon-1}{\varepsilon}} ds \right]^{\frac{\varepsilon}{\varepsilon-1}} \tag{22}$$

and sell the country specific final good to final consumption goods producers, investment goods producers and inventory producers (or intermediate goods producers absent inventories), that is:

$$X_{ij,t} = C_{ij,t} + I_{ij,t} + I_{ij,t}^{s} \tag{23}$$

where $I_{ij,t}^{s} = M_{ij,t}$ in the absence of inventories. They are competitive and choose

$X_{ij,t}$ and $X_{ij,t}(s)$ to solve

$$\max P_{ijt}X_{ij,t} - \int P_{ij,t}(s)\, X_{ij,t}(s)\, ds \tag{24}$$

subject to (22) which implies

$$X_{ij,t}\left(\frac{P_{ij,t}(s)}{P_{ij,t}}\right)^{-\varepsilon} = X_{ij,t}(s) \tag{25}$$

Wholesale retailers

Wholesale retailers buy their country specific intermediate good Y_{it}, transform it one for one into a differentiated good $X_{ijt}(s)$, and sell it to final retailers in their country and in the foreign country.

Wholesale retailers maximize real profits subject to Rotemberg cost on adjusting the nominal price of their good.

Wholesale retailer selling at home choose the price and quantity of their good, $P_{ii,t}(s)$, and $X_{iit}(s)$ to solve

$$\max \sum \beta^t \Lambda_{t,t+i}\Pi^f_{it+i} = \sum \beta^t \Lambda_{t,t+i}\left[P_{ii,t}(s) - MC_{i,t}\right]\frac{X_{iit}(s)}{P^c_{it}} - \frac{\kappa}{2}\left(\frac{P_{ii,t}(s)}{P_{ii,t-1}(s)} - 1\right)^2 X_{ii,t}$$

$$s.t.$$

$$X_{ii,t}\left(\frac{P_{ii,t}(s)}{P_{ii,t}}\right)^{-\varepsilon} = X_{ii,t}(s) \tag{26}$$

Optimization implies the following Phillips curve for the domestic good in country i:

$$(\pi_{ii,t} - 1)\,\pi_{ii,t} = \frac{\varepsilon - 1}{\kappa}\left[mc_{i,t}\frac{\varepsilon}{\varepsilon - 1} - p_{ii,t}\right] + \beta E_t \Lambda_{t,t+1}(\pi_{ii,t+1} - 1)\,\pi_{ii,t+1}\frac{X_{ii,t+1}}{X_{ii,t}} \tag{27}$$

where

$$\pi_{ii,t} = \frac{P_{ii,t}}{P_{ii,t-1}} = \frac{p_{ii,t}}{p_{ii,t-1}}\frac{P^c_{it-1}}{P^c_{it}} = \frac{p_{ii,t}}{p_{ii,t-1}}\frac{1}{\pi_{it}} \tag{28}$$

and $mc_{i,t} = \frac{MC_{i,t}}{P^c_{i,t}}$ are real marginal costs.

Wholesale retailers selling abroad choose the ex-tariff price of their export in foreign currency $P_{ji,t}(s)$, and the quantity of their exports $X_{jit}(s)$ to solve

$$\max \sum \beta^t \Lambda_{t,t+i} \left[e_{ij,t} P_{ji,t}(s) - MC_{i,t} \right] \frac{X_{jit}(s)}{P_{it}^c} - \frac{\kappa_i^*}{2} \left(\frac{P_{ji,t}(s)}{P_{ji,t-1}(s)} - 1 \right)^2 X_{jit}$$

$$s.t.$$

$$X_{jit} \left(\frac{P_{ji,t}(s)}{P_{ji,t}} \right)^{-\varepsilon} = X_{jit}(s) \tag{29}$$

The FOCs imply

$$(\pi_{ji,t} - 1)\pi_{ji,t} = \frac{\varepsilon - 1}{\kappa_i^*} \left[mc_{i,t} \frac{\varepsilon}{\varepsilon - 1} - Q_{ij,t} p_{ji,t} \right] + \beta E_t \Lambda_{i,t+1} (\pi_{ji,t+1} - 1)\pi_{ji,t+1} \frac{X_{jit+1}}{X_{jit}} \text{ for } i = 1..N \tag{30}$$

where

$$\pi_{ji,t} = \frac{P_{ji,t}}{P_{ji,t-1}} = \frac{p_{ji,t}}{p_{ji,t-1}} \frac{P_{jt-1}}{P_{jt}} = \frac{p_{ji,t}}{p_{ji,t-1}} \frac{1}{\pi_{jt}} \tag{31}$$

2.5 Country Specific Intermediate Good Production

The country specific good $Y_{i,t}$ is produced in country i using a combination of value added $V_{i,t}$ and materials $M_{i,t}$ according to a CES technology

$$Y_{i,t} = A_{i,t} \left[(1 - \nu_i)^{1/\varepsilon_Y} (V_{i,t})^{\frac{\varepsilon_Y - 1}{\varepsilon_Y}} + \nu_i^{1/\varepsilon_Y} (M_{i,t})^{\frac{\varepsilon_Y - 1}{\varepsilon_Y}} \right]^{\frac{\varepsilon_Y}{\varepsilon_Y - 1}} \tag{32}$$

where the parameter ν_i captures the share of materials in total production in country i, and the variable $A_{i,t}$ captures exogenous TFP.

Letting $P_{i,t}^V$ and $P_{i,t}^M$ be the prices of value added and materials, the producers of the country specific good choose $Y_{i,t}, V_{it}$, and M_{it} to solve

$$\max MC_{i,t} Y_{i,t} - P_{i,t}^v V_{i,t} - P_{i,t}^m M_{i,t}$$

s.t. (32). The FOCs imply

$$M_{i,t} = \nu_i \left(\frac{p^m_{i,t}}{mc_{i,t}} \right)^{-\varepsilon_Y} Y_{i,t} \left(A_{i,t} \right)^{\varepsilon_Y - 1} \tag{33}$$

$$V_{i,t} = (1 - \nu_i) \left(\frac{p^v_{i,t}}{mc_{i,t}} \right)^{-\varepsilon_Y} Y_{i,t} \left(A_{i,t} \right)^{\varepsilon_Y - 1} \tag{34}$$

where $p^v_{it} = \frac{P^v_{i,t}}{P^C_{it}}$ and $p^m_{it} = \frac{P^m_{i,t}}{P^C_{it}}$.

In addition, these FOCs imply

$$MC_{i,t} = \left[(1 - \nu_i) \left(\frac{p^v_{i,t}}{A_{i,t}} \right)^{1-\varepsilon_Y} + \nu_i \left(\frac{p^m_{i,t}}{A_{i,t}} \right)^{1-\varepsilon_Y} \right]^{\frac{1}{1-\varepsilon_Y}}$$

2.5.1 Value Added Production

We assume value added is produced with a CES of labor and capital as

$$V_{i,t} = \left[(1 - \alpha_{it})^{1/\varepsilon_k} \left(L_{i,t} \right)^{\frac{\varepsilon_k - 1}{\varepsilon_k}} + (\alpha_{it})^{1/\varepsilon_k} \left(K_{i,t-1} \right)^{\frac{\varepsilon_k - 1}{\varepsilon_k}} \right]^{\frac{\varepsilon_k}{\varepsilon_k - 1}} \tag{35}$$

The optimization problem is to choose $V_{i,t}, L_{i,t}$, and $K_{i,t-1}$ to solve

$$\max P^v_{i,t} V_{i,t} - W_{i,t} L_{i,t} - r^k_{i,t} K_{i,t-1} \tag{36}$$

subject to (35) .

The first order conditions for labor and capital are

$$r^k_{i,t} = p^v_{i,t} \left(\alpha_{it} \frac{V_{i,t}}{K_{i,t-1}} \right)^{\frac{1}{\varepsilon_k}} \tag{37}$$

$$w_{i,t} = p^v_{i,t} \left((1 - \alpha_{it}) \frac{V_{i,t}}{L_{i,t}} \right)^{\frac{1}{\varepsilon_k}} \tag{38}$$

which imply with the CES production function

$$p_{i,t}^{v}=\left[\left(1-\alpha_{it}\right)\left(w_{i,t}\right)^{1-\varepsilon_{k}}+\alpha_{it}\left(r_{i,t}^{k}\right)^{1-\varepsilon_{k}}\right]^{\frac{1}{1-\varepsilon_{k}}} \tag{39}$$

2.6 Capital Producers

Capital producers create capital using the investment good as input and face convex adjustment costs $\Psi(\frac{I_t}{I_{t-1}})=\frac{\gamma_I}{2}\left(\frac{I_t}{I_{t-1}}-1\right)^2$ proportional to total investment. If we define q_{it}^k as the real price of capital, the optimization problem is

$$\max E_t\sum_{t=0}^{\infty}\beta^t\Lambda_t\left[q_{it}^k I_{it}\xi_{i,t}^{MEI}-\left(I_{it}+\frac{\gamma_I}{2}(\frac{I_{it}}{I_{it-1}}-1)^2 I_{it}\right)p_{it}^I\right]$$

subject to

$$K_{it}=I_{it}\xi_{i,t}^{MEI}+\left(1-\delta\right)K_{it-1} \tag{40}$$

where $\xi_{i,t}^{MEI}$ is a shock to the marginal efficiency of investment.

The first order condition for investment implies

$$q_{it}^k\xi_{i,t}^{MEI}=\left(1+\frac{\gamma_I}{2}(\frac{I_{it}}{I_{it-1}}-1)^2+\gamma_I\frac{I_{it}}{I_{it-1}}(\frac{I_{it}}{I_{it-1}}-1)\right)p_{it}^I-\beta E_t\Lambda_{i,t,t+1}\gamma_I\left(\frac{I_{it+1}}{I_{it}}\right)^2(\frac{I_{it+1}}{I_{it}}-1)p_{it+1}^I \tag{41}$$

2.7 Monetary Policy

The central bank follows an inertial Taylor rule responding to domestic inflation and output growth:

$$\log R_{i,t}^n=\left(1-\rho_{r,i}\right)\log R_{SS}+\rho_{r,i}\log R_{i,t-1}^n+\left(1-\rho_{r,i}\right)\left(\kappa_{\pi,i}\log\left(\pi_{i,t}^{4q}\right)\right)+\xi_{i,t}^m \tag{42}$$

where $\pi_{i,t}^{4q}$ is four-quarter CPI inflation and $\xi_{i,t}^m$ is a monetary policy shock.

2.8 Market Clearing

The aggregate resource constraint for country i requires

$$Y_{i,t} = \sum_{j=1}^{N} \frac{n_j}{n_i} C_{ji,t} + \sum_{j=1}^{N} \frac{n_j}{n_i} I^s_{ji,t} \; + \sum_{j=1}^{N} \frac{n_j}{n_i} I_{ji,t} + G_{i,t} \quad \text{for } i = 1, \ldots, N \tag{43}$$

where n_i is the population of country i.

The domestic bond market clearing for countries $i \neq 1$ is

$$B_{ii,t} = 0 \tag{44}$$

and the market clearing for US bonds is

$$\sum_{i=1}^{N} B_{i1,t} = 0 \tag{45}$$

Using the foreign country household budget constraint we can derive a balance of payment equation

$$B_{i1t} + \frac{\varphi_{it}}{2} \left(B_{i1t} - \bar{b}_i \right) - B_{i1t-1} \frac{Q_{i1t}}{Q_{i1t-1}} \quad \frac{R^n_{1t}}{\pi_{1t}} = EX_{it} - IM_{it} \tag{46}$$

where exports and imports are

$$EX_{it} = Y_{i,t} p_{ii,t} - p_{ii,t} C_{ii,t} - I^s_{ii,t} p_{ii,t} - p_{ii,t} I_{ii,t} \tag{47}$$

$$IM_{it} = \sum_{j \neq i}^{N} p_{ij,t} C_{ij,t} + \sum_{j \neq i}^{N} I^s_{ij,t} p_{ij,t} + \sum_{j \neq i}^{N} p_{ij,t} I_{ij,t}$$

Finally, we define real GDP in country i as

$$GDP_{i,t} = C_{i,t} + I_{i,t} + \sum_{j=1}^{N} \left(\Delta S_{ij,t} \right) + NX_{i,t} = Y_{i,t} - \sum_{j=1}^{N} \tilde{M}_{ij,t} \tag{48}$$

where $NX_{i,t}$ are net exports and $\Delta S_{ij,t} \equiv I^s_{ij,t} - M_{ij,t}$ is the change in inventories of inputs from country j . The second equality follows from goods market clearing: value added equals gross output minus total intermediate input usage.

3 Quantitative Experiments

3.1 Calibration

Table 1 reports the calibration for our baseline model. Most of the parameters are standard from the literature. We calibrate the home bias paramaters to match the share of imported goods in consumption, material and investment. Importantly, capital goods have a larger share of imported inputs, making them more exposed to tariffs. We calibrate the trade elasticity to 5, a standard value in macro literature, and we set the trade adjustment costs to have a relationship between short run and long run trade elasticities in line with the evidence in Boehm, Levchenko and Pandalai-Nayar (2023). The inventory parameters are set to obtain an inventory/sales ratio around 1.5, in line with the data, and to calibrate the elasticity of this ratio to tariff news in line with the target used by Auclert et al. (2025). We assume dominant currency pricing, by having $\kappa^*_1 = 0$, in line with evidence in Gopinath, Boz, Casas, Díez, Gourinchas and Plagborg-Møller (2020).

Table 1: Baseline Calibration

Parameter	Value	Description	Target/Source
Preferences			
β	0.99	Discount factor	Standard
σ	1.00	Inverse IES	Standard
φ	1.00	Inverse Frisch elasticity	Standard
h	0.75	Habit formation	Standard
Technology			
ν	0.40	Materials share in production	Standard
α	0.33	Capital share in value added	Standard
ε_Y	1.00	Elast. subst. value added/materials	Standard
ε_k	1.00	Elast. subst. capital/labor	Standard
δ_k	0.025	Capital depreciation rate	Standard
γ_I	1	Capital adjustment cost	Standard
Price Setting			
ε	6.00	Elast. subst. across varieties	20% SS markup
κ	500	Rotemberg cost domestic sales	0.01 Slope of Phillips Curve
κ_2^*	500	Rotemberg cost imports	0.01 Slope of imports Phillips Curve
κ_1^*	0	Rotemberg cost exports	Dominant Currency Pricing
κ_w	500	Rotemberg cost wages	0.01 Slope of Wage Phillips Curve
Trade			
$\eta_c = \eta_m = \eta_i$	5.00	Trade Elasticity	Standard
$\omega_{c,11}$	0.93	Home bias consumption (US)	Import Share of Consumption Goods
$\omega_{m,11}$	0.90	Home bias materials (US)	Import Share of Materials
$\omega_{i,11}$	0.70	Home bias investment (US)	Import Share of Capital Goods
ψ_{imp}	2.50	Import adjustment cost	SR trade elasticity =1/3 LR elasticity
Inventories			
χ	0.0046	Inventory share in materials	SS inventories=1.5 monthly sales
ε_S	1.00	Elast. subst. inventories/new purchases	Auclert et al. (2025)
γ_s	1.20	Inventory adjustment cost	see text
Monetary Policy			
ρ_r	0.75	Interest rate smoothing	Standard
κ_π	1.5	Taylor rule coeff. on inflation	Standard
Shock Persistence			
ρ_τ	0.95	Tariff persistence	see text
ρ_{MEI}	0.95	MEI shock persistence	see text
ρ_{UIP}	0.95	UIP shock persistence	see text
Country Sizes			
n_1	0.25	Population share (US)	Standard
n_2	0.75	Population share (RoW)	Standard

3.2 Interpreting the 2025 data

In this section we evaluate the model's ability to replicate the behavior of several macroeconomic variables over 2025. We feed into the model three sets of shocks: (i) tariff shocks to τ_{12}^c, τ_{12}^m, and τ_{12}^i, which are perfectly anticipated in 2025Q1; (ii)

a series of MEI shocks capturing the AI investment boom; and (iii) a series of UIP shocks affecting the exchange rate. These shocks are calibrated to jointly match (i) the path of tariff rates reported in Figure 2, (ii) the path of aggregate investment over 2025, and (iii) the path of the real exchange rate over 2025.

Figure 3 reports the model's performance. The target variables are shown in the top row, while the remaining panels display the model's predictions for several untargeted macroeconomic variables. The model performs remarkably well along multiple dimensions. First, the model successfully captures the behavior of aggregate imports, which remain stable despite the large tariff increases. This aggregate stability masks substantial heterogeneity across import categories. In anticipation of future tariffs, endogenous inventory dynamics cause imports of materials to jump considerably in 2025Q1, consistent with the observed front-loading in the data. Imports of capital goods, which face relatively lower tariffs, increase over the year, driven by the investment boom. In contrast, imports of consumption goods decline steadily throughout the year in response to the high tariffs they face. Second, the model replicates key features of domestic activity. Consumption declines by approximately 0.4 percent, matching the data closely. Net exports initially plummet in Q1, driven by the import front-loading, before rising as imports subsequently decline. The behavior of inventories follows a symmetric trajectory—building up sharply in Q1 and then gradually unwinding. Overall, GDP increases by about 1 percent by the end of 2025, in line with observed data. The model also generates an increase in inflation (about 1 percentage point above baseline) and in the policy rate (about 25 basis points above steady state by year-end). These model-implied changes are comparable to the difference between the actual 2025 values for inflation and the Fed Funds rate and their forecasts in the September 2024 Summary of Economic Projections—the last projections made before the 2024 U.S. Presidential Election.

To understand the relative importance of the different forces at play, Figure 4 decomposes the contributions of the three main shocks. Tariff shocks alone have a stagflationary effect: GDP declines by about 1 percent while inflation increases by roughly 0.7 percentage points. The tariffs also depress imports over the year, though the anticipation effect in Q1 generates an initial spike in material imports through

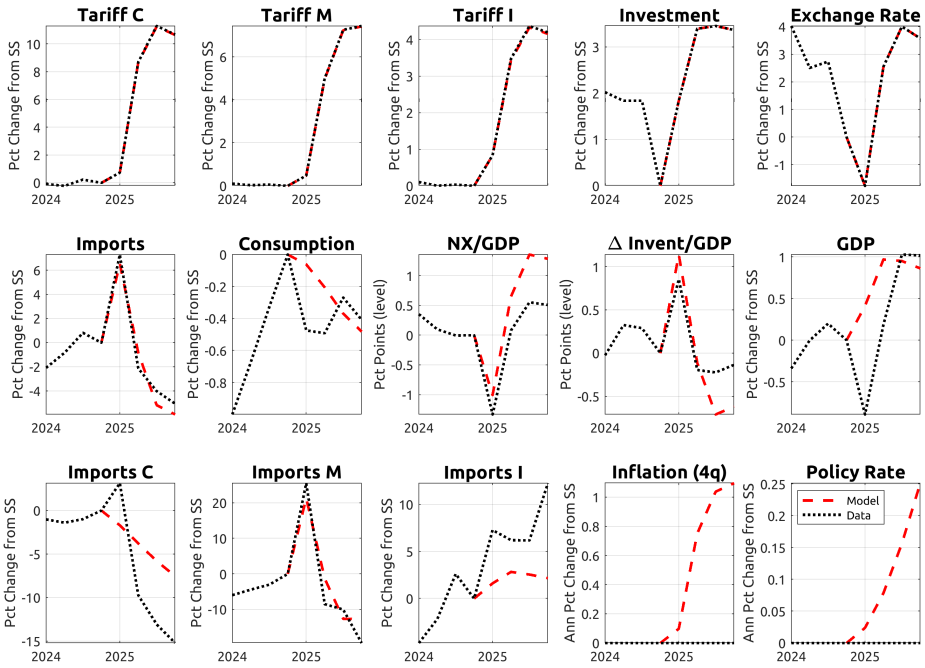


Figure 3: U.S. Data vs Model

Notes: The figure reports the impulse responses of the model when using tariff shocks, MEI shocks and UIP shocks to match the behavior of the variables in the top row. In the data, tariff rates, the exchange rate, NX/GDP, inventories/GDP, are normalized to zero in 2024Q4. All other variables are log deviations from a linear trend (constructed using data from 2015Q1 to 2019Q4) normalized to zero in 2024Q4. A higher value of the exchange rate variable indicates a depreciation of the broad US dollar.

inventory front-loading. The MEI shocks, capturing the AI-driven investment boom, have strongly expansionary effects on GDP and imports while contributing modestly to inflation. The UIP shocks, which generate the observed exchange rate depreciation, provide additional support to GDP through expenditure-switching effects and contribute to inflationary pressures through import price increases.

Figure 5 further decomposes the effects of the three types of tariffs in our model. While all tariffs are contractionary, their macroeconomic impacts differ substantially. Tariffs on capital goods generate the largest negative effect on GDP, as they induce a

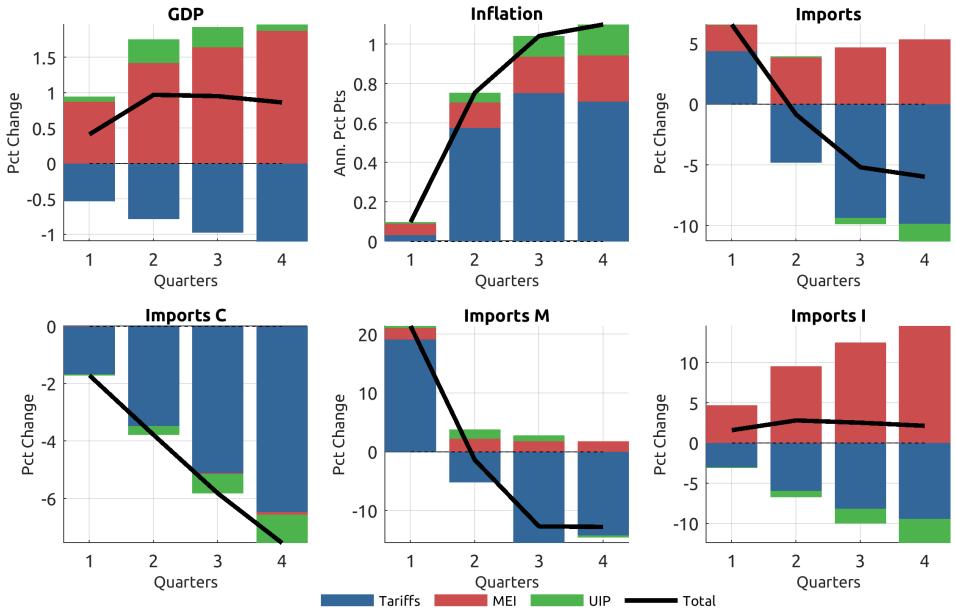


Figure 4: Shock Decomposition

Notes: The figure decomposes the effects of specific shocks from the exercise in figure (3).

substantial decline in investment. This finding aligns with the results in Baqaee and Malmberg (2025), who emphasize the particularly harmful long-run effects of tariffs on investment goods. Turning to inflation, tariffs on consumption goods emerge as the primary driver of the 2025 price acceleration, directly raising the cost of final goods purchased by households. Interestingly, unlike tariffs on consumption and materials, tariffs on capital goods have a *deflationary* effect. This counterintuitive result arises because these tariffs severely depress investment demand, reducing labor demand and putting downward pressure on wages and marginal costs. Regarding imports, while the three types of tariffs have similar negative effects by the end of the year, tariffs on materials generate a particularly large spike in Q1 due to the inventory front-loading mechanism.

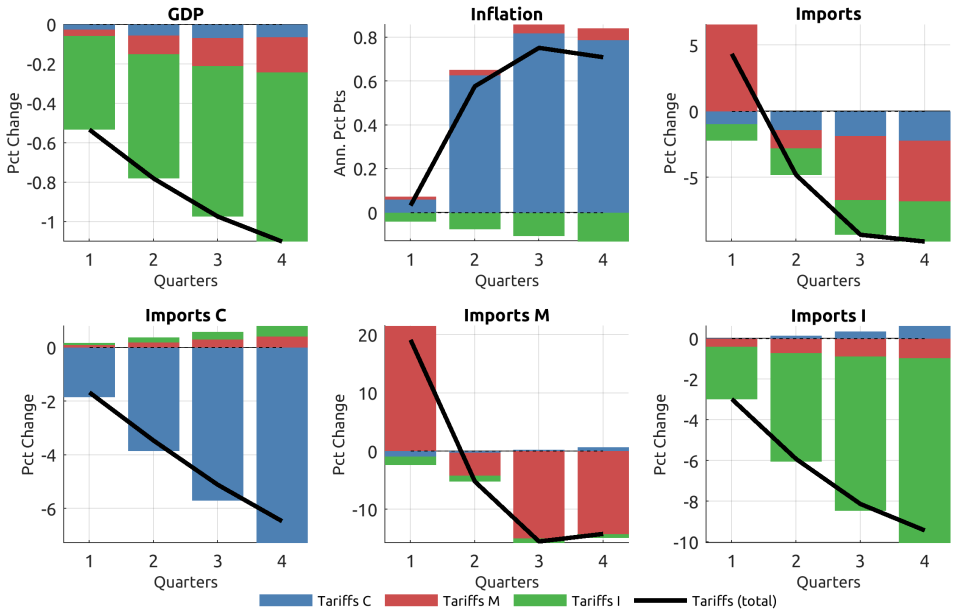


Figure 5: Shock Decomposition: Tariffs Shocks

Notes: The figure decomposes the effects of specific shocks from the exercise in figure (3).

3.3 Counterfactual Exercises

We now examine the role of two key model features—inventories and the distribution of tariffs across goods categories—for our main results. These counterfactual exercises highlight the mechanisms that allow the model to account for the "missing trade collapse" of 2025.

Figure 6 illustrates the critical role of inventory dynamics. The blue solid line replicates our baseline model with inventories, while the red dashed line shows results from a version of the model without inventories. The differences are stark. Absent inventories, the model cannot generate the front-loading of material imports observed in 2025Q1, which was responsible for the aggregate import spike that quarter. Without the ability to stockpile materials ahead of tariff increases, imports of materials decline immediately and persistently. Consequently, aggregate imports fall sharply from the outset rather than displaying the initial surge followed by a gradual decline seen in the data. The GDP effects are also notably different: without the inventory-

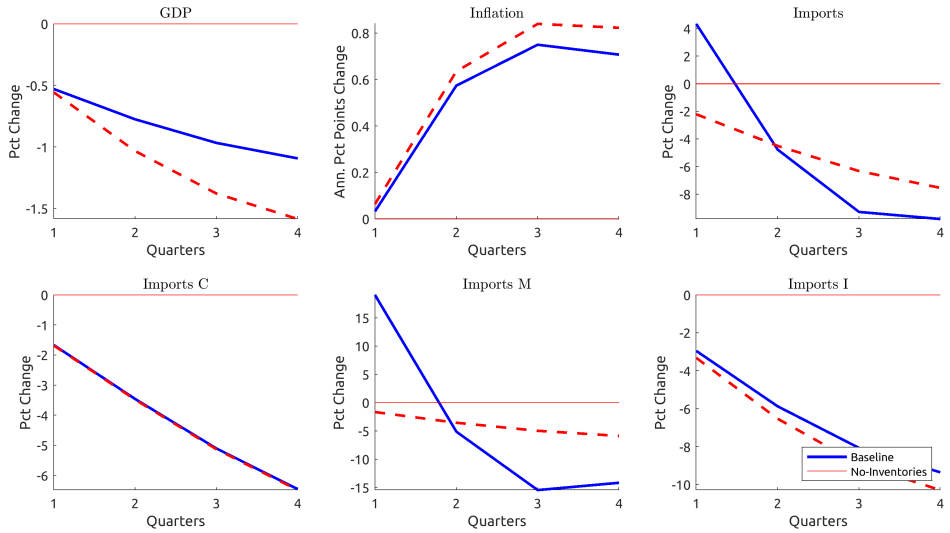


Figure 6: Tariff Shocks and Inventories

Notes: The figure compares the effect of the tariff shocks used in figure (3) in our baseline model and in a model without inventories.

driven import boom supporting production in Q1, the contractionary effects of tariffs manifest more strongly from the beginning. These results underscore that inventory accumulation is not merely a smoothing device but a first-order determinant of the short-run response of trade flows to anticipated tariff changes.

Figure 7 demonstrates that the distribution of tariffs across consumption, materials, and investment goods is equally crucial for understanding 2025 macroeconomic dynamics. The blue solid line shows our baseline calibration using the actual heterogeneous tariff paths, while the red dashed line presents a counterfactual in which all tariff rates increase by the same amount—equal to the average tariff path in 2025. This alternative scenario implies substantially higher duties on investment goods and moderately lower duties on consumption goods, with materials tariffs remaining roughly unchanged. The macroeconomic consequences are pronounced. Investment declines almost twice as much under uniform tariffs, leading to a significantly weaker path for GDP. The output decline is approximately 1.5 percent by year-end, compared to a 1 percent *increase* in the baseline. The inflation dynamics also differ

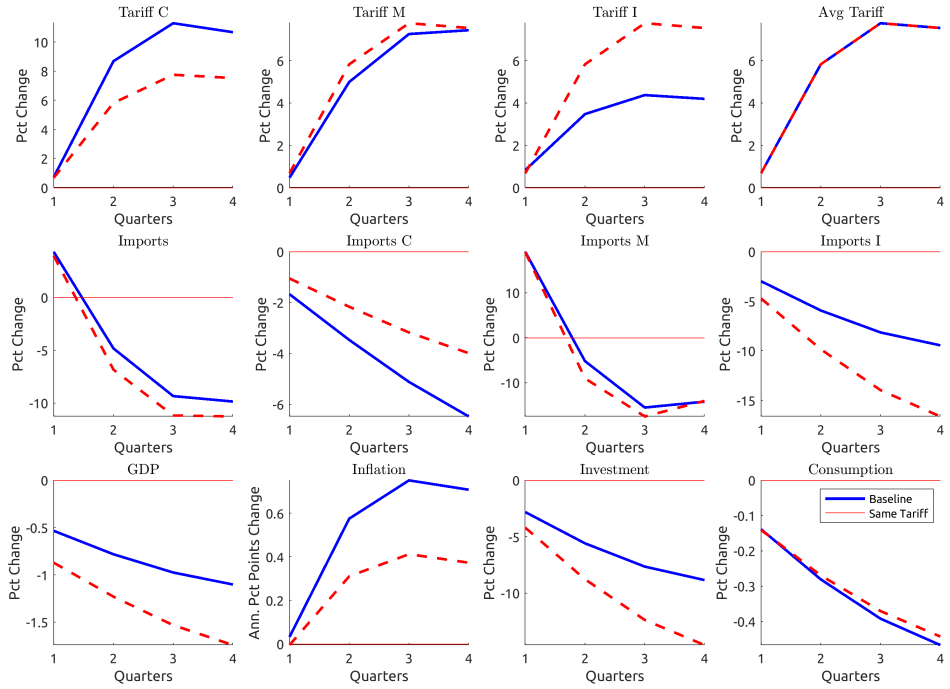


Figure 7: Alternative Distribution of Tariff Shocks

Notes: The figure compares the effect of the tariff shocks used in figure (3) in our baseline model (blue solid line) with a simulation in which all tariff rates are assumed to increase by the same amount (red dashed line).

markedly. The stronger deflationary effect of higher capital tariffs, combined with the smaller inflationary impulse from lower consumption tariffs, results in an increase in CPI inflation that is only about half as large as in the baseline. This counterfactual underscores a key insight: the fact that U.S. tariff increases in 2025 were concentrated on consumption and intermediate goods, while remaining relatively moderate on capital goods, was essential for limiting the macroeconomic damage and allowing the AI investment boom to support aggregate activity.

4 Extension: Two-Sectors Model

The AI investment boom of 2025 was not uniform across all types of capital. Rather, the surge in investment was particularly concentrated in equipment, especially information technology products, which grew by almost 20 percent above trend. This sectoral concentration has important implications for trade dynamics, as different types of capital goods have vastly different import intensities.

To capture these sectoral dynamics, we extend our baseline model to include two distinct sectors. The first sector represents traditional non-AI investment, which accounts for approximately 80 percent of aggregate investment and features a relatively low import share of around 10 percent for both materials and investment goods. The second sector represents AI-related investment (primarily IT equipment and related capital goods), which has a substantially higher import share of approximately 40 percent, consistent with the data on computer and electronic equipment. This sectoral heterogeneity allows us to study how the concentration of the investment boom in the import-intensive AI sector amplifies the effects on trade flows.

Figure 8 presents the results from this two-sector extension. We repeat the main exercise from Figure 3, now applying the MEI shock exclusively to the AI sector to capture the concentrated nature of the investment boom. The model continues to match the targeted variables in the top row (tariff paths, aggregate investment, and the exchange rate). For most aggregate variables—GDP, consumption, net exports, and inflation—the two-sector model produces results that are qualitatively and quantitatively similar to the one-sector baseline. However, the extended model delivers a notably better fit for the dynamics of capital goods imports. Specifically, the two-sector model captures the sharp spike in capital imports in early 2025 and their sustained strength throughout the year more accurately than the baseline specification. This improvement occurs because the MEI shock in the AI sector generates a large increase in demand for highly import-intensive capital goods, amplifying the trade response. These results suggest that sectoral heterogeneity in import intensity is an important driver of trade dynamics during 2025 and that the concentration of the AI boom in import-intensive sectors played a key role in preventing a trade

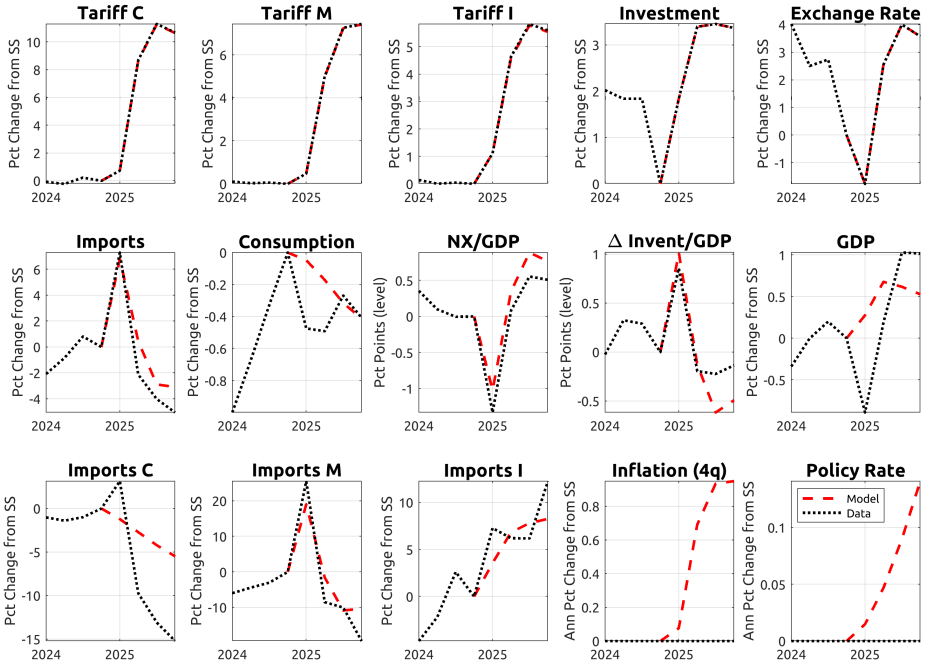


Figure 8: U.S. Data vs Model: Two-Sectors Model

Notes: The figure reports the impulse responses of our extended model with 2 sectors, when using tariff shocks, MEI shocks and UIP shocks to match the behavior of the variables in the top row. In the data, tariff rates, the exchange rate, NX/GDP, and inventories/GDP are normalized to zero in 2024Q4. All other variables are log deviations from a linear trend (constructed using data from 2015Q1 to 2019Q4) normalized to zero in 2024Q4. A higher value of the exchange rate variable indicates a depreciation of the broad US dollar.

collapse despite large tariff increases.

5 Conclusion

U.S. tariff rates in 2025 rose to levels not seen since the Great Depression, yet U.S. imports increased rather than collapsed. This paper resolves this puzzle through the lens of a two-country New Keynesian model with tariffs on consumption goods, intermediate inputs, and capital goods. Three features are essential for understand-

ing the missing trade collapse. First, the anticipation of tariff increases in early 2025 triggered substantial inventory accumulation, particularly in imported materials, generating a front-loading of imports that offset subsequent declines. Second, the AI-driven investment boom created strong demand for capital goods, which faced relatively moderate tariffs compared to consumption and intermediate goods. Third, the heterogeneous distribution of tariffs across goods categories mattered critically for both trade flows and macroeconomic outcomes.

Our quantitative analysis shows that the model successfully accounts for the behavior of imports and key macroeconomic aggregates throughout 2025. The counterfactual exercises reveal that absent inventories, the model cannot generate the observed spike in material imports in the first quarter. Moreover, had tariff increases been uniform across all goods categories rather than concentrated on consumption and intermediates, investment would have declined nearly twice as much, leading to a substantially weaker path for GDP and markedly lower inflation.

The paper highlights an important asymmetry in the macroeconomic effects of tariffs. While tariffs on consumption goods and intermediates are stagflationary—raising inflation and reducing output—tariffs on capital goods exhibit a deflationary effect. This arises because investment tariffs depress capital and labor demand, putting downward pressure on wages and marginal costs. This finding has important implications for understanding the aggregate effects of trade policy and suggests that the composition of tariff protection is a first-order consideration for macroeconomic stabilization.

Our results underscore that the resilience of the U.S. economy in 2025 owed much to the confluence of the AI investment boom and the particular structure of tariff increases. Absent the AI-driven surge in investment demand for import-intensive capital goods, our model implies that imports would have declined nearly 15 percent and overall economic activity would have weakened substantially. The experience of 2025 thus illustrates both the power of anticipation effects in shaping trade dynamics and the critical role that sectoral heterogeneity plays in determining the macroeconomic consequences of large trade policy shocks.

References

Alessandria, George, Joseph P. Kaboski, and Virgiliu Midrigan, "The Great Trade Collapse of 2008-09: An Inventory Adjustment?," *IMF Economic Review*, 2010, *58* (2), 254–294.

Auclert, Adrien, Matthew Rognlie, and Ludwig Straub, "The Macroeconomics of Tariff Shocks," December 2025. Working Paper, Stanford University, Northwestern University, and Harvard University.

Backus, David K., Patrick J. Kehoe, and Finn E. Kydland, "International Real Business Cycles," *Journal of Political Economy*, 1992, *100* (4), 745–775.

Baqaee, David and Hannes Malmberg, "Long-run effects of trade wars," Technical Report, National Bureau of Economic Research 2025.

Boehm, Christoph E., Andrei A. Levchenko, and Nitya Pandalai-Nayar, "The Long and Short (Run) of Trade Elasticities," *American Economic Review*, 2023, *113* (4), 861–905.

Corsetti, Giancarlo, Luca Dedola, and Sylvain Leduc, "Optimal Monetary POlicy in Open Economies," *Handbook in Monetary Economics*, 2010, *1*, 861–933.

Crucini, Mario and James Kahn, "Tariffs and aggregate economic activity: Lessons from the Great Depression," *Journal of Monetary Economics*, 1996, *38* (3), 427–467.

Eaton, Jonathan and Samuel Kortum, "Technology, Geography, and Trade," *Econometrica*, 2002, *70* (5), 1741–1779.

Galí, Jordi and Tommaso Monacelli, "Monetary Policy and Exchange Rate Volatility in a Small Open Economy," *The Review of Economic Studies*, 2005, *72* (3), 707–734.

Gopinath, Gita, Emine Boz, Camila Casas, Federico J Díez, Pierre-Olivier Gourinchas, and Mikkel Plagborg-Møller, "Dominant currency paradigm," *American Economic Review*, 2020, *110* (3), 677–719.

Justiniano, Alejandro, Giorgio E Primiceri, and Andrea Tambalotti, "Investment shocks and business cycles," *Journal of Monetary Economics*, 2010, *57* (2), 132–145.

Melitz, Marc, "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica*, 2003, *71* (6), 1695–1725.

Raffo, Andrea, "Technology Shocks: Novel Implications for International Business Cycles," 2010.